Alcohol use Among Adolescents in Europe

Environmental Research and Preventive Actions

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Foreword

Since 2006 the European Commission launched a Communication that outlines a strategy to support member states in reducing alcohol-related harms. This strategy not only explicitly focuses on protecting young people, it also aims to develop and maintain a common evidence base at the EU level. The European Commission actively contributes to develop this evidence base, by funding research that can help attain the goals as set out by Europe's Alcohol Strategy. The report *Alcohol use Among Adolescents in Europe: Environmental Research and Preventive Actions* is one outcome of these investments and the result of three years of dedicated collaborative work of a cross-national and interdisciplinary research team.

Alcohol policy is a challenging topic for the European Union, and the health message on alcohol has never been greater than today. This health voice is of particular importance given also the rise in problematic alcohol consumption among young people (i.e. underage drinking and heavy episodic drinking) over the past years. Young people are particularly at risk of short term effects of drunkenness, including accidents and violence. While several studies exist that monitor alcohol and substance use from a European perspective (e.g. ESPAD, HBSC), the pathways that lead to problematic and underage drinking are not always well understood. This research complements these studies by focusing on the risk and protective factors of alcohol use. Through objective analysis the researchers have tried to provide a comprehensive overview of risk factors in different domains and on different levels, while at the same time investigating the variation in these relationships between the different European countries.

I believe that this report provides valuable insights and is an excellent resource for policymakers, practitioners, and researchers who work on the topic of prevention of adolescent alcohol use.

Philippe Roux
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Executive Summary

In the contemporary context of globalization, nations can no longer make their alcohol policies in an international vacuum. Several organizations have come to the foreground in handling alcohol policy from a cross-national perspective, of which the most important one is the World Health Organization. Since 2001 also the EU itself has engaged itself in this sphere of public health, and since 2006 the European Commission has distributed a communication that sets out an alcohol strategy to support member states in reducing alcohol related harm. Not only does the EU alcohol strategy explicitly aims to protect young people from alcohol misuse and its harmful consequences, it also sets as one of its five priority themes the development and maintenance of a common evidence base at the EU level. It is in this regard that the current seventh framework programme 'Alcohol use Among Adolescence Prevention Program' (AAA-Prevent) should be framed, that is, as a means to attain these goals for its member states based on the 'knowledge triangle' of research, education, and innovation.

The starting point of this study was the observation that the consumption of alcohol among young people has risen over the past years, and that especially problematic drinking (i.e. underage drinking and heavy episodic drinking) is an issue of growing importance. As drinking patterns only start to develop from adolescence onwards, and strongly determine later drinking habits, tackling these problems necessary asks for a focus on prevention. However, given the unequal allocation of funds in the advantage of treatment and harm reduction programs in most European countries, the impression arises that programs that focus on prevention are much less valued among politicians and policy makers. In this study, we investigate some of the potentials of alcohol prevention by focusing on both person-related and structure-related antecedents of alcohol use as well as on guidelines and examples of good practices in prevention programs.

Alcohol in Europe

To investigate the projects' objectives we made use of the International Self-Report Delinquency study or ISRD-2 (2006), a cross-national dataset of European countries that surveyed also adolescents' alcohol and substance use patterns (aged 12 to 16 years old). The analyses revealed that alcohol use is quite common among European adolescents, although clear differences were observed between the various countries. Overall, 60.4% of the adolescents have been drinking beer, wine and breezers at least once in their lifetime and 34.2% have been drinking spirits. The last month prevalence rates are were nearly half, respectively 28.1% and 13.5%. The prevalence rates for heavy episodic drinking are 28.1% for beer, wine and breezers and 13.5% for spirits. These results are congruent with previous cross-national studies, such as the ESPAD study.

When comparing the different countries, the following conclusions can be made. The highest lifetime prevalence rates of alcohol use for beer, wine, and breezers were found among Eastern European countries, led by Estonia (85.7%), followed by Hungary (84.7%), Czech Republic (84.2%), and Lithuania (81.7%). The lowest prevalence rates for lifetime use was found in Iceland (21.6%), and Bosnia & Herzegovina (30.9%).The country ranking for last month prevalence of beer, wine & breezers differs only minimally with Hungary leading (45.9%), followed by Estonia (44.6%), and Denmark (39.8%). The rates for use during the last four weeks were lowest for Bosnia & Herzegovina (7.5%), followed by Iceland (9.3%). The country rankings were quite similar for spirits.

The analyses indicated high prevalence rates in heavy episodic drinking of beer, wine and breezers in mainly Northern, Western and Anglo-Saxon countries. The highest prevalence rates are observed in Ireland (26.1%), Finland (25.5%), Denmark (22.2%), the Netherlands (19.2%), and Germany (16.7%). Low prevalence rates are observed in Armenia (2.9%), France (3.9%), Iceland (4.4%), Bosnia & Herzegovina (4.9%) and in other countries that border the Mediterranean Sea. The binge drinking prevalence rates for spirits are quite similar. The only exception now is that some countries that border the Baltic Sea (Estonia, 19.9%; Lithuania, 11.4%; and Poland, 11.9%) now complement Ireland (16.7%), and Denmark (15.2%) as the top ranking countries with the highest prevalence rates of heavy episodic drinking. The lowest rates of heavy episodic drinking (spirits) were found in Armenia (1.5%), Bosnia & Herzegovina (1.6%), and Iceland (1.6%).

Risk factors of problematic drinking

A first principal aim of the project is to focus on the multifaceted etiology of alcohol use. In health research, scientists have traditionally focused on what may be called social-cognitive theories, to explain differences in alcohol and substance use. As the umbrella denominator of these theories suggests, these theories pay attention to the question of how cognitive structures (i.e. self-control, self-esteem, attitudes, et cetera) determine adolescents' alcohol and substance use. This tendency to focus on the most proximal risk factors is also illustrated in alcohol prevention practices, where it is observed that most attention is focused at strengthening the individual (i.e. individual prevention), for instance, by working on the development and consolidation of the necessarily skills to manage emotiveness and interpersonal relationships, to resist social pressures, and to prevent and/or delay the use of tobacco, alcohol, and other psychoactive substances.

One of the main criticisms on this strand of research is however that little attention is paid to the social and contextual environment in which these behaviours occur. This project tries to fill this gap by focusing on the more distal risk factors that relate to the structural and cultural environment in which teenagers spent most of their time together (i.e., peers, school, neighbourhood). The analyses conducted in this report showed that investing in these structural environment directly impacts alcohol use, and that the risk and protective factors in different domains are strongly correlated.

First of all, and in line with studies in the psycho-individual sphere, our analyses confirmed that teenagers with low self-control have a much higher prevalence of drinking alcohol. More important from a prevention perspective is however the observation that low self-control is more prevalent in the more vulnerable social groups (i.e. students in disorganized schools and neighbourhoods, and among students living with disrupted families or families characterized by low bonding and weak parental supervision). Given that self-control is a trait that is developed from early childhood onwards, and once formed remains relatively stable over the life course, it is important that parents supervise their children, recognize their deviant behaviour and punish them adequately for it.

One of the most salient findings is that a more peer-oriented lifestyle has the strongest association with alcohol use, and this is true for all analyses and country clusters. This finding makes sense, of course, because for many teenagers adolescence is a phase of experimentation and the most important reference group in this regard are peers. Given that drinking is a largely social phenomenon, and given that adolescents often drink as a way of integrating themselves into groups and gaining status (Crosnoe, Muller, & Frank, 2004), it should not come as a surprise that a more peer-oriented lifestyle is strongly associated with alcohol use.

Apart of the peer domain, the analyses also revealed strong associations with bonding aspects in other domains. For instance, we observed that an intact family structure is a protective factor for alcohol use, and that having a good relation with your parents and parental control decreases the consumption of alcohol. We also found that drinking with the family acted as a protective mechanism for problematic alcohol behaviour, while negative life events (e.g. divorce, death of a parent, et cetera) are considered an important risk factor. Also the neighbourhood where the students' family lives was investigated. Adolescents who experience social cohesion in their neighbourhood or feel connected to their neighbourhood are less likely to drink alcohol. On the other hand, when youngsters describe their neighborhood as disorganized they show higher levels of alcohol use. For the school domain it holds that students who spent a lot of time doing homework, enjoy school, and to a lesser

degree students who perceive their school climate to be positive, have lower prevalence rates on all alcohol outcomes. It is essentially the disaffection from school, as expressed in truancy, which contributes most to alcohol use. In countries where repetition is prevalent as an educational practice (i.e., mainly Western and Southern European countries), it showed significant and sometimes quite strong associations with alcohol use (especially heavy episodic drinking). Finally, the analyses showed that an educational practice such as tracking (or streaming) leads to gradients in adolescents' alcohol use, to the disadvantage of the more vulnerable social groups.

Good practices

This second aim of the project is to draw together a number of good practices that can strengthen the local, national or European policies on alcohol use among adolescents. Given the very few evidence-based prevention programs that exist in Europe, we organized a series of seminars with experts in the field of alcohol prevention in order to get a better view on what works in prevention. From these discussions, several recommendations can be distilled, of which we here briefly summarize the three most important ones.

First, prevention programmes that focus on empowering young people with psychosocial skills (e.g. self-efficacy, coping strategies, assertiveness, handling peer pressure, et cetera) is a powerful tool and currently one of the most popular prevention programmes in Europe. Important in any person-related prevention programme is however to involve the students themselves in this educational process by working interactively and by putting their particular social world to the foreground. By making students actors in prevention instead of passive recipients, and by focusing on positive messages (e.g. it can be cool and healthy to be a non-alcohol drinker) instead of negatives ones (e.g. drinking can kill you) investments in prevention programmes would have stronger and longer-lasting effects. Ideally, this empowerment program is be complemented with the provision of accurate and up-to-date information on both alcohol and drugs themselves, as well as on the use of substances by adolescents' peers. This because adolescents tend to overestimate systematically the alcohol and substance use of their age mates. Adjusting these misperceptions through accurate information campaigns has the additional benefit of diminishing possible negative peer influences.

Second, given the strong relationship with structural factors such as liking school, school climate, family bonding, neighbourhood disorganization, et cetera, our analyses suggest that sometimes changes are needed in the structural conditions these adolescents' lives (i.e. structural prevention) and several recommendation in this regard were put forward in this report. While structural prevention has been widely adopted in the domain of regulation (e.g. drink-driving policy, controlling the availability and taxation of alcoholic beverages, et cetera), this is not the case for the different structural and cultural environments students grow up in. Moreover, while alcohol prevention strategies aimed at working on psycho-individual coping mechanisms (i.e. handling peer pressures, assertiveness, et cetera) are a valuable investment, individual prevention can be efficient only if complimented by measures of structural prevention. The latter focus more on long-term measures which address the underlying causes of alcohol and substance use. As such, they have a much broader scope and have the potential to increase the durability of prevention considerably. Structural prevention, and prevention more generally, is most effective at the local level because this is the level where the various sectorial activities can be brought together and tailored to the needs of the local setting. To conclude, in order to have long-standing effects, prevention needs to engage everybody in the field. Parents, schools and local communities are partners herein, but also civil society, consumer organizations, the alcohol industry, and the social and cultural sector. However, because of the strong cultural influences, both at the national and local level, recommendations for preventive programmes and interventions are best negotiated at these corresponding levels. The success of a prevention program depends to a large degree on the way it is tailored to the needs of the setting at hand, and therefore harmonization of legislation and prevention programs is not recommended.

Finally, the full potential of preventive actions is hampered by a lack of scientific evidence that these preventive actions really work. If evaluation is conducted, it is most often the implementation of the intervention (i.e. process evaluation) that is evaluated. Whether the programme also caused demonstrable effects on the target outcomes (i.e. outcome evaluation) remains often an open question. This project was a first endeavour in this direction, and inventoried a list of best practices in the different European countries that can serve as examples for other prevention workers. Ultimately, however, these programmes should undergo a rigorous test of whether the assumed effects can be scientifically validated. In this regard, more investments are welcome in the construction of knowledge centers specialized in evidence-based prevention. This because in most European countries there is an absence of a culture of evaluation

In this report conclusions and recommendations are defined at the end which have the aim to support the European Commission in giving insights on alcohol use patterns in Europe, the risk factors which are associated with it, and the good practices in the field of alcohol prevention. The realization can be optimized when taking into account some of the recommendations that were put forward in this report:

- To empower young people by means of a life skills approach.
- Person-related prevention complemented by structural prevention.
- Investments in evidence-based prevention programmes and policies and in the diffusion of implementation and knowledge on best practices.

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Partners bibliographical statements

Majone Steketee has a PhD in pedagogical sciences and is head of the department of Youth and Education (Verwey-Jonker Institute). Her research includes youth, youth welfare and youth interventions. She is and has been involved in several cross-national studies on such as alcohol use of young people.

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Nicole Vettenburg is a criminologist and professor at the Department of Social Welfare studies (Ghent University). Apart of her teaching task, she coordinates the Youth Research Platform, she cooperates in the International Self-Reported Delinquency Study (ISRD) and she is correspondent for the European Knowledge Centre for Youth Policy (EKCYP). She is promoter of several other research projects (time-out in school, parent involvement in school, local social policy).

Hans Berten has a PhD in sociology (Ghent University) and his main research area focuses on adolescence, risk behavior, social networks, and both context-related and peer influence effects. During his research he also gained experience with different quantitative data analysis techniques, including social network analysis.

Renate Soellner is head of the division *Research Methods and Evaluation* at the Institute for Psychology (University of Hildesheim). Her department is engaged in projects financed by the Federal Ministry of Education and Research, the Federal Ministry of Health and the Lower Saxony's Ministry of Justice. The main focus is on methodology and methods of evaluation research. Professor Soellner has a long lasting experience in drug research, namely on cannabis, drug mortality and diagnostics of drug dependence. She is member of the board of trustees of the German main office against addiction and member of the European Society for Social Drug Research.

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Gabriele Rocca, MD, is researcher in Forensic Medicine and assistant professor of Forensic Psychiatry (University of Genoa). His main research fields focus on forensic psychiatry and clinical criminology .

Anna Markina received her MSc in Applied Mathematics from the University of Tartu and MA in Society and Politics from the Central European University and Lancaster University joined programme. Since 2001 she holds the position of lecturer in sociology of law at the University of Tartu. Her research has focused on organized crime, trafficking in human beings, and juvenile delinquency. Anna Markina has over 10 years of experience in the field of criminological research and has participated in several international projects.

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Jiri Burianek is head of Department of Sociology (Charles University). He conducted a lot of surveys, as the teacher on methodology he used that experience for general methodological reflection. He published a lot of papers or textbooks and two monographs. During recent 18 years he participated in many international projects as ISRD2, IVAWS, Eurojustis, et cetera. Nowadays he is a grant holder for the project on intimate partner violence. Many times he has been elected for a president of Czech sociological association.

Zuzana Podaná is assistant professor in the Department of Sociology (Charles University, Prague). Her research interests focus on juvenile delinquency and risky behavior, including alcohol consumption, and on intimate partner violence. Since 2005, she has been involved in the International Self-Report Delinquency Study.

Part I

Setting the stage

The consumption of alcohol among young people in Europe has risen during the past years. Several studies have indicated that a considerable amount of adolescents drink alcohol, and this number is continually growing. The use of alcohol has especially increased among 12 to 14 year olds, and problematic drinking (e.g. alcohol intoxication and binge drinking) has also become an issue of growing importance.

Within a time span of more than three years (starting in 2009) the AAA-prevent project *(Effective Environmental Strategies for the Prevention of Alcohol Abuse among Adolescents in Europe*) studied the different potential effective strategies for the prevention of alcohol abuse among adolescents in 25 European countries.

In Part I of this report, the underlying theory and model of this study are elaborated on. This will be followed by a description of the dataset and the sampling decisions that were made for the different levels of analysis, as well as an illustration of the mixed-method research design.

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1 Theory and model of the study

Majone Steketee & Harrie Jonkman

1.1 Introduction

Underage drinking is a serious public health concern, as demonstrated by epidemiological data and results from studies investigating the social, health and economic consequences of drinking by children and adolescents. In particular, it should be reminded that:

- Alcohol is the drug most commonly used by youths (Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E., 2008; Hibell B, Guttormsson U, Ahlström S, Balakireva O, Bjarnason T & A. Kokkevi, 2009).
- Adolescents who indulge in drinking are more likely to engage in risky behaviours, such as drinking and driving (Hingson R.W, Heeren, T., Zakocs, R.C., Kopstein, A. & H. Wechsler, 2005).
- Underage drinking contributes to both unintentional and intentional injury deaths among adolescents (Rehm, J., Room, R., Monteiro, M., Gmel, G., Graham, K. & N. Rehn, 2004).
- Adolescents who drink heavily are at increased risk of short and long term health problems (Hingson, R.W., Heeren, T. & Winter, M.R. 2006; and behavioural problems (Spoth, R. L., & Greenberg, M. T., 2005).

Adolescent alcohol misuse is a problem in all European countries. In early adolescence youths are extremely vulnerable to alcohol initiation. This study aims to create a better understanding of the interrelationships between the influence of individual developmental characteristics on the one hand, and family, school, peers, neighbourhood and societal contexts on the other. This kind of knowledge will contribute to environmental prevention strategies. This cross-national study on the prevalence and etiology of substance use (and related risk behaviours such as drug use and delinquency) can make significant contributions to prevention science, as well as successful policies and effective practices (Oesterle, S., Hawkins, D.J. Steketee, M., Jonkman, H., Brown, E.C., Moll, M. & K.P. Haggerty, 2012; Steketee, M., Oesterle, S., Jonkman, H. Hawkins, J.D., Haggerty, K.P. & C. Aussems, 2012; Jonkman, H.J., 2012; Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Hosman, 2000).

Research on adolescent alcohol and drug (ab)use and effective prevention strategies has been dominated by studies of U.S. samples (IOM, 2009; Hunt & Barker, 2001; Alsaker & Flammer, 1999). This has prompted calls for studies of adolescent development and alcohol and drug use behaviour that compares samples from two or more countries. This type of study would give researchers the ability to distinguish between universal and context-specific influences on behaviour across countries and cultures (Jessor, R., Turbin, M.S., Costa, F.M., Dong, Q, Zhang, H. and Wang, C., 2003; Brook, Brook, Zhang, Cohen, & Whiteman, 2002; Unger & Pardee, 2002).

Cross-national studies regarding alcohol use are difficult to realise as a consequence of differences in registration, working definitions and conceptualizations, and age groups involved in national or local surveys (Trimbos, 2004). Therefore, the World Health Organization uses, for example, sales figures to estimate alcohol use, taking into account illegal import and production (Rehm et al., 2004). This European study on alcohol use among youngsters in 25 countries was able to overcome this dilemma, by using standardized registration processes, working definitions and conceptualisations. This gave us the opportunity to research alcohol use and youth behaviours across countries and cultures, whilst looking at individual as well as country influences on alcohol use as well. Most studies focusing on juveniles and alcohol consumption have been carried out from a psychological perspective or

framework, whereas this current study was carried out from a sociological perspective, looking at the influence of the environment of juveniles on their drinking behaviour.

1.1.1 Alcohol consumption

The majority of youths begin using alcohol (similar to cannabis initiation) between the ages of 12 and 16. This is the age at which young people often go out for the first time, and when the influence of parents decreases while that of friends' increases. When creating a personal social life, it seems that a part of this phase includes experimenting with stimulants. However, there is a growing concern about the use of alcohol among young people. Several recent studies indicate that students not only drink more, but also start drinking at a younger age (Hibell et al, 2004, 2009). In addition, there is a growing trend that young people drink more excessively (Steketee et al; 2012). In 2011, the consumption of alcohol among young people between 12 and 18 years old was still quite high in most European countries, with the exception of Iceland. In 2011, at least 70% of the students (mean average 15.8 years) in all (European) countries consumed alcohol at least once during their lifetime, with an average of 87% (ESPAD, 2012). In the same report we discovered that the corresponding average figures for students from 36 European countries for alcohol consumption in the past 12 months and in the past 30 days were: 79% and 57%, respectively. The ESPAD-study was conducted every four years between 2003 and 2011 (2003, 2007 and 2011). During this time period there was a small decrease from 2003 through 2007 to 2011. Of course, these averages were based on highly divergent country figures. For example, alcohol use during the past 30 days was reported by more than 75% of the students in the Czech Republic and Denmark, but only by 17% in Iceland and 32% in Albania. Although there was no clear geographical pattern, countries with relatively small proportions were mainly found among Nordic and Balkan countries. Averages for important alcohol outcomes (lifetime, lastyear, lastmonth use) were similar for boys and girls, however some differences were detected in terms of higher prevalence rates for boys. Frequent drinking figures were usually higher for boys (ESPAD, 2012).

The International Self-Report on Delinquency 2, which consisted of 67,000 students from 30 countries (Steketee, 2012) and on which this European study is based, also indicated that the overall prevalence rate for alcohol use is quite high. 60.6% of all students in grade seven to nine had drunk alcohol in their lifetime, and 27.7% within the last month. The youths in this study often consumed low-alcoholic beverages (59.6% : lifetime and 26.5% : last month; mean age: 13.95). The majority did not consume strong alcohol frequently. However, the number of students who did consume strong liquor frequently was quite high considering that students from grade seven to nine were between 12 and 16 years old. One out of every three students (34%) consumed strong alcohol at least once, and 13% had done so in the last month.

Nonetheless, the prevalence of drug use is much lower than alcohol consumption. In regards to drug use, the data illustrated that young adolescents generally limit themselves to soft drugs, predominantly marijuana. 9,7% reported that they used cannabis during their lifetime, and 4% used it in the last month. The prevalence of hard drugs is 2% within a lifetime, and 0.8% in the last month. There is also a large group of students who have not consumed alcohol or any kinds of drugs at all (abstainers). The abstinence rate of all students is forty-one percent (39.2%).

Table 1.1 Prevalence of substance use in large and medium-sized cities of the countries (%)

	Beer/Wine	Strong Spirits	Hashish	Hard Drugs	Abstinence
Lifetime	59,6	34,09	9,7	2,0	39,2
Last month	26,5	13,0	3,8	0.8	--

In this study we focused on the early adolescent years, during which young people first start to drink alcohol (the first three classes of secondary school) also marking the age at which most of the students start to drink alcohol on a more regular basis. If we look at our dataset, the average age for drinking beer or wine for the first time is 12 years old. Only in the Northern European countries do adolescents try their first drink a year later. The average of onset for spirits is somewhat later (13 years old).

Risk behaviours such as underage drinking are worrisome phenomena. It is clear that the incidence and prevalence of these consumption behaviours commence and increase significantly during the passing

phase of adolescence, and can lead to lifelong health-related problems, diseases and disorders. Preventing alcohol use at a young age, in large quantities, and the use of strong alcohol are therefore important societal and political targets within European society (Jonkman et al., 2010; 2008; Steketee et al., 2008). As a society we have the responsibility to make sure that all young people grow up to become independent and contributing members of society.

Thus, the question remains: how can we support the development of children, and ensure that child alcohol use does not become a long term societal issue. Against this social background, interesting approaches are those which target problems and possible causes and deal with them a early as possible, reducing the likelihood of further escalation of problems amongst youths. In the next section, we will describe how to study this within a theoretical framework.

1.2 Theoretical framework

In this section we will discuss three fundamental issues concerning the use of alcohol among youngsters in Europe: the phase of adolescence, social determinants, and the levels of influence.

1.2.1 Developmental phase of adolescence

The majority of prevention strategies are focused on delaying the age of onset of adolescent substance use. Empirical evidence from a large number of studies have shown that early initiation is a predictor of later misuse (IOM, 2009; REF, ;DeWit, Adlaf, Offord, & Ogborne, 2000; Kosterman, Hawkins, Guo, Catalano, & Abbott, 2000; Grant & Dawson, 1997). Similar evidence has been found in several European studies for both alcohol and marijuana use and future drug use-related problems (Verdummen et al., 2006; Anderson, 2003; Kraus, Bloomfield, Augustin, & Reese, 2000; Pitkanen, Lyyra, & Pulkkinen, 2005). Recent studies also support this finding. Winters and Lee (2008), conducted a study among 4074 adolescents (12-26 years old) and the so-called recent starters. They illustrated that recent starters between thirteen and eighteen years old were at a higher risk of alcohol dependence, compared to recent starters of nineteen years of age and older. These results suggest that the risk of alcohol use later in life decreases when youngsters start using alcohol between their eighteenth and nineteenth year of life. In addition, McGue and Iacono (2008) conducted a longitudinal study of two twin cohorts whose youngest cohort had a mean age of 11.7 years at the start of the study. They found that when young people start consuming alcohol for the first time before their fifteenth year, they had a greater frequency of alcohol dependence at seventeen, compared to youths who had consumed their first alcoholic beverage at age fifteen, sixteen or seventeen. These youths also exhibited a higher frequency of other detrimental behaviours , such as nicotine addiction, drug addiction and antisocial personality. Finally, next to onset at an early age, drinking patterns at a young age also have significant consequences. For example, a longitudinal study showed, that youths who binge drink (consuming four or more alcoholic drinks during one occasion) when they are 16 years old are more likely to develop an alcohol dependency at age 30 (Viner & Taylor, 2007).

However, it is not yet clear which mechanisms underlie the relationship between the age of onset and alcohol-related problems. Is early alcohol use an important determinant of future alcohol-related problems? Or are there other factors that can explain both early alcohol use as well as subsequent alcohol problems later on in life? There is also overwhelming evidence that the development of alcohol use is often intertwined with one or more other problem behaviours (Jonkman, 2012; REF). Severe alcohol use, for example, is associated with other substance use (Hawkins et al., 2002). A significant correlation between alcohol use and crime has also been recognized in scientific studies (Gatti &Verde, 2012, Steketee, 2011). The intertwining of different problem behaviours prompted the idea of simultaneously addressing underlying factors strongly associated with problem behaviours (Catalano et al., 2012). Over time, several longitudinal and experimental studies identified various risk and protective factors as underlying factors of the problem behaviours (IOM, 2009; Hawkins, Catalano & Miller, 2002). These factors can be found in the daily contexts in which children and youngsters are raised: family, school, peers and communities. Subsequently, these factors have become the building blocks of prevention strategies for children and youngsters.

The most crucial factor which determines human health and development is the social environment in which people live and work throughout their life course, and how they cope with changing

environments (Keating & Hertzman, 1999). Individual social competencies, family skills, school quality, as well as community characteristics and resources, are all important for the development of adolescents, as prevention scientists have supported and clarified in several studies (Weissberg & Kumpfer, 2003). Prevention science has emerged as an interdisciplinary science created by an integration of developmental science and longitudinal studies, social and community epidemiology and research of preventive and randomized trials (IOM, 2009; Mrazek & Haggerty, 1994; Coie et al., 1993; Kellam & Rebok, 1992). Prevention science has identified two different types of groups of predictors in terms of individuals and their social environments. One group identifies which factors increase the likelihood of problems (risk factors), whilst the other focuses on factors which moderate and mediate exposure to risk, which in effect will decrease the likelihood of problems (protective factors). Through a number of experimental studies, it was found that tested and effective prevention programs and policies could be developed, not only for individuals but also for families, schools and communities in order to support the social and healthy development of youngsters (Elliot, 1997).

One of these theories which explains deviant behavior is social bond theory developed by Hirschi (1969). This theory stipulates that every human being is motivated to pursue his own interest by principle and, accordingly, motivated to commit crime. Therefore, the relevant question to explain crime is: "why *don't* we do it?" According to Hirschi (1969), the answer lies in the fact that people form bonds with prosocial people, prosocial institutions and feel committed to prosocial values. The four basic elements of social bond theory are attachment, commitment, involvement in conventional versus deviant or criminal activities, and lastly, the common value system of an individual's society or subgroup. Together, these form the bonds of society, and crime or problem behaviour occurs when in the absence of these social bonds. Various studies have also investigated the extent to which social control theory can predict juvenile delinquency (Junger & Haen Marshall, 1997; Junger, Terlouw & van der Heijden, 1995; Kempf, 1993; LeBlanc & Frechette, 1994; Nagin & Paternoster, 1994; Polakowski, 1994; Rodriguez & Weisburd, 1991). A related set of studies, investigated the separate elements which together form the social bond, and other related aspects. In support of social control theory, research has shown that factors that measure family processes (Hoeve et al., 2009; Loeber & Stouthamer-Loeber, 1986; Rothbaum & Weisz, 1994), school functioning (Maguin & Loeber, 1996; LeBlanc, 1994; Torstensson, 1990; Van der Laan, et al., 2005; Gottfredson & Gottfredson, 1992; Gottfredson, 2001) and leisure time activities (Agnew & Petersen, 1989; Junger & Wiegersma, 1995; Vazsonyi, Pickering, Belliston, Hessing & Junger, 2002), are related to delinquent or problematic behaviour. Broad reviews also supported the predictive value of these risk factors for delinquent and problem behaviour (Loeber et al, 1998).

Recently, two concepts were added to social control theory: self-control and social disorganization theory. Self-control theory was developed by Gottfredson and Hirschi from their book *A General Theory of Crime* (1990). Principally, this theory stipulates that a lack of self-control, in conjunction with opportunity, explains all forms of deviant behaviour, ranging from uncontrolled to extreme, which, next to criminal offences also includes reckless driving, practicing extreme sports and heavy alcohol use. The authors do not consider self-control as an innate characteristic, rather, they postulate that self-control becomes part of a person's personality between the ages of 8 and 10, as a result of their upbringing process. If this upbringing process fails, a lack of self-control will become a permanent characteristic of a child, who will ultimately have to deal with the consequences for the rest of their lives. Gottfredson & Hirschi (1990) stated that a lack of self-control does not only predict all forms of criminal behavior, but also other risky behaviors such as chain-smoking, excessive alcohol use, dangerous sports, and on the whole, a more risky lifestyle. A few researchers have also associated these tendencies with a higher number of accidents, hospitalizations, and higher death risk of delinquents (Cummings et al.,1994; Rivera, 1995, Farrington, 1995, Fergusson & Lynski, 1996; Junger et al., 2001; Van Nieuwenhuizen et al., 2009).

Social disorganization theory hypothesizes that neighbourhood factors have an influence on the behaviour of youths (Sampson & Laub, 1993; Sampson et al., 1997, 1999; Wikström, 1998, 2006). The theory basically argues that social control and social cohesion, which embrace mutual trust and solidarity, increases the willingness of residents to uphold and maintain socially accepted behavioural norms. Neighbourhoods that lack these norms may become breeding grounds for criminal behaviour. A study carried out by Sampson et al., (1997) showed that environments dealing with socioeconomic problems, a concentration of minorities, and which experience a constant flow of in- and outgoing

residents, are negatively associated with social control and positively associated with violence. Interestingly, these factors were higher predictors of violence, than a lack of civil and social services and friend and family bonds.

Furthermore, this study also conveyed that the social control of children is not only carried out by their own parents, but that the social organization of the neighbourhood also plays an important role, such as the existence of contact between parents, informal social control and mutual support between residents (Sampson et al., 1997). Specific neighbourhood characteristics can either promote or halt both social and antisocial behaviour. The importance of the neighbourhood should not be underestimated, not only because it is where most youths find their friends but also because the majority of the offences they commit take place within their own neighbourhoods.

The aim of this study is twofold. First, we would like to uncover which promising and effective prevention and intervention strategies against problematic adolescent alcohol and drug consumption are currently being carried out Europe, and second, which risk and protective factors are being targeted within these programs.

1.2.2 Social determinants

Problem behaviours hardly ever spontaneously develop from one day to the other. Instead, these behavioural patterns generally develop over time with differences but also similarities between them in which genes, social experiences, life course as well as social circumstances play an interactive role (Jonkman, 2012; Marmot, 2000). The social position is affected by what adolescents experienced earlier in life (conception, birth, early life and childhood), as is their social response to social circumstances. We know that alcohol use in early adolescence is strongly influenced by social and familial environmental factors (Kendler, Schmitt, Aggen & Prescott, 2008). This study focuses on different contexts and their influence on alcohol use at an early age.

Overall, youngsters mainly grow up in four different contexts wherein they interact with others on a daily basis over a longer period of time. These contexts include their: family, school, peer group and neighbourhood, and it is within these contexts where specific factors can be identified which either increase or decrease the likelihood of risk behaviours such as alcohol use (risk factors, protective factors).

The majority of youngsters have a place or role within their family, which is also the first social context in which they interact with others. In most cases, the family protects youngsters against risks and problems. Principles of love, protection and safety are important, and it is in this safe context wherein children and youngsters learn social and cultural rules, norms and values. Within this secure context, youngsters can also practice their behaviour, and social and personal skills (Damon, 1997). In order to accomplish social and healthy maturity, the first years of development are crucial. Practices of monitoring and controlling are part of the parental role and are not only vital in this early phase, but also and perhaps especially, during adolescence, when youngsters' lives broaden and interact intensively with other peers. Several studies have shown that there is a relation between disrupted families (divorced, one-parent families) and higher alcohol consumption of adolescents (Nagin & Smith, 1990; Rosen & Neilson, 1982; Smith & Brame, 1994; Van Voorhis et al., 1988). Studies have also examined the effects of parents on the onset and heavy and problematic drinking of their children (Yu 2003; Van der Holst, Engels, Meeus, Dekovic & Leeuwe, 2005; Brook, Balka, Crossman et al., 2010). Increased alcohol use by parents is associated with earlier use of alcohol by adolescents (Jackson, 1997; Ellicson & Hays, 1991). Problematic alcohol use among young people and the probability of developing alcohol disorders at a later age, especially, are linked to a family history of alcoholism (Hill et al, 2000; Lieb et al., 2002). Although young people operate more autonomously during adolescence, family is still an influential environmental context. Family bonding and parental supervision outside the home form the basis of positive child development (Elliott et al., 2006; Furstenberg et al., 1999). Daily interactions and its social character influence development which is also associated with family affluence and other important factors such as life events (Harlan, 2002).

Childrens' worlds expand once they begin attending school. Many young children make their first contacts outside the family within these structured institutions. In most countries, nearly every child attends primary school at four or five years of age. When children reach the age of 12, they may attend different types of secondary school (in some countries they split into different groups at an older age). The school is the second, important context of socialisation for young people. Within this context they learn cognitive, social and creative knowledge and skills in a structured setting. Children spend

thousands of hours at school during their lifetime. They meet similar and different peers, and they interact with students of a similar academic ability on a daily basis. In addition, they are supervised by different teachers over the years. The organisational structure and climate of schools also influence the development of youngsters. In recent times, the role of education has become more important in our society and has replaced the family in allocating and socializing youth (Gottfredon & Hirschi, 1990). Schools are seen as one of the most important settings for influencing the development of health and lifestyle behaviours such as the use of alcohol, but also cigarettes or other drugs (Perry, Kelder, & Komro, 1993),. Research has consistently indicated that school risk factors such as school disorganisation, school climate, truancy and aspirations of students are associated with health and lifestyle outcomes such as the use of alcohol, cigarettes and drugs (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; Hawkins, Catalano, & Miller, 1992).

As for children, but especially for adolescents, the world broadens through peer interaction. Activities with friends, especially during informal leisure time, are important in terms of their individual and social development. Friends are important as they provide reference with regards to interests, perspectives and interaction with others. This time is often 'experimental' in nature. A child's behaviour, thinking, norms, as well as values are confronted and many receive new input during these years. These 'experiments' are important in terms of identity development in adolescents (Erikson, 1987). Especially during adolescence, youths interact with their friends and peer groups frequently and intensively slowly developing into who they aspire to become. During this phase, adolescents are vulnerable to influences of their peers which may be positive (connecting with prosaically peers) but also negative (interaction with delinquent friends, gang involvement and deviant behaviour). The role of the first two contexts (family and the school) will change and become overshadowed by other social determinants, whereby the position of peers increases in importance.

The neighbourhood or community is the social, physical, geographical and organizational unit in which youngsters grow up and develop (Elliott et al., 2006; Kawachi & Berkman, 2003). Neighbourhoods can often be identified by roads and channels, but its borders are not always that clear. They can be identified as the surrounding area where youngsters are born and live, and, where they often attend their first school. It is also where they play with their friends on the street. When youngsters are 12 years or older, their world expands and they begin to attend schools outside their neighbourhood. The influence of the neighbourhood on the development of youngsters is complex and difficult, and our knowledge is still in its infancy (Sampson, 2012; Elliott et al., 2006; Sampson, Raudenbusch, & Earls, 1997). However, the sociodemographic position of the inhabitants and the sociocultural structure (poverty and socioeconomic differences) of the neighbourhood can have a direct influence on child development. However, there are also specific neighbourhood factors which influence the behaviour of youngsters such as neighbourhood disorganization and neighbourhood bonding. Nonetheless, this context may also have moderating and mediating effects on risk factors from other contexts and influences by, for example, influencing family management and regimes (Pinkster, 2009).

Over the last decade, prevention science has identified a variety of risk factors within proximal environments which affect the likelihood of alcohol use among youngsters. Intermediate (family, school, peers and communities) and individual factors play an important role in this and can be placed in a development framework. Although research has typically focussed on individual or intermediate risk factors, there is a growing need to combine these factors into one model and to study their relative influence on the drinking behaviour of adolescents. For example, family and peers also show a strong influence on alcohol use, as we will illustrate in another section. Inevitably, we would like to find out how families and peers influence adolescent drinking, and what these interactions tells us about each environment?

1.2.3 Levels of influence

Behaviours are not randomly distributed within the population, rather they are socially patterned and often clustered together (Oakes and Keyman, 2006; Berkman and Kawachi, 2000). Poverty, socioeconomic status and low education levels, are all factors that increase the likelihood of risk behaviours. The social position in which individuals are born, grow up in and live, is at random a 'Risk of Risks' (Rose, 1992), which is why individual development should be placed into an ecological context. Environments place constraints on individual behaviours, as well as norms, social control, and opportunities which can improve the quality of life (Berkman & Kawachi, 2000). There is an increasing interest and activity in promoting a more multilevel approach in behavioural, social and health sciences (Oakes

and Keyman, 2006). If we want to truly understand behavioural patterns such as adolescent alcohol consumption, we must not only focus on the level of individual but look at a variety of levels ('from genetic to sociocultural and political levels of analysis'). Individual outcomes are more often studied within 'upstream mechanisms' where these outcomes operate (Viner et al., 2012; Galea, 2007; Luke, 2004).

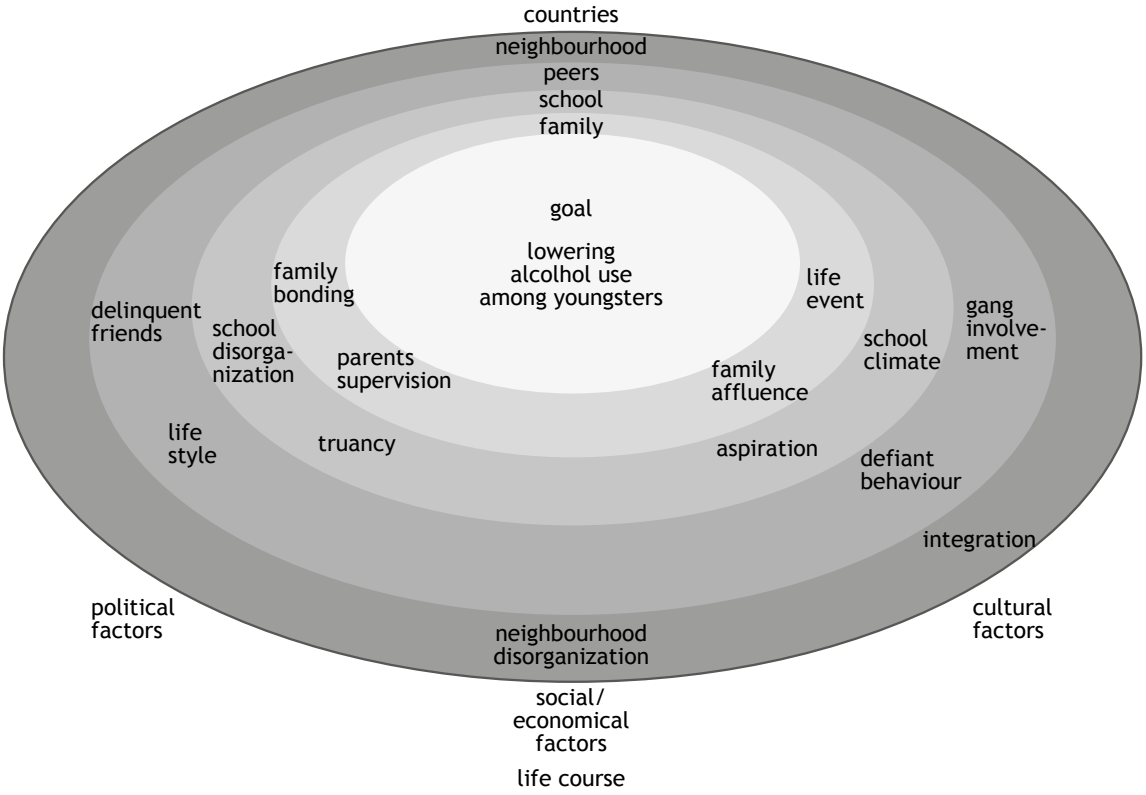
Thus, it is not only the different daily contexts and relations affected by multiple factors which influence the development of alcohol use (intermediate factors), we must also articulate the differences between various levels of influence and their added values. Up until now, most studies on risk factors have been carried out within countries. Yet our large dataset consisting of data on alcohol use and risk factors of youngsters from multiple European countries, allows us to address the individual perspective within a broader framework. It is also clear that broader environments such as countries, structure opportunities and constraints which affect the behaviour of youngsters, and there are many examples of possible variables (structural factors) which may influence alcohol use specifically. Cross-national research can provide an answer to whether risk factors are consistent across countries, or are stronger or even nonexistent in others (Oesterle et al., 2012, Jonkman et al., 2012, Beyers et al., 2004).

It is also clear that most work on alcohol use (and other drug use) and risk factors are dominated by samples from the United States. This sparked our interest in carrying out a cross-national study, with the aim of looking at universal and context specific influences of adolescent alcohol use (Steketee, 2012; Jonkman, 2011; Jessor et al., 2003; Hosman, 2000). Comparing findings between countries will provide us with insight as to whether risk factors are indeed universal predictors of alcohol use and other substances, as proven by different studies. Observing contextual variations across data on adolescent alcohol use from different countries will provide us with additional knowledge about the impact of different environments and their related risk factors.

In this study we used structural factors (besides risk factors), which are defined as higher-level country factors, such as policies (for example laws, prices and collective action), the social and economic system (including wealth, wealth distribution and employment) as well as cultural factors (beliefs, customs). These factors are important, as it is the larger circle of societal constraints and possibilities which may influence youngsters' alcohol behaviour. We have sufficient knowledge concerning the influence of risk factors on our behaviour, but know less about the influence of these larger structural factors.

In the United States of America, Jessor and colleagues found that adolescent substance use (including alcohol and tobacco) is part of a constellation of antisocial behaviour (Jessor & Jessor, 1977). Empirical evidence from the United States also suggests that adolescent drug use (including the use of alcohol and tobacco) is positively correlated with deviant behaviour in the form of delinquency (Mason et al., 2003). Furthermore, alcohol and tobacco have been found to be gateway substances to other drugs such as marijuana and hard drugs (Wagner & Anthonu, 2002). The widespread acceptance of youth alcohol and tobacco use in the Netherlands, for example, suggests that the use of alcohol (or tobacco) is not viewed as deviant in the Netherlands. If this was the case, these behaviours would more likely be associated with other forms of deviance such as delinquent behaviour, as it is in the United States. Furthermore, if this is the case, adolescent alcohol and tobacco use the Netherlands may not serve as a gateway to other drug use in the same manner as it appears in the United States. Norms concerning hard drugs may be different and may possibly show other results (Oesterle et al., 2012). Crucial to carrying out successful cross-national research is the availability of standardized measurements of outcomes of important risk factors of the different contexts in which youngsters grow up, and of higher-level structural factors, as well as similar sampling and data collection approaches across countries.

Figure 1.1 Individual development in ecological framework



Note. Adapted from ecological framework for developmental health. From: Lancet: Vol 379, 2012. p. 1567

1.2.4 Effective interventions

Knowledge about where and when to intervene is important for successful policies. However, it is also important how one can address or target problems which are environment and/or moment specific. This is an important consideration for effective interventions which prevent underage drinking.

In Europe, the appeal of preventive efforts to reduce underage drinking has led to an increase of flourishing projects and programmes. In recent years, however, a number of critical questions have arisen: Are these preventive efforts really effective? Can these interventions be implemented at the right place, the right moment, and as early as possible? Can people and institutions really put them to proper use? Thus far, many of these questions have remained answered. Nevertheless, in many countries, in the last five years a new practice has risen which critically evaluates existing prevention programmes and searches for and implements effective, 'evidence-based' interventions. This practice has shown that in Europe there is a long way to go in terms of identifying and implementing early, practical and effective prevention programmes.

Pleas for prevention policy and programmes are growing steadily. However, the theoretical foundations for this preventive path were limited up until now. Empirical research concerning the validity of these foundations, and the effectiveness of the programmes is still scarce. Prevention policy is not seldom based on intuition rather than a more scientific approach (Junger-Tas, 2001). At the same time, our knowledge about the development of underage drinking, as well as other problem behaviours of youngsters have increased enormously. Research has increased our knowledge concerning development patterns and the influence of different risk factors on development, and has not only shed light on biological aspects, but also on the effects of familial and social influences on adolescent development. It became clear that these developmental pathways could best be influenced at an early stage, when behavioural patterns are still fluid and have not yet stabilized. In addition, studies indicated that some preventive interventions work better than others, yielding increasing insight into 'what works' in the prevention of alcohol and drug use (Axford, 2012; Elliott, 1997; Sherman et al., 1996). Studies on program effectiveness, however, are mainly from the United States, and the findings are slowly being adopted in the ever-growing number of European prevention projects.

A wide range of prevention programmes have been developed of which only a very few have an explicit, up-to-date theoretical rationale (Axford, 2012). Moreover, not many of these programmes have been adequately evaluated for effectiveness. This is a finding which bears relevancy to the European context, as it calls for a drastic renovation of both prevention and evaluation practices in Europe (see Chapter 21). The first step in this process is to examine the theoretical concepts that should be at the foundation of this practice. The second is to learn as much as possible from the few programmes that have a sound rationale and that have a proven success record.

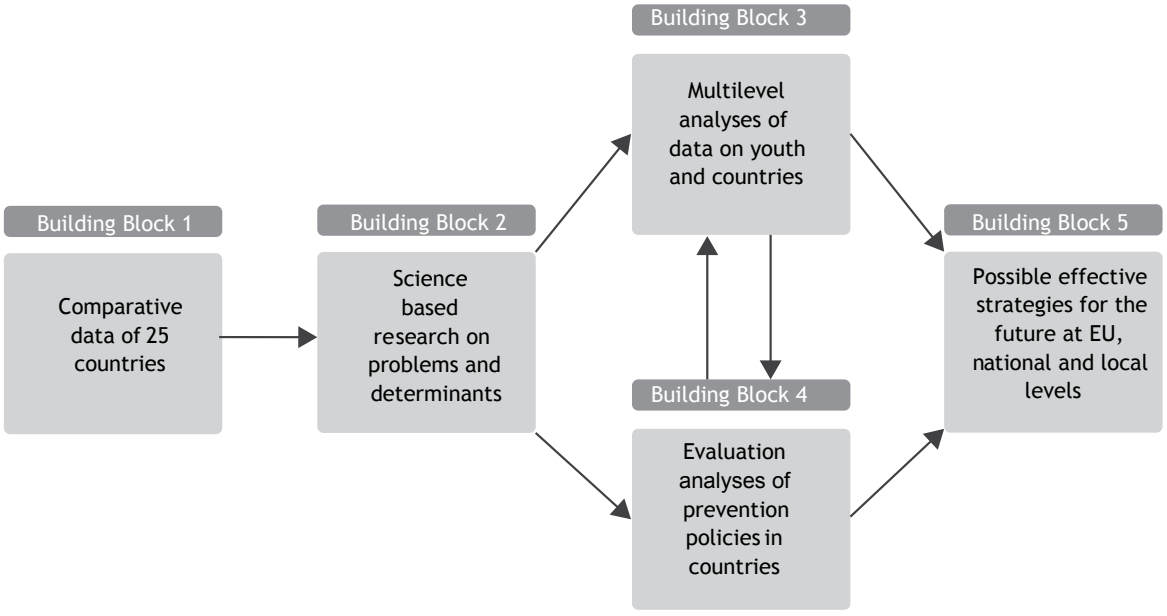
1.3 The model of this study

This study started in 2009 and we formulated the following overall research questions at the beginning of our study.

- What are the differences in adolescent alcohol use (drug use and delinquency) and their associations with risk and protective factors within and between 25 European countries?
- Which factors are associated with patterns of alcohol consumption of young people and which country profiles of alcohol use of young people can be made?
- What are the effects of these factors and country profiles on early adolescent alcohol use, and on the use of illicit drugs, and its additional effect when combined with behavioural measures, particularly in vulnerable population groups?
- What are the environmental prevention strategies, the role of normalisation around substance use and associated problem behaviours, and the spin-off effect of environmental prevention strategies on illicit drug use?
- Which effective policies, programmes and interventions reduce the levels of risk factors and adolescent substance use?

This evidence-based study had five empirical building blocks: 1) Comparative data of 25 countries; 2) Science-based research on problems and social determinants; 3) Multilevel analyses of data of youth and countries; 4) Evaluation analyses of prevention policies in countries; 5) Possible effective strategies for the future (see figure 1.2):

Figure 1.2 Model of this study



Building block 1: Comparative data of 25 countries

This project had the advantage of having access to a unique cross-national dataset of a study we conducted previously. We were able to use the ISRD dataset, which is based on a student questionnaire that was developed and validated by nineteen European Union countries, three associated European countries, and three ICP countries (see Chapter 2).

The database contained information about the use of alcohol, marihuana and hard drugs (LSD, Cocaine, Heroin, ecstasy and speed) of the adolescents in the past month, past year and lifetime use. The dataset also gave us the opportunity to analyse substance use in relation to anti-social behaviour or risky behaviour (delinquency) and to evaluate the many correlates of use with background variables such as age, gender, ethnicity and social class. The dataset also contained scientific and European added value, as it included risk factors such as lack of self-control, lack of bonding within the family, school disorganization, deviant friends within the context of peers and neighbourhood disorganization.

We also had access to answers to descriptive questions concerning alcohol use patterns and related risk behaviours, as well as risk and protective factors. In this phase of the research we were able to convey the results of the first analyses of cross-national similarities and differences.

Building block 2: Science based research on problems and determinants

Next, we compared samples from 25 countries to distinguish between universal and context-specific influences on behaviour across countries and cultures (Brook et al., 2002; Jessor et al., 2003; Unger et al., 2002). In this phase we researched underage drinking, taking into account the influence of multiple contexts and different levels of influence .

The generalization of findings across countries added evidence as to whether or not risk and protective processes are universal predictors of alcohol use. Cross-national studies on the prevalence and etiology of alcohol and illicit drug use and related behaviours can make significant contributions (Hosman, 2000) to prevention science. Extending the study of risk and protective factors and testing theories in different cultural contexts are important steps towards developing a more universal understanding of underlying processes, including equifinality (multiple trajectories to the same outcome) and multifinality (similar trajectories to multiple outcomes) (Cicchetti & Rogosch, 1996; Schulenberg et al., 2001). It also informs us about general and culturally-specific interventions (Beauvais & Oetting, 2002; Unger et al., 2002). Cross-national studies can also be of assistance in identifying new predictors due to potentially increased but overlapping variations in predictors and outcomes between countries. An improved specification of the variation in the patterns of adolescent alcohol use, their association with other adolescent behaviours, and the extent of common versus specific risk influences can support the targeting of prevention efforts (Toumbourou & Catalano, 2005).

While processes of risk and protection have been investigated rather extensively within countries, the international validity of these etiological processes has not yet been demonstrated (Reuband, 1992). International comparative studies may assist in disentangling universal from country-specific components of these processes (Davidov, Schmidt & Billiet, 2011; Hurrelmann & Hamilton, 1996). In part, this lack of international comparison has been due to a deficiency of standardized methodology in measuring outcomes, risk and protection. International research collaborations can help to identify the developmental similarities and differences of patterns of alcohol use, abuse and dependence and the similarities and differences of factors contributing to these developmental patterns. At the hand of an international study in multiple countries, it will be possible to increase our understanding of whether these processes are identical or differ in different cultural contexts.

Thus, the next step in our three-year research project was to compare the prevalence and incidence of alcohol use among youths between 12 and 15 years old in 25 countries, and its association with risk factors (and protective factors if possible) within different contexts. We formulated specific research questions such as: ‘What are the differences in the prevalence and incidence of alcohol use among youths aged 12 to 15 years old (the first, second and third grade in secondary schools) in each of the 25 countries?’, ‘Is there cross-national variability of specific dimensions or patterns, such as the initiation of alcohol use of this age group?’, ‘What can be said about the prevalence and incidence of other drug use and anti-social behaviour among these students?’, ‘Are there differences in the relationships between risk factors (and protective factors) such as norms, attitudes and perceptions on the one side and alcohol use in participating countries on the other?’, ‘Do adolescents from different countries show different combinations of alcohol use, drug use and risk factors?’, ‘Are there specific use patterns according to gender, ethnicity, socioeconomic status and other demographic variables, and do

these differences vary from one country to the other?', and, 'Can we observe gender or ethnic differences in the prevalence of alcohol use due to different risk factors (and protective factors)?

Building block 3: Multilevel analyses of data of youth and countries

In addition to individual, family, school, peer and community predictors, comparative international studies were able to provide us with the possibility of examining school, state and national policies and other higher, contextual influences on alcohol use patterns. These influences did not show a variation within a single country or bi-national study where these patterns were homogeneous. Cross-national analysis with sufficient countries will yield new information about local and national influences on early adolescent alcohol use and symptoms of alcohol use disorders. A cross-national analysis can potentially enable the cultural generalization of risk influences and alcohol consequences. In a study such as this, the influence of environments (e.g., school policy, socioeconomic status and rural location, state and national policy) can also be explored together with the effects of individual influences (e.g., pubertal development, behaviours, personal adjustment and attitudes, risk factors, protective factors). The results of this study are not only interesting to prevention science, they also provide politicians and practitioners with relevant information which may redefine their preventive frameworks and practices in different contexts and levels.

In this study, we did not merely research underage drinking, rather we studied the behaviours' association with the influence of multiple contexts, and different levels of influence. In our research we made a distinction between three levels of influence. The lowest is at the individual level. These include the 57,771 youths and their covariates and risk factors. The research took place at 1,344 schools. These schools influence the behaviour of the youngsters, which we took into consideration by defining this context as the second level of influence (by modelling but not by explaining). The third and final level is the national level. The youngsters are spread out between 25 countries. In our study, it was relevant to ask ourselves how a country influences youth alcohol use and whether this influence could partly be explained by, for example, a specific drug policy or other structural indicators.

The importance of the context and environment should not be underestimated as it strongly influences the development and behaviour of people. Today, these contexts are more fluid, and are constantly changing. The complexity of the matter at hand is overwhelming. It is difficult for governments to control and restrict influences at all the different moments and levels. They must search for other more accessible ways, without running the risk of neglecting the importance of these contextual influences. Risk factors are present at many different levels. In regards to alcohol use, it is important to make distinctions between the influences of different levels, but also to observe and take into account the restrictions as well as the possibilities on each level. For example, in terms of alcohol use: individual behaviour, culture (e.g. ethnicity), local environment (e.g. accessibility of alcohol) and national environment (e.g. national policy) are important. We felt it important to incorporate this multilevel methodology as well as multilevel governance in our study.

The stark figures on youth alcohol use strongly suggest the need for more knowledge about the initiation of alcohol use among young people within Europe and between different European countries. Although youth alcohol consumption is especially serious in specific countries (see Chapter 3), other countries are not immune to this social problem either. Therefore, it is important to examine this issue in a broader and cross-national perspective at a European level (and sometimes more international level, when we compare the results with data from other countries). In order to do so, data from multisite studies are needed, particularly from cross-national studies that provide sound epidemiological data using standard, uniform methodological approaches (Pirkis et al., 2003).

As mentioned earlier, this present project uses the ISRD dataset. The use of a common instrument for measuring alcohol and drug use (as well as risky behaviour and anti-social behaviour) in 25 European countries provides us with a rare opportunity for a comparative epidemiology in the context of different policies and cultural settings. The expansion of the research regarding adolescent alcohol use is especially important since the use of alcohol is rising among young people in different European countries, as mentioned earlier. Alcoholic beverages are now starting to be recognized as 'drugs' with major health risks (Verdurmen et al., 2005). The proposed project brings to the table an opportunity to study the role of European and national policies focused on prevention and health promotion. Because the data was collected in different countries using a similar sample design and identical measurement methods, the international data is truly comparable. Identifying the individual and

national level correlates of alcohol use, as is done in this study, will expand the knowledge base needed to develop effective strategies.

In this phase of our work we also clustered the countries based on variables which measured the policies of the countries concerning adolescent alcohol and drug use, as well a country's' socioeconomic status. These serve as national structural indicators in our study. These structural indicators (mainly concerning alcohol policy, society/economy and culture) provided us with a broader context to make sense of our results. We used these upper-level data in comparative analyses, and we collected statistical data which is internationally comparable, readily available, and has clear policy- or theoretical relevance. The data collection consisted of a series of tables designed to elicit responses in the form of data, primarily statistical data, on the main national indicators for the period closest to the administration of the ISRD-2 survey. A core list of indicators collected for our study contains information about: alcohol policy socioeconomic conditions and national culture. Our data was derived from, for example, Crime and Victimization data, World Values Survey data, and the World Health Organization (Chapter 2).

Building black 4: Evaluation analyses of prevention policies in countries

Besides this empirical knowledge about the initiation of alcohol use, it is also important to have clear insight into alcohol prevention policies and programmes aimed at influencing the use of alcohol amongst youths. For this purpose, multilevel data analyses of young people (Building block 3) were contrasted with analyses of effective policies and programmes in Europe (multilevel governance).

In our understanding, multilevel governance is defined as 'the sharing of policymaking competences in a system of negotiation between nested governments at several levels (supranational, national, regional and local) on the one hand, and private actors (NGOs, producers, consumers, citizens, et cetera) on the other' (Van Tatenhove & Liefferink, 2003). Multilevel governance is also relevant in another sense, as in this new paradigm of multilevel governance, horizontal governance arrangements gain weight and civil society organisations become more important. Many environmental strategies which prevent adolescent alcohol abuse have been developed in collaboration with civil society, social partners, nongovernmental organisations and other relevant organisations. Local and national governments are only active in setting up the preconditions by, for instance, providing information about the prevention of alcohol abuse, or by supporting specific groups. Civil society organisations are just as important as governments, as they play a crucial role in creating stepping stones for young (disadvantaged) people to become involved in different forms of environmental strategies.

In the participating countries, we carried out this multilevel policy analysis by analysing the policies, programmes and interventions used towards the prevention of alcohol and other substance abuse (see also Chapter 19) and asked ourselves questions such as: 'Which national policies do national governments pursue with regard to youth alcohol consumption?', 'Which programmes and interventions target the different risk factors (in families, schools and communities)?', 'Which programmes and interventions target the individual behaviours of young people?', and, 'Which programmes and interventions are effective at preventing underage drinking?

Building block 5: Possible effective strategies for the future

This study (*'Alcohol use Among Adolescents in Europe'*) aims to compare knowledge about adolescent alcohol use and the influences of social determinants on different levels, as well as the identification of different possible effective strategies which prevent adolescent alcohol abuse in different European countries. Policies and prevention concerning adolescent alcohol use differ not only between European countries, but also within. In this project we made an inventory of the current environmental strategies used by the European countries involved in the study.

First we identified which national policies must be pursued by national governments to prevent the use of alcohol amongst youths? Second, we identified which interventions are used within the prevention strategy towards alcohol and drug use, per country (see Chapter 21). Prevention science is based on the premise that empirically verifiable precursors (risk and protective factors) predict the likelihood of undesired health outcomes including substance abuse and dependence. Prevention science postulates that negative health outcomes such as alcohol abuse and dependence can be prevented by reducing or eliminating risk factors and enhancing protective factors in individuals and their environments during the course of development. Which effective or promising programmes and interventions are available and what different risk factors do they target (families, schools, individual and

communities)? A growing number of interventions have been found to be effective in preventing adolescent tobacco, alcohol, and other drug abuse, delinquency, violence, and related health risk behaviours by reducing risk and enhancing protection. Despite advances in the science, which evaluates effective preventive interventions, and investments in community-wide preventive interventions, many countries continue to invest in prevention programmes with limited evidence of effectiveness. Thus we compiled a manual of the most promising and effective programs currently being used in the 25 participating countries.

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2 *Methodology and design*[1]

Majone Steketee & Jessica van Toorn

2.1 *Introduction*

For the comparison and analysis of adolescent substance use we used an existing dataset: the International Self-Report on Delinquency (ISRD-2). The ISRD-2 is a comparative study of youth crime, victimization and substance use and has two distinguishing features: the rather large number of participating countries and the explicitly standardized comparative design. Comparative data provided us with the opportunity to test the universality of hypotheses in a situation of maximum differences (see Marshall & Enzmann, 2012). This chapter will describe the dataset and sampling decisions that were made for the different levels of analysis: the selection of nations, cities and towns, schools, classrooms, and respondents (i.e. pupils) (for an extensive description see: Marshall & Enzmann, 2012).

We shall also describe the different methods used in the more qualitative part of the research. For the AAA-Prevent project we used a mixed-method research design. This means that we combined quantitative analyses of the ISRD-2 data with expert meetings and focus groups. There are multiple advantages to using this approach: 1) quantitative results are better understood when national experts inform researchers about the national context; 2) results are sharpened when reflected upon by national experts; 3) it is easier to translate results into policy recommendations; 4) in international meetings the quantitative findings are directly disseminated to national researchers, policymakers and practitioners, and; 5) the expert meetings and focus groups facilitate mutual learning about the issue of alcohol prevention among adolescents. In addition to the benefits to the AAA-Prevent consortium, the meetings were a great opportunity for the participants to meet each other and discuss alcohol-related issues with European colleagues.

2.2 *Sampling*

The ISRD-2-study was conducted in 15 Western European countries and 10 Eastern and Central European countries. Some countries outside of Europe also participated in the ISRD2-study: the USA and Canada, Aruba, Surinam, the Dutch Antilles and Venezuela. Thus the ISRD-2 study was carried out in 31 countries. Due to the fact that our AAA-Prevent study focused on adolescent alcohol (and illegal drug) consumption in Europe, we only used data from the 25 European countries. The ISRD2-study was designed as a school-based survey in which the primary sampling units were school classes, and not individual students. We decided to only select students between 12 and 16 years old (see paragraph 2.2.4 for the argumentation of this choice). Originally, the whole dataset included 67,883 students. However, the dataset of the AAA-Prevent study was reduced to 57,771 students, because we only included European countries.

2.2.1 *City-based and national sampling designs*

The ISRD-2 design was originally a city-based sample. A major goal of the ISRD-2 study was to explain juvenile problem behaviour, and it may be argued that the (national) representativeness of the sample was less important (when focusing on testing correlates of offending and victimization) than the ability to obtain precise measurement of relevant covariates on the individual as well as the meso- and macro-level (Junger-Tas et al., 2010, p. 6). To explain differences in prevalence rates and to test

1 This chapter used the description of ISRD-2 Study as described in the chapter Ineke Marshall and Dirk Enzmann (2012) Methodology and design of the ISRD-2 study. Junger Tas et al., (eds.) *The Many Faces of Youth Crime.* New York: Springer, 21-65.

theories, not only individual level data but also data on the local or macro-levels are needed. City-based samples offer the possibility to measure these variables that differ locally more precisely. For these, and several other reasons (e.g., more manageable and cost-effective; possibility for multilevel analyses), a city-based random sampling instead of national random sampling was chosen in the ISRD-2 design.

However, the individual objectives of the ISRD-2 participants were quite diverse, which resulted in a mixed sampling strategy of city-based and national samples. Those whose major objective was to use the ISRD-2 data to describe the degree of crime in their country or who lived in a small country, tended to prefer national random sampling, whereas those whose research interests were more focused on explaining local differences and testing criminological theories, preferred city-based sampling (Junger-Tas et al., 2010, p. 7).

With the exception of one country (Spain), the countries with a national sample oversampled at least one large city to make analyses on the level of cities possible for all countries. Eight of the 25 participating countries had a national sample: Bosnia & Herzegovina, Czech Republic, Estonia, France, Hungary, Portugal, Spain, and Switzerland (see Table 2.1 below). The city-based sampling design was based on a minimum of five cities or towns per country, of which the main selection criteria was size, degree of urbanization, and selected economic and demographic variables. The sampling guidelines for the ISRD-2 recommended city-based sampling with about 2,100 respondents per country. Each sample would include at least 700 students from a large city or metropolitan area (about 500,000 inhabitants and more), a medium-sized city (between 96,000 and 144,000 inhabitants), and a cluster of three small towns (10,000–75,000 inhabitants). The sampling design allowed for additional optional samples for those who wished to enlarge the scope of their sample (Italy, for example, included a total of 15 cities and towns). In sum, the data was collected in 36 large and 32 medium-sized cities and 60 small towns (16 clusters of 2–9 small towns), with a total of 128 cities/towns.

Table 2.1 Country samples by city size

Country	National sample	Small Towns %		Medium Sized Cities %		Large Cities %		Unknown	N
Armenia	No	3	32,9	1	31,8	1	35,9	--	2.040
Austria	No	5	34,7	1	28,8	1	36,5	--	2.948
Belgium	No	2	30.8	2	69,2	--	--	--	2.242
Bosnia Herz.	Yes	--	--	--	--	1	26,2	73,8	2.011
Cyprus	No	3	38.90	2	61.10	--	--	--	2,298
Czech Republic	Yes	--	--	--	--	2	37.8	62,2	3,241
Denmark	No	--	--	--	--	1	100	--	1,376
Estonia	Yes	--	--	1	10.7	1	29.9	59.4	2,559
Finland	Yes	--	--	--	--	1	100	--	1,353
France	Yes	6	18,6	3	8,6	3	73,1	--	2,398
Germany	No	3	31,4	2	28,9	2	39,7	--	3,428
Hungary	Yes	--	--	--	--	1	17,1	82,9	2,159
Iceland	No	--	--	1	100%	--	--	--	587
Ireland	No	2	40,0	1	32.8	1	31.2	--	1,560
Italy	No	5	22.7	6	41.8	4	35.5	--	5,235
Lithuania	No	3	36,2	1	31,2	1	32,9	--	2,169
Netherlands	No	9	35,4	5	23,7	1	40,9	--	2,307
Norway	No	2	26,8	--	--	2	73,2	--	1,692
Poland	No	5	39,5	1	27,4	1	33,1	--	1,452
Portugal	Yes	--	--	1	9,1	1	23,2	67,7	2,541
Russia	No	3	35,9	--	--	2	64,1	--	2,306
Slovenia	No	4	66,82	1	33,18	--	--	--	2,227
Spain	Yes	?	71,8	1	12,6	3	`5,5	--	1,786
Sweden	No	2	22,3	--	--	1	77,8	--	2,274
Switzerland	Yes	--	--	1	6,3	1	26,9	66,9	3,582
Total	--	60	23,0	32	21,2	36	36,9	18,9	57,771

City selection for cross-national comparative studies are complicated by the reality that nations vary tremendously in the number and sizes of cities and towns. For example, the capital of Slovenia Ljubljana (276,000 inhabitants) is considered, according to our criteria, a medium-sized city. Therefore, Slovenia does not have a large city in their dataset. One could argue that for Slovenian standards, Ljubljana is a large city. However, compared to Russia and its capital Moscow (ten million inhabitants), it is a medium-sized city. Another issue was the process of selecting "typical" or "representative" cities. An example is the comparison of the literally hundreds of cities with more than 100,000 inhabitants in the vast regions of Russia, and Iceland and its total population of 317,000, of which two thirds live in the capital Reykjavik. As a tentative hypothesis we may then speculate, that the city-based samples of the smaller countries are more likely representative of their respective countries than those in large countries (where there is more variability). Thus, although the data is not representative for juveniles of the selected countries , they are fairly representative of juveniles living in the selected cities. When we compare countries, we are actually comparing cultural differences of cities shaped by the culture and social conditions of their countries. It is important to keep this in mind.

Although the majority of participating countries planned to include equal samples in large, medium, and small cities, some participants predominantly drew large city samples (e.g., Norway, Sweden and Finland). By default, the countries that drew national samples did not have a small town sample, but rather, tended to have large or medium city samples (e.g., Switzerland, France, Portugal, Estonia, Czech Republic, Hungary, and Bosnia & Herzegovina). In fact, all samples included large and/or medium cities, but not all samples include small cities.

The city-based samples were dominated by large cities (37.6%), supplemented by equal representations of medium cities (30.9%) and small towns (30.9%). An additional complicating factor was that the size of the city-based samples differed significantly between countries. For example, Italy collected a total of 5,300 seventh to ninth grade students from a total of 15 cities and towns, whereas Iceland's sample was limited to 591 eighth graders from the largest yet medium-sized city of Reykjavik. The mixed sampling strategy (city-based and national samples) has implications for the proper use of the data. Needless to say, it is important to keep these differences in mind when drawing comparative conclusions. In the following paragraph, we will explain how we attempted to minimize the possibly biasing influences of national sampling idiosyncrasies.

To recapitulate, the total sample (n = 57,771) was constituted, respectively of data collected in cities and towns (68 large and medium cities, 60 small towns) as well as in national samples (which includes oversampled cities). All the cases in the city-based samples (41,942) can be classified as from either a small town (n = 13,364) or from a medium or large city (n = 28,578). For the national samples, however, it is a bit more complicated, because – aside from the oversampled respondents in large or medium cities– there is a "rest" category of the other 10,929 nationally collected cases, where the number of cases from a particular town or city was simply too small to be useful in the city- or town-based analysis. Consequently, for most cases in this category, the size of the city was not indicated and thus unknown. In order to deal with these differences, we created three different datasets: 1) total sample (n = 57,771); 2) students from medium and large cities, only (n = 33,560), including city-based as well as national samples, and; 3) students from small towns (n = 13,276), some of whom were students from national samples (n = 1,723). Apart from the datasets (2 and 3) there were still 10,929 cases from national samples where the city size was unknown. In order to achieve a maximum sample size, in certain analyses, these cases will be classified as "not known" in the city size category.

In our analysis we basically followed two strategies, which reflect the two primary purposes of the analysis. For purely *descriptive* purposes (i.e., for describing the prevalence of substance use) the comparability of samples across countries is important. This strategy is used in Chapter 3. Due to the fact that on the level of cities, sampling was random in nearly all participating countries, we only based such analyses on students of large and medium-sized cities (city-based or national samples). One should note that the maximum comparability across countries is thus achieved at the expense of: (a) restricting the generalizability of students from large and medium-sized cities (which is not a huge price to pay considering the fact that the majority of the population lives in urbanized regions), and (b) reducing the sample size from 57,771 to 33,566 cases.

However, for *theory testing,* the comparability of samples across countries is not as crucial (assuming no interaction of the sampling location such as cities or the country side with relationships under

investigation (see also Maxfield & Babbie; 2001). Thus, for theory testing purposes (parts two and three, chapter 4 t/m 19) we will use the total and maximum sample.

Country samples vary in a number of ways (compare Italy to Iceland, for example). When creating *descriptive* statistics (e.g., of prevalence or incidence rates of substance use) from the total sample or from country clusters, weights have been used to give each country an equal weight. Since some analyses only used samples from large and medium-sized cities, and others only used samples from small towns, or of the total sample, weights were created accordingly.

2.2.2 Description of the data sample

Below, table 2.2 illustrates how the samples obtained in the 25 countries differ with regard to gender, age, grade, and migration status. "Migration status" is divided into three groups: First-generation migrants (born abroad), second-generation migrants (born in the country but has at least one parent born abroad), and natives (including third-generation migrants).

The distribution of gender is generally well balanced although there are somewhat fewer males than females. However, there are some age differences (mean age: 13,9 years). While in most countries the youngest age cohort represents 10% or less of the sample, in the Mediterranean countries such as Cyprus, Spain, Portugal, Slovenia and Italy, the percentage of 12 year old students vary between 21% and 30%. While in some Nordic countries such as Finland, Norway or Estonia but also Switzerland, the students are somewhat older.

Although most of the countries collected data from the three first grades of secondary school, there were some exceptions. Slovenia's sample, for example, does not include students from grade 8 because there were some changes in the school system during that period. Iceland only has students from grade 8 in their sample. Poland's sample does not include grade 7 and Bosnia Herzegovina does not include grade 9 in their data set. We will speculate about some of the reasons for these differences in the next section. In order to compensate for some of these differences, we controlled for age and gender in our multivariate analysis.

Table 2.2 Background variables of the sample by country (in percentages)

	Gender	Age					Grade			Migrant status		
Country	male	12	13	14	15	16	7	8	9	Native	First generation	Second generation
Armenia	45,8	8.6	30.2	34.4	25.3	1,5	31,5	37,5	31,03	91,3	1,1	7,6
Austria	49,3	9.8	21.0	33.4	29.4	6,5	24,1	24,6	51,3	64,7	14,7	20,5
Belgium	51,4	13.5	24.5	32.9	20.5	8,4	33,6	32,9	33,5	68,0	8,8	23,2
Bosnia Herz	50,4	2,1	35,6	45,7	16,1	0,6	48,3	51,7	0	89,6	4,4	6,0
Cyprus	48,8	25,2	32,7	34,6	6,18	0,7	29,2	35,6	35,3	81,3	8,1	10,1
Czech Rep.	50,0	13,1	32,3	34,5	18,2	1,5	40,2	42,9	16,9	91,2	2,5	6,1
Denmark	48,5	0,4	29,7	41,7	24,2	3,8	40,2	42,9	16,9	82,0	5,2	12,1
Estonia	50,0	0,8	18,2	35,0	31,8	14,1	33,4	37,4	29,3	80,0	1,8	18,2
Finland	49,6	0,2	24,0	25,8	39,8	10,2	30,0	25,6	44,4	84,6	5,7	9,7
France	50,0	21,6	27,6	34,0	14,2	2,4	42,6	29,6	27,7	47,1	10,9	42,0
Germany	51,0	6,7	28,6	31,0	26,1	7,4	35,6	33,5	30,1	68,2	9,0	22,8
Hungary	50,5	0,46	22,7	36,1	30,9	9,7	36,4	32,1	31,5	96,2	1,5	2,4
Iceland	46,0	1,0	58,3	31,7	0	0	0	100	0	88,9	3,8	4,8
Ireland	52,8	3,3	28,1	31,7	31,7	3,7	30,1	34,2	35,6	82,3	7,2	9,1
Italy	48,5	20,8	29,7	32,0	14,6	3,1	31,8	31,4	36,8	87,9	5,8	6,3
Lithuania	47,4	3,2	30,2	33,1	30,2	3,1	32,2	33,3	34,5	92,2	0.7	7,0
Netherlands	51,0	8,45	29,0	20,9	25,1	6,4	34,4	32,6	33,1	65,5	7,6	26,7
Norway	49,8	0,3	19,9	34,2	31,1	13,0	36,2	33,2	30,6	67,0	7,1	24,6
Poland	46,1	0,3	7,9	44,2	45,7	1,9	0	46,6	53,4	97,7	0,6	1,7
Portugal	48,5	21,5	33,5	27,0	12,2	5,6	39,2	37,3	23,5	85,4	3,5	11,0
Russia	48,2	4,7	25,4	39,6	27,6	2,7	32,3	34,5	33,2	87,9	5,6	6,4

	Gender	Age					Grade			Migrant status		
Country	male	12	13	14	15	16	7	8	9	Native	First generation	Second generation
Slovenia	49,6	27,8	23,5	26,0	21,8	0,7	52,3	0	47,7	70,8	3,5	25,5
Spain	51,7	29,6	30,2	27,4	9,6	3,0	32,4	35,5	32,1	86,2	8,7	4,9
Sweden	48,4	0,6	25,0	32,0	31,2	9,1	35,9	36,2	27,9	63,7	8,0	26,1
Switzerland	50,0	3,3	20,6	33,5	30,6	11,9	34,5	34,4	31,1	56,7	10,5	32,8
Total	49,4	10,3	26,9	33,5	23,5	5,44	33,6	33,7	32,7	78,0	6,18	15,6

2.2.3 School-based survey

The use of school samples are a very common practice amongst a large number of well-respected and well established youth surveys, such as the ESPAD-survey. As school is compulsory until the age of 16 in most countries, it is likely that many young people are present at school at the time of the data collection. By using a school-based design, a larger representation of lower class respondents and of ethnic minorities is guaranteed (Obberwitler & Naplava, 2002). Another argument is that youths are more likely to report realistic (often higher) incidences of delinquency and alcohol or drug use in school settings than at home (Brenner et al., 2006). The sampling asked for a random selection of 7th, 8th and 9th grade classrooms in the selected cities. Within each grade 700 students should be represented.

There were some school differences between the countries such as: the age of compulsory education (e.g. Belgium 18 and Italy 15), types of schools (general, versus technical or vocational), national differences in grade repetition policy (e.g. in Belgium or the Netherlands repeating a grade is more common than in Slovenia), and national differences in how special educational needs are met (Junger-Tas et al., 2012).

The disadvantage of using a school-based sample is the differences in age of the students. In countries where it is more common to repeat a grade, the age is higher than in other countries.

Also some typical obstacles for school-based sampling should be mentioned, such as the lack of availability of a sampling frame (i.e. listing of individual 7th, 8th and 9th grade classrooms), lack of cooperation of the selected school, and ambiguity about the definition of the grade (resulting in disproportionate age groups in some countries). On the other hand, the commitment to participate in the study was comparably high. Because of the overall low refusal of students, two factors that threatened the representativeness of the sample were a lack of school and parental cooperation. There is considerable national variation in cooperation by the schools. A number of countries reported perfect (Armenia, Finland) or near perfect (Cyprus, Sweden and Slovenia) school cooperation. The west-European countries had the most problems in gaining the participation of schools (Netherlands, France, Denmark).

Active parental consent was required for this study, and was obtained in nearly all the countries, with the exception of Poland (22,5% parental refusal) and Czech Republic (10%). This parental refusal rate is high in comparison to the other countries where the refusal was only a few percent or less.

2.2.4 Design effects of the dataset

The primary sampling units of the ISRD-2 study were school classes, and not individual students. All students present in the school classes were randomly selected (stratified by grade) and asked to fill in the questionnaire. Due to the clustering of students within school classes, characteristics of respondents within classes may be more similar or homogeneous than between classes. Depending on the degree of homogeneity (as measured by intra-class correlations), tests of significance will tend to be too liberal (statisticians describe this phenomenon as design effect). Too liberal means that associations or differences will appear to be significant even though they are not. But, even when taking this design effect into account, small and *substantially* insignificant effects will still become *statistically* significant because of the huge sample size. Therefore, well endowed with a comfortable sample size, we decided to ignore the clustering of students within classes because for our analyses, the size of effects is far more important than their significance. In our situation, not taking design effects into account in tests of statistical significance will practically not affect the interpretation of the results.

Another consequence of using classes (not individual students) as primary sampling units is that although the students are indeed representative samples of members of school classes of grades 7-9, they are not necessarily representative samples of certain age groups. The sampling of school classes

facilitated the practical management of respondent selection and also allowed us to obtain a greater level of cross-national comparability. That is, by focusing on classes at compulsory school age (for most countries ending in eighth or ninth grade), we expected to obtain a more representative sample with cross-national comparability. However, this comes at a price: in countries in which repeating a grade is related to the socioeconomic status or to the problem behaviour of students, socioeconomic status or problem behaviour is confounded with age (but not with grade). This can be demonstrated by investigating the percentage of repeaters per age group vs. grade. The relationship between age and repeating a grade is an artefact of the sampling design that takes classes as primary sampling units, not individual students. Twelve-year-old students who did repeat a grade were overwhelmingly found in grade six instead of grade seven (and are thus excluded from the survey). Meanwhile, 16-year-old students who repeated a grade were overwhelmingly found in grade nine instead of grade ten (and are thus included in the survey).

This is the reason why we often will use grade instead of age in analyses where we want to know whether older students differ from younger students independently from their socioeconomic status, school achievement, or likely problem behaviour. In these instances, grade will serve as a valid proxy for age.

2.3 Measurements

A pencil and paper questionnaire was developed for students, which they were asked to fill in during one class-hour. In most countries there was a researcher present while the students were filling in the ISRD-2 student questionnaire to make sure that their answers remained anonymous. The measurements and variables used are described in the following paragraph.

2.3.1 Outcome variables

Alcohol use

Alcohol was one of the substances that the questionnaire focused on. Alcohol use was measured by the following two screening questions:

- Have you ever drink beer, breezers, or wine? (question 49)
- Have you ever drink strong spirits (gin, rum, vodka, whisky)? (question 50)

Follow-up questions asked about the age of first use, whether or not the youth ever became drunk, and last month use (prevalence, and number of times). There was also an attempt to measure the amount of consumed alcoholic beverages (how many glasses, cans or bottles?), and whether the youth drank alone, whether an adult (parents, police, teacher, or someone else) noticed or were aware that they were drinking, and whether or not they were punished as a consequence of their actions. Some of these questions proved to be somewhat problematic because of the switch of time frames between the question: “Did you use it during the last 4 weeks?”, and the next question which asked about their usage the “the last time” (did you use it alone or with others?).

Based on this information we created two measurements for problematic drinking: non-risky and risky alcohol use (cp. part 2, chapter 10), and heavy episodic drinking. The latter implies a drinking session where a youth consumes five or more glasses of alcohol (soft alcohol or strong spirits). The variable ‘problematic drinking’ was created because of the age differences within the dataset, and the idea that a twelve-year-old drinking alcohol three times or more during the last month, is more problematic, than if a 16-year-old had a similar drinking pattern. Thus we created two variables: based on theoretical and practical considerations, a youngster will be treated as a non-risky alcohol user, if:

- he/she never drunk before in his lifetime or;
- he/she drunk at least once in his lifetime but not during the last month or;
- he/she drunk at least once in his lifetime and during the last month, but is at least 14 years old and has not consumed alcohol on more than five occasions in last 30 days or has not consumed more than five alcoholic beverages during the last drinking occasion.

A risky user will be defined as a student who:

- drank during the last month and is younger than 14 years old, or;

- drank during the last month, is at least 14 years old and has consumed alcohol on more than five occasions during the last 30 days or consumed more than five alcoholic beverages during the last drinking occasion.

Drug Use

There were separate questions about types of drugs: (1) weed, marijuana or hash; (2) drugs such as XTC or speed, and; (3) drugs such as LSD, heroin, or cocaine. Follow-up questions asked about the age of first use, last month use (including frequency), whether the drugs were consumed alone or with others, whether or not use was detected (by parents, teachers, police or someone else), and whether or not youth received punishment.

Regarding the convergent validity of the ISRD-2 data, we compared alcohol and soft drug use with other available data sources on substance use among young people, namely: the ESPAD-study. The analyses show that there is a reasonable degree of consistency between the ISRD-2 and the ESPAD data (see Steketee, 2012).

2.3.2 Background Variables

Social Economic Status

Based on the ISRD-1 Study we knew that we would be faced with a substantial amount of missing data if we included questions about the type of job, income, or education of the youths' parents. Instead, we opted to include four questions that would provide a more indirect measure of a youths relative affluence. These questions were initially developed for studying health-wealth relationships in cross-national health behaviour research (Currie et al., 1997; see also Boyce et al., 2006). The number of positive answers to questions about having an own room; having access to a computer at home; owning a mobile phone; and one's family owning a car, were summed to obtain an indicator of *family affluence* (scores ranging from 0 to 4, transformed to scores ranging from 0 to 100). Although these questions turned out to be among the most straightforward and simple to answer, we found that the value of this variable as a measure of affluence was debatable. This is mainly because it is conceivable that in affluent societies, the questions measured the propensity to consume instead. The internal consistency (standardized Alpha = 0.50) is low. There was relatively little variation between the youths: very few of them answered negatively on all items; most of the youth answered positively on three or four items.

We also used a more traditional measure of socioeconomic status by including two questions about whether their father or mother had a job (questions 8 and 9); i.e., *employment*. It took considerable debate to determine how to formulate this question and which response categories we should provide. The questions had a relatively large number of possible response options (eight in total), which were not necessarily mutually exclusive and exhaustive. Importantly, the different options (i.e., he has a steady job, he works at his own business, he sometimes has work, and so on) reflect the compromises made, and the most useful way of recoding these variables was by creating a dichotomous variable: 'is one of the adults in the household working or not?'.

Immigrant Status and Ethnic Minority Group

Based on the responses to questions 3 (were you born in this country, et cetera.), question 4 (in what country was your mother born?), and question 5 (in what country was your father born?), we created the variable of *migran*t, which was sometimes used as a simple dichotomy (native born, vs. first or second generation migrant), and sometimes as a trichotomy. Some additional questions were included which may be of interest, but they were not part of our core definition of ethnic minority group and/or migrant. For example, language spoken at home (question 7), experience of discriminatory treatment (question 8), and friends of foreign origin (question 35) may be used to shed more light on whether a youth may be classified as a migrant or belongs to an ethnic minority group.

Family

Questions related to family are a central part of most youth surveys. Some similar questions may be used as indicators for different theoretical perspectives (which is also true for questions related to friends, leisure time, and school). Here, we will provide a brief overview of those family-related questions used in this report. We recognize that there are other ways in which these questions may be employed, and there are some other family-related questions on the survey which we will not discuss here. Some of these questions were derived from well-known sources (i.e., Hirschi's 1969 social

bonding theory), and others were formulated especially for our comparative study, in consultation with partner researchers.

Attachment to parents was measured by two questions: 'How well do you usually get along with your father (or stepfather)?', and; 'How well do you usually get along with your mother (or stepmother)?' (questions 16 and 17). Values range from 1 (not at all) to 4 (very well). We also included these two questions in a *family bonding scale*. The family bonding scale is a composite of four questions: (1) the frequency of a family doing things together (1 = almost never, 6 more than once a week) (question 18); (2) the frequency of eating dinner together (1 = never, 8 = daily) (question 19); (3) attachment to father (question 16), and; (4) attachment to mother (question 17). The scores were converted to POMP scores, ranging from 1 (low) to 100 (high), Cronbach's Alpha = 0.55). *Parental supervision* was measured by asking youths whether their parents usually know with whom they are with when they go out (question 20). In order to accommodate those youths who responded that they never go out, this variable was recoded as: (1) rarely or never; (2) sometimes, and; (3) always or do not go out. A low value (1) reflects low levels of parental supervision, and a higher value (2 or 3) indicates more parental supervision. Occasionally, instead of parental supervision, we used the term *family control*.

Family disruption was measured by a scale comprised of answers to three questions on the life event scale. The Life Event scale (item 22) is an 8-item fixed response question (yes/no), and asks youths whether they: "have ever experienced any of the following serious events …." Three questions related to the family are: (1) problems with one of your parents who consume alcohol or drugs; (2) repeated serious conflicts or physical fights between parents, and; (3) separation/divorce of parents. The family disruption scale scores range from 1 (no disruption) to 100 (high disruption), Cronbach's Alpha = 0.49.

Family structure or *family composition* was measured by one question (question 6). Not surprisingly, in view of the complex and changing living arrangements of young people today, we needed to provide a large number of response categories (eight, including an open-ended "other" category) in addition to the common category of living with both parents. We created three different recoded variables, ranging from five categories (living with both parents at home = 72.6%, living alternatively with father or mother = 4.9%, living with one single parent = 13.0%, living with a stepparent = 7.0%, and other = 2.5%) over four categories (collapsing "living alternatively with one parent" and "living with a stepparent") to two categories distinguishing between a complete family (with both parents at home) versus "no complete (with both parents at home) versus family" (all other situations).

School

A number of questions tap into school-related experiences of the youth. We made use of the true-and-tried question: "Do you usually like school?" (question 41), with four response categories ranging from "I like it a lot" (16.5%) to "fairly well" (45.0%) and "not very much" (27.5%) to "I do not like it at all" (11.0%) reflecting the level of *school attachment*. We also included an 8-item question, which asked the student: "How strongly do you agree or disagree with the following statements about your school?" (1=fully agree, 4=fully disagree). We used this question to construct two scales. First, we constructed a scale measuring *school climate or school bonding*, using the first four items (if I had to move I would miss my school; teachers do notice when I am doing well and let me know; I like my school; and there are other activities in school besides lessons). This scale represents factors that normally belong to a positive school climate, Cronbach's Alpha =0.61. The *school disorganization* scale is comprised of the last four items of this question (there is a lot of stealing at my school; there is a lot of fighting at my school; many things are broken or vandalized in my school; Cronbach's Alpha = 0.75. These two scales measure the students' *perception* of the level of school disorganization. Two questions asked were related to the students' *performance*: one objective (school failure, i.e., repeating a grade, question 42) and one subjective (self-assessment of achievement, question 44).

Since a lot of variation was found between countries with regard to the practice of repeating a class, the subjective measure of school performance proved to be a more useful variable. *Truancy* was measured by asking whether student ever stayed away from school for at least a whole day without a legitimate excuse in the past year (question 43). A related question tried to capture the students' educational *aspirations* (question 46), by asking about the student's plans after compulsory school. The age of compulsory education differs significantly between countries, as do the opportunities for continuing education. We tried to capture all possibilities by including a variety of responses (looking for a

job; starting an apprenticeship; start training on the job; attending a school where a trade may be learned; continuing school to prepare for higher education, or; other).

Neighbourhood

We adapted a frequently used measure of the youth's perception of his/her neighbourhood (Sampson et al., 1997; Sampson et al., 1999). This neighbourhood scale (question 47) initially consisted of 13 items. However, upon analysis, three items proved to be irrelevant to our study (items 47.2, 47.4, 47.13). We created a *neighbourhood quality* scale of ten items, transformed to POMP scores ranging from 0 to 100 (Cronbach's alpha = 0.77). We also constructed three subscales. *Neighbourhood attachment* (or *neighbourhood bonding*) is comprised of two items (If I had to move I would miss my neighbourhood, 47.1, and; I like my neighbourhood, 47.3). A second scale measured *neighbourhood disorganization*, using five items (47.5 through 47.9). The third subscale uses three items (47.10, 47.11, 47.12) to measure *neighbourhood integration* (or *neighbourhood cohesion*).

Lifestyle/Leisure time

A significant portion of the questionnaire asked about leisure time activities of the students (questions 23 through 37). Routine activities and other opportunity perspectives stress the importance of unstructured and unsupervised activities. We tried to capture this in the *lifestyle* scale, comprised of four questions: frequency of going out at night (item 23); time spent hanging out with friends (item 24.5); most free time spent with large group of friends (item 26), and; having groups of friends who spend a lot of their time in public places (item 29) (Cronbach's Alpha = 0.63). More details about this scale are presented in Chapter 9.

Deviant group behaviour was measured by a subscale created from four items (37.3, 37.4, 37.5, 37.8), which asked about the kinds of activities youths engaged in when they hung out with their friends (drinking a lot of alcohol, smashing or vandalizing for fun, shoplifting just for fun, frightening and annoying people for fun). The questionnaire also included six items to measure *gang membership* (items 27, 29, 30, 31, 32, and 33). These items were developed by the Eurogang (Decker & Weerman 2005), with the explicit objective of measuring gang membership in a comparative context. This will be discussed in more detail in Chapter 9. In the meantime, a number of interesting analyses have been conducted on this measure (see Gatti et al., 2010). Translation of the term "gang" proved to be problematic, for instance in France, one speaks of a "*bande criminelle*" rather than a "*bande*" (see also Chapter 9). Closely related to lifestyle/leisure is whether or not the youth has friends involved in deviant or illegal behaviour. Admitting to having *delinquent friends* is often used as an alternate way of asking about one's own involvement in delinquency: respondents are often more willing to admit that they have friends who do undesirable things, rather than admitting to doing these things themselves. Research has shown that the self-reported delinquency of friends is strongly correlated to a youths delinquent involvement (Warr 2002). In the ISRD-2 questionnaire, a 5-item question on the delinquency of friends preceded the section on self-reported delinquency and substance use, partly as a way of neutralizing the social desirability effect. This question asks how many of a youths' friends are involved in drug use, shoplifting, burglary, extortion, or assault (48.1–48.5).

Life events

Serious events in a youngster's life may disrupt his or her normal development, which may then be expressed through misbehaviour. In order to tap into that dimension, we asked whether the youth had had an accident serious enough to require medical attention (question 40). Additionally, we included a *life events* scale (question 22). The eight items on this scale were not expected to correlate, thus Cronbach's Alpha of 0.43 was no indication of unreliability. Rather, a high score on the life events scale indicated that the student experienced a large number of negative life events. Two subscales were created: *family disruption*, and; confrontation with *death and illness* (combining items 22.1 through 22.5: death of a brother or sister; of father or mother; of someone else significant; long term illness of oneself; long term illness of parents or someone close).

Attitudes toward Violence

Subcultural theories of violence and delinquency assume that violent attitudes are a key explanatory component. Therefore, we included a well-established scale of attitudes toward violence (Wilmers et al., 2002) in the questionnaire. This 5-item question measures positive attitudes towards violence by asking respondents to agree (fully or somewhat) or disagree (fully or somewhat) that: a bit of violence

is part of the fun (38.1); one needs to make use of force to be respected (38.2; if one is attacked, one will reliate (38.3); without violence everything would be much more boring (38.4), and; it is completely normal that boys want to prove themselves in physical fights with others (38.5). The responses were transformed to POMP scores (Cronbach's Alpha = 0.71).

Self-Control

Low self-control has been one of the main theoretical perspectives on crime and delinquency since the general theory of crime was first introduced by Gottfredson and Hirschi (1990). We included an abbreviated version of the most frequently used self-control scale (Grasmick et al., 1993). The reliability coefficient for the total 12-item *self-control* scale is high (Cronbach's Alpha = 0.83). There are four subscales: *impulsivity*, *risk taking*, *self-centeredness*, and *volatile temperament*.

Delinquency

Self-reported delinquency was measured by the following 12 items:

1. Have you ever *damaged something on purpose*, such as a bus shelter, a window, a car or a seat in the bus or train, a car…? (*vandalism*)
2. Have you ever *stolen something* from a shop or department store? *(shoplifting*)
3. Have you ever *threatened somebody* with a weapon or beat them up, just to get money or other things from them? (*robbery/extortion*)
4. Have you ever *broken into a building* with the purpose of stealing something? *(burglary*)
5. Have you ever *stolen a bicycle, moped or scooter*? (*bicycle theft*)
6. Have you ever *stolen a motorbike or car*? (*car theft*)
7. Have you ever *stolen something out of or from a car*? (*theft from car*)
8. Have you ever *snatched a purse, bag or something else from another person*? *(snatching*)
9. Have you ever *carried a weapon*, such as a stick, knife, or chain (not a pocket knife)? (*carrying a weapon)*
10. Have you ever *participated in a group fight* on the school playground, a football stadium, the streets, or any public place? (*group fight*)
11. Have you ever *intentionally physically assaulted someone, or hurt him/her* with a stick or knife, so bad that he/she required medical attention? (*assault)*
12. Have you ever *sold any (soft or hard) drugs* or acted as an intermediary? (*drug dealing)*

All items were asked within two time frames: (a) lifetime prevalence ("Have you ever …"), and (b) last year prevalence ("Have you done this in the last twelve months") as well as incidence ("Yes, ___ times"). Each of these questions also included a number of follow-up questions (i.e., How old were you when you committed this act for the first time?; Did you commit this act in the last year?; and if so, How many times, were you alone or with others, were you detected and by whom, and were you punished?).

Victimization

The ISRD-2 study also included four items on victimization (question 15). Three of the questions concerned a criminal offense (robbery/extortion, assault, theft); the fourth item (bullying) is not considered a crime. In retrospect, the design of the question left something to be desired; we found that some youngsters had difficulties following the instructions.

Structural indicators

The ISRD data also included national and local (city-level) structural indicators to supplement the self-reported survey information. These structural indicators provided a context for the findings, and were used in comparative analyses. Tests of macro-level comparative hypotheses routinely draw from secondary data sources and statistics provided by a large variety of government and nongovernmental agencies (e.g., World Health Organization, World Bank). A number of these indicators were collected by the national partners in the ISRD-2 study: they had the obvious advantage of having more intimate knowledge and a better understanding of the availability and meaning of the national level data sources. The nine basic indicators (similar to those collected at the local level) were complemented with macro-level indicators derived from sources such as the International Crime Victim Survey (ICVS), the European sourcebook, Transparency International, the World Values Survey, and the World Bank.

Within the AAA-prevent study we also added national structural indicators that were more focused on alcohol and drugs. For these structural indicators we used information provided to us by our partners who researched and wrote about their country's national policies about alcohol and drugs. We supplemented their research with extra information from other sources such as the World Health Organization, ESPAD survey, European values study and the RAND report.

The data collection consisted of a series of tables designed to elicit responses in the form of data, primarily statistical data, on the main national indicators for the period closest to the administration of the ISRD-2 survey. A core list of indicators collected for our study contained information about: Alcohol Policy (Affordability, Availability, Restrictions on juvenile drinking, Sale restrictions, Severity of alcohol policies, Legal blood limit driving a vehicle), Socioeconomic conditions (Human Development Index, Life expectancy, Gross Domestic Product, Education index, Global Competitiveness Index/ quality of higher education and training, Employment rate) and National Culture (Per capita consumption, Proportion of alcohol disorders, Importance of friends, Percentage of youngsters drinking spirits only, Drinking culture). We derived our data from various sources such, Crime and Victimization data, World Values Survey data, WHO et cetera, REF, see also Chapters 19 and 20).

2.4 Multilevel analysis

Multilevel logistic regression analysis is necessary to model the dichotomous outcome variables in our research. All researchers made use of different programs for the multilevel analyses. Some of them used R to perform all data manipulations and analysis, and others used STATA, HLM or MLWin for their analyses. In part three of this report, everyone describes which program they used.

There are three levels of clustering that will be modeled in the analyses: the individual, school, and country level. The main interest in these analyses is the individual (what is the impact of variables on the probability of adolescent problematic drinking?) and the country level (are there differences in the relation between variables and problematic drinking between countries?). A school-level intercept variance will be modeled, but we will not look at the random slope variance on the school level. School influences behaviours, and by using three-level models we will be able to take this into account in several analyses.

The analyses were carried out for each hypothesis (each corresponding to one domain of interest separately: for instance for the domain peers we looked at: lifestyle, deviant group behavior, delinquent friends and gang membership. We will use a bottom-up modeling approach in which the fixed part will be built up first, followed by the random part. The following modeling sequences will be applied in several chapters:

1. *Null model*. By estimating this model, the total variance can be partitioned into three components: individual, school, and country. The proportions of variance on each level can be calculated by the intraclass correlation coefficient and it gives a baseline deviance to which the other models can be compared.
2. *Control variables*. In the second model, the demographic variables gender (base: female), grade (dichotomized to grade eight and nine, grade seven is the referent group), and migrant status (dichotomized, nonnative is the baseline) are added to the model. The interest is not in the impact of these variables, but they are included to control for there effects (i.e., spuriousness) before including our explanatory variable.
3. *Explanatory variable*. The explanatory variable is included in the model to estimate its impact on intense drinking. This regression coefficient represents the relationship between the explanatory variable and the outcome variable on the individual level. The slopes for the explanatory-variable are fixed in this model, which reflects the assumption that the effects do not differ across countries. In this model the interest is in explaining the within-group variance.
4. *Higher-level explanatory variables*. In this model country-level explanatory variables are added to the model. In these analyses we will only use the aggregated versions of our individual-level explanatory variables in our model to investigate whether there are between-country effects of the peer-variables on the outcome variable intense drinking.

5. *Random slopes*. In the next step we will investigate whether the relationships between the explanatory variables and intense drinking differs across countries. We will not estimate the associations for each country, but just the variance in impact across countries.
6. *Cross-level interactions*. The final model includes predictor variables for the random slopes, which are added to the model as cross-level interactions. The main aim is to explain variance in the slopes across countries.

During each step in this modeling sequence, a likelihood ratio test will be carried out to assess whether a model fit improves. To make a fair comparison between countries, it is necessary to keep the number of observations constant across the models. List wise deletion was used to remove the observations that had missing data on the variables that were used in these analyses.

All predictor variables that were measured on the interval/ratio scale were standardized before including them in the models.

2.5 *Regional expert meetings on national policies and effective prevention programs*

Besides the quantitative data collection we also made use of qualitative data where we used other methods for the purpose of comparing and cross-checking our outcomes on juvenile alcohol use and collecting some information on the policies used within the 25 European countries involved in the AAA-Prevent study, and the prevention programs they were using. In ten regional expert meetings – five on national policies and five on effective prevention programs- the results of the quantitative analyses of the ISRD-3 data were enriched, interpreted and discussed with national researchers, policy-makers and practitioners.

2.5.1 *National policies*

The main goal of the AAA-Prevent study was to analyse differences in alcohol consumption between European countries and reflect upon the possible risk- and protective factors which influence these differences. Therefore, national indicators were needed for the analyses. To gain more insight into the national context of the 25 participating countries, we asked experts from each country to write a national report on substance use in their country and their national policies and culture towards alcohol and (soft and hard) drug consumption. Most of these experts were involved with the ISRD-2 network. In some cases, however, the representatives suggested a substitute person. The experts were asked to provide information about adult substance use; youth substance use; the national policy towards alcohol and drugs (for example,zero tolerance, supply reduction, demand reduction and/or harm reduction); the availability of alcohol and drugs, and; the cultural attitude towards alcohol and drug use.

These national papers were presented in five regional expert meetings where five participating countries would discuss the outcomes of our study and their national reports. In addition to the subcontractors, who wrote the national reports, we also invited one policymaker and one practitioner from each country involved in the field of prevention policies towards alcohol and drugs. These participants were selected by the subcontracted experts, as a part of their contract.

Every partner of the research team organized two expert meetings, and they were responsible for the organization of a two-day meeting , which they chaired. During the first meeting in Gent, 15 researchers, policymakers and practitioners from Flanders, Wallonia, the Netherlands and Denmark were present. There was no one from Ireland at the first meeting, but the expert wrote a national report. At the next meeting in March 2011, in Prague, there were also 15 researchers, policymakers and practitioners from the Czech Republic, Hungary, Poland, Russia and Armenia present. All experts wrote a national report. The same number of people (15) attended the meeting in Tallinn, from Estonia, Finland, Sweden, Norway, Lithuania, again with the exception of Iceland. However the expert did submit a country report. We held another meeting in Berlin with 11 people from Germany, Austria, Switzerland and Slovenia. The expert from Bosnia & Herzegovina was not able to attend, nor submit a national report. The last meeting took place in Genoa, were 16 experts were present from Italy, Cyprus, France, Spain and Portugal.

After the presentations of the national reports, we held a discussion about the similarities and differences in terms of policies between the participating countries. An important conclusion of the meetings was that even though a large number of the policy indicators described in these reports were originally collected, not all of them were usable for various reasons. Firstly, some experts found that the indicators were too subjective making their cross-cultural comparability highly questionable. Unfortunately, this was, especially the case for items which we were hoping to use to measure the implementation of policy in everyday life, i.e. how strictly are norms grounded in policy enforced? Even though this issue is of great importance, its reliable estimation would have to be based on opinions from a larger group of experts and on more precisely defined criteria. Secondly, some indicators were not reported by a number of countries and this hindered their use in further analysis. Therefore we decided to collect more objective and comparable data from sources such as the World Health Organisation, the European Commission, ESPAD, RAND and the European Values Study. These indicators will be described in chapter 20. The information from the national reports will serve a more illustrative purpose in this chapter.

2.5.2 Prevention programs

Another aim of the AAA-Prevent project was to identify different potential local effective strategies for the prevention of adolescent alcohol abuse in different European countries. The development of effective preventive and early interventions for youth alcohol use is important for a number of reasons, including: the high clinical demand for such programs; the possibility of influencing the typically negative course of early onset drinking (Grant & Dawson, 1997; Hawkins et al., 1997), and; the possibility of preventing the early onset of associated psychological problems such as depression (Newcomb & Bentler, 1989).

In order to obviate the consequences of juveniles alcohol abuse, local and state authorities have adopted many kinds of prevention programs, which vary considerably among countries (Anderson & Baumberg, 2006). In some European countries, preventive interventions have been broadly implemented for many years, and in some cases they have been evaluated thoroughly and scientifically. However, in other countries, preventive interventions are scarcer, and efforts to evaluate them have been less scientific (Foxcroft et al., 2002).

A growing number of interventions have been found to be effective in preventing adolescent substance use and related health risk behaviors (Foxcroft et al., 2002¸ Foxcroft & Tsertsvadze, 2012). Nevertheless, many countries continue to invest in programs or interventions with limited evidence of effectiveness.

In order to gain more insight into the available prevention programs and interventions in the participating countries, we again subcontracted experts to write a national report. This time focussing on the programs and interventions which target juvenile alcohol and drug consumption in their countries.

The experts were asked to:

- Draw up an inventory of preventive programs in their country on the meso (school and neighbourhood) and micro (family and individual) level aimed at alcohol use among juveniles in European countries.
- Describe two 'best practices' in more detail.
- In this study, a youth intervention strategy working towards the prevention of alcohol use is: goal-directed, uses a systematic approach, and is carried out by various providers. In order to diminish researcher subjectivity, we used a modified Kahan & Goodstadt (2001) definition of best practices in health promotion, which is defined as: "*those sets of processes and actions that are consistent with health promotion values, theories, evidence and understanding of the environment, that are most likely to prevent alcohol use among juveniles*". The inventory had to be based on published scientific literature and on "grey" literature (technical reports from government agencies or scientific research groups, working papers from research groups or committees, white papers, preprints, et cetera.).

The criteria of inclusion were:

- The prevention programs should explicitly include the prevention of underage drinking among their aims, even if other issues are targeted (e.g. drug use or abuse, et cetera.).

- Every program/intervention should be developed in accordance with a manual, text or defined guidelines, in order to make its characteristics and implementation clearly understandable to enable other parties to replicate the program or intervention.

Each program was briefly described and classified according to five domains: individual, family, school, community or multi-component.

Because of the high heterogeneity among the reports (not all papers followed our template, particularly with regard to qualitative descriptions), and the lack of scientific evaluation of most programs, there were some limitations for an in-depth analysis of these programs. Thus, we asked national experts to choose and propose two (or more, if available) "good" programs or interventions in their country (one at the meso level and the other at the micro level) according to their competence and experience, as "best practice models".

During the regional seminars (Spring 2012), the findings were discussed, with particular attention to similarities and differences between the countries. The same people (researchers, politicians, and practitioners) who present at the first meeting were invited to the second regional seminar. During the second meeting in Gent, 10 researchers, policymakers and practitioners from Flanders, Wallonia, The Netherlands and Ireland were present. Due to personal circumstances the experts from Denmark from the first meeting, were not able to attend, but the expert was able to submit a country report. During the second meeting in Prague, 18 researchers, policymakers and practitioners from the Czech Republic, Hungary, Poland, Russia and Armenia were able to attend. All the experts wrote written a country report. Sixteen experts from Estonia, Finland, Sweden, Iceland, and Lithuania were present at the meeting in Tallinn, with the exception of an expert from Norway, who did submit a country report. At the meeting in Berlin, 14 people were present from Germany, Austria, Switzerland and Slovenia. At the meetings in Genoa, 14 experts were present from Italy, Cyprus, France, Spain and Portugal. Thus, in total 72 persons were present at the regional conferences. The objective of the meetings was to identify and select programs/interventions, which had been evaluated and proven of effectiveness, with the intent of enabling politicians and policymakers to discern which interventions are effective or promising in the field of prevention. The selected effective programs are published on the AAA-Prevent website (www.aaaprevent.eu/strategies).

2.5.3 Focus groups on policy recommendations

The final goal of the AAA-Prevent project was to create policy recommendations which would strengthen the prevention of alcohol and drug use of (vulnerable) young people on different levels of policymaking (local, national, European level). The conference in Ghent (September 20th, 21st), which included all the participants from the first and second regional expert meetings, provided substantial input towards reaching this final aim. The conference counted 34 participants from 17 different countries, and among them were 24 researchers, 4 policymakers and 6 practitioners.

The purpose of the Ghent conference was to formulate a set of policy recommendations that could serve as guidelines for further preventive actions against alcohol use among minors. In focus groups participants were encouraged to reflect on the findings from the AAA-Prevent study and to formulate policy recommendations, based on a series of statements.

The focus group sessions of the Ghent conference were organized in five topics (two fixed ones and three variable ones, see table 2.3).

Table 2.3 Overview of the focus groups during the Ghent conference and the moderating country

FOCUS GROUPS	**Topic**	**Topic**	**Topic**
Session 1	Levels to work on prevention	Levels to work on prevention	Levels to work on prevention
Day 1: 16.00 - 17.00	The Netherlands	Germany	The Netherlands
Session 2	Handling alcohol cultures	Handling alcohol cultures	Handling alcohol cultures
Day 2: 09.00 - 10.00	Italy	Estonia	Germany
Session 3	Involving parents & adolescents in prevention	Person-related prevention efforts	Alcohol use and schools
Day 2: 10.20 - 11.20	Estonia	Czech Republic	Belgium

Three sources of data were used for these statements: (1) the results from the analyses of the ISRD-2 dataset anda cross-national dataset on adolescent alcohol use and risk factors on different levels and domains; (2) findings from the regional expert meetings on national policies, and; (3) the findings from the regional expert meetings on prevention programs and the database that was constructed based on this inventory.

The three focus group sessions on day 1 (session 1) focused on the different levels of prevention, taking into account some of the findings from the multilevel analyses at the country-level. This session also discussed which approaches were more effective: an integral national approach, a combination of separate interventions or another approach.

The next session of focus groups (session 2) on day 2 focused on how to handle different alcohol cultures. Given the strong differences of alcohol cultures in Europe, the session focused on which strategies could best be employed to change these alcohol cultures, and influencethe different groups of users within these countries. The session resulted in policy recommendations in terms of how to pursue the prevention goals as defined by national and European governments, given the strong impact of these alcohol cultures.

The final sessions on day 2 comprised of three different focus group sessions that tackled more specific topics. The first final session focused on the involvment parents and adolescents as actors in prevention strategies. The second topic addressed prevention strategies targeting the individual's skills (e.g. self-control), and the last focus group focused on how structural characteristics of the schools within countries could generate inequalities in drinking patterns. Again, all three sessions were directed at formulating policy recommendations for future prevention programs.

The method of focus groups

The purpose of focus group discussions is to gain knowledge about a particular topic or need by interviewing a group of people directly affected by the issue. Focus group data can be used to collect information for many purposes, such as conducting a needs assessment or evaluating a program.

The focus groups in Ghent were led by one moderator, one assistant and one student. The moderators were knowledgeable about the project, were able to deal tactfully with the different group members, kept the discussion on track, and made sure every participant in the group was heard. The moderators set the tone for a comfortable and enjoyable discussion. The task of the assistants was to help summarize the results or reflections of the focus group. Both moderator and assistant were partners of the AAA-Prevent consortium. There was also a student of the Ghent University present in each focus group to take minutes. The sessions were also tape-recorded.

In a plenary session at the second day all moderators presented the main findings of their focus groups.

2.6 Summary and conclusions

This chapter presented the data and methods used in the AAA-Prevent study. We discussed some methodological issues and decisions that were made in terms of the dataset. The dataset was designed to take full advantage of the comparative design, which allowed us to test specific hypotheses about the relations between risk and protective factors and juvenile alcohol consumption within the national context of European countries. By using the same sampling plan and instruments and data treatment, we were provided with a unique opportunity to conduct this study about youth alcohol consumption in Europe.

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Part II

Alcohol use among adolescents in Europe

The second part of the report provides information about adolescent alcohol use in Europe. The first chapter provides an extensive overview of substance use on basis of descriptive analyses for 25 European countries. Besides alcohol (beer, wine, breezers and spirits) this section also describes the use of other drugs by adolescents in Europe, including Cannabis (hashish, marijuana), Ecstasy or Speed and LSD, Heroin, and Cocaine.

This part of the study also takes closer look at the term “risky or problematic alcohol use”. This term is often not clearly defined in European research, and there is a need for clarification in order to develop a sound prevention strategy. Therefore this part identifies distinctive alcohol consumption profiles in adolescence by comprising alcohol use indicators in a multivariate way, instead of only focusing on a single indicator.

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3 Descriptive Analysis of Substance Use in Europe

Herbert Scheithauer, Kristin Göbel, Renate Soellner & Stefan Huber

3.1 Introduction

The present report is part of the AAA-Prevent (Alcohol Abuse among Adolescents in Europe) project, which aims to discover different effective strategies to prevent alcohol abuse among adolescents from different European countries. The misuse of alcohol among adolescents is a major concern for all European countries. The cross-national AAA-Prevent study contributes to new environmental prevention strategies and successful policies by looking at individual characteristics and/or societal, school and family influences. The project identifies and analyses the risk factors which might influence the initiation of alcohol use building upon the substance use data collected from the Second International Self-Report Delinquency Study (ISRD-2). In the ISRD-2, self-report data of adolescents between 11 and 18 years old from a total of 31 countries were collected with a focus on juvenile delinquency. The data included information concerning demographics, family, neighbourhood and school, leisure time and peers, predisposing attitudes and personal inclination, alcohol intake, use of soft and hard drugs. Compared to the first ISRD study which commenced in the early 1990's, some major improvements were indicated in the second ISRD study, starting in 2006. A major goal of the large scale survey was to achieve a high degree of standardization to minimize confounding results with regard to cross-national differences and similarities. Standardization of the survey, sampling and data entry methods was a significant source of improvement. The main aim of the present report is to provide information about substance use on the basis of descriptive analyses for 25 European countries.

3.2 Sample Statistics

For the purpose of the AAA-Prevent study which focuses on substance use in Europe, some of the participating countries within the ISRD-2-study were excluded for this report (United States, Aruba, Suriname, Canada, Venezuela and the Dutch Antilles). Consequently, the following were countries included in the following analyses (in alphabetical order):

Armenia, Austria, Belgium, Bosnia & Herzegovina, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Russia, Slovenia, Spain, Sweden, Switzerland.

The remaining dataset had a sample size of 33,566 students from 25 countries. The distribution of the participants between countries (national sub-samples) was not equal as the amount of participating students ranged from 12% (N = 4,046) in Italy to 1.1% (N = 369) in Hungary (see Table 3.1).

Table 3.1 Total sample size split by participating countries (with all adjustments explained in the report)

Country	N	%
Italy	4046	12.1
Germany	2351	7.0
France	1958	5.8
Austria	1925	5.7
Sweden	1768	5.3
Belgium	1552	4.6
The Netherlands	1490	4.4
Russia	1479	4.4
Cyprus	1404	4.2
Lithuania	1385	4.1
Denmark	1376	4.1
Armenia	1369	4.1
Finland	1353	4.0
Norway	1239	3.7
Czech Republic	1224	3.6
Switzerland	1187	3.5
Estonia	1038	3.1
Ireland	999	3.0
Poland	879	2.6
Portugal	820	2.4
Slovenia	739	2.2
Iceland	587	1.7
Bosnia & Herzegovina	526	1.6
Spain	503	1.5
Hungary	369	1.1
Total	33566	100.0

The data of the ISRD-2 project was either sampled at a city or national level which makes it difficult to directly compare countries. The city-based sampling design aimed to select schools randomly from one large city, one medium city and three small towns. However, eight countries opted for a national-based sampling design for different reasons such as research interest, size of country, or availability of school classrooms. In order to make international comparisons, countries with a national sample design oversampled at least one large city (except Spain). On this basis, only respondents from large and medium cities were included in the following analyses.

The entire analysis was computed with the SPSS module Complex Samples. The module is specialized to analyze studies with a stratified or clustered sample design. In the ISRD-2 study, the sampling units were school grades. The SPSS module takes the stratified sample design into consideration by incorporating their specifications (e.g. school grades) into the analysis and therefore ensuring valid results.

3.2.1 Alcohol and Grade

The primary sampling unit for the dataset is school grades from secondary school, sampled across 25 European countries. The sample is split into grade seven, eight and nine corresponding to the age groups 12-13, 13-14, 14-15 years, respectively. The average age in seventh grade is 12.97 years, 13.86 years in eighth grade and 14.82 years in nineth grade. The grade distribution for the entire sample is evenly split with 32.7 % of seventh graders, 33.9 % of eighth graders and 33.4% of nineth graders. Unfortunately, some countries show huge deviations across grades, for example Slovenia. At the time of data collection, the school system in Slovenia underwent changes which disabled the sampling eighth grade pupils. For Slovenia, only seventh and nineth graders are represented in the dataset. Additional countries with missing grades are Bosnia & Herzegovina (only 7th and 8th grade), Iceland (only

8th grade) and Poland (only 8th and 9th grade). In the remaining 21 countries, pupils from all three grades were recruited for participation in the study (see Table 3.2).

Table 3.2 Mean age distribution within grades by countries

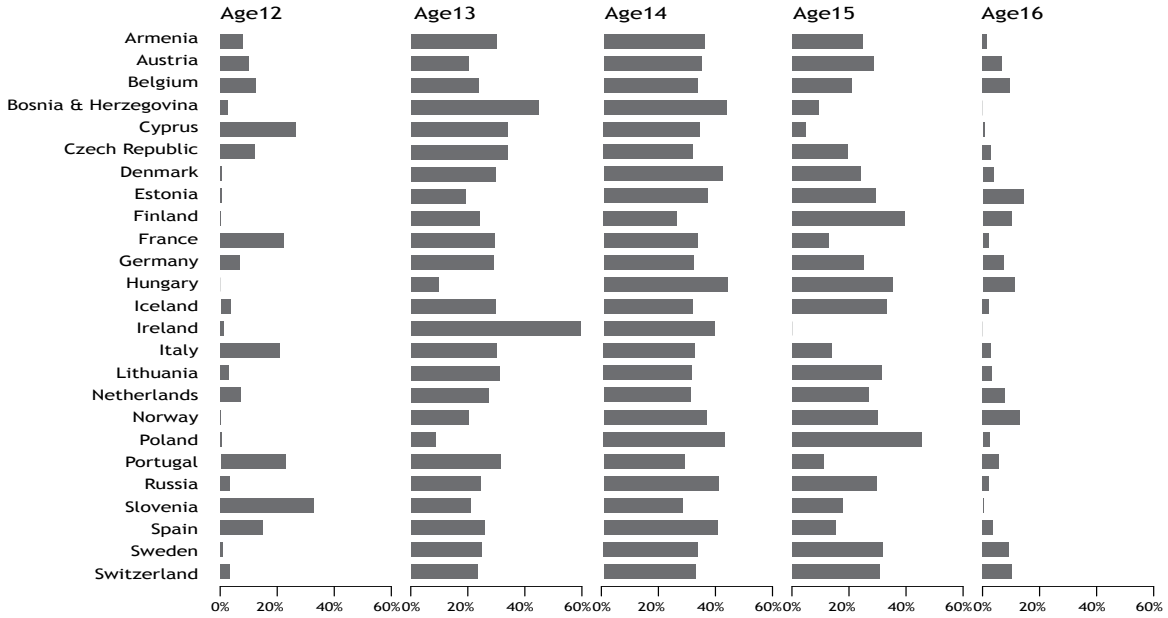
Country	7th	8th	9th
Armenia	12.81	13.80	14.80
Austria	12.77	13.80	14.74
Belgium	12.85	13.90	14.85
Bosnia & Herzegovina	13.14	14.09	*
Cyprus	12.19	13.19	14.10
Czech Republic	12.74	13.53	14.67
Denmark	13.29	14.24	15.12
Estonia	13.57	14.38	15.51
Finland	13.20	14.22	15.21
France	12.65	13.72	14.47
Germany	13.03	14.07	15.06
Hungary	13.79	14.15	15.26
Iceland	*	13.38	*
Ireland	13.01	13.92	14.92
Italy	12.45	13.38	14.49
Lithuania	13.00	13.95	14.99
The Netherlands	13.07	13.94	15.05
Norway	13.43	14.40	15.44
Poland	*	13.87	14.88
Portugal	12.63	13.26	14.34
Russia	13.30	13.90	14.81
Slovenia	12.39	*	14.39
Spain	12.48	13.35	14.22
Sweden	13.29	14.34	15.31
Switzerland	13.28	14.28	15.18

* no grade sampled

3.2.2 *Alcohol and age*

The ISRD-2 questionnaire was completed by pupils between 11 and 18 years old enrolled in secondary school. Some of the age groups (11-, 17- and 18-year-old pupils) were underrepresented (N = 330, 0.2 %) across countries. To enhance the comparability between countries and age groups, we decided to limit the analyses to a group of 12 to 16-year-old youngsters. The average age of the entire sample is 13.90 years. However, the age distribution in the sample still shows some deviation as 12-year-olds make up 8.7% of the sample, 13-year-olds 27.5%, 14-year-olds (with the highest amount of respondents) 34.8 %, 15-year-olds 23.8 %, and 16-year-olds 5.3 %. Therefore, even by excluding some age groups, the fact still remains that some of the other five age groups are under- or overrepresented within certain countries (e.g. Iceland; see Figure 3.1). Due to the fact that Iceland only sampled pupils from eighth grade, not all age groups are represented for this country (only 12-, 13-, and 14-year-olds). Other countries such as Slovenia or Bosnia & Herzegovina show equal patterns of age distribution. Consequently, the results of the analyses have to be interpreted carefully when considering age.

Figure 3.1 Age distribution across countries



Other reasons for differences between countries concerning age group distribution were: school entry age for children across countries, or the amount of grade repeaters in the sample.

3.2.3 Alcohol and grade repeaters

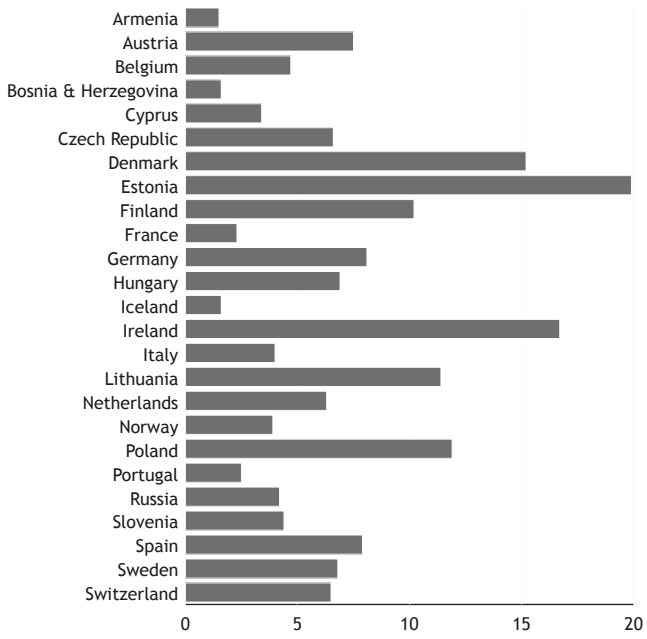
Grade repeaters are not an anomaly. 10.6% of the total sample are grade repeaters (9.1% repeated once and 1.5% more than once). The distribution of grade repeaters across countries ranges from very high (Spain) to extremely low (Iceland). Spain shows the highest percentage of grade repeaters across the sample with 33.9 % of pupils having either repeated a grade once or more than once, compared to Iceland with the lowest percentage of pupils being repeaters (0.3%). The definition of grade repeating varies across countries as well. In some countries, grade repeating reflects the pedagogical approach of giving pupils the chance to improve their skills, so grade repeating is more common and accepted, whereas other countries are more or less intent on keeping the rate of grade repeaters at a minimum. The distribution of grade repeaters per country is presented in Figure 3.2. The distribution of repeaters between grades only shows minimal differences: with 10.5% for seventh grade, 9.8% for eighth grade, and 11.7% for nineth grade. Grade repeaters across age groups are highest within the 16-year-old age group with 40.3%, followed by 15.7% amongst 15-year-olds, 9.1% for 14-year-olds, 5.2% for 13-year-olds and 2.1% of all 12-year-old participants. Grade repeaters are older (14.58 years) compared to non-repeaters (13.81 years) (see Appendix for mean age of grade repeaters per country).

In conclusion, the results with respect to age should be considered with care when interpreting the analyses. Obviously, participants of the ISRD-2 survey cannot be assumed to be representative for adolescents of their respective age groups due to the high amount of grade repeaters.

3.2.4 Alcohol and gender

The distribution of gender is more or less equal across the sample with 49.5% males and 50.5% females. The amount of females and males across countries does not deviate greatly from the entire sample distribution. In the sample, the average age of males (13.93 years) does not differ from the mean age of the females (13.86 years). In addition, there are no gender differences within the grades. However, there are differences within the group of grade repeaters, whereby more males (12.4%) than females (9%) are grade repeaters (see Appendix).

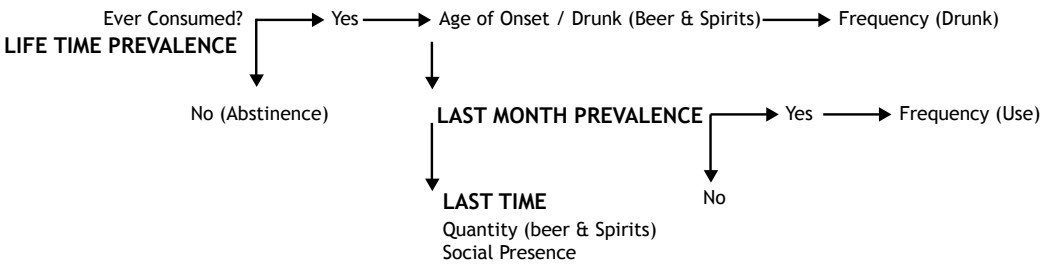
Figure 3.2 Percentage of grade repeaters per country with confidence intervals (ranked by country)



3.3 *Substance use variables*

The ISRD-2 questionnaire contained several questions related to alcohol and drug use. The respondents were asked about their use of *Beer, Wine and Breezers,* or stronger liquors as *Spirits* such as vodka, rum or whisky, about their drug use, i.e. *Cannabis* (hashish, marijuana), *Ecstasy or Speed* and *LSD, Heroin, and Cocaine* respectively. Participants were asked to recall if they had ever consumed each of these substances (yes/no) and they were asked to report their substance use within the last four weeks (yes/no). Adolescents who had ever used substances, were asked further questions such as: age of first use (age of onset); if they ever became drunk, and; how often they became drunk on alcohol and strong liquors. Those adolescents who used substances during the last four weeks were questioned about the frequency of their use. Furthermore, adolescents were asked about their last drinking occasion, by asking questions concerning the amount of drinks they consumed during their last drinking occasion (for beer and spirits), with whom they had used the substances (with parents, alone, adults, or other youths), whether someone saw them using (parents, police, teachers, others), and whether they were punished for using substances. The following analyses are limited to selected variables (see Figure 3.3).

Figure 3.3 Substance use variables selected for the following analyses



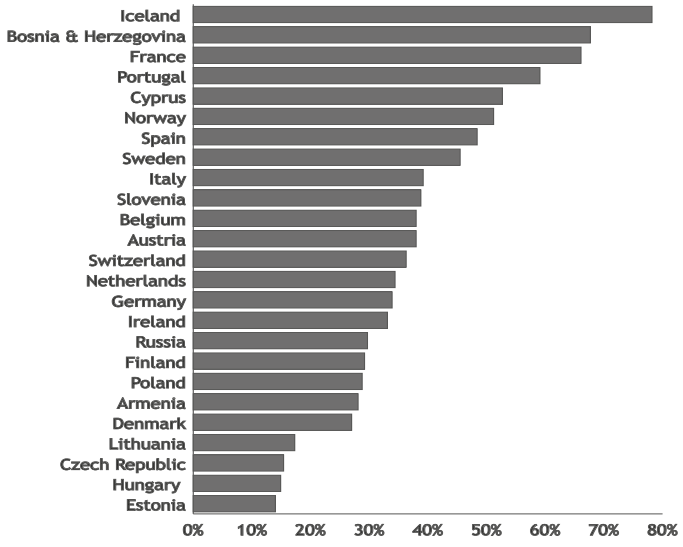
The prevalence rates for having used hard drugs (*Ecstasy* and *LSD, Heroin, Cocaine)* are extremely low for the entire sample with 1.9% (lifetime use) and 0.7% (last month use). Furthermore, the data for illicit drugs was collected differently across some of the countries. For example, the national research teams in Russia and France, decided to ask participants only about their *Heroin and Cocaine* use, excluding *LSD*. Hence, the following descriptive analyses will be limited to *alcohol* and *strong liquors*. Nonetheless, we will also present the results concerning *cannabis (hashish, marijuana)* use, excluding *hard drugs*.

3.4 Descriptive Statistics

3.4.1 Abstinence

Abstinence - or the restraint from alcohol/drugs - seems to be quite common rather than the exception to the rule among adolescents in the sample. This variable was calculated by adding all of the participant responses to the question of whether they had ever used any of the substances (alcohol, cannabis, illicit drugs) during their lifetime. Those respondents with a zero ("no" for all substances) were classified as abstainers. In the entire sample, 38.5% of the participants never used any substance (alcohol, cannabis, illicit drugs) during their lifetime. The amount of abstainers differed across countries, ranging from 78.2% in Iceland to 14.0% in Estonia (see Figure 3.4).

Figure 3.4 Abstinence rates across countries



Abstainers are differently distributed across the grades, with 51.4% for seventh grade, 41.2% for eighth grade, and 23.4% for nineth grade; revealing that the higher the school class the lower the abstinence rates. At age 16, only 19.5% of the respondents reported to not having used or tried any substance. On the other hand, 63.2% of the 12-year-old participants reported that they were abstainers. A high amount (36.8%) of twelve-year-olds have already consumed alcohol or drugs. Additionally, more females (40.1%) than males (36.8%) are abstainers (see Appendix).

3.4.2 Lifetime prevalence and last month prevalence

Adolescents were asked whether they had consumed alcohol (beer, wine & breezers), strong liquors (spirits), or used cannabis. The recall period for the substance use was ever "during their lifetime" and "during the last four weeks". The overall prevalence rate for beer, wine, and breezers ever consumed during their lifetime was 60.1%, 34.2% for spirits, and 9.7% for cannabis. The prevalence rate for substance use within the last four weeks was about twice as low, at: 28.1%, 13.5% and 3.7%, respectively. The use of soft alcoholic beverages was more frequent compared to strong liquors such as whisky and vodka. Some noticeable cross-country differences were found for lifetime and last month prevalence. When ranking the countries according to their prevalence rates, many countries showed a similar rank order irrespective of prevalence rates for alcohol or strong liquors (see Figures 3.5 & 3.6).

Figure 3.5 Prevalence rates for beer, wine & breezers (ranked by lifetime rates)

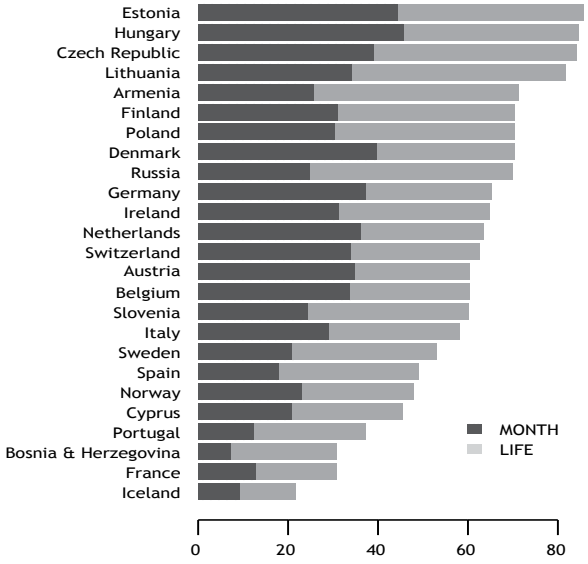
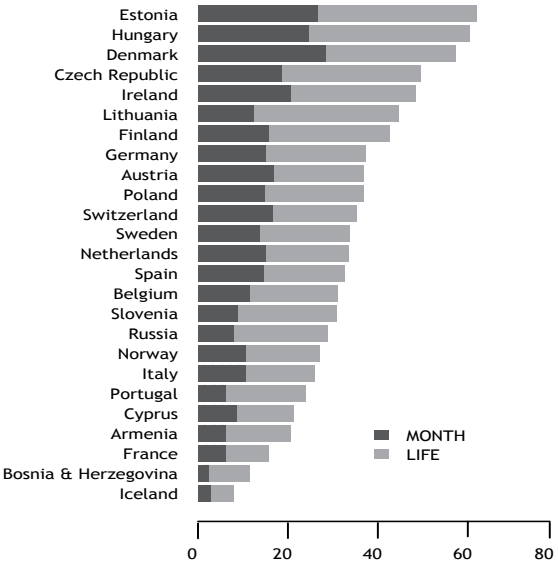


Figure 3.6 Prevalence rates for spirits ranked by lifetime rates

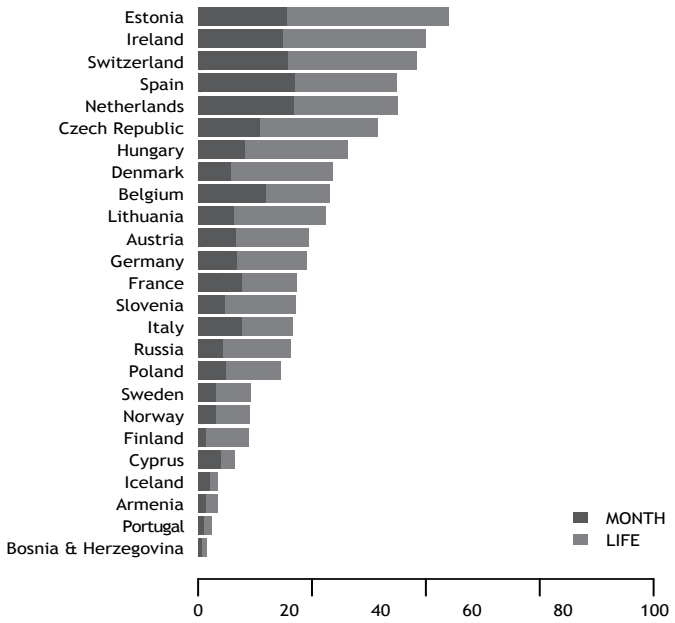


The highest rates of alcohol use for beer, wine, and breezers were found among Eastern European countries, led by Estonia (85.7%), followed closely by Hungary (84.7%), Czech Republic (84.2%), and Lithuania (81.7%). The country ranking for last month prevalence of beer, wine & breezers differs only minimally with Hungary leading (45.9%), followed by Estonia (44.6%), and Denmark (39.8%). The lowest prevalence rates for lifetime use were found in Iceland (21.6%), and Bosnia & Herzegovina (30.9%). The rates for use during the last four weeks were lowest for Bosnia & Herzegovina (7.5%), followed by Iceland (9.3%). The country rank was similar for spirits (see Figure 3.6).

The lifetime prevalence for spirits is highest in Estonia (62%), followed by Hungary (60.3%) and Denmark (57.3%). The country ranking for the last month prevalence is led by Denmark with 28.5%, again followed closely by Estonia (26.8%), and Hungary (24.7%). The lowest rates were found for Bosnia & Herzegovina and Iceland with 11.5% and 8% for lifetime and 2.5% and 3% for last month use, respectively.

The lifetime and last month prevalence rates for cannabis (see Figure 3.7) are highest in Estonia with 22%, followed by Ireland (20%), and Switzerland (19.2%). 8.5% of the adolescents from Spain reported that they used cannabis within the last month, followed by adolescents from the Netherlands (8.4%), and Switzerland (7.9%). The country with the lowest prevalence rate for lifetime use is the same (Bosnia & Herzegovina) as for last month use with 0.8% and 0.4%, respectively (see Appendix A). However, it should be mentioned again that there are national sample differences due to country-specific aspects of data collection. For example, data may be limited to certain grades, cross-national age differences, or cross-national differences in regards to the amount of grade repeaters, which may all affect the country ranking. For example, the grade distribution of the samples from Bosnia & Herzegovina and Iceland differed from the grade distribution of the entire sample, which in turn may affect the respective country's ranking. Due to the fact that ninth graders were not integrated in the sample from Bosnia & Herzegovina, it could be assumed that adolescents are younger compared to a country that represented all grades, which could also have an effect on the prevalence rates as more abstainers might be present.

Figure 3.7 Prevalence rates for cannabis (ranked by lifetime rates)



Nonetheless, this assumption can be rejected when considering the average age of the sample from Bosnia & Herzegovina (13.6 years) compared to the average age of the entire sample (13.9 years) (see Table 3). However, some countries' sample show a higher average age compared to the entire sample (e.g. Hungary, 14.5 years; Estonia, 14.4 years), and other countries' sample show a lower average age (e.g. Cyprus, 13.2 years; Slovenia, 13.3 years; or Iceland, 13.4 years).

Table 3.3 Average age per sample compared across countries (including lower & upper 95%CI)

Country	Age	95%CI lower	95%CI upper
Hungary	14.5	14.2	14.8
Poland *	14.4	14.3	14.5
Estonia	14.4	14.2	14.6
Finland	14.4	14.2	14.5
Norway	14.4	14.2	14.5
Sweden	14.2	14.1	14.4
Switzerland	14.2	14	14.4
Russia	14	13.9	14.2
Austria	14	13.9	14.2
Denmark	14	13.9	14.1
The Netherlands	14	13.8	14.2
Ireland	14	13.8	14.2
Lithuania	14	13.8	14.2
Germany	14	13.8	14.1
Belgium	13.9	13.8	14.1
Armenia	13.8	13.7	14
Czech Republic	13.7	13.5	13.9
Spain	13.7	13.4	13.9
Bosnia & Herzegovina *	13.6	13.4	13.8
Italy	13.5	13.4	13.6
Portugal	13.5	13.2	13.7
France	13.4	13.2	13.6
Iceland *	13.4	13.3	13.4
Slovenia *	13.3	13.1	13.6
Cyprus	13.2	13	13.3

* Country with missing grades

It can also be rejected that the amount of grade repeaters could be an explanation for the low prevalence rates in Bosnia & Herzegovina, as the percentage of repeaters is only 1%.

The prevalence rates for all of the substances investigated are higher for grade repeaters compared to adolescents without grade repetition (e.g. the prevalence rates of soft alcoholic beverages within last month were 33% for grade repeaters and 26.7% for non-repeaters; for spirits 19.4% [repeaters] and 12.8% [non-repeaters], and for cannabis 10% [repeaters] and 2.9% [non-repeaters]). One reason for the differences in rates between grade repeaters and non-repeaters might be due to the age (grade repeaters are older compared to non-repeaters). Interestingly, more 14 and 15-year-old grade repeaters have ever consumed soft alcohol during their lifetime compared to non-repeaters. Similar results were found for adolescents who had ever used cannabis during their lifetime (13, 14, 15 and 16 years old) and during the last month (14, 15 and 16 years old). The amount of individuals who have used alcohol (lifetime or last month) did not differ between grades. However, the substance prevalence rates (lifetime or last month) increase with age, and the prevalence of alcohol (soft alcohol) use is always higher compared to the use of spirits or cannabis. There are no gender differences, except for the use of soft alcoholic drinks (lifetime use) whereby males display a higher rate (61.8%), than females (58.7%). Moreover, more males reported to having ever used cannabis in their lifetime (11.3%) and during last month (4.6%), than females (8.2%; 2.8%). In general, no gender differences were found between the countries in terms of lifetime prevalence for the use of beer, spirits, or cannabis. Some exceptions are Armenia, Cyprus, Italy, Switzerland, and Sweden. In Armenia and Cyprus, more males than females drank beer, spirits, or cannabis. In Italy, more males than females reported drinking beer and more males than females from Switzerland used cannabis. On the contrary, Swedish females (38.3%) reported that they drank more spirits compared to males (29%) (see Appendix A).

3.4.3 Drunkeness

The alcohol intoxication variable is based on self-reported answers to the question: “Have you ever become drunk as a result of drinking?” referring to alcohol (beer, wine & breezers) and strong liquors (spirits). If respondents answered this question with a “yes”, further questions were asked about the frequency of intoxication. The rates for drunkenness were much higher for beer, wine & breezers, compared to strong alcoholic beverages. A high percentage of adolescents reported that they had become drunk following the use of beer, wine and breezers (75.7%) or spirits (82.8%). 24.3 % of the adolescents from the entire sample reported at least one experience of alcohol intoxication due to the use of beer, wine or breezers, whereas 17.2% did so according to the intake of spirits. Cross-national differences are visible in terms of high rates of drunkenness in some countries (e.g. Estonia) along with high prevalence rates of substance use (see Figure 3.8a & b). In Estonia, 51.8% of adolescents became drunk at least once as a result of drinking beer and 47.1% on spirits. Similar results were found in other countries, such as Denmark, where 42.3% of adolescents had become drunk at least once by beer and 33.8% by strong liquors. On the opposite side of the ranking, one will find Iceland, where only 7.2% of the adolescents have been drunk at least once from drinking beer, and 3.3% from spirits.

Figure 3.8a Drunk on beer, wine & breezers by country

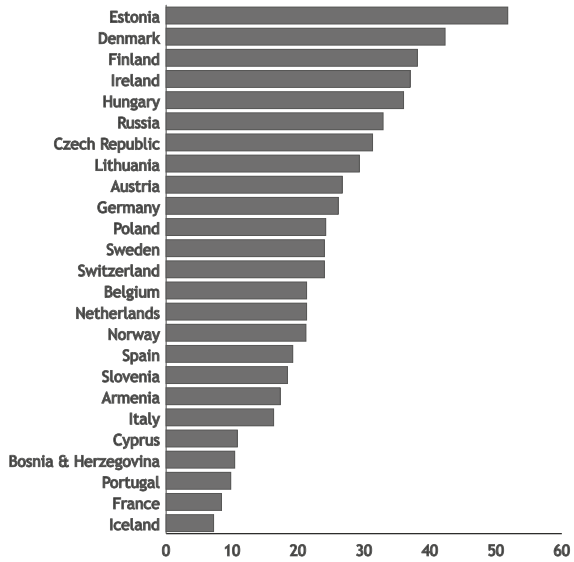
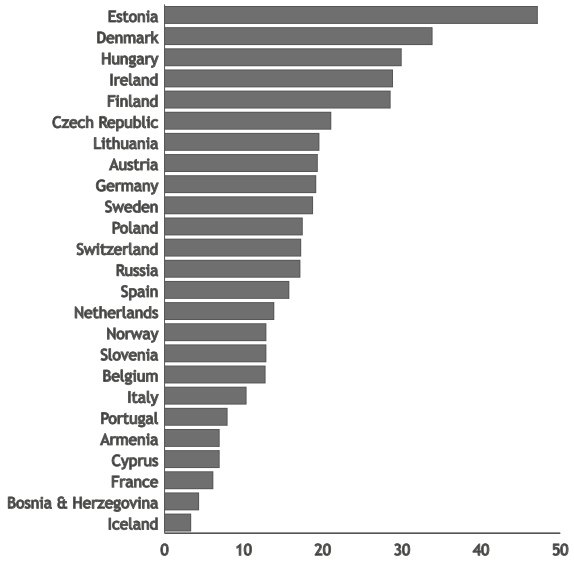


Figure 3.8b Drunk on spirits across countries



The number of adolescents who became drunk as a result of consuming beer and spirits increases with age. The same pattern was found regarding the grade distribution: more adolescents in higher than lower grades, reported that they had been drunk before. Furthermore, a higher percentage of grade repeaters (32%) became drunk due to beer consumption at least once compared to adolescents without grade repetition (23.3%). Similarly, more grade repeaters (24.9%) had become drunk on spirits at least once compared to individuals who did not repeat a grade (16.3%) (see Appendix). A reason to explain this might be the age differences between grade repeaters and non-repeaters. It was apparent that more 12year-old adolescents who repeated a grade had been drunk compared to non-repeaters. There were no gender differences for intoxication or the frequency of getting drunk.

3.4.4 Age of onset

The age of first substance use was asked with the question: "How old were you when you drank/used … for the first time?" The adolescents answered this question for all of the substances (alcohol, spirits, cannabis, and illicit drugs). The age of first use is considered to be a broad term which could be interpreted very subjectively by each respondent. The great range of interpretation and subjective understanding of the question was considered to be a problem for the analyses. Consequently it was decided to handle age of onset as an unreliable indicator. This decision was empirically proven as a great amount of individuals responded to the question "at the age of 4". 14.9% of the respondents reported that their age of onset for beer, wine & breezers was before age 10, for the use of spirits 5.4%, and cannabis 2.1%.

Analyses for the age of onset were based on a subsample of adolescents from grade nine (N=11,992). Overall, with a mean age of 12.12 years, beer and wine were the substances participants reported to come into contact with first, followed by strong spirits, with a mean age of 13.19 years. First time use of illegal drugs usually occurred at a mean age of about 14 years. Having a closer look at a country's specific first time use, there were some interesting differences. For example, , the first time an adolescents used an alcoholic beverage in Slovinia, was about one year earlier than overall average (mean age of 10.78 years for beer/wine and 12.07 years for strong spirits). Furthermore the mean age of first time use of cannabis shows a huge range: the lowest of which was in Cyprus (11.63 years) and the highest in Finland (14.38 years). For other drugs (ecstasy, speed, LSD, heroin, or cocaine) lifetime prevalence was very low, and therefore the sample size for analyzing first time use was too small (in some countries < 5). Thus, comparing countries according to their first time use of other drugs did not seem to be useful (see Appendix A).

3.4.5 Frequency of use within last month

Participants were asked to recall the frequency of alcohol or drug use in the last four weeks. According to the frequency of use it was possible to divide respondents into two groups: the first group of students recalled having used alcohol or drugs once or twice during the last four weeks, and the second group consisted of students who reported having drunk alcohol or used drugs 3 or more times during the last month. The overall prevalence of consuming beer, wine and breezers during the last four weeks was 17.1% (once or twice) and 8.7% (three and more times). The prevalence for the use of spirits and cannabis within the last month was much lower compared to soft alcoholic drinks, with 8.7% for cannabis and 1.8% for spirits (once to twice), and 3.2% respectively 1.3% reporting a use of more than 3 times.

For the following analyses of cross-national differences, we only included individuals who had consumed alcohol (beer, wine & breezers) or spirits or cannabis three or more times during the last month (see Figure 3.9a, b &c). The prevalence for alcohol ranged from 1.2% (Bosnia & Herzegovina) to 16.2% (the Netherlands, Estonia). The prevalence for spirits as well as cannabis ranged from 0.2% (Iceland) to 7.6% (Denmark), and 0.1% (Portugal, Finland, and Armenia) to 4.5% (Switzerland). In Bosnia & Herzegovina, none of the respondents used cannabis three or more times within the last four weeks.

Figure 3.9a Frequency of beer, wine & breezers use by country ("3+ times"

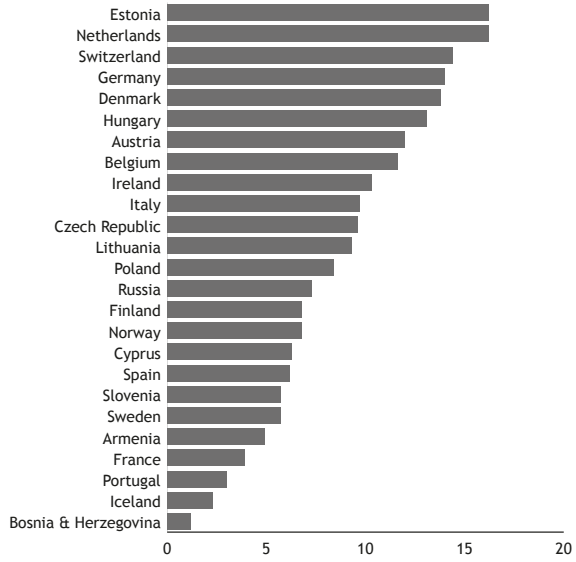


Figure 3.9b Frequency of spirits use by country ("3+ times")

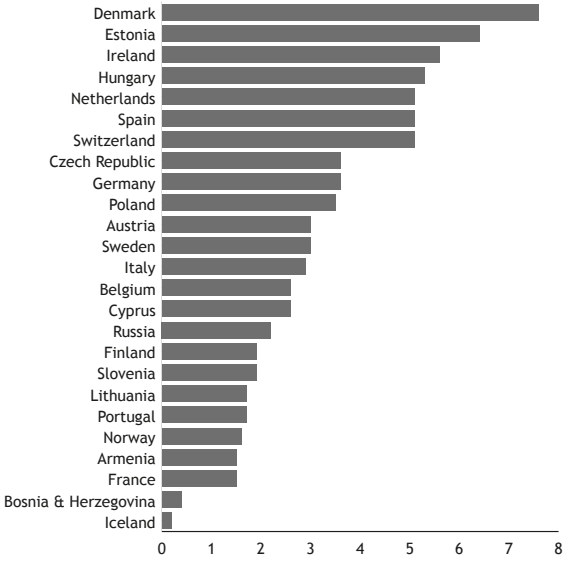
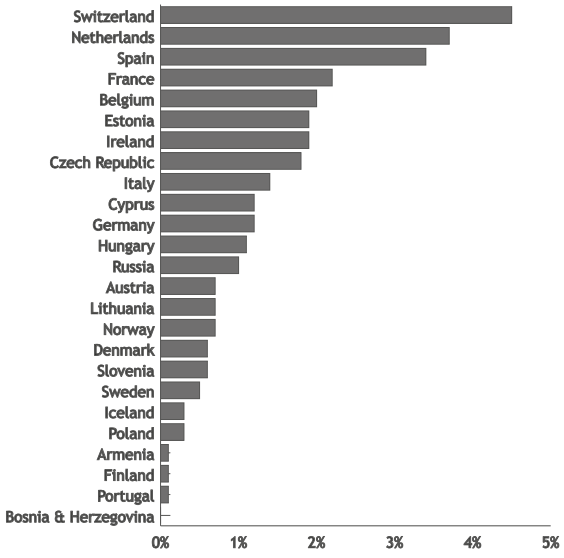


Figure 3.9c Frequency of cannabis use by country ("3 and more times")



The prevalence rates of using any of the substances (beer, spirits or cannabis) three or more times are higher for older adolescents and for youngsters from higher grades. Furthermore, with regard to grade repeaters, results indicate that they more often report an excessive use of beer (14.6%) compared to non-repeaters (8%). One cause for the differences might be the age of grade repeaters and non-repeaters. Cannabis use (3 or more times) was higher for 12-, 13- and 14-year-old grade repeaters, compared to non-repeaters. The same pattern emerged for the use of strong liquors (6.4% vs. 2.8%) and the use of cannabis (3.8% vs. 1%). Finally, we found that males drink beer (9.8%) and use cannabis (1.7%) three or more times as often as females (7.7% for beer and 0.9% for cannabis). No differences were found for spirits.

3.4.6 Quantity of drinking

The following analyses are related to the question as to how much alcohol adolescents consumed during their last drinking occasion. Adolescents were asked to recall the last time they used alcohol and to list the number of glasses, cans, or bottles of beer, wine & breezers and spirits they consumed. The term binge drinking has become quite popular with regard to adolescent alcohol use and is defined as: drinking as much as possible until passing out or even risking hospitalization before the end of night. The threshold which defines binge drinking behavior is: five units of alcohol or more during one occasion. Adolescents were assigned to one of the following groups: the first group consisted of adolescents who reported that they did not drink at all; the second group consisted of adolescents who reported to drinking between 1 to 4 units (glasses, cans, bottles) which is referred to as "no binging", and; the third group consisted of adolescents who reported to consuming 5 or more units of alcohol

during the last occasion (= "binging"). The results indicate that the majority of adolescents who drank alcohol reported drinking beer (43.8%) and spirits (22.6%) moderately (no more than 4 units during one occasion). 12.2% (beer, wine, and breezers) and 6.9% (strong alcoholic beverages) belong to the third group of binge drinkers. Cross-national comparisons (see Figure 3.10a & b) revealed that binge drinking seems to be a popular drinking habit in some countries.

Figure 3.10a Binge drinking (beer, wine and breezers) ranked by country prevalence

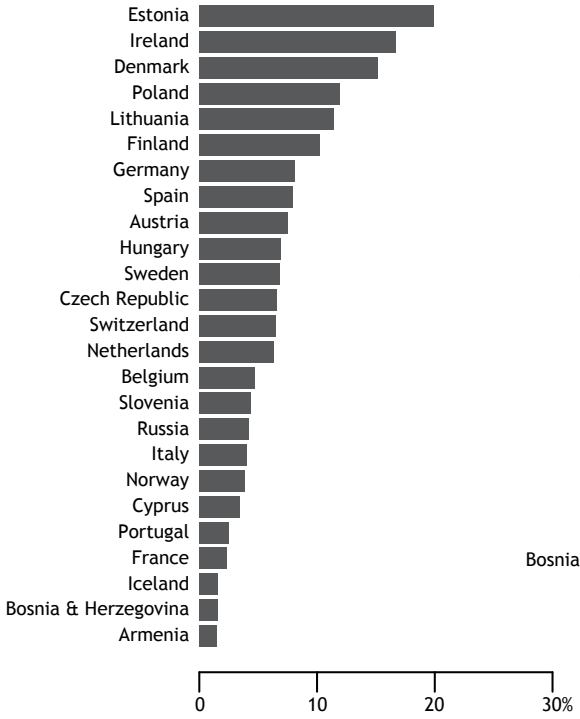
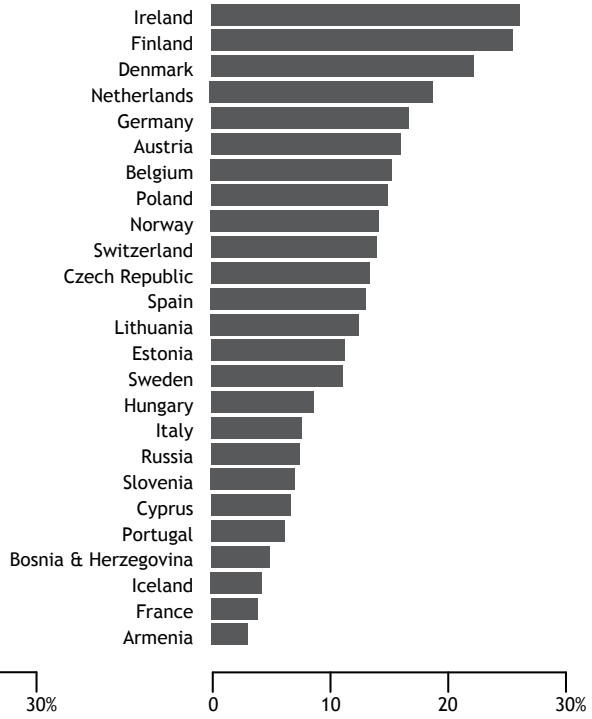


Figure 3.10b Binge drinking (spirits) ranked by country prevalence



We found high percentages of adolescents who admitted to binge drinking beer, wine & breezers in Western countries especially, such as Ireland (26.1%), Finland (25.5%), Denmark (22.2%), the Netherlands (19.2%), and Germany (16.7%). A low rate of binge drinking (beer, wine & breezers) was found in Armenia (2.9%). We found high percentages of adolescents who admitted to binge drinking spirits in Estonia (19.9%), Ireland (16.7%), and Denmark (15.2%). Low rates of binge drinking (spirits) were found in Armenia (1.5%), Bosnia & Herzegovina (1.6%), and Iceland (1.6%).

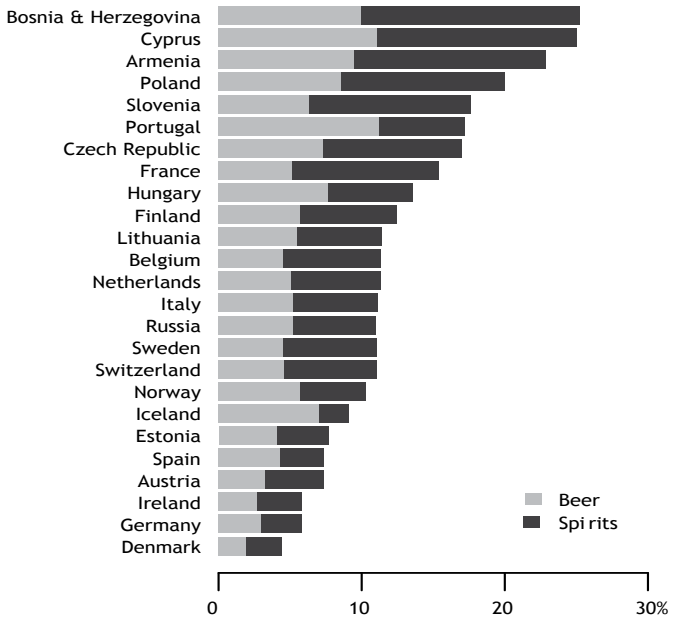
The older the adolescent and the higher the grade, the higher the prevalence of binge drinking. We also found that more males binge drink on alcohol (14.4%) (females: 10.1%), and spirits (7.9%) (females: 6%) (see Appendix A).

3.4.7 Social presence during substance use

The presence or absence of others, whilst drinking alcohol or using drugs, may have an influence on people's substance use. Solitary drinking for example may be judged as an unusual behaviour for adolescents, which may reflect problem drinking. Participants were asked – with regard to the last time they used a substance - whether they drank alone, with their parents (only for beer, wine & breezers), other adults or/and other youths. Adolescents reported that they usually drank beer, wine and breezers with other youths or peers (57.4%), and with parents (24.4%). Adolescents reported drinking with adults (11.9%) to a lesser degree, and 6.2% of the participants drank beer, wine & breezers alone during their last drinking occasion. Most of the adolescents drank spirits with peers (69%) or with other adults (24.3%). Finally, many adolescents (6.7%) were alone while drinking strong liquors.

A small number of adolescents used cannabis alone (5.4%), compared to consuming with adults (7.1%) and peers (87.5%). The prevalence of solitary beer drinking differed across countries: while Portugal (12%), Cyprus (11.9%), Bosnia & Herzegovina (10.7%) and Armenia (10.2%) showed higher prevalence rates, the lowest prevalence rates were found in Denmark (2.2%), Ireland (3%), and Germany (3.3%) (see Figure 3.11 for details).

Figure 3.11 Drinking alone (beer, wine & breezers and spirits) ranked by overall prevalence



According to the analysis, drinking strong liquors is more common – across many countries - than drinking beer, wine and breezers alone (e.g. Bosnia & Herzegovina: 16.1%, Cyprus: 14.7%, Armenia: 14.1%). In Denmark (2.6%) or Germany (3%), only a small proportion of adolescents reported drinking spirits alone. Besides strong liquors, a high proportion of adolescents reported using cannabis alone: Cyprus (28.2%) or Armenia (27.3%). None of the adolescents from Bosnia & Herzegovina and Slovenia reported to use cannabis alone.

We also found gender and age differences. Interestingly, the older the adolescent, the less likely they were to report drinking beer, wine & breezers or spirits alone (e.g. from 9.4% for 12 years old to 4.9% for 16 years old), soft alcoholic drinks (beer, wine & breezers) and spirits (from 14% for 12 years old to 5.7% for 16 years old). Cannabis use deviates from this pattern for age but also for grade. The prevalence rates for solitary cannabis use do not show any differences between age groups or grades.

Finally, we found that more grade repeaters (8%) use cannabis alone compared to non-repeaters (4.6%) which might be an effect of the age difference between grade repeaters and non-repeaters. No differences were found between grade repeaters and non-repeaters for soft alcoholic drinks or spirits. In general, males drank beer (7.7%), spirits (8.4%), or used cannabis (6.8%) on their own more often than females (4.8%, 4.8%, and 3.6%, respectively). Nevertheless, these gender differences did not emerge within all countries. In Cyprus, Lithuania and Russia, more males than females drank beer, wine and breezers alone; in the Czech Republic more males than females drank spirits alone; but in Armenia, Cyprus, Hungary, Iceland, Ireland, and Portugal no females reported that they used cannabis alone (see Appendix).

3.5 Summary

Abstinence is quite common amongst adolescents between 12 to 16 years of age. Altogether, 38.6% of the pupils in the sample are abstainers. Alcohol consumption increases with age and school class, and abstinence is more prevalent among females than males. In general, adolescents are more likely to drink beer, wine & breezers than strong liquors. In regards to the prevalence rates for countries, Estonia ranks highest while Iceland and Bosnia & Herzegovina rank lowest for soft alcoholic drinks and spirits (lifetime and last month). The same countries ranked the highest for cannabis use (lifetime prevalence), however the use of cannabis within last month was the highest in Spain and the lowest in Bosnia & Herzegovina. Adolescents who drank soft alcohol or spirits or used cannabis were also more often grade repeaters (they were also older). No gender differences were found with one exception: more males than females used cannabis (lifetime and last month). Gender differences for substance use were found in countries such as Armenia, Cyprus, Italy, Switzerland, and Sweden. A large number of adolescents in the sample had been drunk more than once within last month. The majority adolescents who had been drunk due to the consumption of soft alcohol and spirits (at least once) were from Estonia, while the lowest rates were reported in Iceland. Prevalence rates rose with increasing age and school grade. Adolescents who were grade repeaters also tended to become drunk more often

compared to non-repeaters (this might have been due to age differences as repeaters are older). No gender differences were found for drunkenness. Most adolescents drank beer, wine & breezers (8.7%) more than three times within the last month compared to spirits (3.2%) and cannabis (1.3%). The highest rates for consumption (3+) were found in the Netherlands (Beer), Denmark (spirits) and Switzerland (cannabis), while the lowest rates of drinking more than three times during the last month were found in Bosnia & Herzegovina (beer), Iceland (spirits), and Armenia (cannabis). In Bosnia & Herzegovina, none of the adolescents used cannabis more than three times within last month. The number of adolescents who used cannabis more than three times within last month rose with age and school grade. The results indicate that grade repeaters report excessive consumption (14.6% vs.8%) more often than non-repeaters (due to age differences). More males drink beer (9.8%), and use cannabis (1.7%) three or more times compared to females (7.7% for beer and 0.9% for cannabis). No differences were found for spirits. Binge drinking on beer, wine & breezers seems to be a very common consumption pattern in Western countries such as Ireland, Finland, Denmark, the Netherlands and Germany. Similarly, drinking more than 5 units of spirits during one occasion seems to be very popular in countries such as Estonia, Ireland, Denmark and Poland. A smaller proportion of adolescents from Armenia are involved in binge drinking on soft alcoholic drinks or spirits. The older the adolescent or the higher the grade, the higher the rate of binge drinking. Generally, more males engage in binge drinking compared to females. No differences were found in regards to the amount of adolescents who drank beer, wine & breezers (6.7%) and adolescents who drank spirits (6.2%) alone. Many adolescents drink alone in Bosnia & Herzegovina although they show the lowest substance use prevalence rates (lifetime and last month). On the contrary, although Danish adolescents reported a high prevalence rate for alcohol and spirits, they showed the lowest rate for solitary drinking. Furthermore, drinking alone is more common among grade repeaters compared to non-repeaters (age differences could be a reason because repeaters are older compared to non-repeaters). Finally, the results indicate that more males use substances alone compared to females, as found in the Czech Republic (spirits), Cyprus (soft alcohol), Lithuania (soft alcohol), and Russia (soft alcohol). No female adolescents reported using cannabis alone in Armenia, Cyprus, Hungary, Iceland, Ireland, and Portugal.

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4 *Alcohol use patterns of youngsters from 25 European countries: A comparison of cluster analysis and defining by theoretical premeditated conditions*

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4.1 Introduction

This present chapter focuses on discovering distinctive alcohol use habits which reflect quantitative and qualitative differences in adolescents' consumption. Many studies have already shown the various negative consequences of harmful alcohol use during adolescence. So, does risky consumption, for example, lead to physical or mental health problems (Boys, et al., 2003; Centre for Addiction and Mental Health, 2012; Oesterle et al., 2004)? The risk of being involved in traffic accidents, unprotected sexual activities and delinquent or violent behaviour is higher for alcohol users (Barnes, Welte, & Hoffman, 2002; Cooper, 2002; Duncan, Strycker, & Duncan, 1999; Hingson, Heeren, Levenson, Jamanka, & Voas, 2002; White, Loeber, Stouthamer-Loeber, & Farrington, 1999). Poorer academic performance in high school, illicit drug use and a higher risk of developing alcohol use disorders in adulthood are further consequences of alcohol use in youth (DeSimone & Wolaver, 2005; Grant & Dawson, 1998; Grant, Stinson, & Harford, 2001; Wagner & Anthony, 2002). To prevent such negative effects for the affected individual and his social surrounding, early prevention is an imperative but also a challenging task. This is especially important given the various and partly conflicting goals and interests during adulthood and of the persons who are responsible for prevention activities, e.g. harm reduction versus economic aims (Bonnie & O'Connell, 2003). In addition, depending on youngsters' reasons for using psychoactive substances and their use habits, different kinds of intervention are needed. In other words, prevention goals and strategies can hardly be the same for the whole youth population. In order to offer adequate alcohol prevention actions to all youngsters it is necessary to identify students' needs and youngsters who are at risk of developing harmful use habits or who already show risky drinking patterns.

However, the term "risky" or "problematic" alcohol use is not defined clearly. Is it, for example, risky to try alcohol early in life or is it more risky to use alcohol often irrespective of the amount of consumed alcoholic beverages? Or is it the amount of alcohol used on one single drinking occasion? The operationalization of the term "binge drinking", for example, differs widely and alcohol prevention goals vary from complete abstinence, reduction or delay of use to so-called "responsible" use (Beseler, Taylor, Kraemer, & Leeman, 2012; Bonnie & O'Connell, 2003; Courtney & Polich, 2009). There is a need to clarify which kind of underage drinking should be regarded as "risky" consumption or alcohol use in need of intervention, e.g. to estimate valid prevalence rates. The introduction of sound individualized prevention should be based on scientific research about the prevalence of adolescents' alcohol use as well as its associated risk factors, motives, origins of use and use habits. A possible starting point for developing such a sound prevention strategy might be the identification of distinctive alcohol drinking profiles in adolescence by including alcohol use indicators in a multivariate way instead of focusing on a single indicator for consumption only.

In alcohol research, many attempts have been made to do so using cluster analysis or latent class analysis techniques. For example, Zapert, Snow, and Kraemer Tebes (2002) used longitudinal data about nine different substances from an adolescent sample from sixth to eleventh grade to extract six distinct use patterns by cluster analysis. They identified non-users, alcohol experimenters, late starters, high escalators, early starters and low escalators which differ regarding types of used substance (tobacco, alcohol, marijuana, LSD, amphetamines, barbiturates, heroin, inhalants and cocaine), frequency of use and development of use behaviour over age. Mitchell and Plunkett (2000) focused on

different substances as well (alcohol, marijuana, inhalants, cocaine and crack) and performed a latent class analysis using categorical data from a sample of American Indian adolescents to identify the four classes of abstainers, predominantly alcohol users, alcohol and marijuana users and plural substance users. A sample of older adults was studied by Sacco, Bucholz, and Spitznagel (2009) using latent class analysis of dichotomous alcohol use indicators which led to the three-class solution of low-risk, moderate-risk and high-risk drinkers. Five drinking classes were identified by Percy and Iwaniec (2007) including post hoc-categorized information about the number of used alcoholic units, the drinking frequency, the number of alcohol-related problems ever encountered and the number of heavy drinking episodes during the last two weeks. They worked with a data set of 16-year-olds from the 1970 British Cohort Study and differentiated the groups of occasional, moderate, heavy, hazardous and limited users. Ludden and Eccles (2007) examined substance use patterns of youngsters by a priori theoretical considerations and classified 733 African- and European-American adolescents as users, initiators, desistors and non-users. Included were measures of alcohol, cigarette and marijuana use in eighth and eleventh grade.

These examples show the lack of a generally accepted solution of alcohol use patterns in Europe. None of the previously named studies focus on current alcohol use of European adolescents only while combining different continuous characteristics of alcohol use habits in one clustering analysis. This is done even though it can be assumed that the majority of youngsters who use so-called hard drugs are alcohol users in the first place and should be identified and transferred to prevention before using hard drugs (Wagner & Anthony, 2002).

Facing this research gap, on the one hand this study tries to identify alcohol-drinking types by using cluster analysis in SPSS 19.0 with information about frequency and amount of current alcohol use in European youth. On the other hand, a second approach to categorizing youngsters as problematic or risky alcohol users is theoretically based. Here, risky alcohol use in adolescence is defined as drinking currently and weekly or excessively. In other words, youngsters should have drunk during the last month and more than five times a month or more than five units of alcohol on the last drinking occasion. This indicator is comparable with the concept of "weekly use", which is used in the *Health Behaviour in School-aged Children* study (*HBSC*), as well as with the indicator "heavy episodic drinking", used within the *European Project on Alcohol and Other Drugs* (*ESPAD*) (Currie et al., 2009). Additionally, an age limit was introduced in this conditional definition of risky alcohol use: according to (1) physiological development of the ability to decompose alcohol, (2) legal age limits about alcohol consumption, and (3) experts' advice. It was suggested that students that are aged younger than 14 years should not drink currently at all.

Thus, in this study it is hypothesized that it is possible to group youngsters according to the frequency and amount of their beer, wine or breezers and spirits (gin, rum, vodka, whisky) use in different user groups. The emphasis then is placed on the comparison of the results of the empirical approach of cluster analysis and the categorization by a conditional definition and their mutual validation for defining youngsters' risky alcohol use. Furthermore, the 25 countries that are included in AAA-Prevent will be clustered according to the proportion of each alcohol use pattern within the country to see whether it is possible to identify groups of countries with similar alcohol use habits. This is done due to the idea that those country clusters might share characteristics that could explain variations in use itself later on (cp. part XX). Last but not least, alternative solutions to identify problematic alcohol users are presented to prepare the discussion about the pros and cons of these different definitions (cp. chapter XX).

4.2 Methods

4.2.1 Statistical analyses

Two methodical approaches were used to identify risky users in an empirical or theoretical way: cluster analyses and a conditional filter. The following passage describes the procedure of the analyses.

A. Cluster analyses

Cluster analysis aims at data reduction and serves as an exploratory method to group test persons according to their responses to as few selected variables as possible into distinctive clusters. There are different ways of clustering and in the present study hierarchical cluster analysis and k-means clustering were performed in SPSS 19.0 (Aldenderfer & Blashfield, 1984). Using Ward's linkage criterion, a random sample of 50% from the youngsters with drinking experience (N=13,689) was clustered agglomeratively with the squared Euclidean distance as measure of dissimilarity (Everitt, Landau, Morven, & Stahl, 2011). The decision of which solution with how many clusters should be picked was based on cluster proportions, response profiles and interpretability respectively practical implications of the clusters. For further optimization, in a second step k-means clustering was performed with the whole sample of alcohol-experienced youngsters (N=27,653). Here, cluster means from the hierarchical analysis were used as starting points and respondents were grouped around those means using an iterative partitioning technique to maximize between- and minimize within-cluster differences (Aldenderfer & Blashfield, 1984). During this sorting, new cluster means were estimated and presented as final results that assign the cluster labels. In both cluster analyses, those students who had never drunk alcohol before were treated as a previously fixed group of abstainers (N=20,770).

In a second hierarchical cluster analysis, the objective was to cluster the 25 European countries into homogenous groups with similar drinking habits within those country clusters. For that reason, in each country the percentages of every use pattern that has been identified in the analyses before were used as clustering variables. Again, Ward's linkage criterion and the squared Euclidian distance were applied. The number of extracted country clusters was specified according to the dendogram.

Additionally, the individual alcohol use pattern variable was dichotomized in a last step ("mild" vs. "intense" users). The reason to do so was to ease the following direct comparison with the categorization that has resulted from the conditional filter command.

B. Conditional definition

As a comparison to the cluster analyses' results, a conditional filter was used for grouping the adolescents into non-risky or risky alcohol users (here, to ease understanding, we use different labels for the two user groupings: "non-risky" vs. "risky" instead of "mild" vs. "intense").
Based on theoretical and practical considerations, a youngster is treated as a non-risky alcohol user if:

- he has never drunk before in his lifetime, or
- he has drunk at least once in his lifetime but not during the last month, or
- he has drunk at least once in his lifetime and during the last month but is at least 14 years old and has drunk at most five times during the last 30 days and drank at most five alcoholic beverages on the last drinking occasion.
- Likewise, a risky user is identified if:
- he has drunk during the last month and is younger than 14 years old, or
- he has drunk during the last month, is at least 14 years old and has drunk more than five times during the last 30 days or drank more than five alcoholic beverages on the last drinking occasion.

In the final step of the analyses, the dichotomized cluster solutions revealed by cluster analyses and conditional filtering were confronted in a cross-tabulation to assess the consistency of both classifications. The overlap of both variables was estimated by a Chi-square test.

4.2.2 Sample

The present analyses were conducted with a subsample of those students who had used alcoholic beverages at least once in their lifetimes. Thus, valid data from 27,653 adolescents aged 12 to 16 were included (M=14.07, SD=1.02) while 20,770 were handled as lifetime abstainers (M=13.5, SD=1.02). 13,691 respondents (49.6%) were female and 22396 (81.1%) were native born. At the time of the assessment, 25.6% (n=7,083) of the youngsters were in seventh and 33.9% (n=9,388) in eighth grade. During the cluster analyses, 9,348 (16.2% of the whole data set) cases were excluded due to missing values on the critical clustering variables and consequently could not be grouped into one use pattern. In addition, in the first step of clustering the sample was reduced to 13,689 respondents by taking a random sample of 50% of those youngsters with drinking experiences. This was done for technical reasons because SPSS 19.0 cannot deal with hierarchical cluster analysis of a larger dataset.

4.2.3 *Measures*

To represent current alcohol use in adolescence, four variables were selected and used as predicting variables for clustering as well as for the conditional filtering. In the ISRD-2 study, questions were included about age of onset, lifetime and last-month prevalence of use, drunkenness experiences, company while drinking, as well as whether and by whom alcohol use was noticed or punished.

In addition, students were asked, firstly, to state the number of occasions during the last month when they drank alcohol, and secondly to specify the number of alcoholic beverages they consumed on their last drinking occasion. Those two questions about frequency and amount of alcohol drunk were asked once for *beer*, *wine* or *breezers* and once for *spirits*. While the amount of spirits drunk was ascertained directly ('The last time, how many glasses did you drink?'), the amount of units drunk of *beer, wine or breezers* was represented by the sum of consumed glasses, (small) bottles and cans which were stated separately. Both expressions of quantity were adjusted for outliers (values over 30 for soft and values over 72 for hard alcoholic beverages were subsumed according to analyses of outliers/extreme values). Finally, four continuous variables reflect frequency and quantity of current alcohol use in youth. Descriptive statistics of the sample's alcohol-related responses are given in Table 4.1. In the last column, results from Kolmogorov-Smirnov tests show that the distribution of each variable differs significantly ($p < .001$) from a normal distribution.

Table 4.1 Descriptive statistics of alcohol use indicating variables (N=27,653)

Variable	Min	Max	M	SD	p
last month intake of beer, wine or breezers	0	30	1.29	2.57	.00
amount of drunken beer, wine or breezers at last drinking occasion	0	30	2.97	3.53	.00
last month intake of spirits (gin, rum, vodka, whisky)	0	30	0.48	1.56	.00
amount of drunken spirits (gin, rum, vodka, whisky) at last drinking occasion	0	59	1.56	2.86	.00

4.3 *Results*

4.3.1 *Cluster analyses*

The hierarchical cluster analysis identified four groups of alcohol use patterns. Cluster 1 contains all youngsters who seldom drink and, when they do, consume very few alcoholic beverages (*mild use*, 73.6%). In the second cluster are found all those respondents who drink relatively often and consume a moderate amount of alcoholic beverages (*moderate use*, 19.9%). Those youngsters who drink moderately often but consume a large amount of alcoholic beverages are categorized in cluster 3 (*high amount use*, 2.7%). Last but not least, a fourth cluster contains adolescents who drink very often but consume a moderate amount of alcoholic beverages (*frequent use*, 3.8%). After k-means clustering the final cluster means show the same profiles as just described (see Table 4.2). The abstainers are those students who had no lifetime prevalence of drinking alcoholic beverages and therefore no current use. After performing the k-means clustering successfully they were relabelled as a fifth cluster (*no use*, 42.9% of the whole dataset).

Table 4.2 Final cluster means

variables	use pattern				
	no	mild	moderate	frequent	high amount
last month intake of beer, wine or breezers	0	0.62	1.91	12.48	3.41
amount of drunken beer, wine or breezers at last drinking occasion	0	1.52	5.51	6.17	15.52
last month intake of spirits (gin, rum, vodka, whisky)	0	0.12	0.94	4.74	2.05
amount of drunken spirits (gin, rum, vodka, whisky) at last drinking occasion	0	0.56	3.76	4.71	7.31

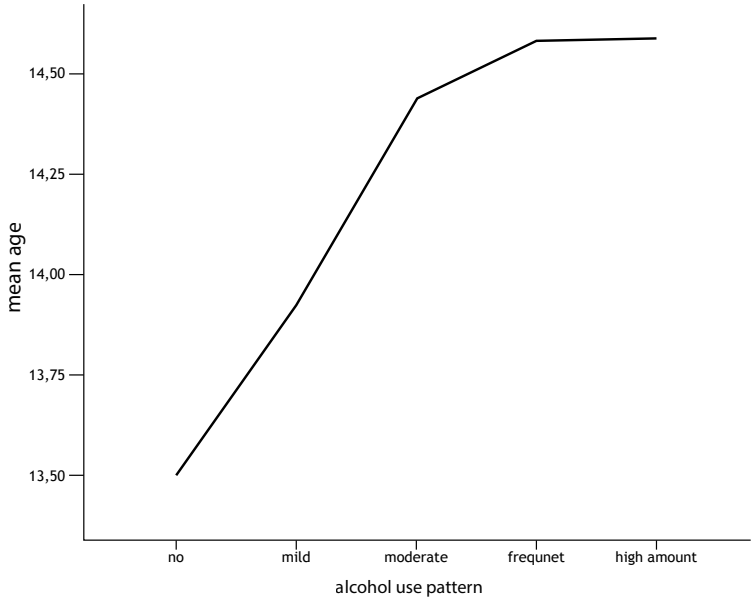
Table 4.3 shows the cluster proportions of the final cluster solution including the mean ages for each cluster.

Table 4.3 Final cluster proportions

cluster	f	%	age in years
no use	20770	42.9	13.5
mild use	20362	42.1	13.93
moderate use	5528	11.4	14.43
frequent use	714	1.5	14.58
high amount use	1049	2.2	14.59
Total	48423	100.0	14.21

An ANOVA which was performed afterwards shows that age differs significantly between groups ($F(4)=1,355.61$, $p<.001$). A post-hoc Duncan test points to four age groups as in Figure 4.1 (frequent and high users are summarized). The graph shows that age increases with increase of use intensity.

Figure 4.1 Illustration of mean age for every alcohol use pattern



The hierarchical clustering of the countries' relative proportions of each use pattern in the next step of analysis led to a three-cluster solution that differentiates between (1) *mainly not* (Norway, Sweden, Cyprus, Portugal, Bosnia & Herzegovina, Spain, France, Iceland), (2) *mainly mild* (Czech Republic, Estonia, Lithuania, Armenia, Russia, Hungary) and (3) *mainly moderate* using countries (Germany, Netherlands, Austria, Switzerland, Belgium, Poland, Italy, Slovenia, Denmark, Finland, Ireland).

Table 4.4 shows the final cluster means of those three country clusters which represent the average percentages of the alcohol use patterns in each cluster.

Table 4.4 Average percentages of use patterns in each country cluster

	country cluster		
	mainly not using	mainly mild using	mainly moderate using
no use	63.6	27.7	38.4
mild use	27.0	58.1	41.1
moderate use	7.4	11.3	15.3
frequent use	0.7	1.6	1.7
high amount use	1.3	1.3	3.5

For a comparison with the typology conducted by the conditional definition, the final cluster solution was dichotomized by summarizing the five drinking habits into two user groups (abstainers and mild users vs. moderate, frequent and high users). Based on that, 41,132 (84.9%) youngsters are labelled as “mild alcohol users” and 7,291 (15.1%) youngsters as “intense alcohol users”.

4.3.2 Conditional definition

The conditional filter command led to a cluster solution in which 53,360 youngsters can be assigned to one of the two use patterns “non-risky alcohol use” or “risky alcohol use”. The distribution is shown in Table 4.5.

Table 4.5 Sizes of conditionally defined alcohol use patterns

	f	%	valid %
non-risky alcohol use	44861	77.7	84.1
risky alcohol use	8499	14.7	15.9
missing cases	4411	7.6	
total	57771	100.0	

A cross-tabulation (Table 4.6) shows the similarity, i.e. the association of the two dichotomized use pattern variables ($X^2(1,N=48,396)=14,039.625$, $p<.01$). The significant results plead for the dependence of both measures.

Table 4.6 Cross-tabulation of both solutions of alcohol-drinking patterns

			conditional solution		
			non-risky use	risky use	total
cluster analysis solution	mild use	f	38758	2321	41079
		% in cluster solution	94.3%	5.7%	100%
		% in filter solution	92.5%	35.8%	84.9%
		% of total	80.1%	4.8%	84.9%
		Std. residuals	16.9	-42.9	
	intense use	f	3157	4160	7317
		% in cluster solution	43.1%	56.9%	100%
		% in filter solution	7.5%	64.2%	15.1%
		% of total	6.5%	8.6%	15.1%
		Std. residuals	-39.9	101.6	
total		f	41915	6481	48396
		% in cluster solution	86.6%	13.4%	100%
		% in filter solution	100%	100%	100%
		% of total	86.6%	13.4%	100%

4.4 Alternative Solutions

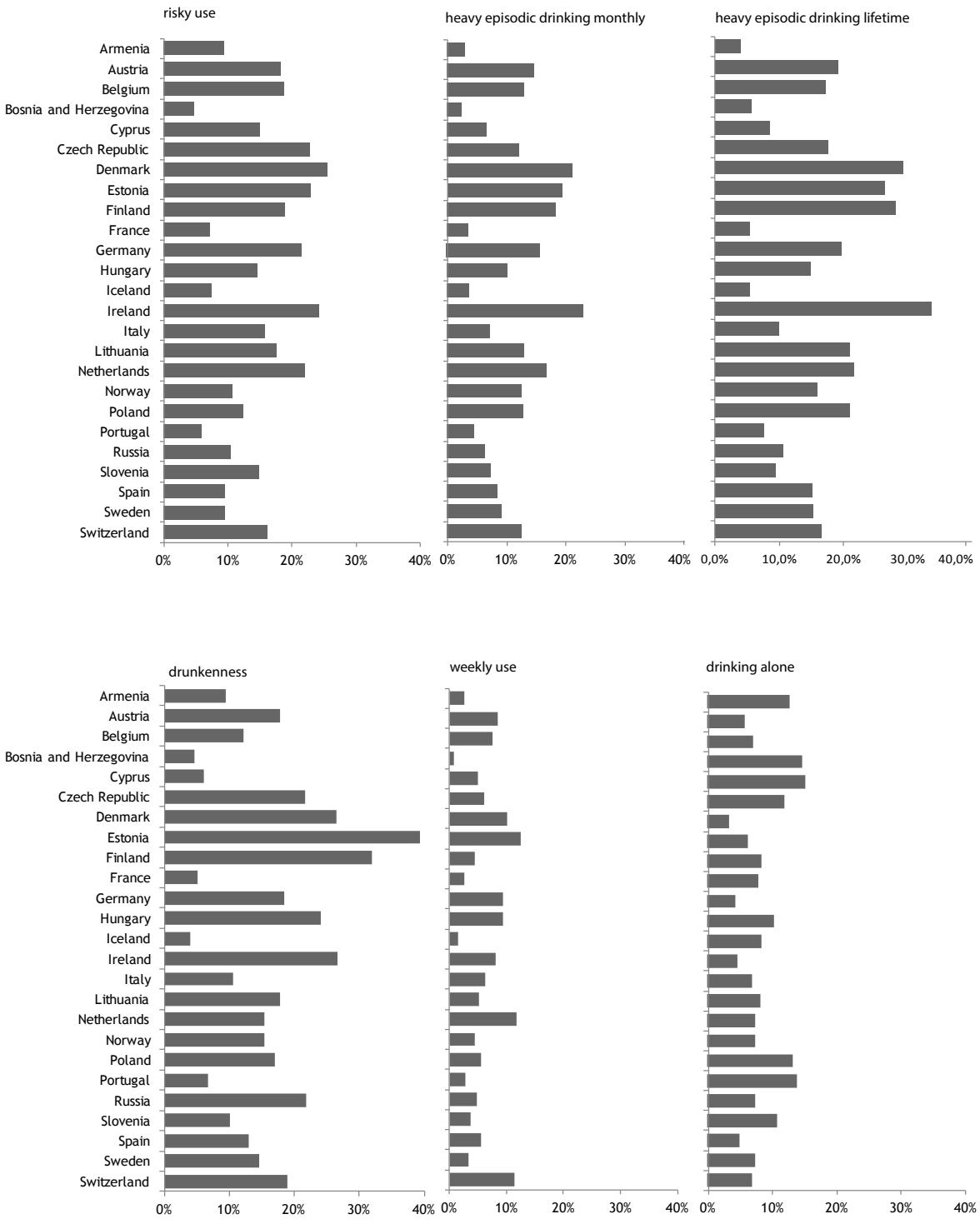
Considering the differences of the two definitions described above as well as their similarities, a decision for one of the two options is not obvious.

Depending on a society's idea of problematic alcohol use in adolescence, different operationalizations of risky use are conceivable that differ regarding strictness and characteristics of alcohol use or users. One may, for example, consider youngsters as problematic users who use alcoholic beverages predominantly alone instead of together with their peers or family members (*drinking alone*). Using alcohol four or more times a month may indicate problematic use as well because it is far more than tasting due to curiosity but rather indicates the first signs of habitual drinking (*weekly use*). Especially in cultures where drinking alcohol is part of daily living, it might be regarded as problematic if a person oversteps the social norms of moderate drinking, e.g. during a meal, and gets drunk. If this is not a once-in-a-lifetime mistake it might be considered as problematic alcohol use as well (*drunkenness*). Often discussed in public is the trend of so-called "binge drinking" or "heavy episodic drinking". Epidemiological studies like ESPAD conceive the use of at least five units of alcohol on one drinking occasion as heavy episodic drinking (Hibell et al., 2009). In this study, youngsters who have shown heavy episodic drinking at least once in their lifetime and those who have shown it at least once during the last month are differentiated according to their drinking patterns (*heavy episodic drinking lifetime*, *heavy episodic drinking last month*).

The comparison of the proportions of problematic alcohol users in the AAA-Prevent study sample according to the different operationalizations shows that the prevalence rates of problematic use ranges from 7% (*weekly use*) to 16% (*drunkenness, non-risky/risky use*) (see Figure 4.2).

Nine per cent of the youngsters are used to drinking alcohol alone, whereas respectively 11% and 14% show experiences of heavy episodic drinking during the last month or lifetime. Looking at the prevalence rates of problematic alcohol use in the 25 European countries with respect to six different operationalizations, it becomes obvious that each one of the indicators can be favoured as the most suitable, moreover each of them describes one specific aspect of problematic alcohol use. Thus the situation within Europe differs depending on the definition of problematic drinking that is used. If, for example, *drunkenness* is chosen as an indicator of problematic use, Estonia would have a serious problem with 39.3% of problematic users, even though only 6.3% would be treated as problematic users if the indicator *drinking alone* was taken into account. In Portugal or France, the situation is the other way around and the problem of problematic drinking youngsters would be graver if *drinking alone* (respectively 13.9% and 7.9%) defined problematic alcohol use instead of *drunkenness* (respectively 6.7% and 5.2%).

Figure 4.2 Proportions of problematic users according to different operationalizations of risky alcohol use



4.5 Discussion

This chapter describes different methods and measures to define risky alcohol use. A comparison of cluster analyses and theoretically derived categorizations regarding youngsters' current alcohol consumption is supplied. In summary, five alcohol use patterns are described by cluster analysis: youngsters who are abstinent (n=20,770, 42.9%), mild (n=20,323, 42.0%) or moderate (n=5,548, 11.5%) using students as well as high amount (n=1,066, 2.2%) or frequent users (n=716, 1.5%). Despite the fact that the exploratory procedure of cluster analysis seems to provide an interpretable solution, the groups were conflated into the two higher-level categories of *mild* and *intense* users.

Such a binary indicator of alcohol use seems more practical for further research and prevention activities because of the possibility of identifying non-problematic or problematic users more quickly and easily. So, alternatively to the empirical cluster solution, a conditional definition of risky alcohol use was established and resulted in the differentiation of 44,861 (84.1%) *non-risky* and 8,499 (15.9%) *risky* alcohol users. One advantage of this filtering method is the fact that fewer missing cases needed to be deleted than in cluster analyses where youngsters with missing information on one of the variables used for clustering were excluded from the analyses. But looking at the conditional filter command is critical as well. In particular, the included age limit is open to question because in most European countries the legal age limit for drinking alcohol is 16 years. Only special rules allow drinking at the age of 14, e.g. in Italy.

The labelling of drinking types might in any case be a critical aspect of clustering methods. For example, the labels of country clusters as *mainly not*, *mainly mild* and *mainly moderate using* countries might give the impression that the most extreme alcohol drinking habit is moderate use even though in every country youngsters show non-excessive as well as excessive alcohol use. The alternative operationalizations of problematic use that are presented in this chapter support this argument. It was shown that prevalence rates of high-risk alcohol use and therefore the awareness of a public need for action differ depending on the underlying definition of problematic alcohol use.

Consequently both solutions presented are also specific to the data used and replications with other data sets are needed to confirm them (Vaughn, DeLisi, Beaver, & Howard, 2008). The focus of the ISRD-2 study was not primarily on drug research, so the alcohol-related variables are not as refined as possible and some details are missing, like, for example, the sizes of alcoholic beverages that were consumed to define the amount of pure alcohol ingested and the concrete date of the last drinking occasion.

One less surprising result is the finding that the older the youngsters are the more intense their alcohol use is. This confirms previous findings but does not explain the development of risky use patterns (Barnes, Welte, & Hoffman, 2002). Further examination of the alcohol user types is needed to get a more particularized picture of the adolescents within and the differences between the groups. In addition, scientific research has to address the issue of possible risk factors and subserving structural indicators that might explain the forming of different use patterns after alcohol use onset. Combined with this information, differential prevention strategies can be framed and introduced.

Nevertheless, it is assumed that the identified groups of *non-risky* and *risky* alcohol users could be characterized as expressive and distinctive use profiles which could influence further research, e.g. about the explanations of such use habits. Because of the multivariate approach in this study a more differentiated picture of adolescent alcohol use in Europe is available now. Policies could even concentrate on the needs of groups with a specific use profile that might be at risk of developing harmful drinking habits. Using the definition of risky alcohol use introduced here, it might be possible to compile a screening instrument to identify youngsters in good time before they habituate risky alcohol use and suffer from its negative consequences. Thus, the present study pleads for concentration on a dichotomous variable called "*risky alcohol use*" but to keep in mind the strictness of grouping youngsters into two distinct classes by a conditional filter.

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Part III

Social contexts, other factors and their influence on alcohol consumption

Part III discusses the different alcohol consumption patterns of adolescents in Europe. In order for prevention strategies to achieve persistent and long-term change in adolescent alcohol behaviors, diminishing susceptibility to risk factors as well as enhancing protective factors is crucial. Therefore, in this part we will take a closer look at the different factors which contribute to these developmental patterns. Research within the socio-medical discourse has traditionally focused on psycho-individual risk factors of behavior, with the assumption that health and lifestyle behaviors are primarily the result of individual choices. Nonetheless, many studies concur that the etiology of adolescent alcohol and drug use is complex, and that risk factors are situated in different social domains and at multiple structural levels.

In this part, the influence of the following domains and risk factors of alcohol (ab)use are studied in more detail: the family, the school, lifestyle and peers, the neighborhood, delinquency and self-control. Hereafter, these domains and factors will be combined into one model to examine their relative importance and to investigate whether they differ in weight between European regions, thus enhancing the external validity of the findings.

Verwey Jonker Instituut

5 *The family*

Anna Markina & Kristjan Kask

5.1 Introduction

Alcohol, drug, and tobacco use are some of the most prevalent youth risk behaviors (Aiken, Sochalske, & Anderson, 1996; MacKay, Fingerhut, & Duran, 2000; Needleman, 2001; O'Malley, Johnston, & Bachman, 1998), and a large amount of empirical studies have demonstrated that adolescent alcohol use is heavily influenced by the quality of attachment between the adolescent and his or her family (Brody & Forehand, 1993; Duncan, Duncan, & Hops, 1994; Velleman, Templeton, & Copello, 2005). Although some studies have found strong relationships between family factors and future delinquency (e.g. Loeber & Stouthamer-Loeber, 1986), weak long-term effects of family factors have also been mentioned (e.g. Sampson & Laub, 1993).

Alcohol use in early adolescence is strongly influenced by social and familial environmental factors (Kendler, Schmitt, Aggen & Prescott, 2008). Many studies have examined which family factors (i.e. characteristics of parenting as well as other family-related issues) can explain delinquency in adolescents. Factors which increase the risk of adolescent delinquency are related to a lack of warmth, minimal supervision, harsh punishment, conflictual family climate, problems of parents, and delinquency within the family (Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1986).

Hirschi's (1969) social control theory is one of the most frequently cited theoretical frameworks regarding this context today, which examines the association between family structure and delinquent behavior (Rebellon, 2002). According to his theory, youths commit delinquent acts because they lack a strong affective attachment to their parents, stakes in conformity, involvement in conventional activities, and belief in conventional norms. He argued that the attachment between parent and child is paramount and the strength of this relationship is the most important factor in deterring delinquent behavior (i.e. it is the quality of bonds that determines delinquency). Social control theory stipulates that children will adopt and adhere to prosocial norms when they experience a strong bond with their parents. This may include the degree of parental supervision, the quality of communication between parents and their children, how much time parents and children spend together, parents' knowledge of children's friends, and issues regarding trust (Agnew, 1991; Hirschi, 1969; Miller, Esbensen, & Freng, 1999). This chapter, will examine the effects of four family-related factors, namely, family structure, social control, affluence and negative life events on adolescent alcohol and drug consumption.

5.2 Theoretical framework

5.2.1 Family structure

Family structure, i.e. whether a child lives with both parents at home or not, has a deep and lasting negative effect on the social behaviour of children, poor supervision at home and is a major determinant of delinquency (Sampson & Laub, 1993; Junger-Tas, Marshall, & Ribeaud, 2003). Scholars are not in agreement as to whether single parents are as effective as two parents in terms of their ability to carry out these tasks (e.g., Demo, 1992; Hetherington & Kelly, 2002; Popenoe, 1996; Rebellon, 2002).

Some empirical studies reported a significant impact of family disruption on delinquency (Ensminger, Kellam, & Rubin, 1983; Glueck & Glueck, 1950; Matsueda & Heimer, 1987; McLanahan & Booth, 1991; Thornberry, Smith, Rivera, Huizinga, & Stouthamer-Loeber, 1999). For example, Wells and Rankin's (1991) meta-analysis of fifty different studies found that most cases indicated that broken homes (or family structure), had a consistent and reliable association with juvenile delinquency. Evidence also suggests that single mothers place fewer maturity demands on their children, engage in less monitoring, and use less effective disciplinary strategies than two-parent families (e.g., Simons,

Simons, & Wallace, 2004). Single parents often have limited financial resources, larger social isolation, and fewer coping resources compared to traditional two-parent families (Elder, Eccles, Ardelt, & Lord, 1995; Gabel, 1992; Norton & Click, 1986). Furthermore, youths from single-parent families are more likely to make decisions without consulting a parent beforehand (Dornbusch et al., 1985).

Only a few other empirical studies revealed little or no impact of family disruption on delinquency (Nagin & Smith, 1990; Rosen & Neilson, 1982; Smith & Brame, 1994; Van Voorhis et al., 1988; Zingraff, Leiter, Myers, & Johnsen, 1993). These studies suggested that the relationship between single-mother households and delinquency was weak at best (Rosen & Neilson, 1982).

In regards to alcohol and drug consumption, those adolescents living in one-parent (compared to two-parent) households are more likely to be involved in severe risk behaviors such as the usage of alcohol, drugs and tobacco (Blum et al., 2000; Flewelling & Bauman, 1990; Oman, McLeroy, et al., 2002; Santelli, Lowry, Brener, & Robin, 2000; Upchurch, Aneshensel, Sucoff, & Levy-Storms, 1999; Young, Jensen, Olsen, & Cundick, 1991). For example, Flewelling and Bauman (1990) reported that youths living in single-parent households had higher rates of drinking alcohol and smoking marijuana (approximately 12% and 7% higher, respectively) compared to those living in two-parent households. Oman, Vesely, Tolma et al., (2007) reported that youths living in one-parent households were also more likely to report using alcohol, drugs, or tobacco in the past thirty days. Recently, Paxton, Valois and Drain (2007) also found that belonging to an intact family acts as a protective effect factor regarding substance use among middle school students. Only a few studies did not note any differences in substance use of adolescents between those belonging to two parent- than those from single-parent families (Fawzy, Coombs, Simon, & Bownan-Terrell, 1987), or that youths from single-mother families are not more likely to be at risk of alcohol and other drug abuse (Amey & Albrecht, 1998).

To conclude, Allen, Donohue, Griffin, Ryan and Turner (2003) indicated that although peers, siblings, and friends are a greater source of influence than parents in terms of substance use, parents do exhibit an influence on the use of substances. Therefore, this study will examine the effects of family structure (i.e. whether adolescents live together with both parents or not) on adolescent alcohol and marijuana use. Based on the literature, it is hypothesized that the family structure acts as a protective factor, whereby those adolescents who belong to two-parent households, use substances less often than those from broken homes.

5.2.2 Family social control

Some studies indicate that supervision and family control are one of the strongest predictors of delinquency (Junger-Tas, 1988; Loeber & Farrington, 1998). Family social control is based on two dimensions, indirect and direct control (Junger-Tas, Marshall, & Ribeaud, 2003). Indirect control is exercised by the quality of the relationship of a young person with his parents (Loeber & Stouthamer-Loeber, 1986). The stronger the bond between parent and child, the more likely their norms will be internalised (even if the parents are not present, see also Hirschi 1969). Direct control in the family is exercised by close monitoring and supervision.

In regards to family social control, previous research has shown that family dinners are positively associated with stronger child-parent relationships (Fulkerson, Pasch, Stigler, Farbakhsh, Perry & Komro, 2010), and that enjoying family dinners together is associated with less aggression overall, as well as less delinquency in youths from single-parent families, and in girls (Griffin et al., 2000). Concerning the consumption of alcohol, children between the ages of 12 and 14 years old who ate dinner with a parent five or more days per week were less likely to use alcohol or marijana (Council of Economic Advisors, 2000). White and Halliwell (2010) also found that family dinners have a positive effect on lowering the likelihood of tobacco and alcohol use (see also Fisher, Miles, Austin, Camargo jr. & Colditz, 2007).

Studies have indicated that the degree to which parents are aware of their child's whereabouts is associated with decreased problem behaviors and delinquency (e.g., Rai et al., 2003; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006; Clark, Kirisci, Mezzich & Chung, 2008). Furthermore, parental support has also been associated with decreased alcohol consumption (Urberg, Goldstein, & Toro, 2005). In this chapter, the effects of family social control on adolescent alcohol and marijuana consumption are examined by two variables: family bonding and parental supervision. It is hypothesized that family social control acts as a protective factor, whereby those adolescents who experience a higher degree of family social control consume alcohol and marijuana in smaller quantities and less frequently than those who experience minimum social family control.

5.2.3 Family affluence

Another variable linked to youth alcohol and drug consumption is parental affluence (e.g. socioeconomic status, SES). Pomerleau, Pederson, Ostbye et al. (1997) found that a high SES is positively associated with a higher alcohol intake. Other studies indicated that adolescents from lower socioeconomic groups have a higher risk of excessive drinking behavior (Lowry, Kann, Clooins & Kolbe, 1996; Lintonen, Rimpelä, Vikat & Rimpelä, 2000; Lemstra, Bennett, Neudorf et al., 2008), while others have found that SES has a weak effect on adolescent alcohol consumption (Tuinstra, Groothoff, Heuvel & van der Post, 1998; Vereecken, Maes & Backquer, 2003). Richter, Leppin and Gabhainn (2006), found that parental SES is only of limited importance for episodes of drunkenness in early adolescence, and this very limited role seems to apply to girls more than boys, and for parental occupation more than family affluence. Their findings concur with some previous studies which did not identify any associations or a weak one at best, between parental SES and alcohol use in adolescence (Tuinstra, Groothoff, Heuvel & van der Post, 1998; Vereecken, Maes & Backquer, 2003).

Kuntsche, Rehm and Gmel (2004) pointed out that while for adults, problematic drinking seems to be more common in less affluent groups; this asscociation might not apply to adolescents, where the accessibility of financial resources is more limited. If one assumes that the availability of pocket money is at least to some degree related to parents' affluence, the results of two Finnish studies, which found a clear relationship between adolescents' own financial resources, i.e. amount of pocket money, and drunkenness, support this view (Lintonen, Rimpelä, Vikat & Rimpelä, 2000; Kouvonen & Lintonen, 2002). Richter, Leppin and Gabhainn (2006) conclude that family affluence appears to be more strongly related to income or spending patterns, therefore indicating a higher availability of resources to indulge in the relatively costly consumption of alcohol. Therefore, in this study, it is hypothesized that family affluence is a risk factor for adolescents to use more (often) alcohol and marijuana more frequently and in larger quatitites, as they have better financial opportunities to do so.

5.2.4 Negative life events

Negative life events (for example illness or death in the family, parental conflicts and alcohol abuse) experienced by adolescents during his or her lifetime can affect their behaviour. For example, Harland et al. (2002) found that those children who experienced divorce or separation had a higher risk of behavioural or emotional problems. Furthermore, Buehler et al (1997) in their meta-analysis of 68 studies on the relationship between interparental conflict and problematic behavior, found that there is a strong link between interparental conflict and juvenile probleem behaviour. In their research, conflicts between parents had effects on both the internalization and externalization of problem behavour (i.e. aggression, delinquency and substance abuse in the latter). Similarly, Burt, Barnes, McGue and Iacono (2008) found that divorce is a consistent predictor of delinquency and other externalizing behaviors during childhood and adolescence (see also Amato & Keith, 1991; Fergusson, Horwood, & Lynskey, 1992; Hetherington, Bridges, & Insabella, 1998; Thompson Jr, Lizardi, Keyes, & Hasin, 2008; Kristjansson, Sigfusdottir, Allegrante, & Helgason, 2009).

When substance use is examined at a family level (taking in account alcohol and drug use amongst dependent children in addition to that of parents), the proportion of families experiencing some form of substance use is considerable (Percy, Thornton, & McCrystal, 2008). For example, Otten, van der Zwaluw, van der Holst and Engels (2008), found that alcohol use of younger children was affected by alcohol use of both parents whereas alcohol use of older children was only affected by alcohol use of the mother.

Parent alcohol consumption is considered a strong precursor of child drinking behaviour (Petraitis, Flay & Miller, 1995). Several studies examined how parents affect the onset of drinking and the degree to which their children consume alcohol (Barnes & Farrell, 1992; Yu, 2003; Van der Holst, Engels, Meeus, Dekovic & Leeuwe, 2005; Brook, Balka, Crossman et al., 2010). Greater alcohol use by parents is associated with earlier use of alcohol in adolescents (Jackson, 1997; Ellickson & Hays, 1991). Parents who suffer from alcohol or drug related problems may disrupt normal social processes within the family, leading to increased levels of family disruption, family and marital conflict, financial strain, alcohol and drug use in other family members, inadequate parenting practices and poorer outcomes for children (Johnston & Leff, 1999; Keller et al., 2008; Lynskey et al., 2002; Sher et al., 2005; Tolan et al., 2006; Gutman, Eccles, Peck, & Malanchuk, 2010). Seljamo, Aromaa, Koivusilta et al., (2006), found that fathers' present heavy drinking and parental early drinking were the best predictors of their children's problematic alcohol use at the age of 15.

Furthermore, children of alcoholics are not only at a higher risk of early alcohol initiation (Hill et al., 2000), they also show a greater increase of alcohol consumption over time than adolescents without alcoholic parents (Chassin & Barrera, 1993). In addition, children with a family history of alcoholism demonstrate a higher escalation of alcohol use (Lieb et al., 2002) and develop alcohol disorders and dependence (Hill et al., 2000) more often than children without a family history of alcoholic parents. To conclude, it is hypothesized that negative life events are a risk factor for higher levels of alcohol and marijuana use amongst adolescents.

5.3 Method

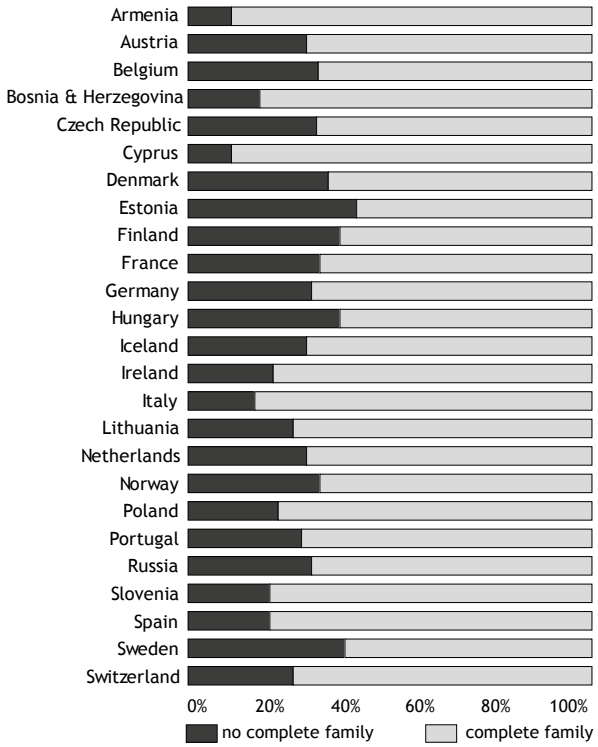
5.3.1 Independent variables

Below, we will examine the five family factors in this study. The dataset was based on the ISRD-2 questionnaire and included the results of 25 European countries. The inclusion criteria for this study were youths between the ages of 12 to 16, in grades seven to nine. The number of total participants was 57,771.

5.3.2 Family structure

Concerning family structure (N=57,505), 25.1% of the sample lived in single-parent or step-parent households, and 74.9% lived with both parents at home. Figure 5.1 presents a comparison of complete and incomplete family structures in different countries (only results regarding large and medium-sized cities are reported in the following figures).

Figure 5.1 The distribution of family structure across countries

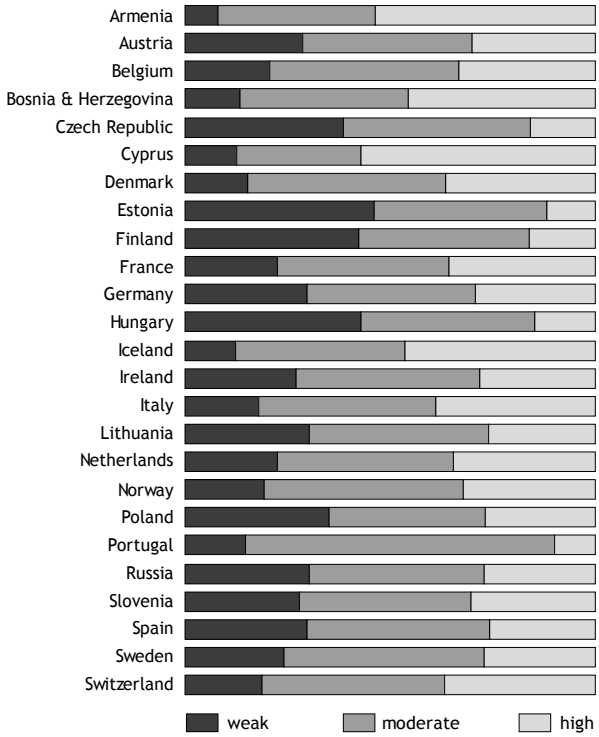


5.3.3 Family social control

Family bonding

Family bonding (N=57,200) is a combined variable which consists of four variables, i.e. (1) whether the adolescent gets along with their father (from 1 “not at all” to 4 “very well”); (2) whether the adolescent gets along with their mother (from 1 “not at all” to 4 “ very well”); (3) whether the adolescent spends leisure time with their parents (from 1 “never” to 6 “more than once a week”); (4) and whether the adolescent has dinner with his/her family (from 1 “never” to 8 “daily”). This variable was trichotomized to distinguish whether youths had weak (26.3%, n=15,068), moderate (57.7%, n=24,505) or strong bonds (16.0%, n=17,627) with their families. Figure 5.2 illustrates youth and family bonding in different countries.

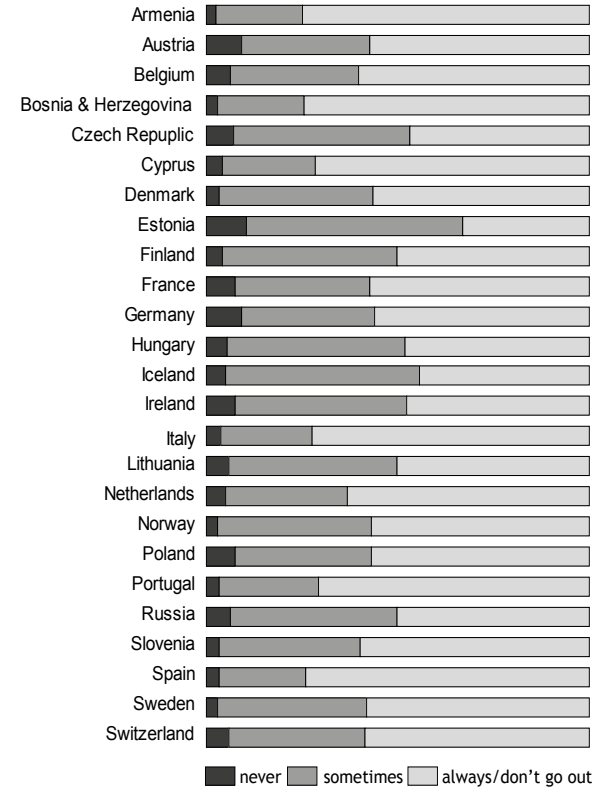
Figure 5.2 The distribution of family bonding across countries



Parental supervision

Concerning parental supervision (N=57,052), 5.4% of the sample indicated that they are rarely or never supervised; 35.3% were sometimes supervised; and 59.3% stated that they were always under the supervision of their parents (or they did not go out). Figure 5.3 presents the degree to which parents supervise their children in different countries

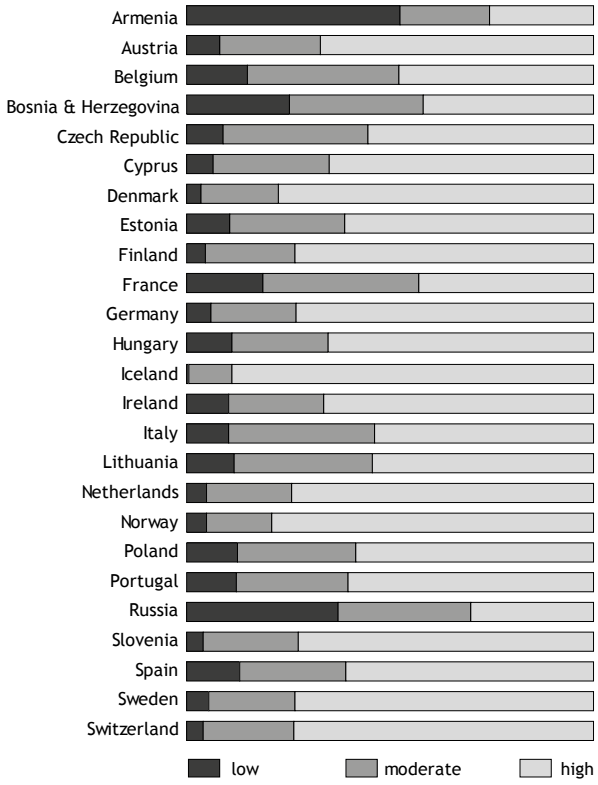
Figure 5.3 The distribution of parental supervision across countries



5.3.4 *Family affluence*

Family affluence (N=57,667) is a combined variable which consists of four variables, i.e. (1) whether the adolescent has their own room ("yes" or "no"); (2) their own computer ("yes" or "no"); (3) their own mobile phone ("yes" or "no"), and; (4) if the family has a car ("yes" or "no"). This variable was trichotomized to distinguish youths with low (12.5%, n=7,205), moderate (26.8%, n=15,475) or high affluence (60.7, n=34,987). Figure 5.4 presents family affluence in different countries.

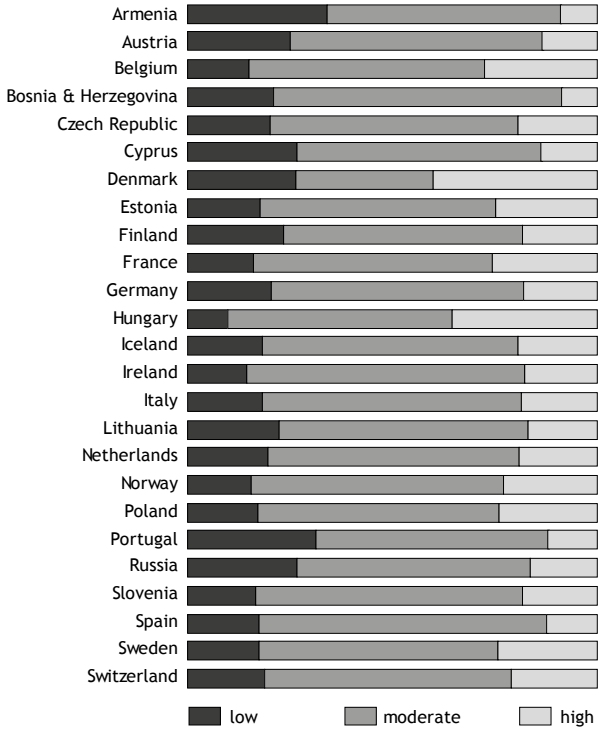
Figure 5.4 The distribution of family affluence across countries



5.3.5 *Negative life events*

Negative life events concerning death/illness and family disruption (N=56,701) consists of eight variables, i.e. (1) whether the adolescent has experienced the death of one of their siblings; (2) death of parent; (3) the death of someone else they loved; (4) illness of themselves; (5) illness of parents; (6) parent alcohol and/or drug use; (7) violence of parents; (8) parents' separation or divorce. This variable was trichotomized to distinguish between youths with low (20.9%, n=11,841), moderate (60.9%, n=34,545) or a high amount of negative life events (18.2, n=10,315). Figure 5.5 presents family affluence per country.

Figure 5.5 The distribution of negative life events across countries



5.3.6 Dependent variables

The dependent variables in this study concerning the **prevalence** (i.e. whether youths used alcohol/ drugs, or not), were lifetime and last month consumption of alcohol (beer/wine and spirits) and drugs (soft drugs such as marijuana, and hard drugs such as ecstacy/amphetamines/LSD/cocaine/heroin), drunkenness of alcohol, binge drinking (drinking at least five drink in a row), and abstinence (not ever drinking/using in their lifetime) from alcohol and marijuana. The dependent variables concerning the **incidence** (i.e. how much the youths used alcohol/marijuana) were the amount of alcohol and marijuana used last month, and the amount of alcohol they used the last time they were drunk.

5.4 Results

Family factors were standardized and analyzed with SPSS version 17, using a binary logistic regression for prevalence and a negative binomial regression for incidence. All analyses were multivariate and controlled for grade, gender, and nativeness.

5.4.1 Prevalence of using alcohol and drugs

This section will analyze the effects of family-related factors on lifetime prevalence of the consumtion of *alcohol* (beer/wine and spirits) and drugs (*soft drugs* such as marijuana/hasish and *hard drugs* such as amphetamines/ecstasy/LSD/heroin/cocaine, see Table 5.1) using a binary logistic regression.

Table 5.1 The effect of family-related factors on the lifetime prevalence of alcohol and drug consumption

Categories	Family structure	Family bonding	Parental supervision	Family affluence	Negative life events
	Odds ratios (CI)	Odds ratios (CI)	Odds ratios (CI)	Odds ratios (CI)	Odds ratios (CI)
Alcohol lifetime (n=56,472)	.946***	.732***	.645***	1.223***	1.172***
Alcohol last month (n=56,381)	.988	.743***	.678***	1.308***	1.157***
Alcohol drunkenness (n=56,388)	.902***	.672***	.622***	1.242***	1.182***

Categories	Family structure	Family bonding	Parental supervision	Family affluence	Negative life events
	Odds ratios (CI)	Odds ratios (CI)	Odds ratios (CI)	Odds ratios (CI)	Odds ratios (CI)
Binge drinking (n=55,551)	.928***	.715***	.669***	1.323***	1.152***
Soft drugs lifetime (n=55,999)	.913***	.650***	.654***	1.249***	1.225***
Soft drugs last month (n=55,933)	.921***	.661***	.650***	1.288***	1.226***
Hard drugs lifetime (n=56,141)	.974	.677***	.571***	1.121***	1.328***
Hard drugs last month (n=56,130)	1.001	.683***	.556***	1.123*	1.287***
Abstinence (n=56,252)	1.055***	1.368***	1.565***	.819***	.852***

Note. Model controlled for gender, grade and migrants. *** p <.001, ** p < .01, * p<.05.

For alcohol, family structure, affluence, bonding, parental supervision, and negative life events had effects in terms of the amount of alcohol youths consumed in their lifetime and in the last month, as well as for being drunk (drunkenness), and binge drinking. Those adolescents who: (i) lived with both parents; (ii) had stronger bond with their parents, and; (iii) who were supervised frequently, were less likely to have consumed alcohol than those from broken families – families defined by weaker parental bonding and less frequent supervision. However, adolescents who: (i) experienced more negative life events, and (ii) lived with more affluent families, used more alcohol than youths who experienced less negative life events and were from less affluent families.

For drugs, a slightly different but similar picture emerged. When it comes to soft drugs, family structure, affluence, bonding, parental supervision, and negative life events had effects in terms of the amount of soft drugs youths consumed in their lifetime and in the last month. The effects were similar to those related to alcohol. For hard drugs, family bonding, supervision and negative life events also had effects on the amount of hard drugs youths consumed in their lifetime and in the last month, the effects of which were also similar to those of alcohol. Family affluence only had an effect on the lifetime use of hard drugs and not last month use. However, family structure had no effect on the amount of hard drugs a youth consumed in their lifetime or in the last month.

Finally, complete abstinence from alcohol and drugs was also examined. Our study found that all variables (family structure, affluence, bonding, parental supervision, and negative life events) had effects on abstinence. Adolescents from two-parent households; who experienced better bonding and were supervised more frequently, were more likely to be abstinent than those from broken households; who had weaker family bonds, and were supervised less often. Adolescents who experienced more negative life events and were from more affluent families were less likely to be abstinent than those who had not been confronted with that many negative life events, and who were from less affluent families.

5.4.2 Incidence of using alcohol and marijuana

Next, the effects of family-related factors on the amount of alcohol youths consumed in the last month and the amount of alcohol they consumed the last time they were drunk will be examined with a negative binominal regression (see Table 5.2), along with the amount of marijuana used in the last month. The results demonstrate that affluence, bonding, parental supervision, and negative life events had effects on the amount of alcohol and marijuana youths consumed in the last month, as well as the amount of alcohol they used the last time they were drunk. Those adolescents from families who experience good family bonding and were supervised more frequently used less alcohol and marijuana, than those who experienced less family bonding and were not supervised as often. Similar effects applied to family structure. However, adolescents who had been confronted with more negative life events, and were from more affluent families consumed more alcohol and marijuana than those who experienced less negative life events and were from less affluent families.

Table 5.2 The effect of family-related factors on the incidence of alcohol and marijuana consumption

	Amount of using alcohol last month (n=52,530)	Amount of alcohol used last occasion when being drunk (n=51,844)	Amount of using soft drugs last month (n=52,400)
	B (SE)	B (SE)	B (SE)
Family structure	-.027* (.011)	-.146*** (.013)	-.085*** (.013)
Family bonding	-.216*** (.011)	-.359*** (.013)	-.389*** (.015)
Parental supervision	-.357*** (.010)	-.494*** (.013)	-.430*** (.012)
Family affluence	.220*** (.010)	.182*** (.013)	.238*** (.015)
Negative life events	.145*** (.011)	.191*** (.013)	.269*** (.015)

Note. Model contolled for gender, grade and migrants. *** p <.001, ** p < .01, * p<.05.

5.5 Discussion

In this chapter, the effects of family-related factors such as family structure, social control, affluence and negative life events on adolescents' alcohol and marijuana consumption were examined. The following section will discuss the results in relation to previous findings in this area of interest.

5.5.1 Family structure

The results indicated that family structure has an effect on an adolescents' substance use. Similarly to the results of Oman, Vesely, Tolma et al. (2007), our study found that those adolescents who lived with both parents consumed less alcohol and marijuana in the last month. We found that the same pattern applies to the consumption of both alcohol and marijuana in their lifetime. Therefore, as some previous studies have confirmed (Flewelling & Bauman, 1990; Santinelli et al., 2000; Upchurch et al., 1999), adolescents from broken homes are more likely to use alcohol and marijuana. Interestingly, the effect of family structure on the use of hard drugs was not that strong. One explanation for this finding may be that usage of alcohol and soft drugs (marijuana) often precedes the use hard drugs, which usually starts later in life, after the age of 16. The adolscents in our sample were younger than 16 years old.

The results also demonstrated that adolescents from two-parent families consumed less alcohol and marijuana in the last month than those from broken families. The assumption that living in two-parent households would reduce the consumption of alcohol and drugs is thereby supported (Flewelling & Bauman, 1990; Paxton, Valois & Drain, 2007). Overall, we can conclude that having **both parents present at home acts as a protective factor,** in that it reduces the frequency and amount of alcohol and marijuana adolescents consume.

5.5.2 Family social control

Research has demonstrated that supervision and control are one of the strongest predictors of delinquency (Junger-Tas, 1988; Loeber & Farrington, 1996). Our study supports this as we were able to demonstrate that family social control has an effect on reducing the quantity and frequency of alcohol and marijuana consumption during a youths lifetime and in the last month (White & Halliwell, 2010; Council of Economic Advisors, 2000; Rai et al., 2003; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006; Urberg, Goldstein, & Toro, 2005).

It is important to note that this correlation not only applies to the use of alcohol, but also to soft and hard drugs, which demonstrates that this factor is universal in its effect. Furthermore, it must be pointed out that both indirect and direct control (Junger-Tas, Marshall, & Riberaud, 2003) had strong effects on adolescent alcohol and drug consumption. From our study, we may conclude that **family social control and good family bonding will act as a protective factor** in reducing the quantity and frequency of alcohol and marijuana consumption amongst youths.

5.5.3 Family affluence

In concurrence with earlier findings (Pomerleau, Pederson, Ostbye et al., 1997), family affluence had an effect on the quantity of alcohol and soft drugs adolescents consumed in last month and in their lifetime. Interestingly, there was only a lifetime effect for hard drugs but not for last month. The notion of Kuntsche, Rehm & Glem (2004) can be therefore affirmed, that those youths who have better access to financial resources can afford more alcohol (see Lintonen, Rimpelä, Vikat & Rimpelä, 2000;

Kouvonen & Lintonen, 2002). Youths with fewer resources will have fewers opportunities to drink alcohol. In conclusion, **family affluence is a risk factor** in that it increases the frequency of alchohol and marijuana consumption amongst adolescents, as they have better access to financial resources to buy the desired substances.

5.5.4 Negative life events

Studies have shown that negative life events can have a great impact in different areas of child development. Our study demonstrated that negative life events had an effect on lifetime and last month use of alcohol and soft and hard drugs, also in terms of the amounts consumed (similarly to Percy, Thornton & McCrystal, 2008; Otten et al., 2008). This confirms just how destructive of an effect negative life events can have on adolescents alcohol and drug consumption. Therefore, we may conclude that the **negative life events are a risk factor** in that they increase the quanitity and frequency of adolescent alcohol and marijuana consumption.

5.6 Conclusion and policy recommendations

Our study has illustrated that family-related factors have a strong effect on the quantity and frequency of adolescent alcohol and marijuana consumption. We may conclude that there were two types of factors that protect adolescents, in that they reduce alcohol and marijuana consumption, and two types of risk factors that have just the opposite effect. Family structure and family social control and bonding act as **protective factors** while family affluence and negative life events were **risk factors**. Therefore, our study also supports Hirschi's (1969) social control theory, which stated that there are strong links between family dimensions and processes and adolescent delinquent behaviour.

Based on the findings of this chapter, we suggest two policy recommendations. First, interventions which include teaching parenting and social skills to parents are encouraged, as the results of this chapter demonstrate that strong bonding and parental control decreases alcohol use among youths. Policymakers should focus on implementing programs which encourage parents to take control of their childrens upbringing and the notion that their own behavior has a strong impact on their children.

Second, it was demonstrated that adolescents who experienced more negative life events were more prone to alchol use. Therefore, it is suggested that programs which strengthen social skills in adolescents should be promoted, as those adolescents who experienced negative life events need to acquire necessary social skills to cope in difficult situations (for example, how to manage parental conflicts at home), and also problem solving skills (for example, how to resist peer pressure).

5.7 References

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Verwey Jonker Instituut

6 The School

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6.1 Introduction

In this chapter we examine in an explorative way which school-related risk factors are most important in explaining different alcohol use outcomes. We also pay attention to variations in the strength of association of these relationships, by taking a closer look at how these school related risk factors vary over the various European countries.

In adolescence, schools are seen as one of the most important settings for influencing the development of health and lifestyle behaviours, such as use of alcohol, cigarettes or drugs (Perry, Kelder, & Komro, 1993), not least because in most European countries full-day schools are prevalent. Not only is the school an environment where adolescents are constantly influenced by their peers; the school is also a major canal by which society tries to transmit —formally and informally, intentionally and unintentionally— certain norms, values, attitudes and behaviours into adolescents' lives. These include features such as commitment, involvement, perseverance, autonomy, responsibility, discipline, obedience, critical reflection, creativity, respect for others, et cetera. The extent to which students adhere to these 'desired' principles can apparently indicate their strong social bond with the school system; and consequently, the school acts as a protective factor for 'deviant' behaviour (Hirschi, 1969). Illicit drug and alcohol use at too young an age generally provokes condemnation among parents and school representatives, and thus is labelled as 'deviant', especially because the consumption of alcohol and drugs at these ages is not without risks. Many studies acknowledge the acute and longer range health implications of these behaviors, and the social and economic consequences that are accompanied with it, both on a personal and a societal level (Ellickson, Tucker, & Klein, 2003; Hawkins, Catalano, & Miller, 1992; Spoth, Greenberg, & Turrisi, 2009; STAP, 2003).

In health research, scientists have traditionally focused on what may be called social-cognitive theories, i.e., theory of planned behaviour (Ajzen, 1991) or health belief model (Janz & Becker, 1984), to explain alcohol and drug use. As the umbrella denominator of these theories suggests, these theories first pay attention to the question of how cognitive structures determine youngsters' alcohol and drug use. One main criticism of these kinds of theoretical models is that they pay little attention to the social and contextual environment in which this behaviour occurs. In the International Self-Report Delinquency 2 (ISRD-2) study on the other hand, with its anchoring in criminological research, much more attention is paid to the social context in which these behaviours take place (i.e., peers, school, neighbourhood). Consequently, a lot of variables present in the dataset measure concepts of theories that put these very social contexts to the foreground.

As with the literature on delinquency, risk factors of alcohol and drug use related to school are often linked to social control theory (Elliott, Huizinga & Ageton, 1985; Elliott, Huizinga & Menard, 1989; Gottfredson & Hirschi, 1990; Hirschi, 1969), although these school factors also take a central place in other criminological theories such as strain theory (Agnew, 2005), situational action theory (Wikström, 2006; 2010) or societal vulnerability theory (Vettenburg, 1988; 1998). According to Hirschi's (1969) social control theory, alcohol and drug use is inherently attractive for young people, and only strong bonds with conventional socializing agents (e.g., parents, school, church) generate the necessary social controls that prevent people from drinking/using alcohol or drugs. Hirschi (1969) sees individuals as rational actors who refrain from being deviant because they anticipate the future costs of it – that is, consequences of investing in 'conventional' behaviours, such as personal relationships with parents or teachers, commitments and accomplishments in family or school life, the social status and rewards

that are associated with these, et cetera. Therefore, a strong bond with the school can be interpreted as an important indicator of conformity with the social norms and values of conventional society.

The ISRD-2 data provides several indicators of these investments in conventional society, and research consistently shows that all of these school factors are associated with health and lifestyle outcomes such as the use of alcohol, cigarettes and drugs (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; Hawkins et al., 1992; Henry & Slater, 2007; Nutbeam, Smith, Moore, & Bauman, 1993; Petraitis, Flay, & Miller, 1995; Samdal, Wold, Klepp, & Kannas, 2000; Simons-Morton, Crump, Haynie, & Saylor, 1999; Takakura, Wake, & Kobayashi, 2010). Most of the 'school-related' variables that we study in this chapter are indicators of one or several of the four bonding dimensions Hirschi denotes.

Commitment refers to a young person's aspirations for, and behaviour consistent with, later attending college or obtaining a prestigious job. Involvement refers to participation in conventional activities such as attending school regularly, spending time on school work, et cetera. Attachment refers to affective ties toward parents, school, friends, et cetera, while belief relates to the degree to which an adolescent accepts and abides the rules of society.

So, the school-related variables studied in this chapter all relate to characteristics of the adolescent (and thus are measured at this level).[1] The ISRD-2 data also includes school bonding variables that measure:[2] how much time students spent doing their homework on an average day ('*doing homework*'), whether they ever had to repeat grades ('*repetition*'), whether they ever stayed away from school without excuse for a whole day ('*truancy*'), how well students did compared to other students in the class ('*proficiency level*'), what students planned to do after completing compulsory school ('*aspiration after school*'), and how well students liked school ('*school attitude*'). Two variables measure the students' perceptions and feelings regarding their school environment. The first expresses the bond with the school ('*school climate/school bonding*') and the second variable measures to what extent students perceive their school to be rather disorganized in terms of crime, drug use, etc ('*school disorganization*'). School disorganization measures how the school in itself deviates from a conventional (often middle class) school where disorganization is minimal. Indicators of school disorganization of course correlate with school climate (see Table 6.1). For a complete description of the school-related variables and their operationalization see next paragraph.

Table 6.1 Correlation matrix of all school-related risk factors

	variables										
	Correlation		%								
	Spearman's rho	N	Missing	2	3	4	5	6	7	8	9
1	Doing homework	56,591	1.7	0.114***	-0.091***	-0.139***	0.161***	0.121***	0.219***	0.199***	-0.124***
2	Proficiency level	56,852	1.2		-0.143***	-0.138***	0.253***	0.011	0.237***	0.146***	-0.040***
3	Repetition	57,235	0.6			0.107***	-0.185***	-0.157***	-0.071***	-0.082***	0.091***
4	Truancy	57,196	0.6				-0.071***	-0.018**	-0.204***	-0.163***	0.151***
5	Aspiration after school	44,578	22.6					0.261***	0.159***	0.116***	-0.133***
6	School level	20,864	63.8						0.025***	0.077***	-0.133***
7	Like school	57,071	0.8							0.439***	-0.176***
8	School climate	56,837	1.3								-0.148***
9	School disorganization	56,562	1.7								

* p < 0.05, ** p < 0.01, *** p < 0.001.

A final remark we should mention here regards the school variable repetition. Grade repetition is a phenomenon that is common mainly in Western and Southern European countries, while this phenom-

1 It is important to acknowledge that alcohol and drug use is not only associated with characteristics of the individual, but also with characteristics of the school. Studying such structural indicators of the school, however, is not the topic in this chapter.

2 Table 5.1 shows the correlations between these school-related risk factors, the total number of cases for which information is available for each variable and the percentage of missing values. The largest percentage of missing values is observed for 'school level' (M = 63, 8%) and 'aspiration after school' (N = 22.6). Most school-related risk variables are only modestly correlated (none of the bivariate associations is larger than 0.3).

enon is almost non-existent in for instance Northern and Eastern European countries (Brophy, 2006). In the latter, these countries enforce automatic promotion policies, while in the former, repetition becomes obligatory for students who fail to meet certain promotion criteria. Figure 6.3 shows the prevalence rates for repetition in the different European countries. As expected, grade repetition is very low in most Eastern European countries, with prevalence rates between 0.74% (Armenia) and 7.79% (Hungary), and between 1.26% (Norway) and 6.46% (Denmark) in Northern European countries. In contrast, repetition rates are much higher in Southern and Western European countries with rates exceeding 25% in the Netherlands, Belgium, France, Portugal and Spain.

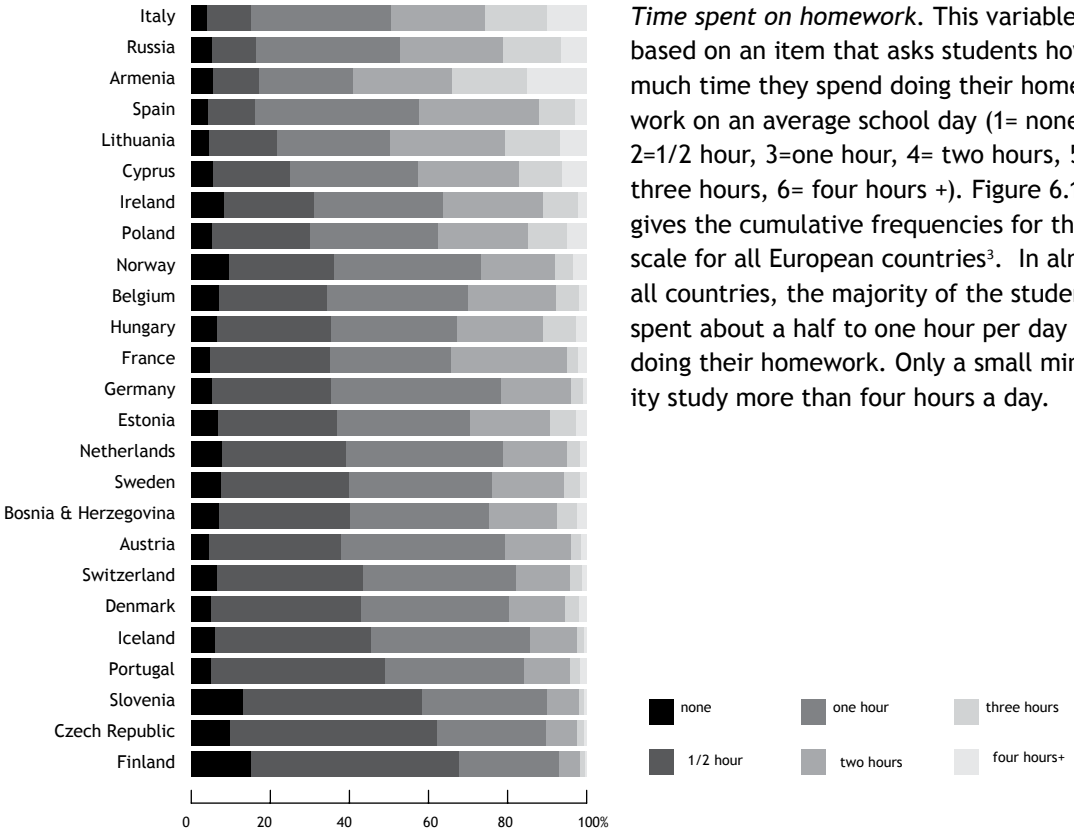
6.2 Description of independent variables and outcomes

6.2.1 Outcome variables

Associations of school variables with the following alcohol and drug use outcomes were conducted: abstinence, lifetime and last month prevalence, last month incidence (frequency of use in the last month), age of onset, lifetime prevalence of drunkenness, lifetime frequency of drunkenness, heavy episodic drinking (i.e. binge drinking) and last time social context in which alcohol or drugs were consumed (in group or alone). 'Abstinence' is defined as not yet having consumed alcohol and drugs in one's lifetime. 'Lifetime prevalence' measures whether the student has ever consumed alcohol or drugs, while 'last month prevalence' asks students whether they have done this in the last four weeks. 'Last month frequency' measures how many times they have consumed alcohol or cannabis in the last four weeks. 'Age of onset' measures the age at which the student consumed alcohol or drugs for the first time. 'Lifetime drunk prevalence' measures whether the respondent has ever been drunk in his life, while 'lifetime drunk incidence' measures how many times the student has been drunk in his lifetime. 'Heavy episodic drinking prevalence' is an overall indication of binge drinking and measures whether the student has consumed five or more glasses (or units) of alcohol on the last occasion. Finally, 'last time alone' is a variable measuring the social context in which alcohol is consumed. This variable is measured as a single question and asks students whether they have consumed alcohol or drugs in a group or alone.

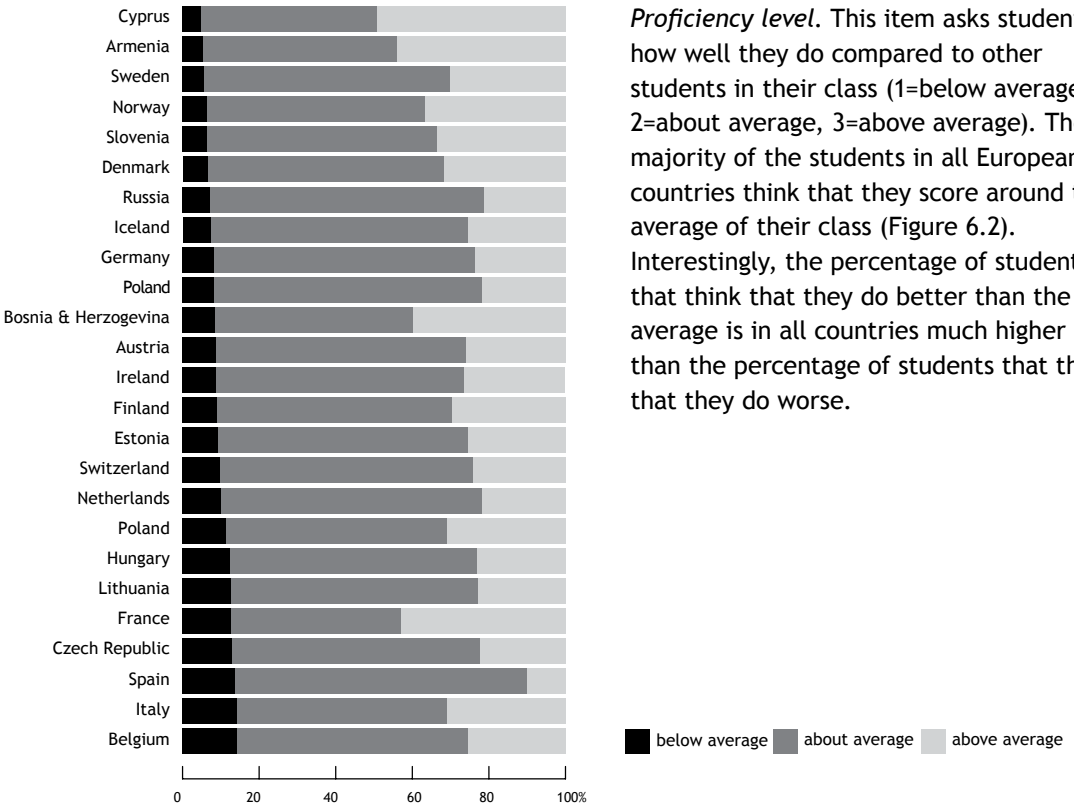
6.2.2 Independent variables

Figure 6.1 Time spent on homework by country



Time spent on homework. This variable is based on an item that asks students how much time they spend doing their homework on an average school day (1= none, 2=1/2 hour, 3=one hour, 4= two hours, 5= three hours, 6= four hours +). Figure 6.1 gives the cumulative frequencies for this scale for all European countries[3]. In almost all countries, the majority of the students spent about a half to one hour per day doing their homework. Only a small minority study more than four hours a day.

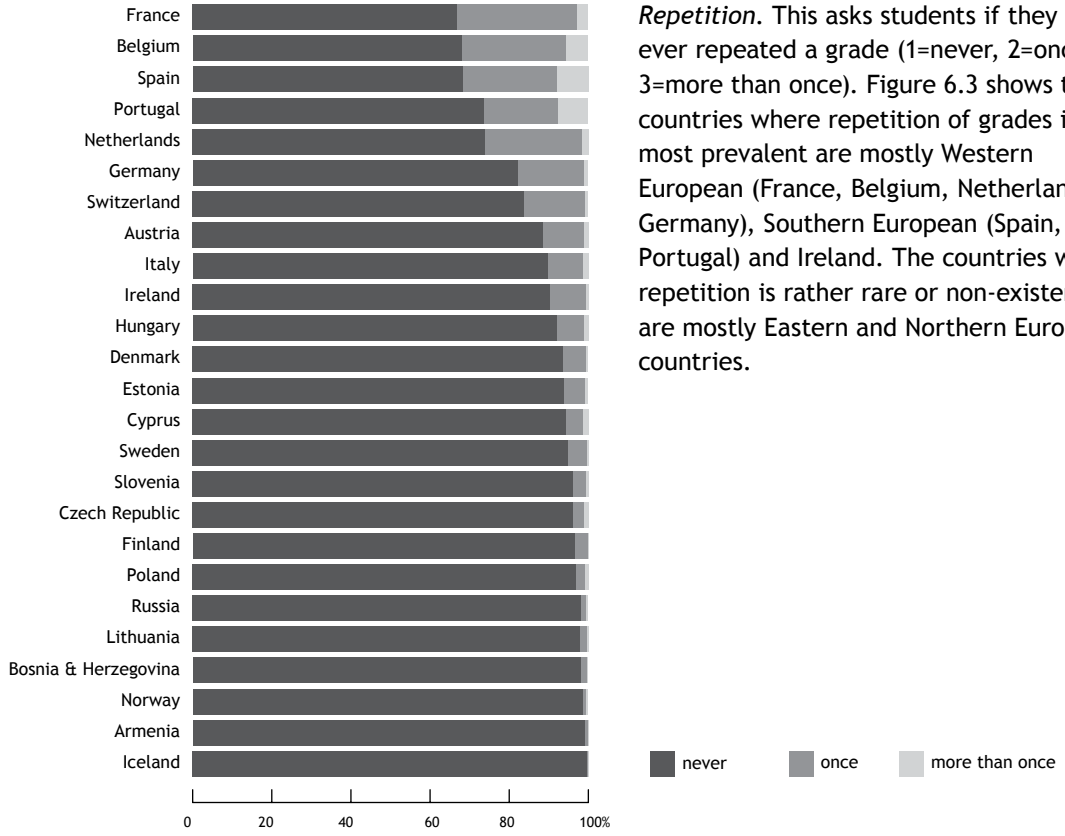
Figure 6.2 Proficiency level by country



Proficiency level. This item asks students how well they do compared to other students in their class (1=below average, 2=about average, 3=above average). The majority of the students in all European countries think that they score around the average of their class (Figure 6.2). Interestingly, the percentage of students that think that they do better than the average is in all countries much higher than the percentage of students that think that they do worse.

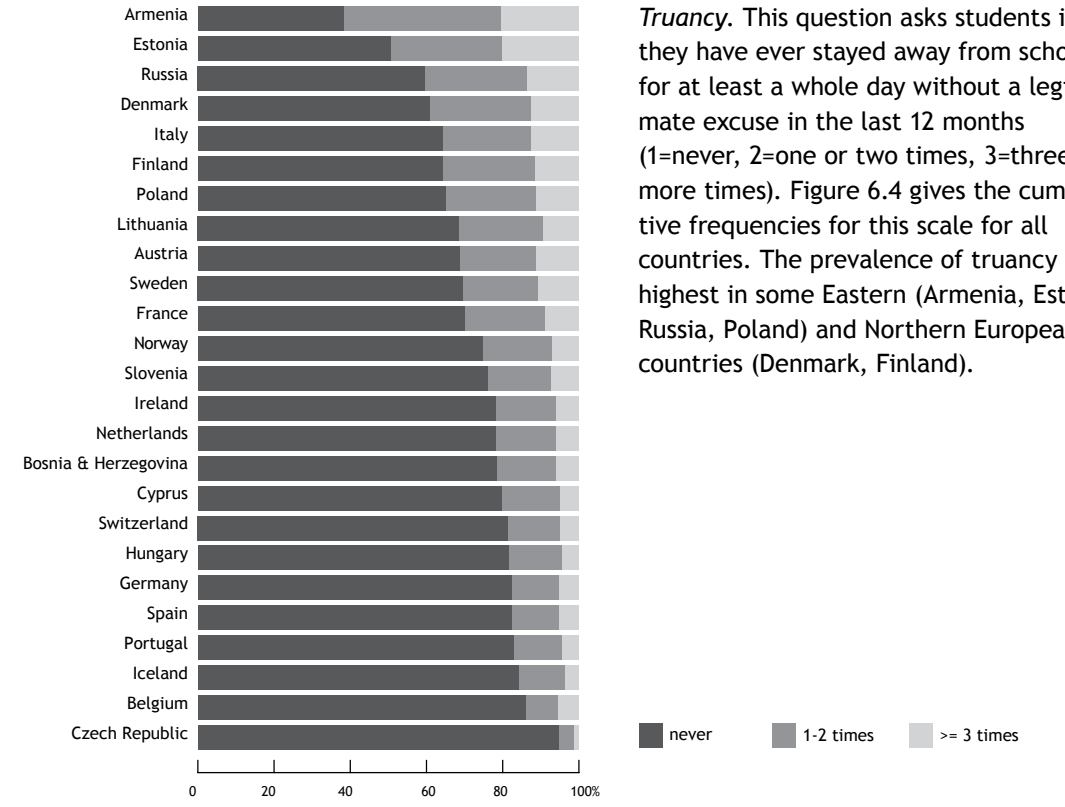
3 For clarity of visual presentation, we reduced the number of the categories to only four categories.

Figure 6.3 Repetition by country



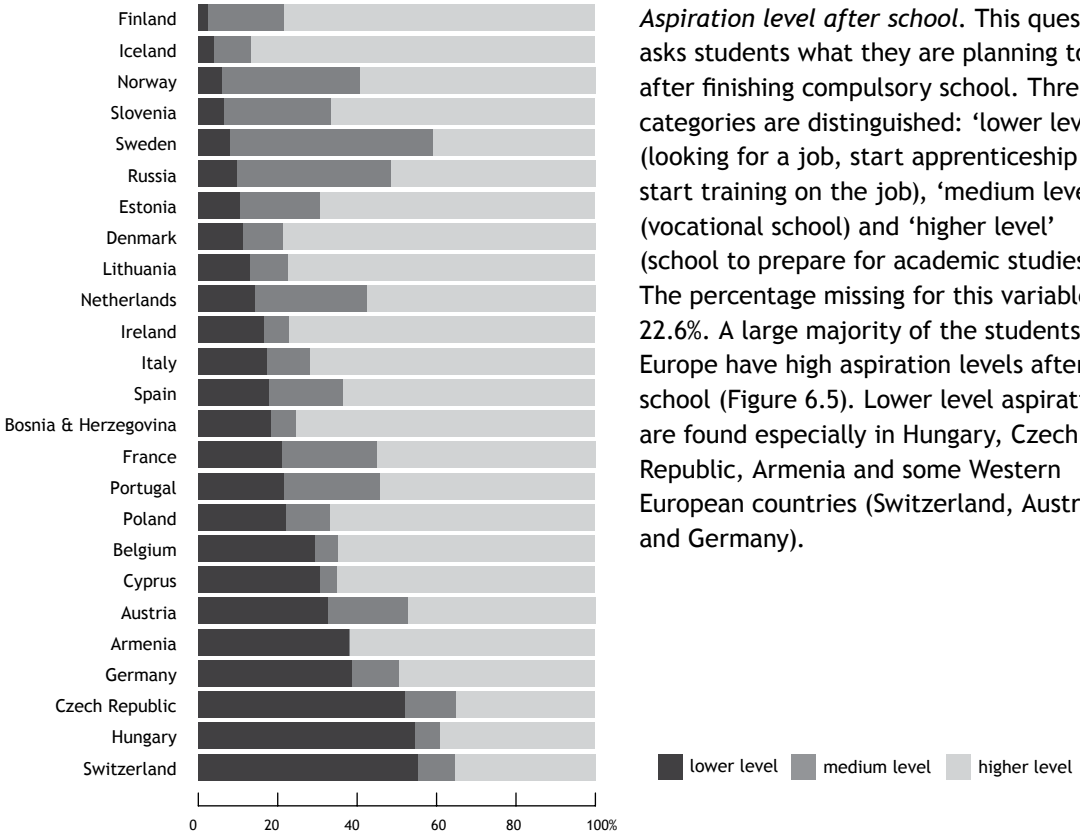
Repetition. This asks students if they have ever repeated a grade (1=never, 2=once, 3=more than once). Figure 6.3 shows that countries where repetition of grades is most prevalent are mostly Western European (France, Belgium, Netherlands, Germany), Southern European (Spain, Portugal) and Ireland. The countries where repetition is rather rare or non-existent are mostly Eastern and Northern European countries.

Figure 6.4 Truancy by country



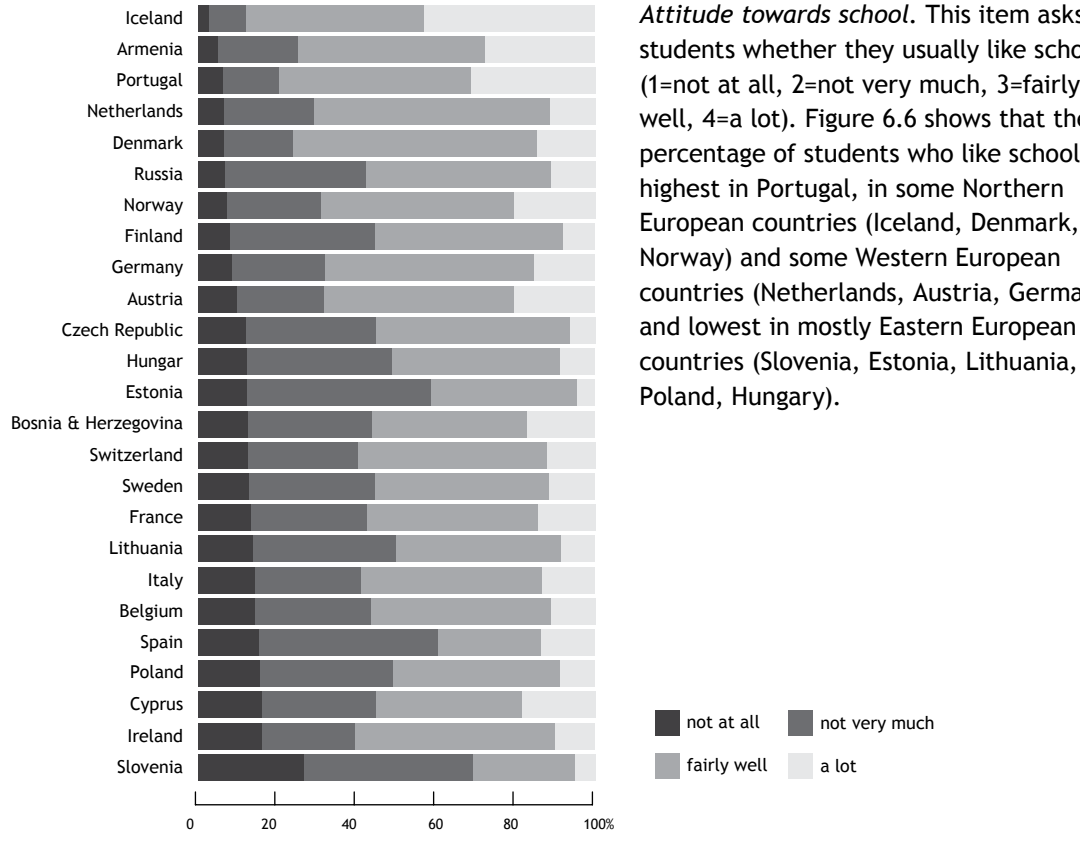
Truancy. This question asks students if they have ever stayed away from school for at least a whole day without a legitimate excuse in the last 12 months (1=never, 2=one or two times, 3=three or more times). Figure 6.4 gives the cumulative frequencies for this scale for all countries. The prevalence of truancy is highest in some Eastern (Armenia, Estonia, Russia, Poland) and Northern European countries (Denmark, Finland).

Figure 6.5 Aspiration level after school by country



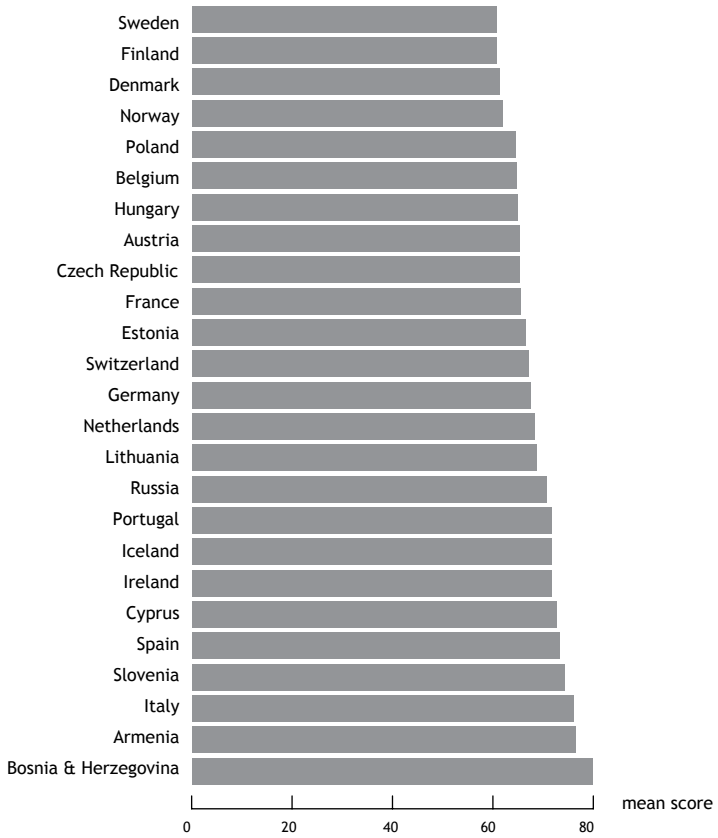
Aspiration level after school. This question asks students what they are planning to do after finishing compulsory school. Three categories are distinguished: 'lower level' (looking for a job, start apprenticeship or start training on the job), 'medium level' (vocational school) and 'higher level' (school to prepare for academic studies). The percentage missing for this variable is 22.6%. A large majority of the students in Europe have high aspiration levels after school (Figure 6.5). Lower level aspirations are found especially in Hungary, Czech Republic, Armenia and some Western European countries (Switzerland, Austria and Germany).

Figure 6.6 General attitude towards school by country



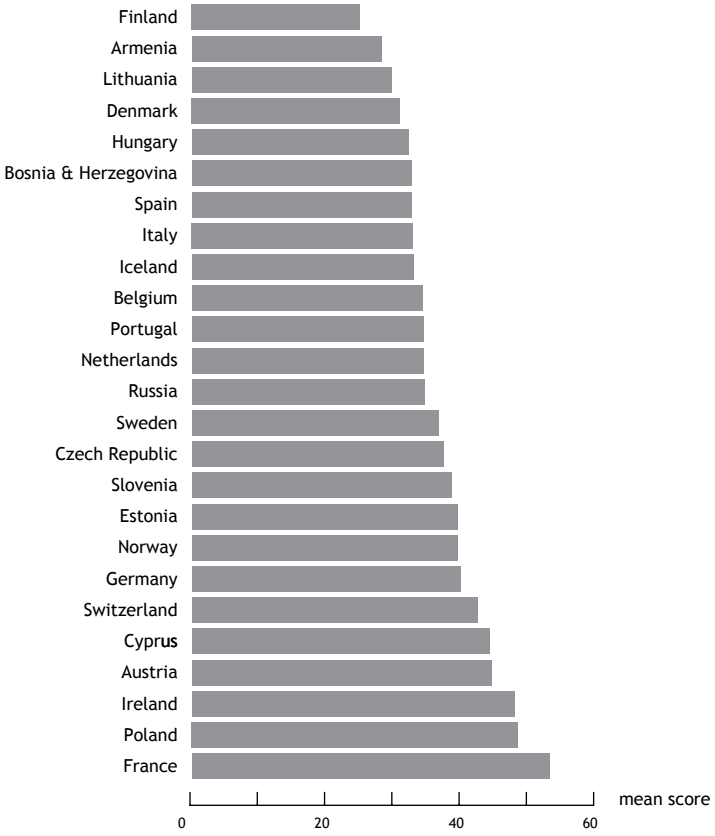
Attitude towards school. This item asks students whether they usually like school (1=not at all, 2=not very much, 3=fairly well, 4=a lot). Figure 6.6 shows that the percentage of students who like school is highest in Portugal, in some Northern European countries (Iceland, Denmark, Norway) and some Western European countries (Netherlands, Austria, Germany), and lowest in mostly Eastern European countries (Slovenia, Estonia, Lithuania, Poland, Hungary).

Figure 6.7 School climate by country



School climate. This variable is an expression of the general school climate and consists of the following four items, which were rated (1= I fully agree, 4= I fully disagree): "If I had to move I would miss my school", "Teachers do notice when I am doing well and let me know", "I like my school", "There are other activities in school besides lessons (sports, music, theatre, discos)". Figure 6.7 indicates that the school climate is lowest in mainly Northern European countries and highest in Southern European countries, with Eastern European and Western European countries in between.

Figure 6.8 School disorganization by country



School disorganization. This measures the students' perception of crime at school. This variable consists of four items which were evaluated (1= I fully agree, 4= I fully disagree): "There is a lot of stealing in my school", "There is a lot of fighting in my school", "Many things are broken or vandalized in my school", "There is a lot of drug use in my school". Figure 6.8 shows that school disorganization is highest in France, Ireland, Austria, Switzerland and Poland.

6.3 *School-related risk factors: overall results*

In this first section, we will present the results regarding the associations of the different school variables with alcohol and drug use among youngsters in Europe. The association of each school variable with alcohol and drug use is estimated using bivariate regression models, with statistical controls for grade, sex and ethnic background[4]. All school variables were semi-standardized before using them in the regression models so that the relative strength of the different school-related risk factors *within* the model can be assessed[5]. The results in the tables present the exponentiated coefficients (exp *b*) which are easier to interpret[6], that is, in terms of odds ratios for binary outcomes such as prevalence rates (in logistic regression models), in terms of incidence rate ratios for count variables (in negative binomial regression models) or in terms of expected means for proportional hazard rates (in survival regression models). In the second part of this chapter, we then focus on how the impact of these school factors differs across the various European countries.

Table 6.2 presents the results for the associations between each of the school variables and lifetime prevalence of drinking/using 1) beers, breezers and wine, 2) strong spirits; 3) weed, marijuana and hash; 4) XTC or speed; and 5) LSD, heroin and cocaine. The next table (Table 6.3) shows the effects of these school variables on last month prevalence and last month frequency. Because of the very low prevalence rates for hard drugs (less than 1.5% of the students in the sample have ever used hard drugs in their lifetime), we look only at the effect of school variables on lifetime prevalence and not on last month prevalence or other outcome variables[7].

The results in Tables 6.2 and 6.3 show that all school variables have significant associations with lifetime and last month prevalence of alcohol and drugs[8]. To summarize the results, students who have repeated grades, truanted or spent little time doing homework on an average school day, students who dislike school or perceive their school climate to be low or rather disorganized and students with low aspiration levels after school and low proficiency levels, have higher (lifetime and last month) prevalence rates for all categories of alcohol and drug use.

When looking at the school factors that have substantive significance in predicting lifetime alcohol and drug prevalence, we can make several conclusions. First, truancy, doing homework and school attitude have the strongest effects on the prevalence rates for alcohol. Thus, students who have been truant, do not spend much time doing homework or dislike school have higher (lifetime and last month) prevalence rates for alcohol use[9]. To a lesser degree, school disorganization and a negative school climate are also associated with higher alcohol prevalence rates. The same conclusions can also be made with regard to abstinence. Truancy is the strongest predictor, followed by school attitude, doing homework, school climate and school disorganization.

Second, for drug prevalence, the same school factors are important. However, in contrast to the prevalence rates for alcohol, we see that school disorganization is a much more important risk factor here. Moreover, for drugs (and for hard drugs prevalence in particular), the perceived school disorganization ranks as the strongest correlate of all school factors. Third, although the most important school

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4 We used the full dataset whenever analyzing causal relationships (i.e., analyzing associations of school variables with the alcohol and drugs outcomes), and no weightings were applied.

5 Semi-standardization refers to the calculation of z-scores for each school variable and then entering these z-scores as predictors into the regression models. Attention: because standardization was conducted only on the predictor side (and not on the outcome side), the relative strength of association can only be assessed within models, and not between models! For example, one can say that the effect of 'truancy' on lifetime beer prevalence (1.529) is substantially stronger than the effect of 'repetition' (1.061). However, one cannot interpret the higher parameter estimate for 'repetition' in the lsd/heroin prevalence model (1.440), as compared to the one for the beer prevalence model (1.061), as an indication that 'repetition' has a stronger effect on lsd/heroin prevalence than on beer prevalence.

6 The Adjusted Odds Ratio (AOR) takes the value '1' when there is no effect,. Values larger than '1' indicate a positive association, while values smaller than '1' indicate a negative association. The sign '*', '**', or '***' next to the coefficient indicates the statistical significance level.

7 Associations of school variables are conducted only on lifetime prevalence because last month prevalence rates for hard drugs are too low to give reliable estimates.

8 Attention: as samples increase in size, so is the likelihood that a variable will be statistically significant. Because in this study a very large sample is used, all variables tend to be statistically significant. As such, statistical significance is not the most suited criterion to judge the importance of a school variable, and thus we also pay attention to substantive significance (which focuses on the relative strength of the association).

9 Interpretation of these coefficients is as follows: the odds ratio for 'truancy' in the model for lifetime beer prevalence is 1.529, which means that for each unit increase in truancy the estimated lifetime beer prevalence increases with 52.9%. For instance, a student who has been truant 'one time' in the last year has a 52.9% more chance to have been drinking beer than a student who has not yet been drinking beer. The odds ratio for 'doing homework' in the model for lifetime lsd/heroin prevalence is 0.501, which means that for each unit increase in doing homework the estimated lifetime beer prevalence lowers with almost 50%.

factors are the same for both alcohol and drugs prevalence, we see that the remaining risk factors (i.e., aspiration level after school, repetition, proficiency level) have relatively more importance for drug prevalence than for alcohol prevalence (that is, when compared with the strength of the other school factors in the model). For alcohol use, these school factors have relatively small effects.

Table 6.2 Adjusted Odds Ratios for lifetime prevalence and abstinence

AOR	Lifetime prevalence					Abstinence
(N)	beer	spirits	cannabis	xtc,speed	Lsd, heroin	
Doing homework	0.758*** (55,820)	0.641*** (55,554)	0.568*** (55,565)	0.457*** (55,500)	0.501*** (49,712)	1.335*** (55,817)
Proficiency level	0.833*** (56,195)	0.785*** (55,927)	0.667*** (55,933)	0.673*** (55,875)	0.709*** (50,071)	1.214*** (56,188)
Repetition	1.061*** (56,554)	1.177*** (56,275)	1.388*** (56,284)	1.479*** (56,225)	1.440*** (50,384)	0.920*** (56,545)
Truancy	1.529*** (56,525)	1.555*** (56,250)	1.737*** (56,261)	2.223*** (56,205)	2.160*** (50,364)	0.638*** (56,520)
Aspiration after school	0.884*** (44,143)	0.863*** (43,902)	0.710*** (43,923)	0.654*** (43,885)	0.654*** (39,380)	1.140*** (44,123)
School attitude	0.681*** (56,396)	0.673*** (56,122)	0.598*** (56,125)	0.541*** (56,071)	0.513*** (50,243)	1.481*** (56,389)
School climate	0.778*** (56,256)	0.739*** (55,974)	0.703*** (55,984)	0.629*** (55,921)	0.627*** (50,120)	1.299*** (56,237)
School disorganization	1.251*** (56,006)	1.368*** (55,730)	1.679*** (55,737)	2.215*** (55,670)	2.333*** (49,899)	0.786*** (55,989)

* $p < 0.05$, ** p < 0.01, *** p < 0.001.

Table 6.3 also gives the results for frequency of drinking alcohol or using drugs in the last four weeks (i.e., incidence rates). One can see that the same variables that ranked among the strongest correlates for the prevalence rates are also important here. More particularly, students who have been truant, do not spend much time doing homework, dislike school, and students who perceive their school climate to be rather disorganized or negative, have higher frequency rates of consumption in the last four weeks. Further, this holds for both frequency of consumption of alcohol and cannabis use. The remaining risk factors (i.e., repetition, aspiration level after school and proficiency level) have relatively stronger effects on drug incidences than on alcohol incidences. Especially, repetition and aspiration level after school have a substantive impact on frequency of using drugs in the last month. Students who have been repeating grades and students with low aspiration levels after school use cannabis more often than students who have never repeated grades or who have high aspiration levels.

Table 6.3 Adjusted Odds Ratios for last month prevalence and last month frequency

	Last month prevalence			Last month frequency		
AOR (N)	beer	spirits	cannabis	beer	spirits	cannabis
Doing homework	0.697*** (55,298)	0.609*** (55,216)	0.520*** (55,495)	0.717*** (53,520)	0.631*** (54,219)	0.545*** (55,206)
Proficiency level	0.830*** (55,663)	0.783*** (55,582)	0.640*** (55,865)	0.822*** (53,865)	0.770*** (54,574)	0.673*** (55,574)
Repetition	1.105*** (56,015)	1.208*** (55,925)	1.447*** (56,213)	1.172*** (54,199)	1.294*** (54,912)	1.667*** (55,921)
Truancy	1.483*** (55,987)	1.561*** (55,901)	1.825*** (56,190)	1.454*** (54,178)	1.645*** (54,890)	1.988*** (55,899)
Aspiration after school	0.869*** (43,730)	0.811*** (43,648)	0.654*** (43,873)	0.832*** (42,372)	0.766*** (42,913)	0.594*** (43,657)
School attitude	0.700*** (55,859)	0.663*** (55,773)	0.544*** (56,055)	0.710*** (54,056)	0.670*** (54,763)	0.545*** (55,764)
School climate	0.776*** (55,753)	0.720*** (55,648)	0.651*** (55,919)	0.766*** (53,948)	0.717*** (54,644)	0.678*** (55,630)
School disorganization	1.300*** (55,505)	1.431*** (55,405)	1.877*** (55,670)	1.370*** (53,707)	1.479*** (54,403)	2.013*** (55,380)

* $p < 0.05$, ** p < 0.01, *** p < 0.001.

Next, we used proportional hazard rates (i.e., survival analysis) to estimate the strength of associations between each of the school variables and age of onset. The analyses for age at first use are conducted only on the three classes of drugs and not on alcohol[10]. The results in Table 6.4 show that the most important school factors are students' being truant, not spending time doing homework, disliking school and school disorganization. School disorganization is even the most important risk factor for age of onset of consumption of drugs (especially hard drugs). So, students who attend schools that are perceived as rather disorganized start using drugs earlier than students who attend more 'exemplary' schools. To a lesser degree, the general school climate is also an important predictor here.

Table 6.4 Adjusted Odds Ratios for age at first use

AOR	**Age of first use**		
(N)	**cannabis**	**xtc,speed**	**lsd, heroine**
Doing homework	0.600*** (55,279)	0.467*** (55,328)	0.475*** (49,587)
Proficiency level	0.697*** (55,644)	0.682*** (55,702)	0.713*** (49,946)
Repetition	1.244*** (55,990)	1.322*** (56,048)	1.302*** (50,256)
Truancy	1.601*** (55,968)	2.119*** (56,028)	2.117*** (50,234)
Aspiration after school	0.760*** (43,705)	0.709*** (43,755)	0.718*** (39,282)
School attitude	0.623*** (55,832)	0.539*** (55,894)	0.505*** (50,115)
School climate	0.740*** (55,699)	0.648*** (55,752)	0.649*** (49,998)
School disorganization	1.603*** (55,451)	2.168*** (55,497)	2.293*** (49,777)

* $p < 0.05$, ** p < 0.01, *** p < 0.001.

Table 6.5 shows the results for lifetime drunk prevalence, lifetime drunk incidence and heavy episodic drinking prevalence respectively. Again, all school variables have significant effects and the overall pattern of earlier analyses is replicated here. Truancy, not spending time doing homework and disliking school are again the most important risk factors, followed by school disorganization and a negative school climate.

Table 6.5 Adjusted Odds Ratios for lifetime drunk prevalence, lifetime drunk incidence, and heavy episodic drinking

AOR (N)	**Lifetime drunk prevalence**	**Lifetime drunk frequency**	**Heavy epsodic drinking**
Doing homework	0.624*** (55,977)	0.637*** (54,610)	0.602*** (55,155)
Proficiency level	0.732*** (56,354)	0.756*** (54,973)	0.756*** (55,522)
Repetition	1.204*** (56,712)	1.174*** (55,319)	1.254*** (55,868)
Truancy	1.752*** (56,684)	1.704*** (55,293)	1.574*** (55,846)
Aspiration after school	0.817*** (44,266)	0.815*** (43,231)	0.795*** (43,650)
School attitude	0.642*** (56,557)	0.643*** (55,169)	0.662*** (55,715)
School climate	0.723*** (56,414)	0.707*** (55,033)	0.718*** (55,579)
School disorganization	1.377*** (56,158)	1.386*** (54,778)	1.408*** (55,336)

* $p < 0.05$, ** p < 0.01, *** p < 0.001.

10 For age of onset of drinking alcohol, the data are not sufficient to give reliable estimates. This is because a substantial group of students reported to have drunk alcohol for the first time at ages 10 or younger. Such answers may, however, not be very reliable nor informative. For instance, 27% of the students (who have already drunk alcohol in their life) say that they did this for the first time at age 10 or younger, and 5% at age 6 or younger. For strong spirits, these percentages are respectively 11% and 1.5%. For the three drug categories, such extremely early reported ages for onset were not present in the data.

Finally, we will look at the social context in which the last time consumption of alcohol or soft drugs took place. The results in Table 6.6 show that school factors have only a weak or no association with solitary drinking/using patterns. The most remarkable findings here are that students who have repeated grades or have been truant drink spirits more in a group, while students who have repeated grades more often use cannabis alone. Also, students with high aspiration levels use soft drugs and drink beers more in a group than students with low aspiration levels.

Table 6.6 Adjusted Odds Ratios for last time social context

AOR (N)	**Last time alone?**		
	beer	**spirits**	**cannabis**
Doing homework	1.061* (33,751)	1.081* (18,432)	1.112 (4,865)
Proficiency level	0.958 (33,973)	1.085** (18,551)	1.002 (4,885)
Repetition	0.988 (34,160)	0.886*** (18,655)	1.111** (4,918)
Truancy	0.976 (34,142)	0.915*** (18,640)	1.069 (4,906)
Aspiration after school	0.870*** (26,658)	0.975 (14,521)	0.791** (3,706)
School attitude	0.970 (34,060)	0.951 (18,594)	1.136* (4,901)
School climate	0.987 (34,060)	0.984 (18,579)	1.000 (4,887)
School disorganization	1.025 (33,944)	0.993 (18,525)	1.061 (4,887)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

6.4 The relationship between school factors and alcohol and drug use: differences between European countries

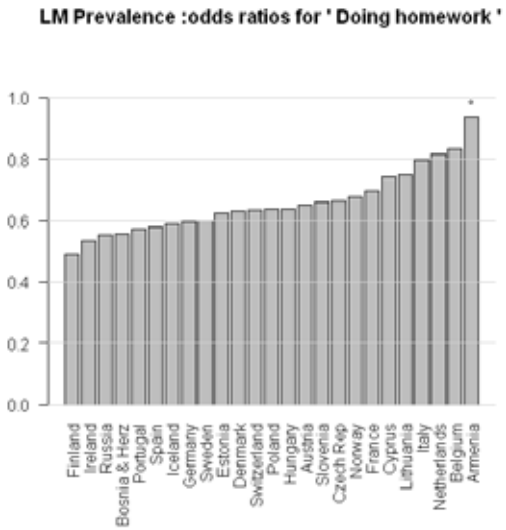
The second aim of this chapter is to look at whether and how these school-related risk factors differ between the various European countries. In other words, are there particular school factors that play more strongly in some countries than in others? Because no specific hypotheses were found in the literature on why some school risk factors are expected to be of more importance in some countries than in others, this chapter is largely descriptive in nature. To look at these differences between countries, we conducted bivariate regression analyses for each country separately[11]. Associations of alcohol use with seven different school factors are studied, with statistical controls for grade, sex and ethnic background. One variables was not included in the analyses because of the large percentage of missing values, that is, aspiration level after school (M= 22.6%). Also, where countries had very little variation on one of the school variables, interpretation of the observed effect sizes is done with caution, because parameter estimates may not give reliable results. This is especially the case for variables such as '*repetition*', where repeating grades is very rare to non-existent in some countries. We pay attention to differences in effect sizes between *countries* in the first place[12].

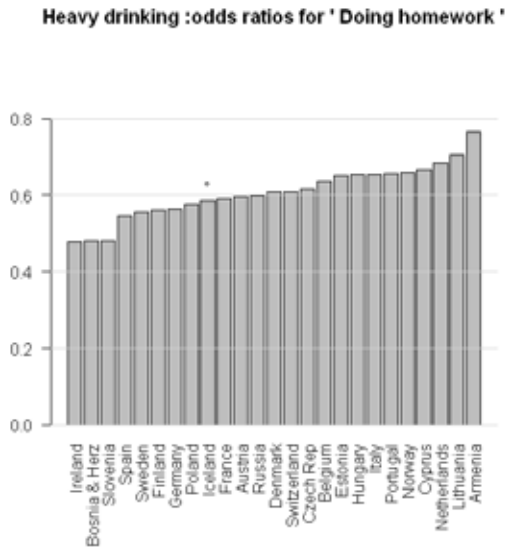
The focus in this chapter is on two indicators of alcohol use: last month alcohol prevalence and heavy episodic drinking prevalence. The latter being an indicator of problematic alcohol drinking, while the former can be considered as a rough indicator of age of onset. Given the very young adolescents in this study, and given that adolescence is the phase when behaviors such as alcohol use emerge (Boyer, 2006), we can assume that most of the students who report that they already have drunk alcohol, have started doing so in this life stage. Although prevalence rates of drinking alcohol or alcohol drunkenness is not the same as age of onset, a higher prevalence rate also implies on the average

11 We used the full dataset per country whenever analyzing causal relationships, and no weightings were applied.
12 All reported effect sizes are ranked according to the strength of the association.

earlier onset of drinking (especially given the relative age homogeneity of seventh, eighth and nineth grade students).

Figures 6.9 & 6.10 Adjusted Odds Ratios for time spent on homework: last month alcohol prevalence & heavy episodic drinking



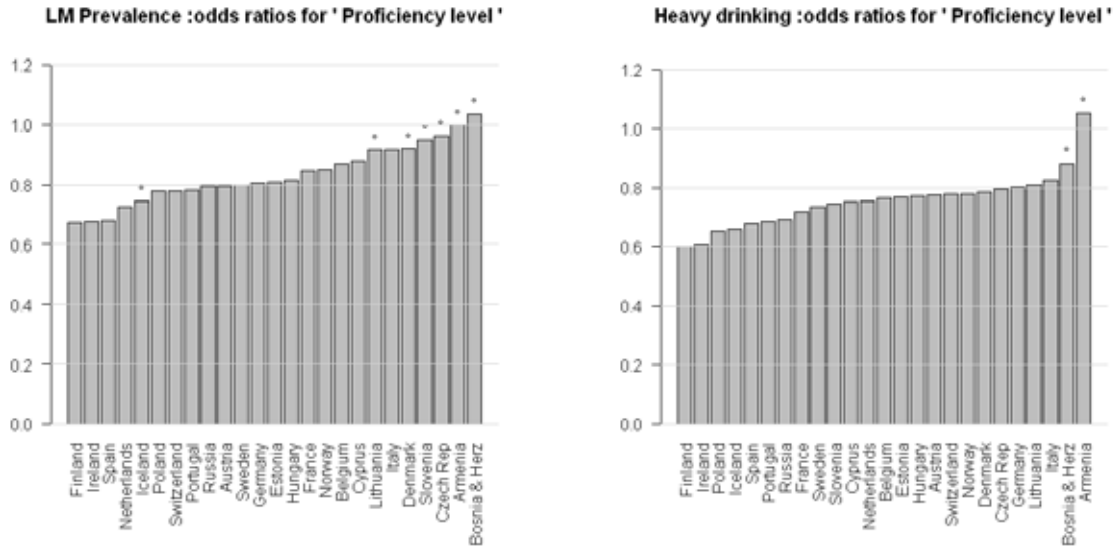


Figures 6.9 and 6.10 give the effect sizes (odds ratios)[13] for the different European countries of '*time spent on homework*' on last month alcohol prevalence and heavy episodic drinking prevalence respectively. In all but two European countries, students who spent more time doing homework have lower last month alcohol prevalence and heavy drinking prevalence rates[14]. Spending time doing homework has the largest protective effect on last month alcohol prevalence (Figure 6.9) in Finland and Ireland, followed by Russia, Bosnia & Herzegovina, Portugal, Spain, Germany and Sweden. In all of these countries, the odds ratios (OR) are around 0.6 or lower. This means that for each unit increase in time spent on homework, the estimated last month alcohol prevalence in these countries lowers about 40%. The protective effect of this school variable is, however, the lowest in the Netherlands, Belgium, France, Italy, Cyprus and Lithuania (OR around 0.8). For the analyses on heavy episodic drinking (Figure 6.10), a similar pattern emerges, with the strongest effects of doing homework being in the countries Ireland, Bosnia & Herzegovina, Spain, Sweden, Finland and Germany (OR = 0.6 or lower). Also, in Slovenia the effect of doing homework is among the strongest ones observed. The lowest effects are registered in the Netherlands, Lithuania and Armenia (OR between 0.7 and 0.8).

13 The odds ratios (OR) take the value '1' when there is no effect, and the sign '°' above a bar indicates that this effect is statistically not significant. Values larger than '1' indicate a positive association, values smaller than '1' indicate a negative association.

14 The odds ratios are not significant for Armenia (last month prevalence) and for Iceland (heavy episodic drinking). For Iceland, it should be noted that the sample is much smaller (N=585) and only one grade is surveyed here. This smaller sample size explains why significant results are more difficult to obtain here.

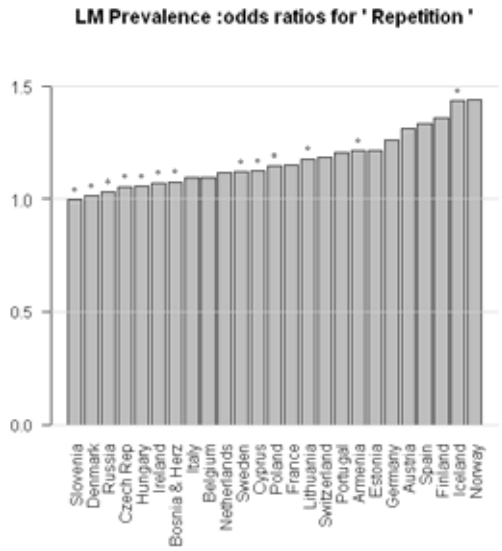
Figures 6.11 & 6.12 Adjusted Odds Ratios for proficiency level: last month alcohol prevalence & heavy episodic drinking

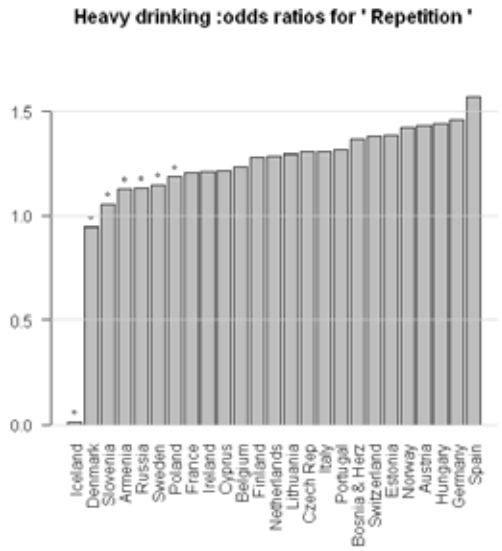


Figures 6.11 and 6.12 give the effect sizes for the school variable '*proficiency level*'. As one can see, in the majority of the countries, students who think they do better than the other students in their class are much less likely to have drunk alcohol in the last four weeks or to have been binge drinking on the last occasion. The effect of proficiency level on alcohol prevalence (Figure 6.11) is the strongest in Ireland, Finland, Iceland and Spain. The odds ratio for these countries is about 0.65, which means, for instance, that a student who thinks (s)he does better than the average of his/her class has a 35% less chance to have drunk alcohol in the last month than a student who thinks (s)he scores around the average. Or alternatively, for each unit increase in proficiency level, the estimated alcohol prevalence lowers by 35%. In the Netherlands, and in a whole series of other countries (i.e., Switzerland, Austria, Germany, Portugal, Russia, Poland, Hungary and Estonia) this effect size is around 0.8. In contrast, in Cyprus and Italy this effect is much smaller (OR= 0.9 or higher), and in Denmark and five Eastern European countries (Lithuania, Slovenia, Czech Republic, Armenia and Bosnia & Herzegovina) the parameter is not significant.

The effect of proficiency level on heavy episodic drinking prevalence (Figure 6.12) is also the strongest in Ireland and Finland. The parameter estimate for both of these countries is 0.6, indicating a strong relationship. Thus, for these two countries, it holds that a student who thinks (s)he does better than the average of his/her class has 40% less chance to have been binge drinking on the last occasion than a student who thinks (s)he scores around the average. Also, in Iceland, Poland, Russia, Spain, Portugal, France and Sweden, the effect size is below 0.7. In all other countries, the effect size is in the range 0.7- 0.8, and in two countries the association is not statistically significant (i.e., Armenia and Bosnia & Herzegovina).

Figures 6.13 & 6.14 Adjusted Odds Ratios for repetition: last month alcohol prevalence & heavy episodic drinking



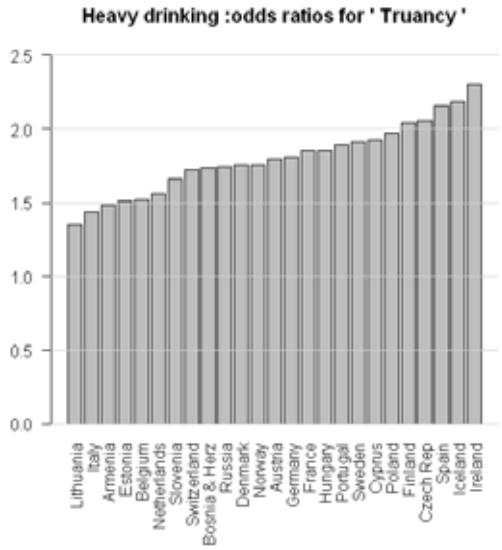


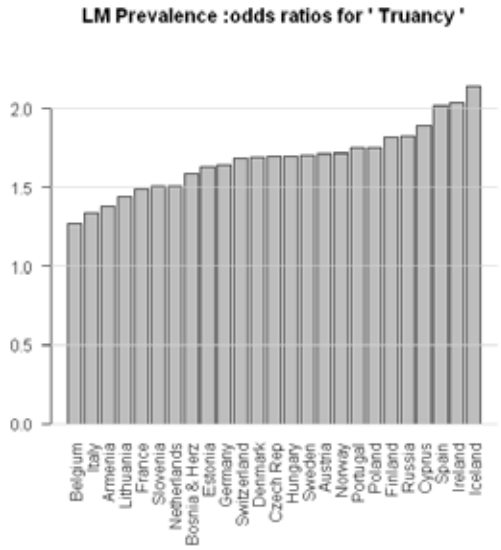
The effect sizes for '*repetition*' are reported in Figures 6.13 and 6.14. When interpreting the results for repetition, we should also consider the country specific profiles regarding the prevalence of repetition (see Figure 6.3). Figure 6.3 illustrates that repetition is mainly a phenomenon present in Western and Southern European countries and in Ireland, with prevalence rates between 10% (Italy) and 33% (France). In most Northern and Eastern European countries, repetition is almost non-existent as governments enforce here automatic promotion policies. As such prevalence rates of repetition are much lower here: between 0.34% (Iceland) and 6.5% (Denmark) in Northern European countries, and between 0.74% (Armenia) and 7.8% (Hungary) in Eastern European countries.

As one can see from Figure 6.13, the effects of repetition are significantly associated with last month alcohol prevalence in exactly those countries where repetition is also most prevalent, that is, in all Western and Southern European countries (except Cyprus). Cyprus, however, has the lowest prevalence rate of repetition of all Western and Southern European countries (5.6%). Also, in Estonia repetition is associated with higher last month prevalence rates. Repeating grades seems to have no significant effect on last month prevalence in all other European countries, that is, countries that generally enforce a policy of automatic promotion (i.e., Eastern and Northern European countries). The results regarding the other two Northern European countries (Norway and Finland) should however be interpreted with caution. The odds ratios for these countries are the highest of all countries. However, given that repetition is extremely rare in these countries – only 3.25% (n=44) of the students in Finland and 1.26% (n= 21) of the students in Norway have repeated grades – these results may be not very reliable as compared to countries where repetition is a much more common phenomenon. Note further that there is a large variation in the strength of the association, with odds ratios between 1.1 (Italy, Belgium) and 1.4 (Spain). For Spain, a country with one of the highest prevalence rates of repetition in Europe, a one unit increase in repetition is thus accompanied with a more than 40% increase in alcohol last month prevalence. The observed effects of repetition are of course in part an effect of age, as students who have repeated grades are generally older than their other peers in their grade.

The effect sizes of repetition on heavy episodic drinking prevalence are reported in Figure 6.14. In contrast to the analyses on alcohol last month prevalence, the effects of repetition are not only associated with heavy episodic drinking in those countries where repetition is most prevalent, but also in countries where repetition is rare. Repeating grades is significantly associated with heavy episodic drinking in all but six countries (i.e., Denmark, Sweden, Slovenia, Armenia, Russia and Poland). Note that these six countries are again all countries where repetition is a rather rare phenomenon. In the countries where repetition is significantly associated with heavy episodic drinking, the odds ratios are all above 1.3, indicating that students who have repeated a grade have a 30% chance or more to have been binge drinking on the last occasion. In countries such as Spain, Germany, Austria, Switzerland, Hungary, Estonia and Norway these odds ratios are in the range of 1.4 - 1.5.

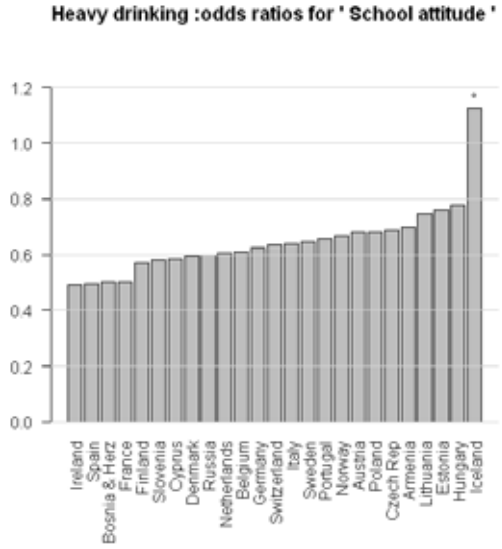
Figures 6.15 & 6.16 Adjusted Odds Ratios for truancy: last month alcohol prevalence & heavy episodic drinking

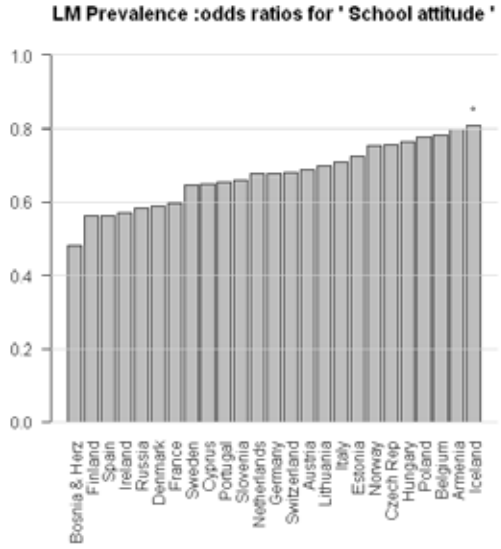




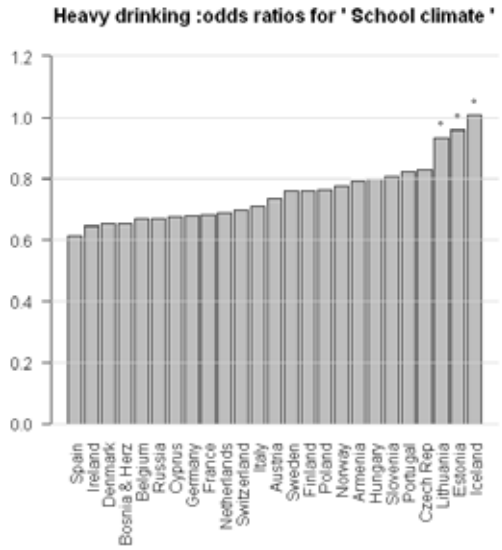
The school variable that has the strongest impact on alcohol last month prevalence and heavy episodic drinking prevalence is '*truancy*' (Figures 6.15 and 6.16). In all European countries, truancy is significantly associated with these alcohol outcomes, and the odds ratios are quite high here. In the majority of the countries, these odds ratios are well above 1.5, indicating a more than 50% increase in both alcohol last month prevalence and heavy episodic drinking prevalence per unit increase in truancy. The effect of truancy is the strongest in Ireland, in all Southern European countries (except Italy), in Poland and Russia and in most Northern European countries (especially Iceland, Finland and Sweden). The effects are the lowest in Italy, and in mainly Western European (especially Belgium and the Netherlands) and Eastern European countries (i.e., Armenia, Lithuania, Slovenia, Estonia and Bosnia & Herzegovina). Interestingly, some of the countries with the highest prevalence rates for truancy (i.e., Armenia, Estonia, Italy), showed the lowest observed effects of truancy, while other countries with some of the lowest prevalence rates for truancy (i.e., Spain, Portugal, Cyprus) had some of the strongest observed effects of truancy on alcohol last month prevalence and heavy episodic drinking prevalence.

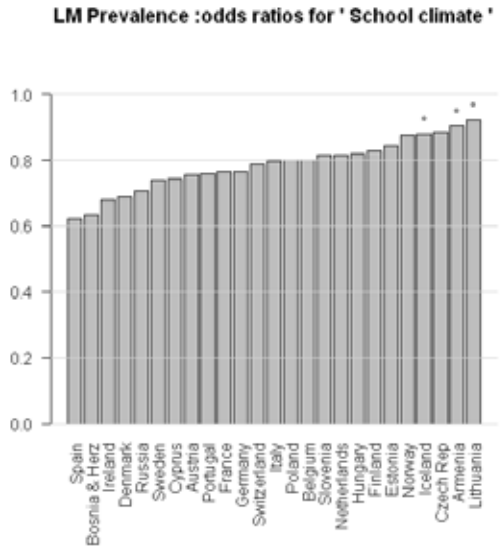
Figures 6.17 & 6.18 Adjusted Odds Ratios for school attitude: last month alcohol prevalence & heavy episodic drinking





Figures 6.19 & 6.20 Adjusted Odds Ratios for school climate: last month alcohol prevalence & heavy episodic drinking



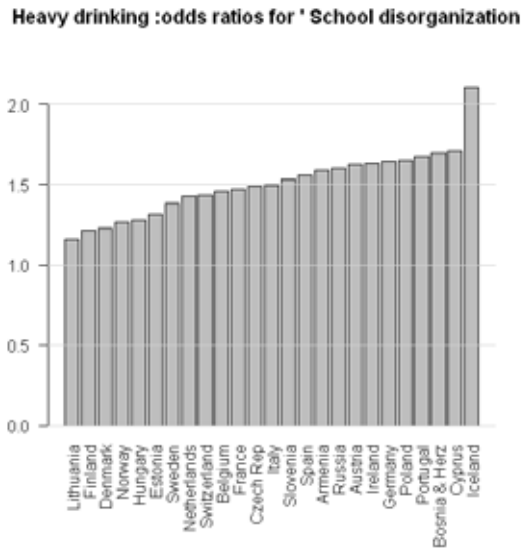


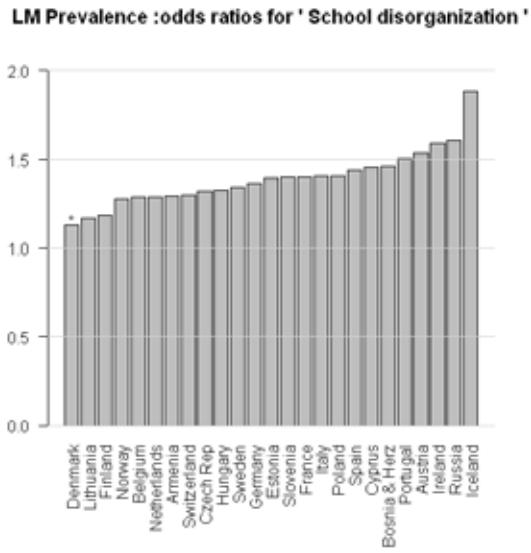
The same pattern more or less repeats itself for the school variables '*attitude towards school*' (Figures 6.17 and 6.18) and '*school climate*' (Figures 6.19 and 6.20). A positive attitude towards school and a belief that the general school climate in the students' school is positive are associated with lower rates of both alcohol last month prevalence and heavy episodic drinking prevalence. The only exception is Iceland, where no significant results were registered. The effects of attitudes towards school are quite similar to the results for school climate. Both have odds ratios in the range of 0.6 – 0.8, with only some countries having odds ratios below 0.6 for attitude towards school.

For both school variables, we observe the strongest effects in countries such as Ireland, Spain, Denmark, Russia and Bosnia & Herzegovina. Intermediary effects are observed in the Western European countries, and the smallest effects are registered in mostly Eastern European countries. Finland has one of the strongest associations of school attitude with both alcohol outcomes, while this is not the case for school climate. Non-significant associations are found in Armenia, Iceland and Lithuania (for school climate effects on last month alcohol prevalence) and in Estonia, Iceland and Lithuania (for school climate effects on heavy episodic drinking prevalence).

Finally, Figures 6.19 and 6.20 report the results regarding the associations of *school disorganization* with the alcohol outcomes. In all countries (except Denmark), students who perceive their school to be rather disorganized have higher last month alcohol prevalence and heavy episodic drinking prevalence rates. The countries where school disorganization has the largest impact are more or less the same on both alcohol outcomes. Strong effects are observed in Iceland, Ireland, Austria, Russia, Poland, Bosnia & Herzegovina and the Southern European countries. The lowest effects of school disorganization are found in the Lithuania and Northern European countries – almost all countries where school disorganization is perceived as among the lowest in the whole of Europe.

Figures 6.21 & 6.22 Adjusted Odds Ratios for school disorganization: last month alcohol prevalence & heavy episodic drinking





From the findings presented in the previous paragraphs, we can conclude that school variables had an influence on the alcohol and drug use of young people. We also found that countries that had strong effects on one particular school variable often also had strong effects on other school variables, which may be an indication that these school-related variables constitute a kind of latent construct that measures school bonding and performance. To recapitulate our findings, Table 6.7 summarizes the countries that had the strongest effects on the investigated school variables. Spain and Ireland have the strongest observed effects on almost all school variables, while Russia has strong effects on almost all school variables for alcohol last month prevalence, but not for heavy episodic drinking. All other countries in the table have one of the strongest observed effects on three or four school variables, but not on the others (i.e., Finland, Bosnia & Herzegovina, Poland, Iceland and Cyprus).

Table 6.7 Summary of countries with the strongest effects on multiple school variables

	Spain	**Ireland**	**Russia**	**Finland**	**Bosnia**	**Poland**	**Iceland**	**Cyprus**
Doing homework	x	x	x	x	x			
Proficiency level	x	x	x	x		x	x	
Repetition	x							
Truancy	x	x	x	x		x	x	x
School attitude	x	x	x	x	x			
School climate	x	x	x		x			x
School disorganization		x	x		x	x	x	x

6.5 *A multilevel analysis of differences in associations between school risk factors and heavy episodic drinking*

We should remark that the analyses as presented so far do not let us conclude whether these differences in effects sizes between the various European countries are meaningful. For that reason, we examine in this final section the question whether the variances in the slopes of the different school variables are statistically significant. To do this, we conducted a multilevel analysis and studied the multivariate associations of alcohol use with the different school factors, with statistical controls for grade, sex and ethnic background[15]. It should be underlined again, however, that the observed varia-

15 Because model fit comparison, based on the likelihood ratio test, requires the same sample size over the different models, cases with missing values were deleted list-wise, resulting in a sample size of N= 53,761.

tion in effect sizes for repetition is not very meaningful as repetition as a school practice is not prevalent in all European countries (Brophy, 2006). This because in most Northern and Eastern European countries an automatic promotion policy is enforced and so in general all students move up to the next grade. So most of the variation in these effect sizes is simply a by-product of whether this school practice exists or not. We also illustrated that in countries where this school practice is not prevalent or very rare the effect sizes of repetition may be not reliable. For that reason, we did not include repetition in the final multivariate model.

Table 6.8 Logistic multilevel regression models for heavy episodic drinking: the impact of school related variables

Heavy episodic drinking (N= 53,806)									
	Model 0: Intercept only			**Model 1: Background predictors**			**Model 3: With School predictors**		
	b	**s.e.**	**OR**	**b**	**s.e.**	**OR**	**b**	**s.e.**	**OR**
Fixed part									
Intercept	-1.997	0.123		-3.086	0.126		-3.087	0.131	
Male				0.476	0.027	1.610	0.276	0.029	1.318
1st generation migrant				-0.214	0.058	0.807	-0.261	0.061	0.770
2nd generation migrant				-0.124	0.039	0.883	-0.197	0.041	0.821
Grade 8				0.835	0.041	2.304	0.744	0.043	2.104
Grade 9				1.539	0.040	4.661	1.418	0.042	4.127
Doing homework							-0.280	0.017	0.756
Proficiency level							-0.122	0.014	0.885
School attitude							-0.203	0.017	0.816
School climate							-0.065	0.016	0.937
School disorganization							0.259	0.015	1.295
Truancy							0.412	0.013	1.510
Random part									
Var (Intercept/school)	0.474			0.282			0.243		
ρ(Intercept/school)	11.6%								
Var (Intercept/country)	0.359			0.353			0.380		
ρ(Intercept/country)	8.7%								
Loglikelihood	-20842			-19898			-18255		
df	3			8			14		

All parameter estimates are significant at the $p < .001$ level

Table 6.8 presents the results for these analyses for problematic drinking behaviour (i.e., heavy episodic drinking). The first model (Model 0: Intercept model) is an empty model, and this model indicates that there exists variation in heavy drinking between the different European countries. This model, without any predictors, provides a partitioning of the variability in the data into three levels (the individual level, the school level and the country level). This model indicates that 8.7% of the total variance in heavy drinking is explained by differences between countries[16], while 11.6% is explained by differences between schools. The likelihood ratio test indicates that this country level variance is significant (x^2=320.38, df_{diff} =1, $p < .001$) and thus justifies a multilevel analysis[17].
In Model 1, we add the background characteristics (i.e., gender, migrant status and grade). All of these betas are significant and the loglikelihood decreases substantially when compared with model 0

16 The explained variance at the level of the countries is expressed by Rho (ρ) or the Intraclass Correlation coefficient (ICC).
17 The likelihood ratio test as calculated here compares the fit of the null model in multilevel logistic regression with that of an alternative model (in this case, the null model of a standard logistic regression).

(x^2=1,889, df_{diff}=5, p < 0.001). We can see from this model that, for instance, boys are 1.318 times more likely to have been heavy drinking in the last month than girls. We also observe that grade level has strong effects. The likelihood of ninth grade students to have been heavy drinking is 4.127 higher than for seventh grade students. Immigrant students have lower chances for heavy drinking than native students.

When adding the school-related variables (Model 2), the odds ratios of the control variables grade and gender decreased, while those of migrant status increased. All school predictors have significant associations with heavy drinking, and the loglikelihood decreases substantially when compared with model 1(x^2=3,286, df_{diff}=6, p < 0.001). The strongest school-related risk factor is truancy[18]. We can see that truancy increases the chances for heavy drinking with a factor of 1.510. Bonding indicators, such as spending a lot of time doing homework and school attitude, act as protective factors and decrease the likelihood of heavy drinking by respectively 24.4% and 18.4%. School disorganization increase the likelihood of heavy drinking with 29.5%. Proficiency level and school climate have significant but relatively weak effects when compared with the other school predictors.

From Table 5.8, we concluded that there exists quite a lot of variation in heavy episodic drinking between the European countries (see Model 0), and the findings in previous paragraphs indicated that there also exists variation in the effect sizes of school predictors over the different countries. In Table 6.9, random effects of the slopes of school predictors are tested one by one in seven different models. The fixed part of these models did not change much, so we omitted these coefficients from the table for clarity of presentation. The random part of Table 6.9 shows that there exists significant variation in the effects sizes for all school predictors, except for the variable '*doing homework*'[19]. However, by far the largest variation in effect sizes is observed for truancy (x^2=48.8, df_{diff}=2, p < 0.001).

Table 6.9 Logistic multilevel regression models for heavy episodic drinking and the impact of school related variables: random slope variation (N= 53,806)

Random part	Doing homework	School attitude	Truancy	Proficiency level	School climate	School disorganization
Var (Intercept/school)	0.243	0.242	0.238	0.243	0.242	0.241
Var (Intercept/country)	0.375	0.387	0.368	0.378	0.378	0.378
Var (School predictor/country)	0.003	0.007**	0.012***	0.003**	0.008***	0.007**
x2 (dfdiff=2) (Slope/country)	4.2	11.1	48.8	9.6	18.5	10.3
Loglikelihood	-18253	-18249	-18231	-18250	-18246	-18250
df	15	15	15	15	15	15

Note: All six models include the background and school predictors of model 3 in Table 6.7

6.6 *Summary and conclusions*

This chapter has been an effort to evaluate the influence of school-related risk factors on adolescents' alcohol and drug use. We posited that schools not only are one of the most important settings for influencing adolescent development of health and lifestyle behaviours, such as the use of alcohol or drugs, but these schools can also be considered a target arena for promoting such behaviours. Theoretically, we advanced that students are more likely to refrain from engaging in school misconduct, but also from lifestyle behaviours such as alcohol and drug use, if they have strong connections with the school.

One of the most important findings from the analyses is that variables that tap certain dimensions of social bonding or conformity with conventional society's norms and values, together with school disorganization, showed to have some of the largest protective effects. In almost all European countries, students who spent a lot of time doing homework, enjoy school, and to a lesser degree students

18 Since all school-related variables are standardized variables, we can compare them in order to assess their relative strength of association.

19 More particularly, the test is based on model comparison of Model 3 in Table 5.7 with a model that introduces a random slope for each of the seven school predictors. The x2 test statistics (df=2) for these random slopes are : 4.2 (doing homework), 11.1 (school attitude), 48.8 (truancy), 9.6 (proficiency level), 18.5 (school climate) and 10.3 (school disorganization).

who perceive their school climate to be positive, have lower prevalence rates on all alcohol and drug outcomes. These findings are congruent with central propositions of social control theory, and with numerous other studies that put emphasis on the social context in which behaviour is modelled (i.e., strain theory, situational action theory, societal vulnerability theory), and are in line with numerous empirical studies on this topic (Catalano et al., 2004; Hawkins et al., 1992; Nutbeam et al., 1993; Petraitis et al., 1995; Samdal et al., 2000; Simons-Morton et al., 1999). Adolescents who are not committed to or involved with schools' norms, values, goals, etc, or who are confronted only with negative experiences when in contact with their school, may experience more strain; this in turn may lead to unfavourable future perspectives and 'push' them towards alternative sources of status and popularity (Vettenburg, 1988, 1998). It is in such a context that peers especially become important influences, as alternative sources of status and popularity are often attained in the peer domain and because drinking alcohol or using drugs is a behaviour that is often performed among and reinforced by peers. Following this line of reasoning, it is not so surprising that time spent on homework showed one of the strongest effects in all of the analyses. This variable not only measures both educational commitment and involvement, but time spent on doing such conventional activities is also time that cannot be spent among peers.

The effects for repetition were not as strong as other bonding indicators. Furthermore, additional analyses showed that these effects are explained partially by age effects, as students who have repeated grades are generally older. Controlling for the age of the respondent lowered further the predictive power of this variable. However, repetition clearly is a more important predictor for heavy episodic drinking behaviour (i.e. binge drinking) and frequent cannabis use than for alcohol and cannabis (lifetime and last month) prevalence rates. We also illustrated that repetition is not prevalent in all European countries, making cross-national comparisons of effect sizes for this variable somewhat superfluous. However, in the countries where it is prevalent (i.e., mainly Western and Southern European countries), it showed significant and sometimes quite strong associations with alcohol use (especially heavy episodic drinking). Spain for instance, a country where repetition is quite prevalent, also had one of the largest observed effects for repetition.

It is essentially the disaffection from school, as expressed in truancy, which contributes most to alcohol use. All other school-related variables had considerably lower effect sizes (the highest among them being doing homework, school attitude, and school disorganization). That truancy shows such strong associations with alcohol and drug outcomes is in itself not surprising, as earlier studies have consistently showed that this form of school misconduct is strongly correlated with other risk behaviours (Jessor & Jessor, 1977; Petraitis et al., 1995). Some theorists even argue that, in adolescence, school misconduct together with alcohol and drugs use and other risk or deviant behaviours constitute what one may call a problem behaviour syndrome (Jessor & Jessor, 1977).

The results also yielded that school disorganization is a much more important risk factor for drug use than for alcohol use. The findings regarding school disorganization, however, should be interpreted with caution, as one of the four items that constitute this scale measures to what extent the student thinks there is a lot of drug use in their school. Of course, one can reasonably expect that a students' perception of drug use in his/her school is correlated with the self-reported drug use.

For what concerns the cross-national comparisons on the effects of the different school factors, the following conclusions can be made. First, the results regarding alcohol last month prevalence and heavy episodic drinking prevalence yielded quite similar results in terms of the rankings of the different European countries. For instance, countries that had strong effects of proficiency level on alcohol last month prevalence often also had strong effects of proficiency level on binge drinking prevalence. This finding in itself does not come as a surprise, as heavy episodic drinking also measures, to a large extent, the prevalence of drinking alcohol in itself. This is also because the large group of abstinent youth is largely the same in both outcomes measures. However, when conducting the same analyses only on the subgroup of students who already have drunk or used in their life, the general pattern of rankings was not much disturbed.

Second, not only are the rankings of the European countries over the two outcome variables quite parallel, countries with strong effects for one school risk factor often also had strong effects for the other school factors. Countries who consistently ranked as those with the strongest effects on all school-related risk factors were Spain, Ireland, Finland and Russia. Of these four countries, only Spain also had one of the strongest observed effects for repetition, while Russia ranked among the strongest

effects for school factors on alcohol last month prevalence, but not on heavy episodic drinking prevalence. Because these cross-national comparisons in effect sizes were largely descriptive and do not tell us whether this variation in strength of association is meaningful, we conducted additional analyses. Multilevel analysis on heavy episodic drinking prevalence indicated that the variation in the slopes over the various European countries was statistically significant for all school factors. However, this variation was by far most pronounced for truancy and this raised the question of what might explain these wide cross-national differences.

Finally, as a word of caution, it is important to underscore some limitations of the results as presented in this chapter. First, this study is based on a cross-sectional design. This makes it difficult to establish causality, especially with regard to the relation between alcohol use and the school-related variables, but also regarding whether the relationship with tracking (i.e., school level) is due to self-selection or socialization. Another limitation is that in this chapter attention was paid only to school-related risk factors. However, beyond characteristics related to the school, individual characteristics (e.g., self-control, sensation-seeking, self-esteem, et cetera), and characteristics related to the family, peer group and neighbourhood also play a central role in influencing alcohol and drug use. The reader should therefore assess the results as presented in this chapter in the light of the analyses presented in other parts of this book. Ultimately, a multivariate analysis is imperative in which the relative influence of the school variables is assessed in comparison with other risk domains (families, peers, neighbourhoods). Based on theoretical insights, one may expect that schools, together with the peer group, will have the strongest influences on adolescents' alcohol and drug use.

6.6.1 Policy recommendations

This final chapter draws together a number of recommendations that can strengthen the local, national or European policies on alcohol use among adolescents. In alcohol policy, there is a tendency to focus on the most proximal risk factors. This is illustrated by the fact that most attention is focused at strengthening *the* individual (i.e. individual prevention), for instance by working on the development and consolidation of the necessarily skills to manage emotiveness and interpersonal relationships, to resist social pressures, and to prevent and/or delay the use of tobacco, alcohol, and other psychoactive substances.

In our analyses we focused on more distal risk factors that relate to the structural and cultural environment in which teenagers spent most of their time together (i.e. the school). We showed that alcohol use is associated with a number of factors that measure to a large degree the social binding with the school. Given the strong relationship with factors such as liking school, school climate, and school disorganization, our analyses suggest that policy should focus also on the structural environment of the school itself (i.e. structural prevention). While structural prevention has been widely adopted in the domain of regulation (e.g. drink-driving policy, controlling the availability and taxation of alcoholic beverages, et cetera), this is not the case for the different structural and cultural environments students grow up in. Moreover, while alcohol prevention strategies aimed at working on psycho-individual coping mechanisms (i.e. handling peer pressures, assertiveness, et cetera) are a valuable investment, we believe that individual prevention can be efficient only *if* complimented by measures of structural prevention. The latter focus more on long-term measures which address the underlying causes of alcohol and substance use. As such, they have a much broader scope and have the potential to increase the durability of prevention considerably.

Given the enormous amount of time teenagers spent in school, school experiences determine to a large extent students' well-being, and ultimately their health behavior such as alcohol and substance use. Alcohol use might, for instance, become a coping mechanism to handle the strain that comes along with negative school experiences. Or, teenagers might drink more alcohol because they follow classes in schools where role models promoting alcohol and drug use are much more salient (i.e. schools that are rather disorganized). The analyses conducted in this chapter showed that investing in these structural environment directly impacts alcohol use. Examples of structural measures that might lead to better school bonding, and ultimately to lower alcohol, are creating a better physical and psychosocial school environment for these students, starting up and supporting a student council to increase student involvement and commitment, and promoting positive contacts between students and school administration. Other examples are providing appropriate training and support for teachers in working pro-actively with these students, taking into account the specific profile of these students (i.e. *student*-focused education). Significant is also a better cooperation with other local agencies that

work with youth, such as social work, neighborhood organizations, organizations for student support and coaching, et cetera.

Changing the cultural climate within these schools is however also possible in other ways. For instance, many studies have shown that students systematically overestimate the substance use behavior of their same-age peers (Reid, Manske, & Leatherdale, 2008). And teenagers view on what is acceptable and normal 'drinking' behavior is based to a large degree on these false *perceptions*. Correcting these false images might be one way to change the social norms regarding alcohol and substance use. This goal can be achieved by supplying accurate and up-to-date information on alcohol and substance use within their school (Bernaert, 2008).

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Verwey Jonker Instituut

7 Leisure time and Peers

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7.1 Introduction

The majority of young people start to consume alcohol or smoke cannabis between the ages of 12 and 16. This is the age at which young people often go out for the first time, and when the influence of parents decreases while that of friends increases. When creating a personal social life it seems that experimenting with stimulants is a part of this phase. However, there is a growing concern about the use of alcohol among young people. Several recent studies show that students not only drink more, but also start drinking at a younger age (Hibell et al., 2004, 2007). In addition, there is a growing trend that young people drink more excessively. In this report we examine how friends and the way people spend their leisure time have an influence on substance use, especially heavy alcohol consumption.

7.2 Theory about alcohol and the influence of peers

Friends are important when it comes to alcohol and drug use among young people. The initial exploration of illegal drugs usually takes place through friends or acquaintances, while alcohol, a legal drug, is usually tasted for the first time with family.

Youngsters can be an important mainstay and protect and correct one another. However, at the same time they challenge each other with various risk behaviours (Meeus et al., 1999). Peer pressure and group norms may lie at the basis of problematic alcohol consumption. From the desire of belonging to a group or being seen as 'cool', it is difficult to withstand drinking within a group context. This is especially characteristic of boys in large groups, and they will sometimes compete with each other to see who can endure the most alcohol. Drinking or 'handeling' excessive amounts of alcohol, has become synonymous to being "strong".

Andrews et al., (2011) also showed that drinking behaviour is a social reaction rather than an intentional action. They found evidence for Gibbons and Gerrard's theory (1997), which stipulates that adolescents have social images, shaped as prototypes, about their peers who engage in risky behaviours. They believe that engaging in the same behaviour will compel their peers to believe that they (also) posses attributes of the prototype. As a result, more favorable social images leads to more willingness to engage in the behaviour. The authors acknowledge the correlation between willingness and intentions but found that they have independent effects as well. 'Young people may not intend to try alcohol but, under risk-conducive circumstances, they may be willing to try.' (p.449) In contrast to Meeuw et al. (1999), Andrew et al., found that girls are more easily influenced by their peers than boys, in terms of social images. They explain that girls may be more aware of their social surroundings and have a greater ability to empathize with others, in comparison to boys (Zahn-Waxler, Race, & Duggal, 2005).

In their study, Danielsson et al., (2010) emphasize that the development of alcohol use differs for different groups of individuals. Using Windle, Mun, & Windle's (2004) typology, we can make a distinction between abstainers, experimenters, early high and stable consumers and sudden increasers. Longitudinal data from students in Sweden showed that having friends who drink predicts membership of the gradual increase/high consumer/sudden increase trajectories. These results also indicate that truancy and bullying are related to higher alcohol consumption.

Some studies indicate that the extent to which a youngsters conduct is influenced by the problematic behaviour of their friends is great, as they often mirror those behaviours, by committing similar offenses, using the same substances, or even imitating suicidal behaviours (Steketee, 2011, Prinstein e.a., 2000). Sieving et al. (2000), found that similarities in drinking behaviour among adolescent friends may be more related to processes of peer influence than those of peer selection. Findings support the utility of alcohol use prevention programs that equip younger teens with skills to resist peer influences to use alcohol. Briere et al., (2011) investigated the simultaneous use of alcohol and cannabis among adolescents. With self-reported data from students in Quebec, they found that adolescents were more likely to use both drugs if they had drug-using friends in the first years of high school.

In their study, Ennett & colleagues (2008) highlight that adolescent alcohol abuse can only be explained by taking into account multiple social contexts and the relations between them. Through a social network analysis of longitudinal data of almost 7,000 adolescents, they found that the influence of peers on alcohol use is always moderated by the nature of the social bond. High levels of peer alcohol consumption only increased the risk of alcohol use when higher social regulation was experienced as well. In addition, the authors also concluded that the family environment influences the effect of peers on alcohol use. A positive family environment acts as a protection mechanism against negative peer influences, while family conflict and family alcohol use amplify the negative peer effects.

Capaldi et al. (2009), argue that while parents are most influential during childhood, peers have the strongest influence on problem behaviours during adolescence. However, according to the authors, parental monitoring at this age and their efforts at reducing the opportunities for their child to engage in drinking with their peers, is still one of the most important prevention strategies. Van der Vorst et al. (2010) addressed this question of whether parental supervision of adolescent alcohol use actually lowers their intake. By using a dataset of 885 Dutch families they concluded that ‘if adolescents start to drink, no matter in what setting, with whom they drink, or how old they are, adolescents will drink more alcohol over time and (consequently) are at risk of problem drinking’ (p.8).

Chuang et al., (2009) investigated the influence of the neighbourhood context on the effect of peers on adolescent behaviour. According to their analyses of adolescents in six different neighbourhood types, peer smoking was associated with the smoking behaviour of adolescents in rural neighbourhoods, while peer drinking was associated with adolescent drinking in urban neighbourhoods. One of the explanations given in this study is the higher prevalence of adult alcohol use in urban areas which intensifies the influence of peer alcohol use, both through modeling and greater access to substances. Nevertheless, in all neighbourhood contexts peer behaviours were more influential than parental behaviours.

Even though most scholars focus on the negative effect of peers on alcohol use, belonging to a particular group can act as protection mechanism as well. Buckley et al., (2009) explored the role of peers as a protective factor for reducing or limiting the engagement in risky behaviour. For this study more than five hundred adolescents, with a mean age of 14, were asked about their intention to intervene if their friend(s) were at risk of alcohol or drug related harms. Examples of these harms are getting drunk, driving under the influence of alcohol and getting into fights. More than half of the respondents indicated that they would intervene, especially (83%) when a friend wanted to drink and drive. Predominantly female adolescents who were more connected to their schools, and youngsters with less risk-taking friends, were more likely to intervene. On the other hand, community adolescents with high alcohol consumption rates were less likely to do so. This is most likely due to a greater pressure to comply with group norms. The scholars also highlight that privacy may be an important factor.

Not only are friends, but also different lifestyles strongly related to smoking, drinking and using drugs (Karvonenea et al., 2001). Conventional activities were not associated with a reduction of drinking. However, involvement in sports/games consistently acts as independent protective factors in both contexts. Both commercialized and peer-oriented lifestyles were independently associated with higher levels of alcohol use. Four leisure dimensions were studied by Piko & Vazsonyi (2004). These include, peer-oriented, commercial leisure (having a chat with friends, parties, listening to music, looking around the shops, hanging around the streets), aesthetic-sophisticated leisure (movie, theater, pop concert and reading), conventional type of leisure (reading, sports, hobbies, housework, religious

events), and a sensation/technical-oriented leisure (computer/internet use, watching TV and/or video and hobbies). “Similar to evidence from other national contexts, conventional activities or family activities act as buffers against problem behaviours; on the other hand, peer-oriented activities or commercial types of leisure place youth at greater risk for a wide variety of problem behaviours.” (p.728). This effect is the same for both boys and girls.

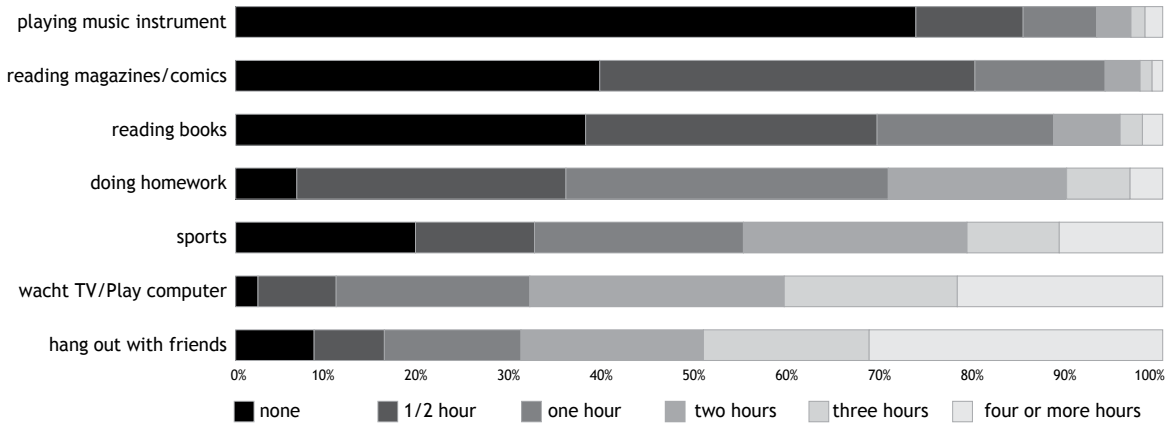
The aim of this present study is to examine whether, in what manner and with whom adolescents spend their leisure time with, has an influence on their alcohol and drug consumption.

7.3 Characteristics of leisure time in European countries

The ISRD questionnaire consists of many questions concerning how students spend their leisure time. The students were asked how much time they spent engaging in different activities outside of school, on an average school day. We also found it interesting to find out how juveniles spent their leisure time. The youngsters, on an average school day, spent most of their free time hanging out with friends and watching television, or playing games and chatting on the computer (see figure 7.1). Playing a music instrument and reading were not popular activities, even magazines or comic books. The majority of the youngsters do their homework, and only a small percentage (7.2%) said that they never do homework. Most of the students spend half an hour up to two hours (83.1%) doing their homework.

There are differences between girls and boys as to how they spend their leisure time. Boys spend much more time on sports (66% versus 34, while the girls spend much more time on their homework (66% versus 33%) and reading books (70% versus 40%). There are not so many differences in regards to the other activities. There are also no differences with respect to migrant background or grade.

Figure 7.1 The percentages for the hours spend on the different activities (N=57,771)



When we look at the effect sizes of the logistic regression analyses of different alcohol use indicators on youngster leisure time activities, we can observe that the more time a youngster spends with their friends, the more likely they are to drink, and drink heavily (see table 7.1). However, when students engage in more individual activities, such as homework, reading books or magazines, it is more likely that they will not drink at all. There is no significant relation between playing an instrument or practicing sports, and alcohol consumption.

The results also convey that when we look at students who used marijuana or hard drugs they were more likely to hang out with their friends more frequently and play a music instrument. Furthermore, it is unlikely that they practiced sports, did homework or read books.

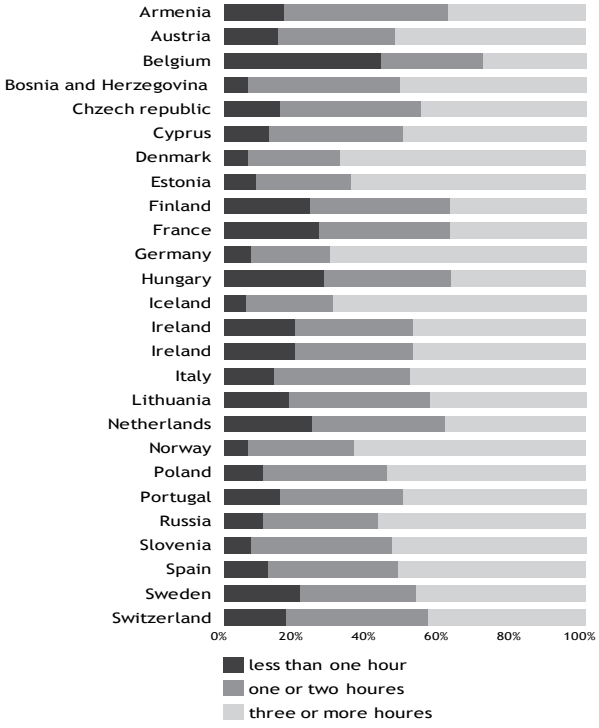
Table 7.1 The standardized effect sizes of the activities on substance use. Logistics regression corrected for grade, gender and migrant status (N=57,771)

	Last month alcohol	Lifetime alcohol	Binge	Hashish lifetime	Hashish last month	Hard Drugs last month	Abstinence
Playing music instrument	1.05***	1.01	1,05**	1,10***	1.13***	1,23***	0.99
Reading magazines/comics	0.91***	0,95***	0,90***	0,87***	0,81***	0,97	1.06***
Reading books	0.81***	0,88***	0,80***	0,82***	0.77***	0,80*	1.14***
Doing Homework	0.75***	0,82***	0,67***	0,64***	0,60***	0,49***	1,22***
Sports	1.01	0.99	1,01	0,90***	0,87***	1.00	1,01
Watch TV/ Play computer	1.11***	1.18***	1,14***	0,98	0,95***	1.00	0,84***
Hang out with friends	1.36***	1.33***	1,64***	1,76***	1,81	2,10***	0,74***

* P<.01 **P<01 ***P<.000

Hanging out with friends is clearly related to substance use and especially to problematic drinking or the use of (soft or hard) drugs. We also investigated whether there were differences between countries regarding the time young people spent hanging out with their friends (see figure 7.2).

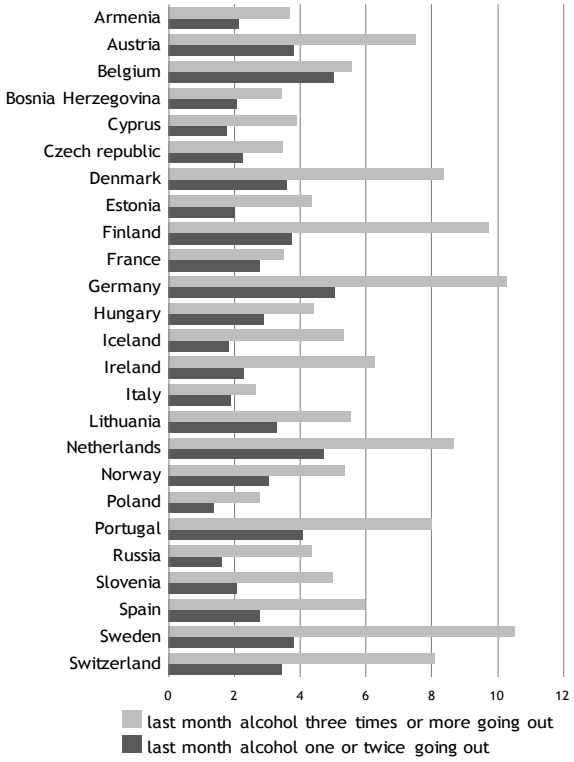
Figure 7.2 the time students spent hanging out with friends % (N=57,771)



In Belgium, most of the youngsters spent less than one hour hanging out with their friends (44%), while in Germany, the majority of the students spent most of their leisure time hanging out with friends (71%). Although there are large differences between the countries regarding the time youngsters spent with their friends, hardly any differences can be detected in relation to last month alcohol use (see figure 6.3). For almost all countries the odds ratios of whether students drank alcohol at the last occasion was 1.5. In only Finland and Iceland, the odds ratios were somewhat higher (2.13 and 2.24).

According to the literature, drinking alcohol is a part of a youngsters' social life. Hanging out and especially going out with friends provides them with the opportunity to drink alcohol. That said, we asked the students: how many times a week do you usually go out at night, such as going to a party or a disco, to somebody's house or hang out on the street. The majority of the youngsters go out (74.9%), and only a small group don't go out at all. Most of the juveniles who go out at night, only go out once or twice a week. However, almost a quarter goes out more often than they stay at home (26.1%), and 10 percent goes out on a daily basis (9.4%). There is a small gender difference: more girls don't go out at night at all (28% versus 24.1%) and more boys go out more than three times a week (37.3% versus 31.8%). Furthermore, there is a tendency for more students in seventh grade to stay at home than the students in higher grades, which could be explained by the age differences between the school grades. There are no large differences between native born and migrant juveniles.

Figure 7.3 Odds ratios for going out and alcohol use last month: logistics regression controlled for gender, migrant status and grade (N=57,771)



Having the opportunity to drink outside the house is indeed relevant, as there is a relationship between going out frequently and drinking alcohol. Juveniles who go out more frequently are more likely to drink alcohol. Those who go out once or twice a week are more likely to drink than those who stay at home (odds ratio 2.51), and the likelihood is even higher if they go out three times a week or more (odds ratio 4.29). Although going out at night has an influence on last month's drinking behaviour in every country, there are differences to be noted (see figure 7.3).

The relation is stronger in Sweden, Germany, Finland, the Netherlands and Switzerland, than in Italy, Poland or France. It is remarkable that in the majority of Eastern European countries such as Bosnia & Herzegovina, Czech Republic, Armenia or Russia, the relationship between going out and drinking is weaker than in others, while the pattern of going out is not that different. We may conclude that perhaps going out and drinking is more a Western and Northern European phenomenon. An explanation for this difference could be that in countries such as Italy, France and Spain it is more common to drink at home with meals. Thus we sought to find out with whom the youngsters have been drinking. Most of the youngsters drink soft drinks with their peers (57%), and only a small proportion say that they have been drinking alone (6%) and with their parents (24%). 13% of youngsters are reported to have been drinking with other adults.

Table 7.2 Logistics regression corrected for grade, gender and migrant (N=57,771)

	Last month Alcohol Odds	**95% interval**	**Binge drinking Odds**	**95% interval**	**Being drunk Odds**	**95% interval**
Drinking alone	1.40***	1.21 – 1.61	1.26	1.05-1.52	0.90	0.77-1.05
With parents	1.26***	1.13 – 1.40	0,59***	0.52-0.67	0.45***	0.40-0.50
With adults	1.72***	1.55 – 1.90	1.86***	1.66-2.09	1.30***	1.17-1.45
Friends	3.08***	2.77 – 3.43	4.59***	4.05-5.21	3.29***	2.95-3.67

*** P<.000

When we look at the relationship between problematic alcohol consumption, such as binge drinking or ever being drunk, we see that drinking within the family in the presence of the parents acts a protective factor (odds 0.6 and 0.45), while drinking with friends results in the highest rates for last month alcohol use (odds 3.08). We found the same pattern for ever being drunk. Our study shows that problematic alcohol use of youngsters is not related to drinking with parents. Those youngsters show a more moderate alcohol use pattern than those who consumed alcohol with their peers, the last time they drank. There are large differences in regards to whom they have been drinking with (see table 7.2).

7.4 Friends and the use of alcohol and drugs

As mentioned earlier, during adolescence friends become very important. During the transition to adulthood, the relationship with parents becomes more distanced and the relationship with friends becomes more dominant (Thornberry, 2005). To determine whether the students are more family-oriented or peer-oriented we asked them with whom they spend most of their free time. There were four mutually exclusive answer categories: on their own, with their family, with a few friends (less than four), or with a large group of friends (four or more). Most of the students are peer-oriented (57%), and spend more time with a small group of friends (34%) or with a larger group of friends (23%). Almost 9% of the students spent most their free time on their own, and one third spent most of their free time with their family (34%).

There are no differences between girls and boys, nor are there any differences as to migration background. As expected, students in higher grades spend more time with their friends and less with family.

If adolescents belong to a larger group of friends they are more likely to drink alcohol and in a non-moderate way, while spending time with their family acts as a protective mechanism against problematic drinking behaviour (see table 7.3). Due to the fact that spending more time with a large group of friends increases the likelihood of (excessive) drinking, they are also more likely to develop problematic drinking patterns.

Table 7.3 Regression analyse of alcohol use last year and with whom they spent their time corrected for grade, gender and migrant status (N=57,771)

	Alcohol use last month Odds	**95% interval**	**Binge drinking Odds**	**95% interval**	**Being drunk Odds**	**95% interval**
Time on my own	0.94	0.84 – 1.04	1.30	1.09-1.56	0.92	0.80-1.0
With my family	0.56***	0.52 – 0.61	0.59	0.58-0.67	0.44	0.39-0.4
With 1-3 friends	1.47***	1.35 – 1.61	1.83	1.64-2.05	1.30	1.18-1.4
With a large group	2.31***	2.10 – 2.53	4.64	4.12-5.24	3.33	2.99-3.6

***p<.000

Differences can also be noted between the countries. For example, in Anglo Saxon countries, juveniles are more peer-centred and spend more time with their friends, while in the Mediterranean countries, youngsters are more likely to spend their time with family. This is consistent with the fact that students from those countries do not go out that often in the evening.

7.4.1 Lifestyle

In the literature it is assumed that if juveniles spend more time with their friends they will be more easily influenced to consume alcohol or drugs. This study also illustrates that there is a significant correlation between 'hanging out with friends' and drinking behaviour. Thus we created a scale for different lifestyles where we used those items that were more family-orientated rather than friend-oriented.

The results show that there are some elements of juvenile leisure time that are related to substance use. These are, the frequency of going out at night, spending a lot of time hanging out with friends, and spending a lot of time in public places with a group of friends. On the basis of this conclusion, we developed the scale "lifestyles of the youth". We recoded these four variables as -1, 0 and +1. The final score varies between -4 to 4 (Cronbachs' Alpha =0.60).

Table 7.4 Definition of lifestyle

Variables	-1	0	1
Going out at night	Never	Once or twice	Three times or more
Hanging out with friends	Less than one hour	One to two hours	Three or more hours
Time spent with	Family	On my one/ with small group of friends	With a large group of friends
The group of friends spent a lot of time in public places	No		Yes

7.4.2 Deviant group behaviour

There is a question in the survey which asks what activities youngsters engage in when they hang out with their friends, e.g. using substances with friends. Going to the disco or concerts is a risk factor for using alcohol or drugs, while more delinquent behaviour, such as shoplifting is more connected to (soft) drug use than alcohol (see table 7.4). Other deviant behaviours, such as vandalism, or frightening other people just for fun, is only slightly related to substance use. Two protective factors are practicing sports and playing in a band. Especially playing in a band is somewhat surprising because we found that playing an instrument is related to soft and hard drug use, while playing an instrument in a band is not related to substance use.

Table 7.5 Activities that adolescents do when they hang out with friends and their relationships to substance use (odds) (N=57,771)

	Last month alcohol	Lifetime alcohol	Binge drinking	Hashish lifetime	Hashish last month	Hard Drugs last month	Abstinence
Go to disco or pop concerts	1.31***	1.50***	1,33***	1,34***	1.28***	1.37***	0.66***
Play in a band	0.96***	0.99	0.91***	0.96	0.95	0.96	1.00
Drink a lot of alcohol or take drugs	2.80***	3.45***	2.54***	2.14***	2.12***	1.84***	0.27***
Smash or vandalize things just for fun	1.04	1.18***	1.10**	1.13***	1.10**	1.17	0.84***
Shoplifting just for fun	0,91***	0.89***	0.95	1.16***	1.16***	1.12	1.10***
Play sports	0.96	0.95**	0.99	0.85***	0.91	0.92	1.05**
Play computer games or chat on the computer	1.04	1.10***	1.00	0.88***	0.99	0.87	0.90***
Frighten and annoy people around us just for fun	1.15***	1.18***	1.05*	1.03	0.88**	1.21**	0.79***

*P<.01 **P<.00 ***P<.000

Deviant group behaviour was measured by a subscale created out of four items, which asked youngsters what kinds of activities they normally engage in, when hanging out with their friends. This included, drinking a lot of alcohol, smashing or vandalizing for fun, shoplifting just for fun, and frightening and annoying people for fun.

7.4.3 Delinquent behaviour of friends

Whether or not the youngsters have friends involved in deviant or illegal behaviour is closely related to lifestyle. Admitting to having *delinquent friends* is often used as an alternative way of asking about one's own involvement in delinquency. This is because respondents are often more willing to admit that they have friends who do undesirable things, rather than admitting to the fact that they do these things themselves. Research has shown that self-reported delinquency of friends is strongly correlated to an adolescents' own substance use (Mulvay, 2010, Richardson et al., 2003). In the ISRD-2 questionnaire, an item consisting of 5 possible response choices concerning the delinquency of friends, preceded the section on self-reported delinquency and substance use, partly as a way of neutralizing the social desirability effect. This question asks the youngster how many of their friends are involved in drug use, shoplifting, burglary, extortion, or assault.

Most of the students do not have delinquent friends who commit serious offenses. Only a small proportion have friends who committed a delinquent act such as, burglary (7.5%), extortion (5.6%), or assault (8.3%). Having friends who shoplift is more common (32%), and one out of four students have friends who use drugs.

Having friends who use any kinds of drugs is relevant as to a respondents' own use, especially in the case of soft and hard drugs. Students between the ages of 12 and 16, who have friends who use (soft) drugs are 19 times more likely to use soft drugs themselves and 7 times more likely to use hard drugs.

Other types of peer delinquent behaviour, is also of influence on a students' substance use. The correlation is stronger for stealing and hard drug use, while the more serious violent offenses are related to alcohol as well as to drug use.

Table 7.6 Delinquent friends and substance use (N=57,771)

I have friends:	**Last month alcohol**	**Lifetime alcohol**	**Binge**	**Hashish lifetime**	**Hashish last month**	**Drugs last month**	**Abstinence**
who used soft or hard drugs like weed, hash, speed, heroin or coke	3.19***	3.98***	3.60***	14.72***	19.44***	7.14***	0.24***
did steal something from a shop or department store	1.72***	1.95***	1.69***	1.34***	1.21**	0.81	0.51***
did steal something from a shop or department store	1.30***	1.28***	1.40***	1.39***	1.54***	2.68***	0.75***
did threaten somebody with a weapon or to beat him up, just to get money or other things from him	1.11*	1.04	1.31***	1.38***	1.47***	2.30***	0.91
did beat someone up or hurt some-one badly with something like a stick or knife	1.78***	1.94***	1.91**	1.76***	1.71***	2.21***	0.49***

*P<.01 **P<.00 ***P<.000

7.4.4 Being a gang member

Most adolescents have a certain group of friends with whom they spend their time doing things with or just hanging out (77.2%). In addition to risky group behaviour, we also wanted to know whether this group of friends consisted of 'delinquent peers'. When a group of delinquent adolescents band together they are usually defined as a gang. According to many researchers, being a gang member is an important factor that influences juvenile delinquency. The crime rates among the members of such groups are higher, especially for serious and violent crimes (Haymoz & Gatti, 2010; Weerman & Esbensen, 2005). In this study, we used the Eurogang definition (Klein, 2001) to determine whether an adolescent belongs to a gang or not: 'A street gang is any durable, street orientated youth group whose own identity includes involvement in illegal activity'. The Eurogang definition consists of the following six questions:

1. Do you have a group of friends?
2. How long has this group existed (> 3 months)?
3. Does this group spend a lot of time together in public places?
4. Is committing illegal acts accepted by your group?
5. Do people in your group actually commit illegal acts together?
6. Do you consider your group a gang?

In our study, an adolescent was considered to be a gang member only if he/she scored affirmatively on all six items. Cronbachs' alpha for this scale is quite high at 0.77.

According to the research, only a small proportion of juveniles belonged to a gang (4.3%, see table 7.7 below). However, to better assess the meaning of this result we first recorded the frequency of affirmative answers for the six questions. It should be pointed out that all the percentages shown in the table refer to the whole sample and not only to those who said that they have a group of friends.

Table 7.7 Percentage of youngsters who replied affirmatively to the questions relating to the Eurogang definition

	N = 41.335
Do you have a group of friends?	76.3
How long has this group existed (> 3 months)?	69.5
Does this group spend a lot of time together in public places?	75.4
Is doing illegal things accepted by your group?	19.8
Do people in your group actually do illegal things together?	16.8
Do you consider your group a gang?	14.4
Being a gang member	4.3

Here it is clear that a larger group of adolescents considered their group of friends to be a gang (14.4%), in comparison to being classified as a gang member according to the six-point definition by Eurogang (4%). These results reflect the usefulness of the different items for defining whether someone is a gang member, rather than using a single question regarding gang membership (see also Haymoz & Gatti, 2010). Thus, for many youngsters, the term 'gang' is probably more closely associated with the informal definition, which refers to a group of people who associate regularly on a social basis, rather than, a delinquent group whose identity revolves around illegal activities. Haymoz and Gatti (2010) suggest that the term 'delinquent youth group' is more appropriate than the term 'gang'.

Twice as many boys belong to a gang (2.6%), compared to girls (1.4%). This gender difference is the smallest in the Anglo-Saxon countries and the largest in the Latin American and Mediterranean countries, where almost three times as many boys are gang members than girls. Although there are more boys involved in the gangs, these figures provide evidence to support the fact that the gang phenomenon is not exclusively a male-oriented domain. Of all the gang members, one-third (34.7%) are girls and the groups are mostly mixed (68.1%). There is even a small proportion of gangs that consist exclusively of girls (4.5%).

When we look at all the different scales, we see that those who actually commit delinquent offenses and spend time with friends, who are involved in deviant activities, are at risk of using alcohol and especially soft or hard drugs.

Table 7.8 Logistic regression for this behaviour of the students themselves and of their friends (N=41,335)

	Last month alcohol	Lifetime alcohol	Binge	Hashish lifetime	Hashish last month	Drugs last month	Abstinence
Lifestyle	1.42***	1.42***	1,63***	1,61***	1.59***	1,63***	0.70
Deviant group behaviour	1.77***	1.75***	1.73***	1.70***	1.76***	1.87***	0.56***
Delinquent friends	1.48***	1.74***	1.51***	1.91***	1.75***	1.69***	0.56***
Being a gang member	4.32***	3.78***	4.57***	6.27***	7.12***	9.39***	0.23***

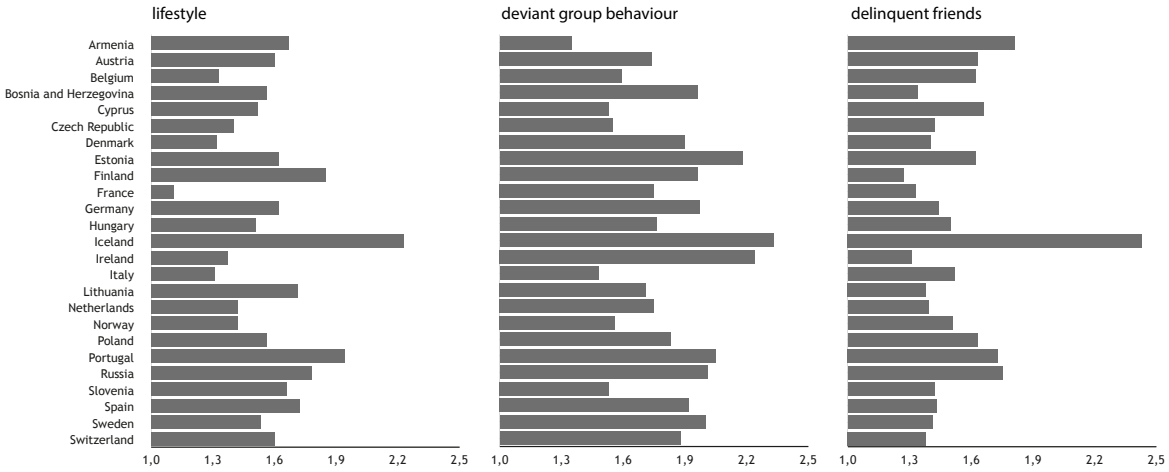
7.5 Differences in leisure time and peers between the European countries

The second aim of this chapter is to look at whether and how these peer and leisure factors differ between the various European countries. In other words, are there some particular factors that influence the drinking behaviour of adolescents stronger in some countries, than in others? In the literature, we have not found any evidence to suggest that friends or leisure time will have different effects on the consumption patterns of adolescents. Nonetheless, one may expect that in Mediterranean countries, where it is more common to drink at home during the meal than drinking with friends, the effect should be weaker, than in other countries where it is more common to go out and drink alcohol with friends.

When we look at the influences of lifestyle, deviant group behaviour and delinquent friends on alcohol consumption, a significant relationship was found in all European countries involved in this study. Especially belonging to a deviant group of friends has a large impact on the drinking behaviour of the students during the last month. However, large discrepancies can be found between the countries in regards to this relationship. For instance, in Iceland, the odds that one will be drinking if he or she belongs to a deviant group of friends is 2.3 times higher, while in Armenia, the odds are 1.3. There is also a strong relation between having delinquent friends and alcohol use last month. The highest odds ratios are found within Iceland (2.4), and the lowest in Denmark (1.4). Furthermore, lifestyle also

has an influence on alcohol consumption, but the differences between the countries are not as large as for the other variables. We only detected a strong correlation between alcohol use and having delinquent friends in Iceland, but it must be noted that the data was only collected from students in the eighth grade.

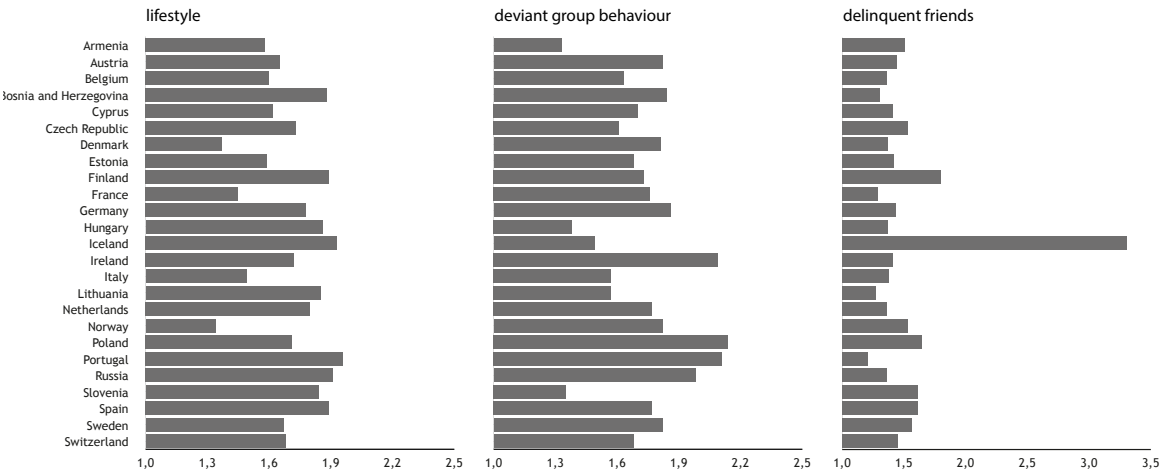
Figure 7.4 Adjusted odds ratios of lifestyle, deviant group behaviour, delinquent friends and gang member on last month alcohol prevalence. (N= 41.335)



We also sought to find out whether there were any country differences in regards to the relationship between binge drinking (five or more glasses the last time they have been drinking) and how students spent their leisure time, having delinquent friends and extreme alcohol consumption.

For all scales there is a significant relation between binge drinking and these scales, within each country. However, we don't see many differences in terms of lifestyle between the countries for binge drinking. For deviant group behaviour, the lowest associations were found in Armenia, Slovenia, Hungary and Iceland, and the largest in countries such as Poland, Portugal and Ireland. For delinquent friends there was one outlier, Iceland (odds ratios: 3.3), while in the other countries the odds ratios range between 1.2 (Lithuania) and 1.8 (Finland).

Figure 7.5 Adjusted odds ratios of lifestyle, deviant group behaviour, delinquent friends and gang membership on binge drinking (N=41.335)



When we look at having delinquent friends, the odds ratios are lower for binge drinking than for last month drinking. The outlier here again is Iceland, so although the data in Iceland is only from eighth grades students, the relation between drinking and the influence of deviant friends is consistent the highest especially for extreme drinking behaviour like binge drinking. For the variable, having delinquent friends, the lowest associations were found in Denmark and the Netherlands, where we know from other studies, that youths like to drink outside the house with friends with the intention of getting drunk (ESPAD, 2006).

7.6 Conclusion

The adolescents involved in this survey vary enormously in terms of their lifestyles and the way they spend their leisure time, and it is these factors, which influence their use of alcohol and drugs. When youngsters spend more time with their friends, they are more likely to drink alcohol. Being with friends as a leisure time activity is also related to other forms of substance use, such as cannabis and hard drugs. Adolescents who spend more time engaging in individual activities (e.g., reading books, doing homework) are less likely to drink alcohol.

Alcohol use is strongly related to going out at night. Thus, juveniles who go out more frequently also tend to use more alcohol. Adolescents who are going out once or twice a week are more likely to drink than those who stay at home. Going out increases this probability even more. There are differences between countries with respect to the relationship between going out and drinking behaviour. In many of the Eastern European countries (e.g., Bosnia & Herzegovina, Czech Republic and Russia), the relation between going out and drinking is less strong than in most Western European countries. However, differences can be found in Western Europe as well. For example, countries such as Sweden, Germany, Finland and the Netherlands show stronger associations than Italy, Poland and France.

Youngsters who are more peer-oriented have a higher probability of drinking more alcohol than youngsters who are more family-oriented. We also found that drinking with the family acted as a protective mechanism for problematic alcohol behaviour, while drinking with friends has a large impact on last month alcohol use. If adolescents spend more time with a larger group of friends they are more likely to show excessive alcohol use. There is also a strong relation between having friends who are delinquent, or being a member of a group who commit illegal acts (gang membership), and the use of alcohol.

The results of this research suggest that policies regarding heavy alcohol consumption should direct their attention towards youngsters who are more peer-oriented and frequently go out at night. Policies should focus on the social and psychological processes in friendship groups that encourage alcohol consumption among its members. Furthermore, guided drinking within the family could be an effective strategy in preventing excessive drinking patterns.

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8 *The neighbourhood*

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8.1 Introduction

Compared to the influence that families or peers have on adolescent alcohol consumption, the weight of various neighbourhood factors have been studied far less (Tobler et al., 2009; Ennet et al., 2008). Nevertheless, findings from a growing body of research, collected in the past ten years, provide evidence for its increasing importance. As Stock et al. states: *"Neighbourhood effects can be considered as societal and cultural (i.e. contextual) risk factors for alcohol use, in that they provide legal and normative expectations for behaviour"* (Stock et al., 2010: p.1). Studies on the neighbourhood and alcohol use among adolescents not only emphasize a direct influence, but they also indicate an interaction between environmental and other factors.

The most studied neighbourhood characteristics include the neighbourhood socioeconomic status (SES) (Stock et al., 2010; Chuang et al., 2009; Trim & Chassin, 2008) and urban-rural differences (Donath et al., 2011; De Haan & Boljevac, 2010; De Haan, Boljevac & Schaefer, 2010; Chuang et al., 2009) of alcohol use among adolescents. For example, Trim & Chassin (2008) found that the SES of a neighbourhood has a different effect on children whose parents were alcoholics compared to those whose parents weren't. For the first group (children of alcoholics), lower SES neighbourhoods (with risk factors such as poor social control and environmental stress) predicted a higher increase of alcohol consumption and its affiliated consequences. For the second group, (children of non-alcoholics) this was the case for neighbourhoods with a higher SES (with risk factors such as social norms that include high achievement pressures, and easier access to alcohol). With respect to urban-rural differences, Donath et al. (2011) came to the conclusion that 15 year-olds residing in rural areas drink on more occasions per year, engage more often in binge drinking, and have a higher lifetime prevalence for all alcoholic beverages, as compared to 15-year-olds residing in urban areas. According to De Haan, Bolsjevac & Schaefer (2010), community disadvantage is a significant risk factor for rural adolescents with respect to alcohol use.

Most studies which research the effect of a given neighbourhood on adolescent alcohol consumption also test a wide range of possible interaction effects between the neighbourhood and, for example, individual characteristics, family, peers and school factors. Tobler et al. (2009) e.g. longitudinally examined the direct and indirect relations between an alcohol-related neighbourhood context, home and family management practices, and alcohol use. This study illustrates the importance of multifaceted efforts to minimize alcohol-related risk by addressing both the community and the family. Parents, simply, 'buffer' the effects of risky environments. When neighbourhood risk increases, by, for example, increased access to commercial alcohol, protective family management practices also increase. This is especially the case during the early years of adolescence. Chuang et al. (2009) examined this 'buffer-effect' of parents more closely by comparing rural and urban neighbourhoods. The results of this study suggest that parental monitoring is only an effective strategy in white urban neighbourhoods with a high-SES. *"Parents in this neighbourhood type may be more likely to have resources which influence the opportunities for adolescents to be exposed to environments where alcohol is more available and where a greater variety of beliefs and values are held by neighbors, compared to rural neighbourhoods"* (Chuang et al., 2009: p. 1395).

Stock et al. (2010) investigated how school district-level factors, such as a low occupational and educational level, affect the initiation of alcohol consumption in Danish adolescents. They found that peer and parental drinking might be higher in low SES school districts, due to the composition of the

district. In other words: they found an effect of individual level factors but not of the district characteristics (compositional but not contextual influences). According to these authors, another potential reason for this result could be the relatively high level of tax-funded governmental investments in these areas of Denmark. Socially deprived school districts are compensated by extra state investments in facilities, services and infrastructure. *"Thus, living in socially deprived areas in strong welfare states may in general have less impact on health inequity"* (Stock et al., 2010: p.4).

In their study, Donath et al. (2011) found that adolescents in rural areas drink more and more frequently than adolescents in urban areas. They give several possible reasons for this result. First of all, they state that rural areas provide adolescents with fewer alternatives for engaging in interesting leisure activities than urban areas. Stock et al. (2010) came up with the same explanation for the differences between Danish adolescents in rural and urban areas. Furthermore, Donath et al. also mention cultural traditions, such as country fairs, which are traditionally strongly associated with alcohol consumption. Events such as these are celebrate more often and have stronger roots, in rural areas.

According to our knowledge so far, the majority of research concerning the neighbourhood effect on alcohol use among adolescents has been conducted within one country. There are some bi-national comparison studies which also convey the importance of the rural area on (especially heavy) alcohol use among youngsters (Jonkman et al., 2011, submitted). However, multinational studies that highlight the influence of the neighbourhood on alcohol consumption among youngsters, remain scarce. Considering the various theories which may support our deeper understanding of the relationship between neighbourhood characteristics and adolescent alcohol consumption, we have chosen to focus on the social control theory (social bonding theory) and the social disorganization/collective efficacy theory. Our cross-national data provides us with the opportunity to examine to what extent these predominantly American theories may be valid in other countries than the Anglo-Saxon ones.

Social control theory, also known as social bonding theory, posits that a tendency towards deviance only occurs when the bond between an individual and society is weakened (Hirschi, 1969). It is one of the most tested theories in criminology. Social bonding is measured through four major elements: attachment to significant others, such as parents, teachers, family, friends; commitment to act and achieve one's personal goals in a way that conforms to the social normative system; involvement in conforming social activities; and, beliefs in the general social and moral norms and values of society.

The results of De Haan & Boljevac (2010) and De Haan, Boljevac & Schaefer (2010), show that social control theory also applies to neighbourhood bonding.

Whilst studying community influences on substance use in rural environments, they found that living in a community which adolescents perceived as being supportive (operationalized as containing adults interested in both their activities and well-being) and exhibited firm discipline, was effective in lowering alcohol use among rural adolescents. So just as the positive effect of authoritative parenting, an authoritative community also seems to lower the use of alcohol.

Another important aspect to mention is that the social control of children is not exclusively exercised by their own parents. Rather, the social organizational characteristics of a given neighbourhood also play an important role. These include, mutual contacts between parents, exchange among parents, informal social control and mutual support of residents (Sampson et al., 1999).

This theory came into play with the renewed interest in the possible impact of neighbourhood factors on delinquent behaviour, such as alcohol use (Kubrin, 2003; Sampson & Laub, 1993; Sampson et al., 1997; Wikström, 1998). Kornhauser (1978) pointed out that disorganized neighbourhoods could not transmit shared norms and values because they lack social control on (adolescent) residents. Sampson et al. built on this idea by developing the concept of collective efficacy, which links social cohesion in a neighbourhood as a function of mutual trust and solidarity, with the willingness of people to enforce social norms of behaviour (Sampson et al., 1997, 1999). The capability of neighbourhoods to realize a positive social climate is variable, and disorganized neighbourhoods in particular, with their concentration of poverty, minorities, and single parent families, lead to isolation. In addition, Sampson & Laub argue that the environment and living conditions of families have a great influence on parents' management skills in raising their children (Sampson & Laub, 1993).

This study, which uses data from 25 countries and 57,771 adolescents (ISRD-2 study), greatly contributes to the existing knowledge on the relation between alcohol use of youngsters and the influence of the neighbourhood.

8.2 The Method

In this study we researched the influence of different neighbourhood factors (independent variables) on alcohol and drug use (as dependent variables) which were adjusted for specific variables (control variables).

Independent variables
The existing studies on the influence of neighbourhood factors on alcohol use tell us that the assessment of these effects is by no means easy. (Junger-Tas et al., 2012) distinguish two important problems: how do you define a 'neighbourhood' and how do you deal with the possible selection bias in the sense that certain neighbourhoods may attract certain families? Therefore, in this study we considered these problems carefully. We collected data concerning the community where the young people resided, as well as other factors such as social control, school and the peer group.

We adapted a frequently used measure of the youth's perception of his/her neighbourhood (Sampson et al., 1997; 1999). This neighbourhood scale (question 47) initially used consisted of 13 items. However, upon analysis, three of these items proved of no use (items 47.2, 47.4, 47.13). Thus, we created a *neighbourhood quality* scale of 10 items, which were transformed to POMP scores ranging from 0 to 100 (alpha = .77). Three subscales were also constructed.

1. Neighbourhood integration. We measured neighbourhood integration –or neighbourhood cohesion- by using three statements: people around here are willing to help each other; this is a close-knit neighbourhood; and, people in this neighbourhood can be trusted.
The internal consistency of the scale yields an alpha of 0.82.

2. Neighbourhood bonding. This variable was also measured by three statements: I like my neighbourhood; if I had to move I would miss my neighbourhood; and, there is a lot of space for children to play. The internal consistency of the scale yields an alpha of 0.67.

3. Neighbourhood disorganization. We measured neighbourhood disorganization with the following five statements: there is a lot of crime in my neighbourhood; …a lot of drug dealing; …a lot of fighting; …a lot of graffiti and; …a lot of empty and abandoned buildings. The internal consistency of the scale yields an alpha of 0.82.

Dependent variables
The dependent variables in this study concern the prevalence and the amount of alcohol consumed by adolescents. The prevalence (i.e. whether the youth have used alcohol/drugs or not) is measured as lifetime consumption and last month consumption of alcohol (beer/wine and spirits) and drugs (soft drugs such as marijuana and hard drugs such as ecstasy/amphetamine/LSD/cocaine/heroin), drunkenness, binge drinking (drinking at least five drinks in a row), and abstinence (not drinking/using all in their lifetime) from alcohol and marijuana. Dependent variables concerning the incidence (i.e. how much the youth have used alcohol/marijuana) consist of the amount of alcohol and marijuana used last month and the amount of alcohol used the last time they were drunk.

Control variables
In all analyses the effect of neighbourhood characteristics on alcohol use was controlled for gender, grade and immigrant status.

8.3 Results

The first table below presents the means of three neighbourhood measurements per country. All statements had scales from 0-100. The mean of neighbourhood integration is 61.9. Finland has the lowest score (52.5) and Armenia has the highest (74.7). The mean for Neighbourhood Bonding is 74.7 (from 54.6 in Russia, to 85.7 in Norway and Slovenia). Neighbourhood Disorganization (mean is 20.5) varies from 13.0 in Switzerland to 33.9 in France.

Table 8.1 Means (Std. Err) of Neighbourhood Integration, Bonding and Disorganization by Country (N=55,717)

	Neighbourhood Integration	Neighbourhood Bonding	NeighbourhoodDisorganization
Armenia	74.7 (.60)	84.5 (.56)	21.3 (.42)
Austria	63.8 (.53)	63.7 (.61)	13.4 (.36)
Belgium	60.1 (.66)	74.8 (.67)	18.9 (.53)
Bosnia & Herzegovina	74.2 (.62)	78.7 (.67)	17.8 (.52)
Cyprus	71.9 (.62)	84.2 (.57)	17.3 (.51)
Czech Republic	52.7 (.46)	73.4 (.42)	27.3 (.41)
Denmark	66.2 (.74)	78.9 (.77)	20.8 (.65)
Estonia	56.2 (.49)	71.5 (.54)	21.5 (.41)
Finland	52.5 (.69)	78.6 (.71)	17.6 (.53)
France	62.0 (.62)	76.7 (.67)	33.9 (.64)
Germany	59.0 (.45)	63.3 (.54)	14.9 (.36)
Hungary	54.7 (.58)	84.9 (.53)	19.8 (.44)
Iceland	66.3 (1.04)	81.6 (.1.00)	13.4 (.76)
Ireland	67.8 (.69)	78.9 (.77)	25.4 (.76)
Italy	58.9 (.43)	66.1 (.43)	26.8 (.37)
Lithuania	57 (.57)	82.3 (.56)	24.2 (.49)
Netherlands	66.8 (.59)	78.2 (.59)	19.5 (.49)
Norway	70.1 (.66)	85.8 (.59)	15.7 (.51)
Poland	57.1 (.67)	82.7 (.64)	32.7 (.64)
Portugal	62.7 (.52)	70.0 (.55)	19.9 (.45)
Russia	54.6 (.58)	54.7 (.67)	16.8 (.39)
Slovenia	61.0 (.61)	85.8 (.51)	18.6 (.47)
Spain	65.6 (.68)	84.2 (.65)	22.6 (.58)
Sweden	66.5 (.58)	81.2 (.56)	15.4 (.43)
Switzerland	62.3 (.45)	69.1 (.50)	13.0 (.33)
Total mean	**61.9**	**74.7**	**20.5**

After the first descriptive we standardized the neighbourhood variables and analyzed the associations between alcohol and drug use and the neighbourhood variables with STATA version 11.1 using a binary logistic regression. All analyses were multivariate and controlled for grade, gender, and immigrant status. Table 8.2 shows the results of the adjusted odds ratios (AOR) for the three neighbourhood variables.

The impact of neighbourhood integration

The results convey that neighbourhood integration has a negative effect on all kinds of substance use. In other words: adolescents who experience a high degree of social cohesion in their neighbourhood are less likely to drink alcohol (both beer and spirits), smoke hash or use hard drugs. For example, adolescents who feel integrated in the neighbourhood where they live, show an 18% decrease of lifetime alcohol use. In addition, these adolescents are more likely to practice complete abstinence (21%).

The impact of neighbourhood bonding

The experienced degree of bonding to the neighbourhood had a similar negative effect on alcohol and drug use as neighbourhood integration. If adolescents feel more connected to their neighbourhood, they are less likely to drink alcohol, smoke soft and use hard drugs and are less likely to use them on a regular basis. These adolescents are also more likely to practice complete abstinence (12%).

The impact of neighbourhood disorganization

As one would expect, the degree of experienced disorganization in a given neighbourhood has the opposite effect on substance use. Adolescents who described their neighbourhood as disorganized are more likely to drink alcohol, smoke soft and use hard drugs and they are more likely to use them more frequently. Interestingly, the positive effect on hard drug use within the last month is quite astonishing (137% higher prevalence rate). Neighbourhood Disorganization also decreases the likelihood that adolescents are abstinent (24%).

Table 8.2 The adjusted odds ratios (95% confidence interval) of neighbourhood-related factors of alcohol and drug consumption

Categories	Neighbourhood Integration	Neighbourhood Bonding	Neighbourhood Disorganization
	Odds ratios (CI)	Odds ratios (CI)	Odds ratios (CI)
Alcohol lifetime	.82*** (.81-.84)	.89*** (.87-.91)	1.29*** (1.27-1.32)
Alcohol last month	.87*** (.85-.88)	.91*** (.89-.92)	1.32*** (1.30-1.34)
Alcohol drunkenness	.83*** (.81-.85)	.90*** (.88-.92)	1.43*** (1.40-1.46)
Beer lifetime	.82*** (.81-.84)	.89*** (.88-.91)	1.28*** (1.25-1.30)
Beer last month	.86*** (.85-.88)	.91*** (.89-.93)	1.30*** (1.28-1.33)
Spirits lifetime	.83*** (.82-.85)	.91*** (.89-.93)	1.40*** (1.37-1.42)
Spirits last month	.87*** (.85-.89)	.94*** (.91-.96)	1.44*** (1.41-1.47)
Binge drinking	.88*** (.86-.90)	.93*** (.92-.96)	1.40*** (1.37-1.43)
Hash lifetime	.79*** (.77-.81)	.88*** (.85-.90)	1.79*** (1.74-1.83)
Hash last month	.81*** (.77-.85)	.91*** (.87-.95)	1.89*** (1.83-1.96)
Hard drugs last month	.79*** (.72-.87)	.90* (.82-.99)	2.37*** (2.20-2.55)
Abstinence	1.21*** (1.19-1.24)	1.124*** (1.10-1.15)	.76*** (.75-.78)

Note. Model controlled for gender, grade and immigrant status. *** p <.001, ** p < .01, * p<.05

8.4 *Differences in neighbourhood-related factors between European countries*

In the previous paragraph we discussed the results of all countries together. In this paragraph we will examine if and how these neighbourhood-related factors differ between European countries. Perhaps particular neighbourhood characteristics have a stronger effect on alcohol consumption in some countries than in others. To test this, we conducted bivariate logistic regression analyses for each country separately, controlling for grade, gender, and immigrant status. The focus of this country comparison will be on the prevalence of alcohol in the last month.

Figure 8.1 Adjusted Odds Ratios (AOR) of neighbourhood integration on last month alcohol prevalence

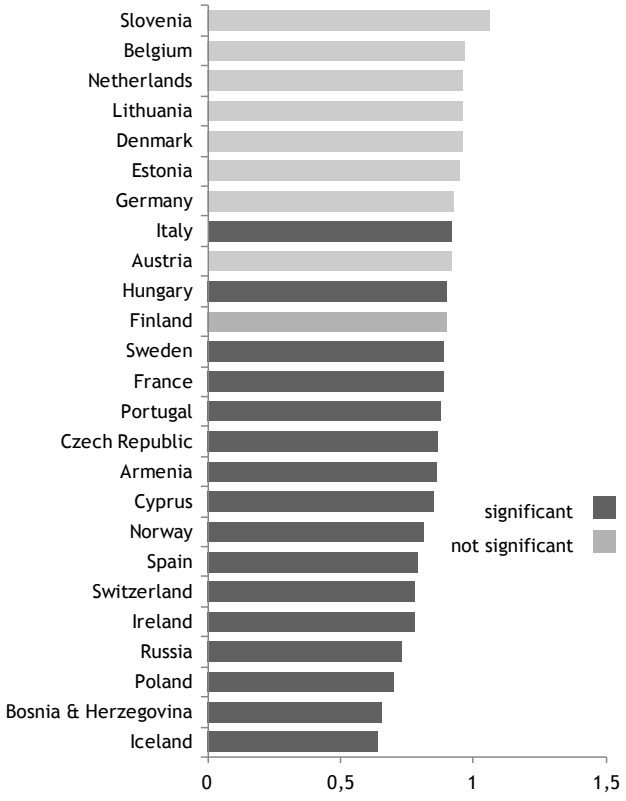

Figure 8.1 illustrates the Adjusted Odds Ratios of neighbourhood integration on last month prevalence of alcohol for the different European countries. In nine countries the effect was not significant (grey bars). However, in all of the other countries the figure conveys that students who experience more neighbourhood integration have a lower last month prevalence. The protective effect is the largest for Iceland with an AOR of 0.64, followed by Bosnia & Herzegovina with 0.66. This means that for these countries each unit increase in neighbourhood integration, the estimated last month alcohol prevalence lowers with about 35%. The protective effect of this neighbourhood variable is the lowest for Italy with an AOR of 0.92.

Figure 8.2 Adjusted Odds Ratios of neighbourhood bonding on last month alcohol prevalence

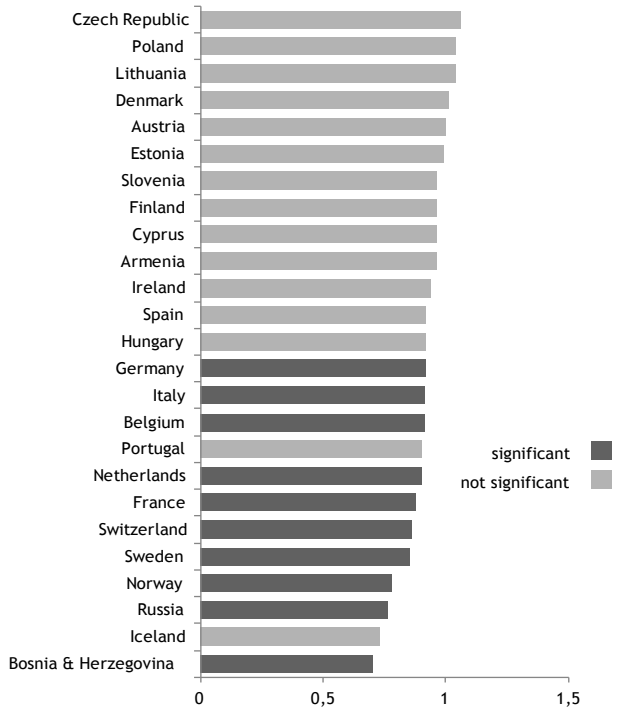

Figure 8.2 shows the odds ratios of neighbourhood bonding of last month prevalence of alcohol for the different European countries. If we compare this with the effect of neighbourhood integration, we see that this particular neighbourhood variable is significant in far less countries, namely in 10 out of 25 (the black bars are significant). In these ten countries, students who experience a higher degree of neighbourhood bonding have a lower last month prevalence. The protective effect is the largest for Bosnia & Herzegovina with an AOR of 0.7, followed by Russia (AOR= 0.76) and Norway (AOR= 0.78). This means that for each unit increase in neighbourhood bonding, the estimated last month alcohol prevalence in these countries lowers with 30 to 22%. The protective effect of this neighbourhood variable is the lowest for Germany with an Adjusted Odds Ratio of 0.92.

Figure 8.3 Adjusted Odds Ratios of neighbourhood disorganization on last month alcohol prevalence

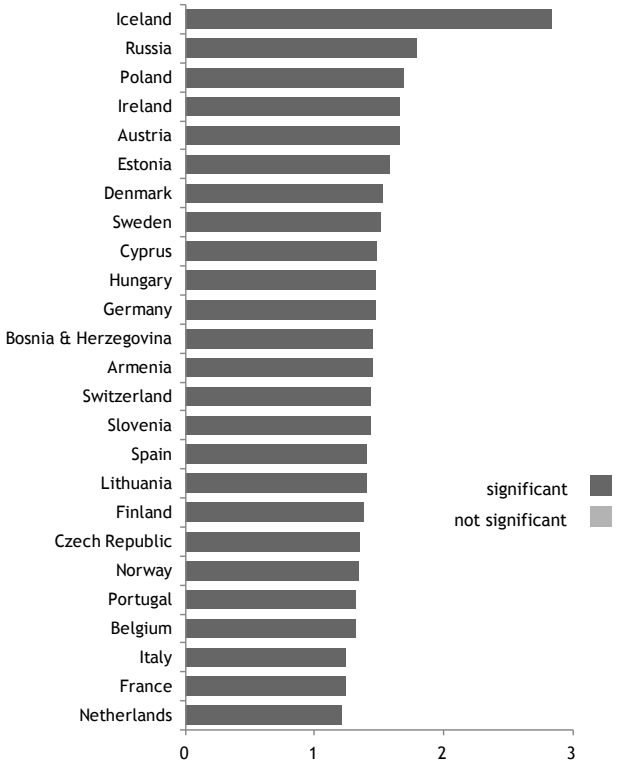

Figure 8.3 illustrates that the variable, neighbourhood disorganization, has the opposite effect in comparison to the other two variables on last month prevalence of alcohol consumption. This effect is significant in all 25 countries. The results convey that students who experience more neighbourhood disorganization have higher last month prevalence. The effect in Iceland is especially surprising, as an AOR of 2.84 implies that for each unit increase in neighbourhood disorganization, the estimated last month alcohol prevalence in these countries rises with 184%. With an AOR of 1.21 the effect of neighbourhood disorganization is the lowest in the Netherlands.

To recapitulate our findings, Table 8.3 gives a summary of the countries that showed the strongest effects of the investigated neighbourhood variables.

Table 8.3 Summary of the countries with the strongest effects of neighbourhood variables (in AOR)

	Iceland	**Russia**	**Bosnia & Herzegovina**	**Poland**	**Ireland**
Neighbourhood integration	0.64	0.73	0.66	0.70	0.78
Neighbourhood bonding		0.76	0.7		
Neighbourhood disorganization	2.84	1.79		1.69	1.66

8.5 *Alcohol use of youngsters in a multilevel perspective*

So far, however, we have not yet tested whether these differences in effect sizes between the countries in question are meaningful. Therefore, this final section will investigate the use of alcohol among youngsters from a multilevel perspective, testing whether the differences between countries on neighbourhood variables are statistically significant. Table 8.4 presents the results of the conducted multilevel analysis, controlled for grade, gender and immigrant status. Four different models will be subjected to comparison.

The first model (Model 0: Intercept only), without any predictor, indicates an inherent variation in last month prevalence of alcohol drinking in all the countries involved. Compared to a standard logistic analysis multilevel analysis is better: a substantial part of the variance on alcohol last month prevalence is explained by the country in which youngsters live. The differences between countries, for example, explains 9% of the total variance in last month prevalence (Intra-class Correlation Coefficient (ICC) = .09) and the Median Odds Ratio (which measures the influence of the country) is 1.7.

Table 8.4A Logistic multilevel regression models for last month prevalence and the impact of neighbourhood related variables.

	Last month prevalence								
Models	**Model 0: Intercept only**			**Model 1: With background predictors**			**Model 2a: With neighbourhood integration**		
Betas, standard errors (s.e.), and odds ratios (OR)	**b**	**s.e.**	**OR**	**b**	**s.e.**	**OR**	**b**	**s.e.**	**OR**
Fixed part									
Intercept	-.92	.11		-1.63	.11		-1.62	0.11	
Male				.16	.02	1.17	0.16	0.02	1.17
1st generation migrant				-.47	.04	.62	-0.49	0.04	0.61
2nd generation migrant	-0.45	0.03		-.36	.03	.70	-0.37	0.03	0.69
Grade 8				.69	.03	2.00	0.68	0.03	1.97
Grade 9				1.28	.03	3.60	1.26	0.03	3.53
Neighbourhood integration							-0.12	0.01	0.89
Neighbourhood bonding									
Neighbourhood disorganization									
Random part									
Var (intercept)	.31	.09		.31	.09		0.30	0.09	
ICC	0.086			0.085			0.083		
MOR	1.7			1.69			1.68		
Deviance	-33011			-31457			-31387		
N	55218			55218					

Note: All parameter estimates in the fixed part are significant at the p < .01 level

Table 8.4B Logistic multilevel regression models for last month prevalence and the impact of neighbourhood related variables.

	Last month prevalence								
Models	**Model 2b: With neighbourhood bonding**			**Model 2c: With neighbourhood disorganisation**			**Model 3: With all neighbourhood predictors**		
Betas, standard errors (s.e.), and odds ratios (OR)	**b**	**s.e.**	**OR**	**b**	**s.e.**	**OR**	**b**	**s.e.**	**OR**
Fixed part									
Intercept	-1.62	0.11		-1.59	0.12		-1.58	.12	
Male	0.16	0.02	1.17	0.09	0.02	1.1	.1	-.2	1.1
1st generation migrant	-0.5	0.04	0.61	-0.56	0.05	0.57	-.57	.05	0.56
2nd generation migrant	-0.37	0.03	0.69	-0.45	0.03	0.64	-.45	.03	0.64
Grade 8	0.68	0.03	1.98	0.68	0.03	1.98	.67	.03	1.96
Grade 9	1.27	0.03	3.57	1.27	0.03	3.56	1.26	0.3	3.51
Neighbourhood integration							-0.05	0.01	0.95
Neighbourhood bonding	-0.08	0.01	0.92				-0.03	0.1	0.97
Neighbourhood disorganization				0.34	0.01	1.41	0.33	0.1	1.39
Random part									
Var (intercept)	0.30	0.09		0.33	0.1		0.33	0.09	
Rho	0.084			0.09			0.09		
MOR	1.69			1.73			1.73		
Deviance	-31423			-30870			-30847		
N	55218			55218			55218		

Note: All parameter estimates in the fixed part are significant at the p < .01 level

In Model 1 we added the control variables (gender, immigrant status and grade). The loglikelihood test between Model 0 en Model 1 is significant (LR=3107.32, p<0.01). All betas in Model 1 are significant. The table conveys that boys are 1.17 times more likely to have consumed alcohol in the last month than girls. Furthermore, especially first but also second generation migrants are less likely to have consumed alcohol within the last month compared to the natives. Finally, adolescents in the eighth but especially in the ninth grade are much more likely (up to 3.6 times) to have been drinking in the last month than the seventh grade students.

In Model 2 we added the neighbourhood-related variables seperately. We started with the variable neighbourhood integration. This variable lowers the likelihood of alcohol use with 11%. The variable neighbourhood bonding also has a lowering effect on alcohol use (OR=0.92), while neighbourhood disorganization has a positive influence on alcohol use. The likelihood of alcohol consumption improves with an odds ratio of 1.41. Compared to the previous model, we see a decrease in the effect of gender and grade, but an increase of the effect of the immigrant status. However, the addition of neighbourhood variables doesn't have a strong effect on the background variables. Nevertheless, adding one of the neighbourhood variables improves the model every time. The strongest risk factor on alcohol use is neighbourhood disorganization.

In Model 3 we added the three neighbourhood variables together. There is some lowering effect of neighbourhood integration and neighbourhood bonding, and there is a significant influence of neighbourhood desorganization (still 39%). Model 3 is stronger than model 1, but not stronger than Model 2c, with background variables and neighbourhood disorganization only.

8.6 Conclusion and discussion

In this study, we researched the prevalence and level of alcohol and drug consumption and sought out to what extent this activity was influenced by different neighbourhood variables. This study was carried out, drawing on data from 25 European countries. We made use of similar outcome variables and neighbourhood scales which were then controlled for similar background variables. Our study illustrated that neighbourhood integration and neighbourhood bonding have a negative effect on all kinds of substance use. Adolescents who experience social cohesion in their neigbhorhood are less likely to drink alcohol (beer, spirits), and use less soft and hard drugs. If these adolescents feel connected to their neighbourhood, they show similar results. Disorganization, on the other hand, has a positive effect on substance use. When youngsters describe their neighbourhood as disorganized they show higher levels of alcohol use as well as drug use.

If we look at the 25 countries separately, we find that the influence of these variables varies between them. The protective effect of neighbourhood integration, for example, is not significant in nine countries. The effect is the highest for Iceland and the lowest for Italy. The protective effect of neighbourhood bonding is significant in far less countries, namely 10 out of 25. The effect is the largest for Bosnia & Herzegovina and the lowest for Germany. Finally, neighbourhood disorganization increases the likelihood of last month prevalence in all countries, whereby the most profound effect was found in Iceland whilst a minimal effect was found in the Netherlands.
The differences between countries were significant when we researched alcohol consumption in the last month from a multilevel perspective. Here, the influence of the neighbourhood variables, especially neighbourhood disorganization, was also apparent. Nevertheless these variables hardly influenced the variation between countries.

Throughout this study we only looked at the relationship between neighbourhood-related factors and substance use. This created certain limitations for our study, as human actions and development take place within multiple changing environments which influence each other and thereby shape the behaviour of individuals (Bronfenbrenner, 1977). Future studies, therefore, should have a closer look at the interaction effect between neighbourhood factors and variables in other domains, such as family, school, peers and the individual. In addition, we may expect that neighbourhood variables influence variables in these domains (indirect effects).

Nonetheless, what we may conclude from this study is that the influence of the neighbourhood can play a crucial role in alcohol prevention strategies aimed at adolescents. Programs should especially focus on the decrease of neighbourhood disorganization, by combating crime, drug dealing, fighting, graffiti and empty and abandoned buildings. In addition, programs could promote healthy development by targeting the attachment between neighbours, involvement in the neighbourhood, and focusing on the norms and values of individual. Furthermore, social control and prevention of isolation may also enhance integration and bonding in the neighbourhood, which ultimately leads to less alcohol consumption among adolescents.

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9 *Delinquency, Victimization and alcohol involvement*

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9.1 Introduction

The existence of a significant correlation between alcohol and crime has long been recognized in the scientific literature (Graham, West, 2001; Nash-Parker, Auerhanh, 1998; White et al., 1999; Richardson, Budd, 2003). In the literature, various interpretative models have been proposed to explain the relationship between alcohol and delinquency. One such model hypothesises that alcohol leads to crime as a result of both direct and indirect psychopharmacological effects, whereby crimes are committed in order to meet the financial needs of the consumer (Goldstein, 1985). Another holds that alcohol consumption is "determined" by delinquency, in that it is a product of a delinquent lifestyle, of which alcohol abuse is a common feature (Johnston et al., 1978). A third model combines the first two; according to this interpretation, alcohol use and delinquent behaviour exacerbate each other reciprocally (White et al., 1999). Finally, the relationship between alcohol and crime has been seen as spurious, in that both form part of a more general behavioural problem (Jessor et al., 1991).

An aid to interpreting the relationship between alcohol use and delinquency has been provided by the results of some longitudinal studies, which have revealed the temporal sequences of the phenomena under investigation. Dembo and coll. (1991) conducted a cohort study among delinquent youths; after a follow-up of 10-15 months, it emerged that alcohol use often precedes antisocial behaviour. In order to assess the socio-behavioural effects of precocious alcohol use, Ellickson et al. (2003) observed a cohort of young people from the age of 12 years up to the age of 23 years; the authors noted that subjects who drank alcohol at the age of 12-13 years were more likely to become delinquents than were non-drinkers of the same age (Ellickson et al., 2003). Another study, which utilised the data from the National Longitudinal Study of Adolescent Health (NLSAH), confirmed the effect of alcohol use on the involvement of young people in delinquent behaviour, especially violent crime (Resnick et al., 2004).

Other studies have tried to evaluate the effect of delinquency on alcohol use among young people more specifically by examining the effects of delinquency on subsequent alcohol consumption. Windle (1990) analysed the data from the National Longitudinal Youth Survey in order to assess the impact that committing antisocial acts at the age of 14-15 years might have on delinquency 4 or 5 years later. What emerged was that general delinquency (taken as a function of the frequency of non-alcohol-related crime) among young people significantly predicted future alcohol use. Similarly, a study carried out on a sample of 218 males and 213 females aged between 12 and 18 years aimed to ascertain whether the precocious involvement in delinquency led to an increase in alcohol use. The results revealed that, among males, involvement in antisocial acts was a predictive factor for both alcohol use and alcohol-related problems (White et al., 1993). A few years later, these results were reanalysed with the aid of a structural-equations model in order to investigate the relationships over time between alcohol use and delinquency. From this analysis, it emerged that the precocious involvement in violent crime increased alcohol abuse (White, Hansell, 1996).

Other studies have investigated the association between juvenile delinquency and alcohol use on the basis of the interpretative model according to which the relationship between the two phenomena is reciprocal. In this regard, D'Amico and coll. (2008) conducted research on a group of young delinquents in California. After a 1-year follow-up, the authors found that, on the one hand, alcohol use increased the risk of delinquency, while on the other hand, delinquency significantly predicted future alcohol use. Moreover, in an 8-year study conducted on high school students, Xue et al. (2009)

investigated the bidirectional nature of the relationship between alcohol and juvenile delinquency more analytically. Their study confirmed, on the one hand, that the precocious involvement in delinquency was a risk factor for alcohol use, while on the other hand, precocious alcohol use strongly predicted future criminal behaviour, especially violence. The reciprocity of the relationship between alcohol and delinquency was also confirmed by other authors (Brady et al., 2008), who observed that this association was stronger in late adolescence.

The relationships between alcohol use and victimisation have also been amply reported in the literature (Shepherd et al., 1998; Cherpitel et al., 2003). Again, there is evidence of a significant association. Various studies have attempted to explain this association both from the standpoint according to which alcohol use "causes" victimisation and from the opposite standpoint, whereby being the victim of a crime predisposes the subject to involvement in alcohol use. In the first perspective, the researchers highlighted the role both of direct risk factors (e.g. the pharmacological effect of alcohol) and of indirect risk factors (sex, social settings) (Donovan, Jessor, 1978; White et al., 1999). By contrast, the hypothesis that victimisation "induces" alcohol use is supported by the "stress and coping theory" (Lazarus, Folkman, 1984), which postulates that victimisation weakens the coping strategies needed to withstand stress factors; by this token, victims would be driven to drinking in an effort to alleviate the unease caused by their condition (Stewart, 1996; Kilpatrick et al., 1997; Swahn, 2004).

The aims of the present study were to examine the nature and characteristics of the relationships between alcohol use and delinquency and between victimisation and alcohol use, and to evaluate the strength of these relationships in various European countries.

9.2 Materials and methods

9.2.1 Sample

In order to investigate the relationships between alcohol use and delinquency and victimisation, a database regarding the ISRD-2 study (Junger-Tas et al., 2010) was drawn up by selecting a sample of 7th-, 8th- and 9th-grade students (comprising 12- to 16-year-olds) from 25 European countries (N=57,771).

In country-level comparisons, we used only the data collected in medium-sized or large cities, rather than the entire sample (N=33,566).

9.2.2 Measures

Delinquency and related variables

A questionnaire regarding self-reported illegal and risk behaviour was administered, in which two time-frames were considered: "lifetime" and "last year". However, in our analysis we referred to "last year" and distinguished between property and violent offenses. The property offenses considered were: shoplifting, theft from a car, car theft, bicycle theft and burglary. Violent offenses were: group fighting, carrying a weapon, assault, extortion, and bag-snatching. We also distinguished between serious property crime, including stealing from a car, car theft, and burglary, and serious violent crime, including serious assault, extortion and snatching.

In addition to the above indicators, we also considered another variable, "versatility", which combines frequency and seriousness by measuring the number of different types of offences committed (0 = "no offence", 1 = "one kind of offence", 2 = "two kinds of offence", 3 = three or more kinds of offence"), and some factors linked to the lifestyle of young people. Specifically, in the literature it is assumed that juveniles who spend more time in public places are living a lifestyle in which they are more often confronted with opportunities to offend, so we created an index (risky lifestyle) made up of 4 variables related to youngsters criminality (frequency of going out at night, spending a lot of time hanging out with friends, being peer-centred and spending a lot of time in public places with a group of friends).

Moreover, on the grounds that sub-cultural theories of violence and delinquency assume that violent attitudes are a key explanatory component (Wilmers et al., 2002), we also analyzed another variable, which represents attitudes toward violence. This 5-item question measures positive attitudes towards violence by asking respondents to agree (fully or somewhat) or disagree (fully or somewhat)

that a bit of violence is part of the fun; that one needs to make use of force to be respected; if one is attacked, one will hit back; without violence everything would be much more boring; and it is completely normal for boys to want to prove themselves in physical fights with others.

The questionnaire also included six items to measure gang membership[1]. These items were developed by the Eurogang Network (Decker, Weerman, 2005), with the explicit objective of measuring gang membership in a comparative context. An adolescent was considered by the Eurogang Network to be a gang member if he/she scored affirmatively on the first five items; we used in this study a more strict definition, considering as gang member only adolescents who scored affirmatively on the six items (Cronbach's alpha for this scale is .77).

In order to refine our analysis of gang membership, we put forward the hypothesis that there is a continuum between a well-socialized group and a youth gang, and utilised a Mokken Scale Analysis to classify the various degrees of involvement in gangs ("gangness"). This is a hierarchical scaling method and is similar to Guttman scaling (but probabilistic, not deterministic). Both techniques assume the existence of an underlying latent (unobservable) attribute, which is represented by a set of items related to the latent attribute. In addition, the items must have a hierarchical property, since the scaling method is hierarchical.

The hierarchical property of the items means that they can be ordered by rank, so that any individual who agrees with a particular item will also agree with all the items ranked below it. Scalability must be verified. Unscalable items are left out of the analysis. A limited number of errors can be accepted; the H parameter indicates the number of errors. The calculation of Hi (regarding each item) and H (regarding the total scale) depends on comparing the probability of errors in ranking with the probability of such a ranking occurring if the items were unrelated. An error consists of a positive answer to a more serious item (question) and a negative answer to a less serious item (question). If the Hi is lower than .30, the item is left out. We found that each Hi was > .40 and H = .60.

An individual's score on the scale is the total number of positive replies; on our scale, the individuals score corresponds to the sum of the positive replies to the 6 questions utilised to define a gang.

Alcohol use

Alcohol use was measured by means of questions concerning lifetime alcohol consumption, age on first use, whether or not the respondent had ever got drunk, and consumption during the last month use. We also attempted to measure the amount of drinking, whether the responder drank alone, whether drinking had come to the attention of adults (parents, police, teachers, or others), and whether or not the respondent had been punished.

For our purpose, we mainly used 4 variables as indicators of alcohol involvement: lifetime consumption of alcohol, consumption within the last 4 weeks, getting drunk at least once, and consumption of 5 or more units of alcohol on the last occasion of drinking.

Victimisation

The questionnaire included 4 items regarding victimisation during the last 12 months (robbery/extortion, assault, theft and bullying); however, we referred only to the most serious offenses (not bullying). In order to assess victimisation more accurately, we introduced a cumulative variable to indicate whether the individual had been a victim of at least one of the three offences.

Country clusters

In accordance with the ISRD-2 study, we grouped the 25 countries into 5 clusters.

- The Anglo-Saxon cluster, represented by Ireland.
- The Western European cluster, comprising Germany, France, Belgium, Netherlands, Austria and Switzerland.
- The Scandinavian cluster, covering all Northern countries (Finland, Sweden, Norway, Denmark and Iceland).
- The Southern European cluster, grouping Spain, Italy, Portugal and Cyprus.
- The Post-Socialist countries, which are considered as a category apart and comprise the Czech Republic, Poland, Hungary, Estonia, Lithuania, Slovenia, Bosnia, Armenia and Russia.

1 The Eurogang Network uses the following six questions: 1) Do you have a group of friends? 2) How long has this group existed (> 3 months)? 3) Does this group spend a lot of time together in public places? 4) Is doing illegal things accepted by your group? 5) Do people in your group actually do illegal things together? 6) Do you consider your group a gang?

A further aspect to be borne in mind concerns the presence of different cultural and social attitudes towards drinking in the various countries considered. On the basis of the prevalent modality of alcohol consumption in the country, we can distinguish between "dry countries", where drinking tends to be of the "binge" type (infrequent but recurrently heavy drinking), as traditionally in Northern European culture, and "wet countries", where drinking has a more "social" nature (frequent consumption of moderate amounts of alcohol, i.e. alcohol use integrated into everyday life), as is typical of Southern European countries (Beccaria, Vidoni, 2002).

9.3 Methods

The study was conducted in different phases.

In the first phase, we analysed the diffusion of the various patterns of alcohol consumption (alcohol use at least once in the subject's lifetime; drinking during the last month; being drunk at least once in the subject's lifetime, and drinking 5 or more units of alcohol on the last occasion of drinking) among the adolescents who had/had not reported episodes of delinquency (having committed a least one offence; having committed one or more serious offences against persons; having committed one or more serious property offences), and among youths who had/had not reported episodes of victimisation (having been the victim of robbery, assault or theft).

In the second phase, we conducted a statistical-epidemiological analysis of the nature and characteristics of the relationships between delinquency and alcohol use among young people in the 25 countries considered. Specifically, we correlated the indicators of delinquency with the variables concerning the patterns of alcohol use, and conducted regression analyses, controlling for sex, age and migration in order to exclude spurious relationships. In addition, we examined the weight of the other factors linked to delinquency (delinquent lifestyle and positive attitudes towards violence) with respect to alcohol use.

In the third phase, we assessed whether the involvement in youth groups played a role in alcohol consumption. To do so, we analysed the relationships between the various indicators of alcohol use and the various degrees of involvement in delinquent groups, as classified on the basis of the score obtained on the Mokken scale (gang scale). We also conducted regression analyses in order to exclude spurious relationships between gang membership and alcohol use.

After analysing the various aspects of the association between alcohol use and juvenile delinquency on the whole sample, we examined the specific weight of this interaction in the countries considered, which, as mentioned above, were grouped into clusters on the basis of cultural and geographic similarities.

Finally, we examined the relationship between alcohol use and victimisation. Specifically, after examining patterns of alcohol use among adolescents who had/had not been victims of offences, we investigated whether victimisation could have a noticeable impact on alcohol consumption.

9.4 Results

Table 9.1 reports the prevalence rates of four different patterns of alcohol use among young people who: had not committed any offences; had committed a least one offence; had committed at least one serious violent offence against persons (assault, robbery, snatching) or at least one serious property offence (theft from a car, motor vehicle theft, burglary) during the last year.

Table 9.1 Prevalence rates of alcohol use by delinquency (N=57,771) Source: ISRD-2

	No offence	1 or more offences	1 or more serious violent offences	1 or more serious property offences
Alcohol lifetime	56.2%	86.30%	89.8%	90.7%
Alcohol last month	24.0%	55.50%	69.0%	69.0%
Drunkenness lifetime	18.5%	51.90%	65.5%	67.5%
Binge drinking last time	9.2%	32.9%	49.0%	51.0%

As can be seen, the youths who had not committed any offences displayed lower prevalence rates on all the indicators of alcohol use. By contrast, the values proved to be higher among youths who had committed a least one offence, and higher still among those who had committed one or more serious offences against persons or property. Moreover, these figures show that the differences between delinquents and non-delinquents are greater with regard to the more serious forms of alcohol abuse; this is especially true of binge drinking, for which the prevalence rate among youths who had committed a serious offence (against persons or property) proved to be five times higher than among those who had not committed any offences (9.2% vs. 49% and 51%, respectively).

Table 9.2 shows the prevalence rates of the four indicators of alcohol use in relation to the variable "versatility", which, as mentioned above, combines frequency and seriousness by measuring the number of different types of offences committed.

Table 9.2 Prevalence rates of alcohol use by versatility (N=57,771) Source: ISRD-2

	Versatility			
	none	1 offence	2 kinds of offence	3 or more kinds of offence
Alcohol lifetime	56.3%	83.1%	88.1%	93.4%
Alcohol last month	24.0%	47.4%	60.0%	73.7%
Drunkenness lifetime	18.5%	42.8%	56.0%	73.1%
Binge last time	9.2%	24.3%	34.9%	54.9%

The table shows that, as the number of types of offence committed rises, the percentage of subjects who have used alcohol increases. In this case, too, the greatest differences can be seen with regard to the more serious forms of alcohol abuse, particularly binge drinking.

To better evaluate the relationship between alcohol use and involvement in antisocial behaviours, we carried out a factorial analysis using dichotomic variables indicative of the prevalence of various offences in the last 12 months (vandalism, robbery, shoplifting, housebreaking, bicycle theft, car theft, theft from a car, bag-snatching, carrying a weapon, fighting, assault) and the use of alcohol (lifetime use, use in the last 4 weeks, lifetime drunkenness, binge drinking last time). We eliminated from the analysis two variables (shoplifting and robbery, which fell simultaneously within two factors); we then extracted three factors. The first, defined as "involvement in alcohol use" (Cronbach's Alpha .77), comprises the four items regarding the different patterns of alcohol use; the second, called "involvement in property offences" (Cronbach's Alpha .63), is made up of five items concerning theft (burglary, bicycle theft, car theft, theft from a car, bag-snatching); and the third, called "involvement in violent offences" (Cronbach's Alpha .60), comprises four items regarding violent offences against persons (carrying a weapon, fighting, assault) or property (vandalism). By summing the values of the items (all dichotomic) of each of the three factors, we constructed three indexes, which we called *alcohol4* (involvement in alcohol use), *theft5* (involvement in property offences) and *violence4* (involvement in violent offences).

Tables 9.3 and 9.4 show the prevalence rates of the four patterns of alcohol use in relation to the involvement in property offences (theft5) and violent offences (violence4) of different degrees of seriousness.

It is interesting that, for both indexes, the prevalence rates of all four patterns of alcohol use steadily increase as the degree of criminal involvement rises. In other words, as “delinquency” increases, so too does alcohol use.

Table 9.3 Prevalence rates of alcohol use by involvement in violence (N=57,771) - Source: ISRD-2

	Violence involvement				
	0	1	2	3	4
Alcohol lifetime	57.5%	83.7%	89.7%	94.0%	95.7%
Alcohol last month	25.2%	49.3%	64.4%	73.2%	79.7%
Drunkenness lifetime	19.8%	44.7%	62.1%	73.2%	80.7%
Binge last time	10.0%	26.5%	41.1%	54.8%	66.5%

Table 9.4 Prevalence rates of alcohol use by involvement in theft (N=57,771) - Source: ISRD-2

	Theft involvement					
	0	1	2	3	4	5
Alcohol lifetime	61.6%	90.9%	90.3%	91.5%	93.7%	100%
Alcohol last month	29.2%	67.0%	74.4%	75.5%	85.7%	81.4%
Drunkenness lifetime	24.1%	63.2%	71.6%	75.5%	87.1%	76.6%
Binge last time	12.9%	43.9%	58.1%	65.7%	75.4%	75.0%

Moreover, it can be seen that, for both indexes, the differences between the score 0 and the score 1 are the greatest, the gap being of about 25% for involvement in violence and 30% for involvement in theft.

To better assess the link between involvement in delinquency and alcohol use, we examined the associations between the indexes of criminal involvement (theft5 and violence4) and the various indexes of alcohol use (lifetime consumption, consumption in the last month, lifetime drunkenness, binge drinking last time and alcohol involvement). Table 9.5 shows the results of these correlations.

Table 9.5 Correlations between alcohol use indexes and involvement in violence and theft (N=57,771) - Source: ISRD-2

	Involvement in theft	**Involvement in violence**	**Versatility**	**Alcohol lifetime**	**Alcohol last month**	**Drunkenness lifetime**	**Binge drinking last time**
Involvement in violence	.419	1					
Versatility	.495	.904	1				
Alcohol lifetime	.099	.215	.243	1			
Alcohol last Month	.148	.262	.298	.515	1		
Drunkenness lifetime	.165	.299	.337	.455	.484	1	
Binge drinking last time	.188	.288	.320	.319	.383	.532	1
Alcohol involvement	.191	.343	.387	.776	.794	.800	.686

All: $p < .001$

These results indicate that alcohol use is correlated with all types of delinquency, and that violent offences are more closely associated with every form of alcohol use than are property offences.
In Table 9.6 the variables sex, age and migration are included in the correlation analysis.

Table 9.6 Correlations between alcohol involvement, involvement in violence, involvement in theft, gender, age and migration (N=57,771) - Source: ISRD-2

	Involvement in violence	Versatility	Alcohol involvement	Gender (male)	Age	Migrant
Involvement in theft	.419***	.495***	.191***	.094***	.066***	.031***
Involvement in violence	1	.904***	.343***	.198***	.088***	.036***
Versatility		1	.387***	.184***	.103***	.042***
Alcohol involvement			1	.055***	.339***	-.047***
Gender (male)				1	.024***	.009**
Age					1	.052***

*P<001 **p<.05 ***p<.001

As can be seen, the correlation between involvement in alcohol use and delinquency is particularly strong, especially with regard to the index of involvement in violent offences and the variable "versatility".

Male sex and age are correlated with both delinquency and alcohol use, while immigrant status is correlated positively with delinquency and negatively with alcohol use. On the basis of these findings, and in order to avoid considering spurious relationships, we carried out a series of regression analyses to evaluate the nature of the associations between the indexes of "delinquency" (theft5, violence4 and versatility), when considered as independent variables, and the index of involvement in alcohol use (alcol4), considered as the dependent variable, on controlling for sex, age and migration.

Table 9.7 shows that all the indexes of delinquency have a significant impact on the involvement in alcohol use, with particularly high values emerging with regard to violent offences and "versatility".

Table 9.7 Alcohol involvement by versatility, involvement in violence and involvement in theft, on controlling for gender, age and migration. Linear Regressions (N=57,771) - Source: ISRD-2

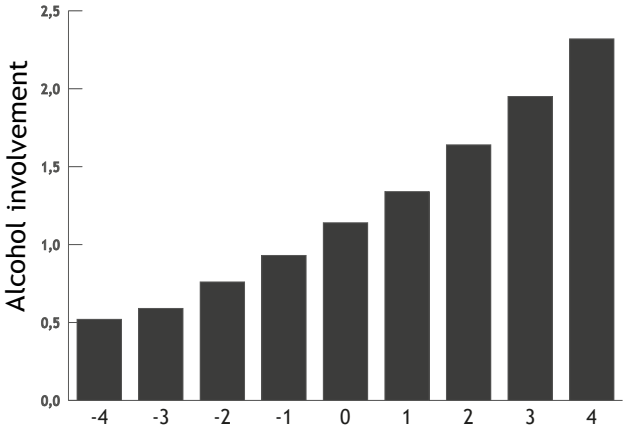
	Alcohol involvement		
	Model 1	Model 2	Model 3
	Beta coefficients		
Involvement in theft	.169***		
Involvement in violence		.323***	
Versatility			.364***
Gender (male)	.029***	-.018***	-.020***
Age	.336***	.318***	.308***
Migrant	-.082***	-.089***	-.094***
R2 adj.	.152	.223	.250

***p<.001

The nature of the association between alcohol use in delinquency was further investigated by considering other factors linked to delinquency. The cumulative variable "risky lifestyle" was used to analyse the relationship between a risky style of life and alcohol use.

As will be seen in Figure 9.1, the values of involvement in alcohol use steadily increase as the level of risky lifestyle rises.

Figure 9.1 Alcohol involvement by risky lifestyle



Means (N=57.771)n Source: ISRD-2

Table 9.8 shows the values of the various indicators of a positive attitude towards violent behaviour in relation to alcohol use.

Table 9.8 Alcohol involvement by positive attitude towards violence (N=57,771) - Source: ISRD-2

		Positive attitude towards violence
Alcohol involvement	0	26.79
	1	31.16
	2	35.19
	3	40.73
	4	45.81

As shown in the table, a positive attitude towards violence displays an increasing trend as the index of alcohol involvement increases.

Another aspect that we investigated was the question of whether the involvement in youth gangs plays a role in alcohol use. First of all, we examined the prevalence rates of the indexes of alcohol use in relation to various degrees of involvement in delinquent groups, as classified on the basis of the score obtained on the Mokken scale (gang scale).

In Table 9.9, it can be seen that the prevalence rates of all the indexes of alcohol use rise significantly as the value of the "gangness" score rises. Indeed, with the exception of the score 0 (for which the indexes of alcohol use are always slightly higher than for the score 1), from scores 1 to 6 (maximum) the values of the alcohol use indexes increase uniformly, suggesting the existence of a significant association between involvement in delinquent youth groups and alcohol use, particularly alcohol abuse (drunkenness and binge drinking).

Table 9.9 Prevalence rates of alcohol use by gang scale (N=57,771) - Source: ISRD-2

	Gang scale						
	0	1	2	3	4	5	6
Alcohol lifetime	50.7%	49.2%	53.4%	63.5%	74.8%	87.1%	87.5%
Alcohol last month	20.2%	18.2%	21.3%	28.1%	41.3%	60.3%	66.0%
Drunkenness lifetime	15.2%	13.2%	14.7%	22.0%	37.2%	58.9%	64.7%
Binge last time	7.9%	7.2%	7.5%	10.8%	20.5%	37.0%	44.5%

Moreover, since the score 0 represents youths who do not frequent a group of friends, while the score 1 indicates youths who frequent non-delinquent peers, it would seem that having a well-socialised group of friends is a protective factor against alcohol use. However, when the group of friends is of a deviant type (scores 2-6), all patterns of alcohol use increase markedly, and at the highest levels of

“gangness”, the use and abuse of alcohol are even more evident. Similar results emerge when the various “gangness” (gang scale) scores are analysed in relation to the index of involvement in alcohol use (alcol4), as shown in Table 9.10.

Table 9.10 Alcohol involvement by gang scale (N=57,771) - Source: ISRD-2

	Gang scale						
	0	**1**	**2**	**3**	**4**	**5**	**6**
Alcohol involvement	0.93	0.86	0.96	1.23	1.72	2.42	2.61

To better assess the relationship between youth gang membership and the use of alcohol, we examined the association between the dichotomic index “gang membership/non-membership” and the index of involvement in alcohol use.

Table 9.11 reports the results of the correlations among the variables “gang”, alcohol involvement, sex, age and migration.

Table 9.11 Correlations among alcohol involvement, gender, age and migration (N=57,771) - Source: ISRD-2 (*p<.05 **p<01 ***p<.001)

	Alcohol involvement	**Gender**	**Age**	**Migrant**
Gang	.210*	.079*	.073*	.043*
Alcohol involvement	1	.055*	.339*	-.047*
Gender (male)		1	.024*	.009**
Age			1	.052*

As can be seen, alcohol use correlates with gang membership.

The correlation between belonging to a delinquent youth group and involvement in the use of alcohol is confirmed in Table 9.12, which shows the results of regression analysis between gang membership as an independent variable and the index of involvement in alcohol use as the dependent variable, on controlling for sex, age and migration.

Table 9.12 Alcohol involvement by gang membership, on controlling for gender, age and migration. Linear Regressions (N=57,771) - Source: ISRD-2

	Alcohol involvement
	Beta coefficients
Gang	.187*
Gender (male)	.041*
Age	.344***
Migrant	-.075*
R2 adj.	.167

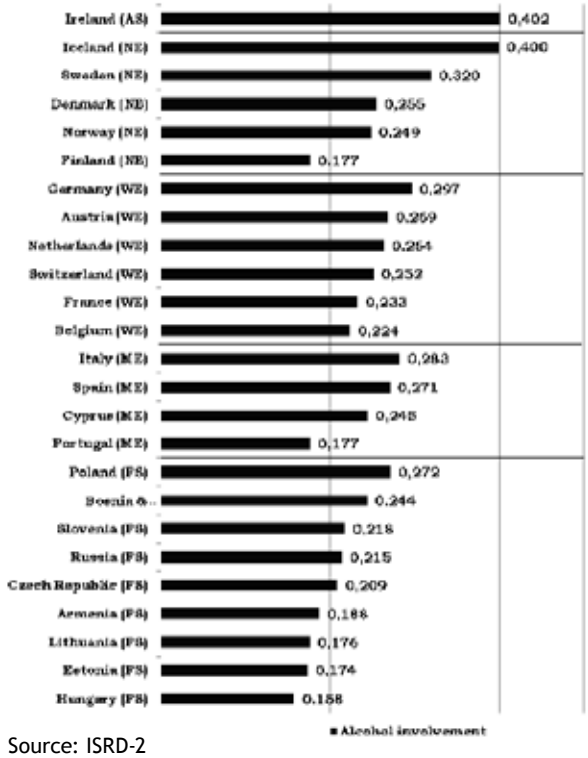
*p<.05 **p<.01 **p<.001

In the light of the results obtained on the overall sample, we investigated whether that there were significant differences among the 25 European countries considered. In this analysis, only the data collected in medium-sized or large cities were used (N=33,566).

Figures 9.2, 9.3 and 9.4 provide graphic representations of the results of the regression analyses carried out in order to assess the nature of the relationships between the indexes of “delinquency” (versatility, violence4 and theft5), considered as independent variables, and the index of involvement in alcohol use (alcol4), as a dependent variable, among youths in the 25 countries, on controlling for sex, age and migration.

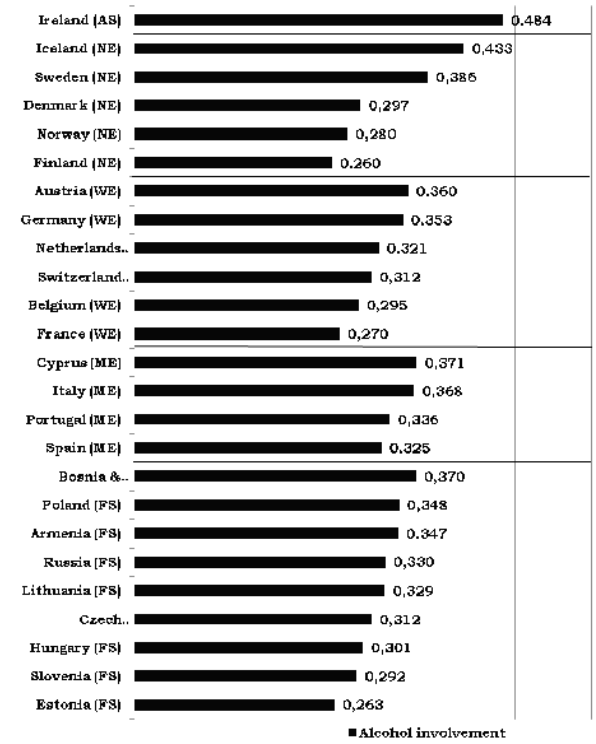
It is immediately noticeable that involvement in alcohol use is significantly correlated with all the delinquency indexes in all 25 countries. With specific regard to the relationship between versatility and alcohol use, a very close correlation can be seen in the majority of countries; this is especially evident in Ireland, the only country considered to represent the Anglo-Saxon culture (Figure 9. 2).

Figure 9.2 Effects of versatility on alcohol involvement controlling by gender, age and migration linear regressions. Beta coëfficiënt (N=33.566)



Source: ISRD-2

Figure 9.3 Effects of involvement in violence on alcohol involvement on controlling for gender, age and migration Lineair regressions. Beta coëfficiënt (N=33.536)



Source: ISRD-2

Figure 9.3 shows that the relationship between involvement in violent offences and alcohol use is also very close in the various countries, especially Ireland and Iceland. It is interesting to note that the values recorded in the cluster of Scandinavian countries (except for Sweden) are relatively low in comparison with those of the Southern European cluster, even though the latter countries are characterised by a culture of “social” (rather than binge) drinking.

Figure 9.4 Effects of ivolvement in theft on alcohol involvement on controlling for gender, age and migration
Lineair regressions. Beta coëfficiënts (N=33.566)

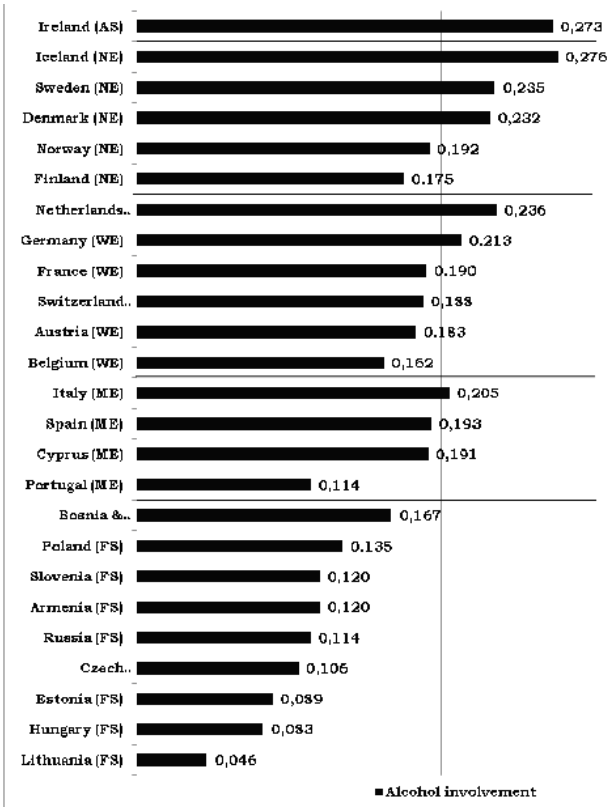
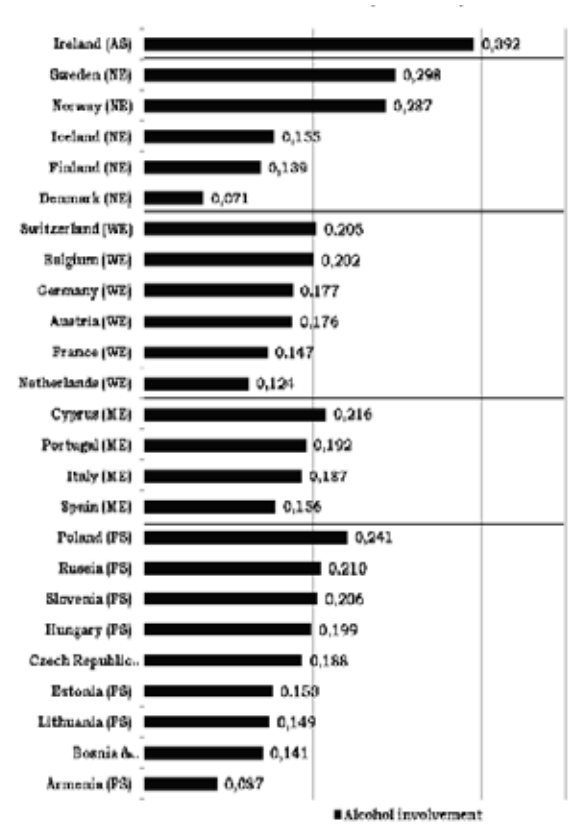


Figure 9.4 depicts the relationship between alcohol use and property offences. What emerges is that, with the exception of Bosnia, the cluster of "post-socialist" countries displays generally lower values.
With regard to this type of offence, Ireland and Iceland again emerge as the countries with the highest values of correlation.

The most significant aspect, however, is the fact that, in all countries, the correlation between alcohol use and involvement in violent offences is stronger than the correlation between alcohol use and property offences, thus confirming the close relationship between alcohol and violence.
The link between alcohol use and versatility is also evident in all of the countries considered.
Figure 9.5 depicts the weight of the association between belonging to a delinquent youth group and involvement in alcohol use in the 25 countries considered, on controlling for sex, age and migration. This analysis clearly confirms the close relationship between gang membership and alcohol use in the countries considered (except for Denmark and Armenia).

Figure 9.5 Effects of gang membership on alcolholinvolvement on controlling for gender, age and migration
Lineair regressions. Beta coëfficiënts (N=33.566)



Specifically, this association appears to be particularly strong in Ireland, and moderately robust in Sweden, Norway and Poland.

Finally, we investigated the possible link between alcohol use and victimisation among young people. Table 9.13 reports the prevalence rates of the four indexes of alcohol use among young people who have been the victim of a least one offence and among those who have not been victimised.

Table 9.13. Prevalence rates of alcohol use by victimization (N=57,771) - Source: ISRD-2

	Victimization	No Victimization
Alcohol lifetime	72.7%	60.2%
Alcohol last month	40.2%	28.3%
Drunkenness lifetime	36.2%	22.7%
Binge last time	20.9%	12.5%

The table shows that alcohol use is significantly higher among those who have been victims of offences than among non-victims, and that alcohol abuse is particularly frequent (drunkenness 36.2% and binge drinking 20.9%).

In order to investigate the link between alcohol use and victimisation more thoroughly, we correlated the cumulative variable "victimisation" (having been a victim of robbery, assault or theft in the last year) with the index of involvement in alcohol use and the variables sex, age and migration.

Table 9.14 Correlations between alcohol involvement, victimization, gender, age and migration (N=57,771) Source: ISRD-2

	Alcohol involvement	Gender	Age	Migrant
Victimization	.146*	.059*	.038*	.042*
Alcohol involvement	1	.055*	.339*	-.047*
Gender (male)		1	.024*	.009**
Age			1	.052*

*p<.05 **p<.01 ***p<.001

As can be seen, alcohol use correlates significantly with victimisation. In order to gain a clearer picture of the nature of this association, we conducted a regression analysis between victimisation, considered as an independent variable, and the index of alcohol use (alcol4) as a dependent variable, on controlling for sex, age and migration. Confirmation that being the victim of an offence is correlated with alcohol use can be seen in Table 9.15.

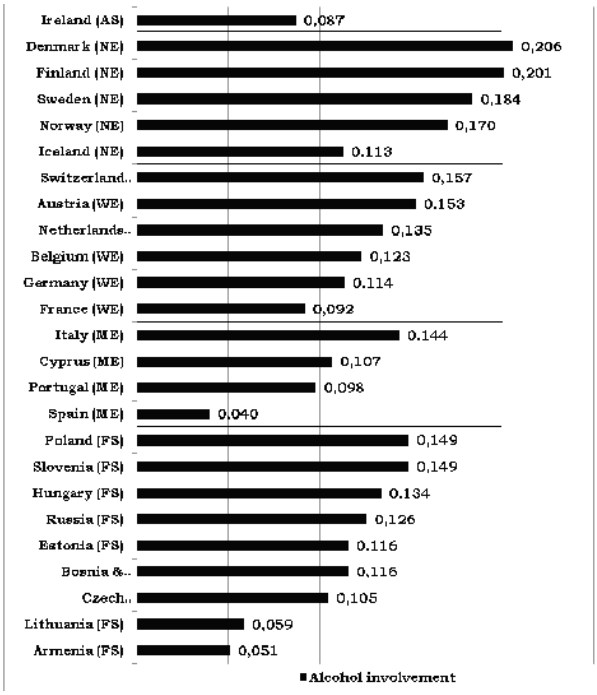
Table 9.15. Alcohol involvement by victimization, on controlling for gender, age and migration. Linear Regressions (N=57,771) - Source: ISRD-2

	Alcohol involvement Beta coefficients
Victimization	.135*
Gender (male)	.039*
Age	.340*
Migrant	-.082*
R^2 *adj.*	.143

*p<.05 **p<.01 ***p<.001

Figure 9.6 provides a graphic representation of the results of the regression analyses carried out in order to evaluate the relationship between victimisation and alcohol use in the 25 European countries considered, on controlling for sex, age and migration. These results confirm the marked association between victimisation and alcohol use.

Figure 9.6 Effect of victimization on alcohol involvement on controlling for gender, age and migration
Lineair regressions. Beta coëfficiënts (N=33.566)



Specifically, this association proved to be stronger in the cluster of Scandinavian countries, while it is clearly weaker in those countries with a culture of "social" drinking (except for Italy).

9.5 Conclusions and recommendations

The present study aimed at investigating the relationships between alcohol use and delinquency and victimization among juveniles.

In agreement with the literature data (Felson et al., 2004; Maldonado-Molina et al., 2009), the most important finding was that alcohol consumption proved to be particularly widespread both among young people who commit offences and among those who are victims of offences. In particular, it emerged that alcohol abuse (drunkenness and binge drinking) was most strongly associated with both delinquency and victimisation among young people.

For what specifically concerns the relationship between alcohol use and delinquency, after selecting and analysing factorial indexes of involvement in alcohol use, property offences and violence, we observed that alcohol consumption increased as the degree of delinquency increased. Unfortunately, as this was a cross-sectional study, it was not possible to ascertain the temporal sequence of alcohol use and delinquency. This means that it was practically impossible to establish the direction of any cause-effect relationship between the two phenomena. Nevertheless, the relationships that emerged clearly confirm the existence of a close link between alcohol use and juvenile delinquency. In the light of numerous longitudinal studies (Brady et al., 2008; D'Amico et al., 2008; Xue et al., 2009), however, this relationship seems to be reciprocal rather than one-directional.

Another interesting aspect is that all the indexes of alcohol consumption proved to be more strongly correlated with violent offences than with property offences. A possible explanation for this may be that violent offences are generally committed in a more impulsive manner than property offences. This notion is in line with the findings of several experimental studies, which have demonstrated that alcohol consumption exerts a direct effect on aggressiveness and violence (Pernanen et al., 2002; Norström & Pape, 2010) and that it may play an important role in unplanned offences (Felson et al., 2008).

In addition, it is noteworthy that alcohol use proved to correlate particularly strongly with the variable "versatility", thus suggesting that the gravity of delinquent behaviour (represented in this case by the commission of several types of offence) is closely linked to alcohol consumption.

Of particular importance were the analyses conducted to evaluate the relationship between alcohol use and various psychosocial factors: lifestyle, temperament (inclination to violence) and gang membership. Indeed, it emerged that a deviant lifestyle was significantly associated with alcohol consumption, thus raising the possibility that a delinquent lifestyle could provide the context and peer associations to facilitate alcohol use (White & Hansell 1996).

Likewise, temperamental features also proved to be closely linked to alcohol use. Indeed, the propensity to violence increases in relation to the degree of involvement in alcohol use. It is therefore evident that this personality variable is a risk factor both for alcohol use and delinquency, and that, as such, it must always be given the greatest consideration (Buker, 2011).

Frequenting youth groups or belonging to a gang also appeared to play an important role in the patterns of alcohol consumption. Indeed, the data seem to suggest that the presence of socially well-integrated peers, as opposed to the absence of friends, is a protective factor against alcohol use. If, however, the peer group is of a delinquent type, all forms of alcohol use increase significantly.

Examination of the results of these analyses in the individual countries substantially confirms the presence of an association between alcohol use and delinquency. In particular, in all of the countries, alcohol use correlated more closely with "versatility" and violent offences than with property offences.

Ireland, which was the only country that represented an Anglo-Saxon type of culture, displayed the strongest correlation between alcohol and delinquency.

An interesting aspect is that no particularly significant differences emerged between countries where binge-type drinking patterns are more common (so-called "dry countries") and those where alcohol consumption displays a more "social" nature (so-called "wet countries"). In view of the fact that binge drinking is most closely associated with delinquency, a possible explanation for this finding may be that the Northern European model of alcohol consumption (infrequent but recurrently heavy drinking) has been adopted by youths in the various other countries.

Finally, in agreement with the literature data (Finkelhor et al. 2005; Shepherd et al., 2006), we observed that alcohol use correlated significantly with victimisation. In particular, alcohol consumption proved to be closely associated with the experience of being a victim of violent offences, a finding which is in line with those of other studies (Morojele & Brook, 2006). These results were confirmed by our analyses of the individual countries, which revealed that the link between alcohol consumption and victimisation was particularly close in Scandinavian countries, while it was less evident in Southern European countries.

The bulk of the evidence in this study indicates that alcohol use is linked to both delinquency and victimization among juveniles, and that binge-type consumption patterns are most closely associated with the likelihood both of committing and of suffering criminal offences.

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10 Self-control

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10.1 Introduction

This report deals with the notion of self-control and examines its relationship to alcohol and soft drug use among juveniles. Self-control is a key concept of the general theory of crime formulated by Gottfredson and Hirschi (1990). This theory declares its applicability not only to crime, but also to "analogous acts" which include alcohol and drug use as well and, therefore, it is highly relevant for substance use research.

Gottfredson and Hirschi analyzed the features of crime and out of them, they tried to deduce the characteristics of offenders which they then subsumed under the concept of low self-control. "In sum, people who lack self-control will tend to be impulsive, insensitive, physical (as opposed to mental), risk-taking, short-sighted, and nonverbal, and they will tend therefore to engage in criminal and analogous acts." (Gottfredson, & Hirschi, 1990, p. 90). Low self-control is declared to be the only important propensity for the involvement in crime and deviance; its influence is, however, not deterministic and it is affected, above all, by the structure of opportunities to various forms of deviance (cf. Cohen, & Felson, 1979).

Gottfredson and Hirschi studied also the genesis of self-control and they stress the fundamental importance of socialization in the family. In their opinion, high self-control develops through good consistent parenting practices – parents must be able to supervise their children, recognize their deviant behavior and punished them adequately for it. If this process works well in the early childhood, high self-control is successfully developed; if not, there is only little chance for improvement through later socialization. In this respect, the level of self-control is considered to be a relatively stable trait once it was formed in early childhood.

The general theory of crime definitely belongs to the most influential criminological theories and there were countless attempts to test empirically its different parts. Even though not all its claims can find unconditional support, the concept of self-control proves to be an important correlate of crime (Pratt, & Cullen, 2000). There are two major approaches to measuring self-control. The first relies on attitudinal scales, out of them the most popular is the one suggested by Grasmick at al. (1993). They identified six dimensions of self-control in Gottfredson and Hirschi's text which they operationalized, empirically tested and finally proposed 24-item scale in which each dimension is covered by four questions. The second approach measures self-control by its various manifestations. Although Hirschi and Gottfredson (1993) declared their support to the later, behavioral, measures, a meta-analysis conducted by Pratt and Cullen (2000) revealed that there is not much difference in results whatever approach is used.

10.2 Methodology

We use data from ISRD-2 for European countries limited to 12-16 year old children (see chapter 2). Two sampling designs were allowed in ISRD-2 study: city based samples and national representative samples. Therefore, we further limit our dataset to only large and medium cities when comparing descriptive statistics across countries (Figures 10.2-10.4); otherwise, the whole sample is used.

The focus of our analysis is on substance use which can be measured by different ways. In this paper we concentrate on six binary variables: two indicating general experience with alcohol (life-time

and last month prevalence); two measuring excessive drinking (binge drinking on the last occasion and drunkenness ever during the life-time); marihuana/hashish life-time use; and abstinence from both alcohol and soft and hard drugs.

10.3 Results

10.3.1 Self-control scale

The self-control scale used in ISRD-2 includes 12 items from the original Grasmick et al. scale (1993) and is supposed to cover four dimensions of self-control: impulsivity, risk-taking, self-centeredness, and temper (three items per each dimension). The items used in the questionnaire were following:

1. I act on the spur of the moment without stopping to think.
2. I do whatever brings me pleasure here and now, even at the cost of some distant goal.
3. I'm more concerned with what happens to me in the short run than in the long run.
4. I like to test myself every now and then by doing something a little risky.
5. Sometimes I will take a risk just for the fun of it.
6. Excitement and adventure are more important to me than security.
7. I try to look out for myself first, even if it means making things difficult for other people.
8. If things I do upset people, it's their problem not mine.
9. I will try to get the things I want even when I know it's causing problems for other people.
10. I lose my temper pretty easily.
11. When I'm really angry, other people better stay away from me.
12. When I have a serious disagreement with someone, it's usually hard for me to talk calmly about it without getting upset.

We performed exploratory factor analysis to find out if the four dimensions can be clearly distinguished in our data (see Table 10.1). Both the Kaiser criterion and scree plot suggest that a three factor solution would be preferable, but several items would not belong to any factor in this case. If a four-factor solution is forced, the four original dimensions can be well identified, with the only exception of impulsivity which has relatively low factor loadings on two of three items. The results of factor analysis are supportive of the use of a single dimension (i.e. overall self-control) as well – all factor loadings are reasonably high in the first dimension of unrotated solution and, furthermore, the size of correlations between four dimensions is relatively high for all pairs (it ranges from 0.48 to 0.64 in absolute values).

Table 10.1 Results of factor analysis (pattern matrix)

	Factor			
	self-centered	**risk taking**	**temper**	**impulsivity**
act on spur of moment	0.01	-0.03	0.09	0.47
act for short pleasure	0.04	0.03	-0.08	0.80
more concerned w/ short run	-0.01	-0.11	0.12	0.26
do risky things	-0.07	-0.75	0.08	-0.01
risk just for fun	0.03	-0.87	-0.04	-0.03
excitement important	0.13	-0.55	-0.04	0.11
look out for myself first	0.57	0.02	0.03	-0.01
don‘t mind upsetting others	0.67	-0.01	-0.03	0.02
don‘t mind causing problems	0.68	-0.04	0.05	0.01
lose temper easily	-0.00	0.01	0.67	0.04
people stay away if angry	0.04	-0.05	0.63	-0.03
hard to discuss calmly	0.02	0.03	0.62	0.02

Extraction Method: Principal Axis Factoring; Rotation Method: Oblimin with Kaiser Normalization Source: ISRD-2

Reliability analysis (Table 10.2) shows that Cronbach alpha is highly satisfactory for the overall scale (α=0.83), acceptable for risk-taking, self-centeredness, and temper, but quite low for impulsivity (α=0.57), which is not unexpected considering the results of factor analysis.

There are also substantial variations among countries, both in factor analysis results (not presented here) and in scale reliability (see Table 10.2) which again identifies impulsivity as the most problematic dimension which has extremely low reliability in some countries (e.g. Cronbach alpha in Armenia is only 0.4). For further analysis of self-control scale in ISRD-2, see Marshall and Enzmann (2011).

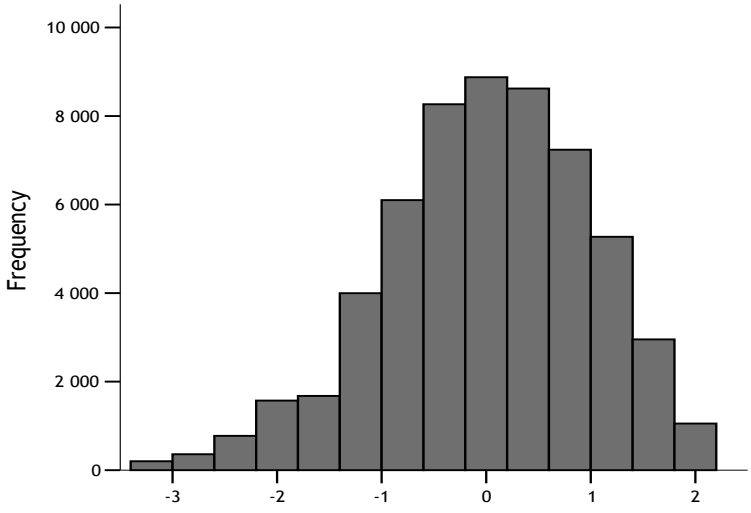
Table 10.2 Reliability analysis (Cronbach alphas reported)

	all countries	**minimum**	**maximum**
impulsivity	0.57	0.36 (Armenia)	0.70 (Norway)
risk taking	0.79	0.60 (Armenia)	0.86 (Iceland)
self-centeredness	0.69	0.64 (Belgium)	0.78 (Portugal)
temper	0.69	0.60 (Lithuania)	0.75 (Denmark)
self-control scale	0.83	0.77 (Armenia)	0.88 (Norway)

Source: ISRD-2

In subsequent analysis, the self-control scale created from all 12 items[1] will be our primary focus, although we will present some results also for the four dimensions separately. The following Figure 10.1 shows the distribution of the self-control scale. The shape resembles normal distribution, but it is somewhat skewed to the left.

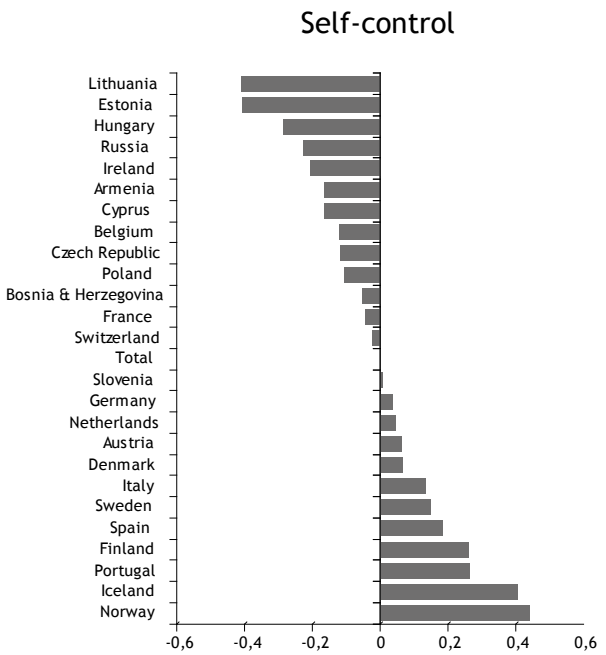
Figure 10.1 Histogram of self-control (standardized)



The average level of self-control differs considerably across countries, the span between the lowest and highest average being almost one standard deviation (see Figure 10.2). The lowest self-control can be found in Eastern European countries and in Ireland; on the other hand, the highest is in Scandinavian countries and in Mediterranean countries (except for Cyprus). Self-control in Western Europe usually oscillates near the total European average.

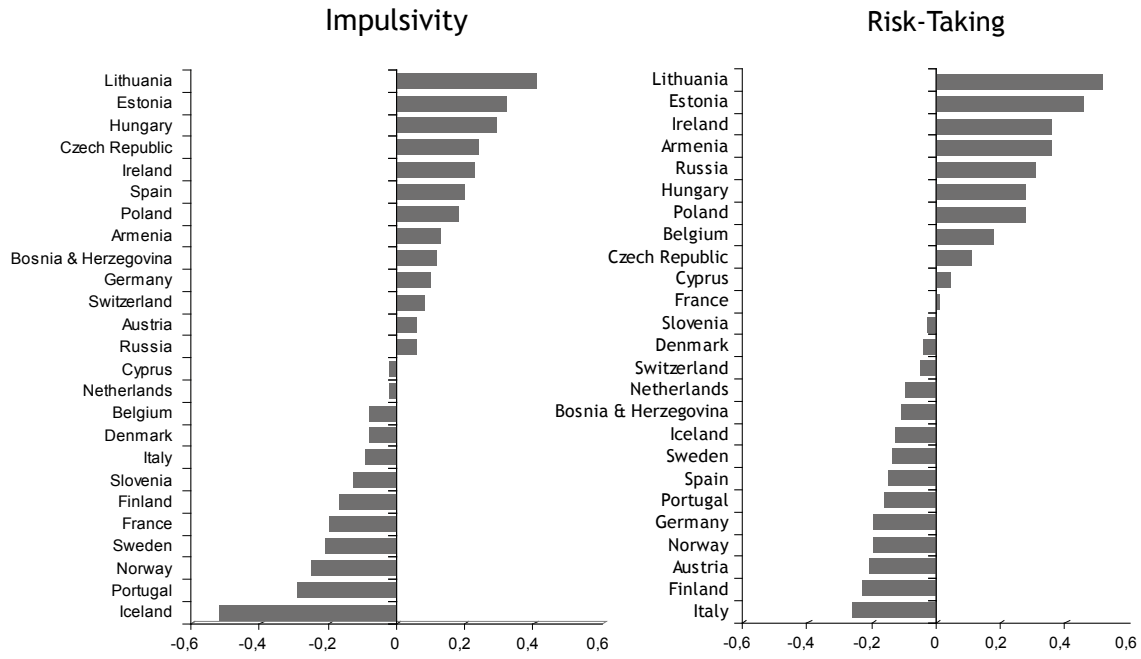
1 The self-control scale was computed as the average of 12 items. If the scale is linearly transformed to 0-100 scale, the mean is 61.2 and standard deviation 20.1 (higher values indicate higher self-control). In subsequent analysis, we use, however, a standardized version of the scale.

Figure 10.2 Mean self-control (standardized) by country



Note: Results only for large and medium cities. Source: ISRD-2

Figure 10.3 Mean impulsivity (standardized) and risk-taking (standardized) by country

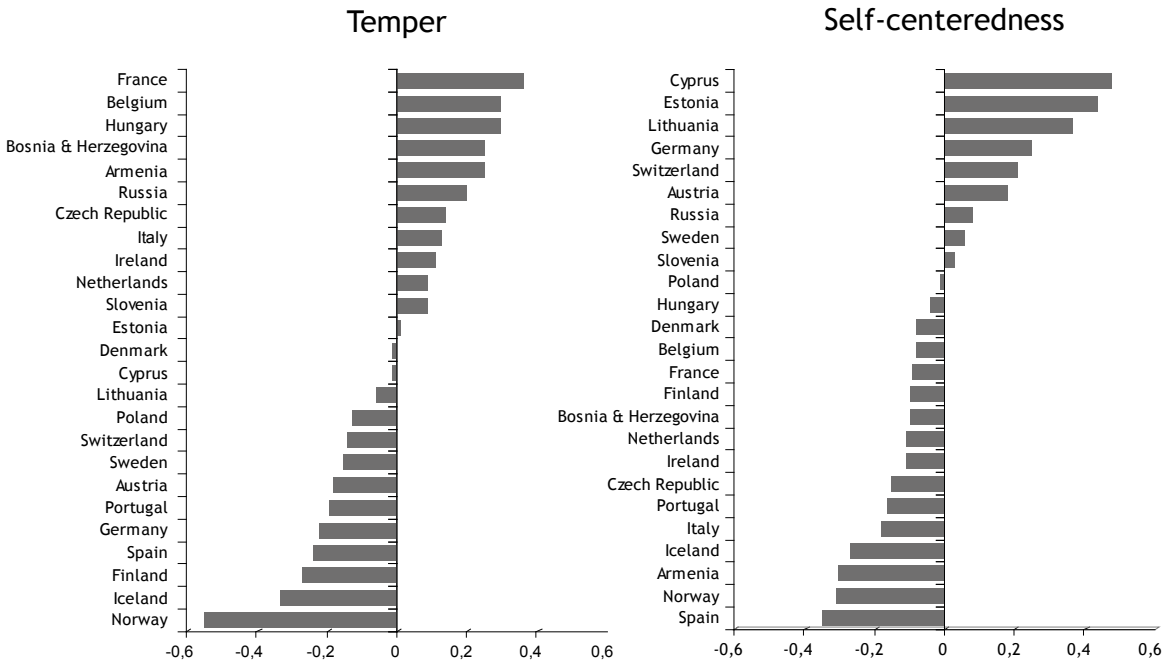


Note: Results only for large and medium cities. Source: ISRD-2

The scales for four dimensions of self-control were constructed analogously and standardized as well, but in this case, higher values indicate higher impulsivity, higher risk-taking, higher self-centeredness, and higher temper (i.e. the direction is opposite compared with overall self-control scale). The variation in all four dimensions of self-control is also large, but a careful inspection reveals that the patterns are not uniform in all countries (see Figure 10.3 and 10.4). High impulsivity can be found in some post-communist countries (but not in Slovenia and Russia), in Ireland, and also in Spain; in contrast, low impulsivity is typical of Northern European countries, but Portugal and France as well. The inclination to risk-taking is high in post-communist countries and Ireland again; on the other hand, somewhat lower in Italy, Finland, Norway, Austria, and Germany. In addition, more self-centered

children can be found in Cyprus, Baltic countries and German-speaking countries, but less in Spain, Norway, Iceland and Armenia. Finally, high temper is typical of some Southern countries (France, Bosnia and Herzegovina, Armenia), Belgium and Hungary; in contrast, under average temper is revealed in some Scandinavian countries (Norway, Iceland, Finland), Spain and Germany. In summary, even though some countries have a consistent pattern in all dimensions – for instance, averages of all scales are low in Norway – it is more common that countries score high in some dimensions and low in others. For instance, Baltic countries (Estonia and Lithuania) have high scores on first three dimensions, but not on temper and almost exactly inverse pattern is revealed in Italy.

Figure 10.4 Mean self-centeredness (standardized) and temper (standardized) by country



Note: Results only for large and medium cities. Source: ISRD-2

Finally, we examine the relationship of self-control with grade, gender, and migrant status (Table 10.3), which will be our control variables in subsequent analysis of alcohol use. Self-control clearly decreases with grade (i.e. age), which is not entirely in accordance with Gottfredson and Hirschi's (1990) proposition of relatively stable self-control level during life-course after is was formed in early childhood. On the other hand, the difference between the 7th and 9th grade is only 0.14 standard deviation which is not too large. Furthermore, somewhat lower self-control can be identified among boys compared with girls and among migrants compared to natives.

Table 10.3 Mean self-control by age, gender and migrant status

	self-control (mean)	p [1]
grade		
7th grade	0.08	<0.001
8th grade	-0.02	
9th grade	-0.06	
gender		
female	0.10	<0.001
male	-0.11	
migrant status		
native	0.01	<0.001
1st generation	-0.05	
2nd generation	-0.03	

[1] level of statistical significance for t-test or ANOVA. Source: ISRD-2

10.3.2 Alcohol use and self-control

In this section, we focus already on the relationship between self-control and substance use measured by six different dichotomous indicators. Table 10.4 presents odds ratios of our substance use variables for self-control and its dimensions while controlling for grade, gender, and migrant status. The effect of self-control is relatively strong – an increase in self-control by one reduces the odds of substance use approximately to half (or almost doubles the odds of abstinence). The strongest effect of self-control can be seen for excessive drinking, namely binge drinking and drunkenness, and for marihuana use. The analysis of separate dimensions of self-control clearly shows that risk-taking is the feature with most substantive effect on substance use. The second strongest relationship is identified for impulsivity. Given the fact that the reliability of this scale is low, we can assume that the effect might be larger if it was measured more appropriately. Odds ratios for self-centeredness and temper are already somewhat lower, but still statistically significant.

Table 10.4 Odds ratios of substance use for self-control and its dimensions while controlling for grade, gender, and migrant status

	self-control	**impulsivity**	**risk- taking**	**self-centered**	**temper**
alcohol lifetime prev.	0.53**	1.64**	1.92**	1.38**	1.42**
alcohol last month prev.	0.55**	1.62**	1.82**	1.39**	1.37**
binge drinking last time	0.52**	1.72**	1.89**	1.45**	1.44**
ever got drunk	0.48**	1.77**	2.05**	1.50**	1.49**
marihuana lifetime prev.	0.46**	1.90**	2.20**	1.51**	1.60**
abstinence	1.91**	0.61**	0.51**	0.72**	0.70**

Note: Scales of four self-control dimensions are inverted compared to overall self-control (i.e. higher values mark higher impulsivity. higher risk taking etc.).

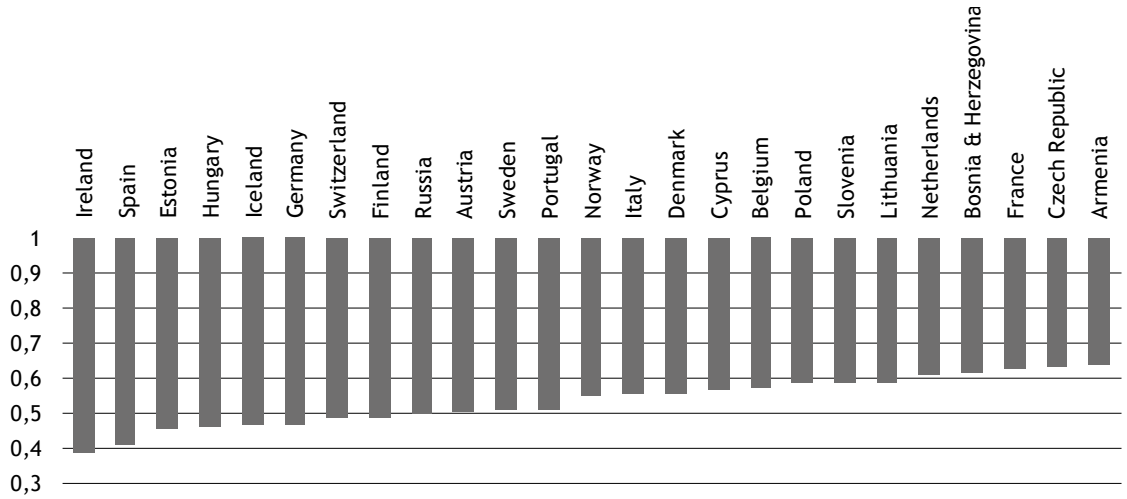
* p<0.05; ** p<0.01. Source: ISRD-2

Next six graphs (Figures 10.5-10.10) present odds ratio for alcohol life-time prevalence, last month prevalence, binge drinking, drunkenness, marihuana life-time prevalence and abstinence separately for each country. All graphs indicate that the impact of self-control is not of the same strength in European countries – the strongest effect is always app. 50-80% larger compared with the weakest effect.

Unlike average level of self-control, which was similar in geographically close regions, the influence of self-control on substance use does not follow any clear pattern. Not surprisingly, a very similar order can be found for alcohol life-time use, last month use, and abstinence. In these cases, largest effects are in Ireland, Iceland, Estonia, Spain, Hungary, and Germany; in contrast, weakest relationships are revealed in Armenia, Czech Republic, Bosnia and Herzegovina, and France. The order of odds ratios remains relatively similar also for excessive drinking variables (binge drinking and drunkenness); however, minor differences can be located. For instance, the effects in France belong no longer to the lowest, but they are approximately average for these variables and the odds ratios in Russia are among the weakest for excessive drinking. Solely for drunkenness, the effect of self-control belongs to the stronger in Slovenia whereas it is rather weak for other alcohol related variables.

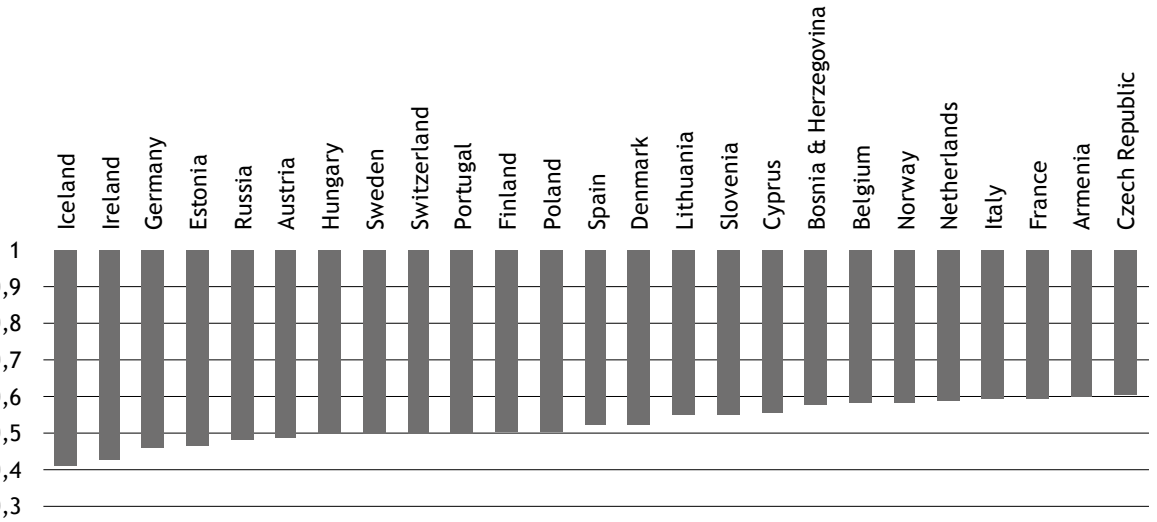
Remarkable differences in the order of odds ratios are, however, revealed for marihuana use (life-time prevalence). The effects are again stronger for Iceland, Hungary and Germany, but also for Norway, Bosnia and Herzegovina, Denmark and France which was not the case for the alcohol related variables. On the other hand, weaker effects remain for Armenia, Lithuania and Belgium, but also for Russia, Estonia and Switzerland which belonged to stronger with respect to alcohol.

Figure 10.5 Odds ratios of life-time prevalence of alcohol use for self-control by country (controlled for grade, gender and migrant status)



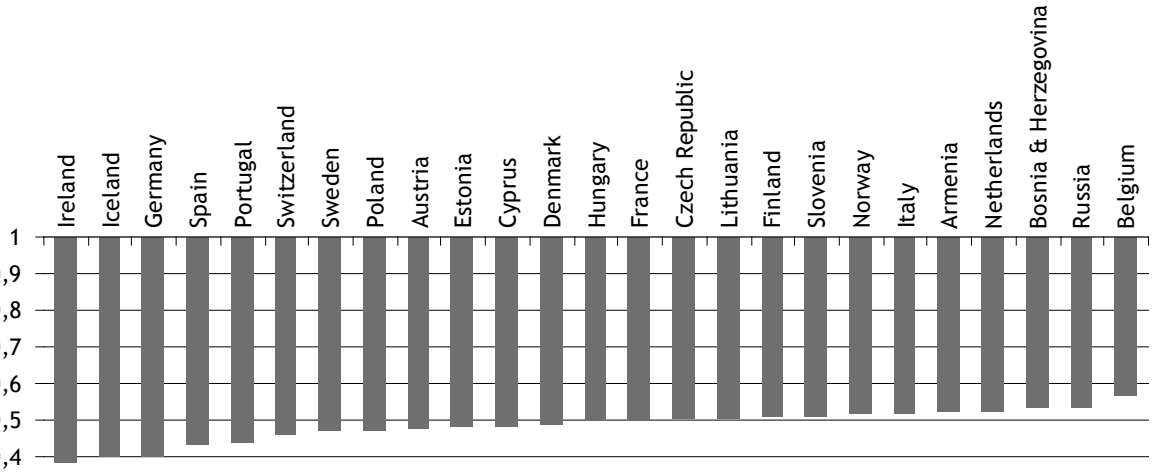
Note: All effects are statistically significant (p<0.001). Source: ISRD-2

Figure 10.6 Odds ratios of last month prevalence of alcohol use for self-control by country (controlled for grade, gender and migrant status)



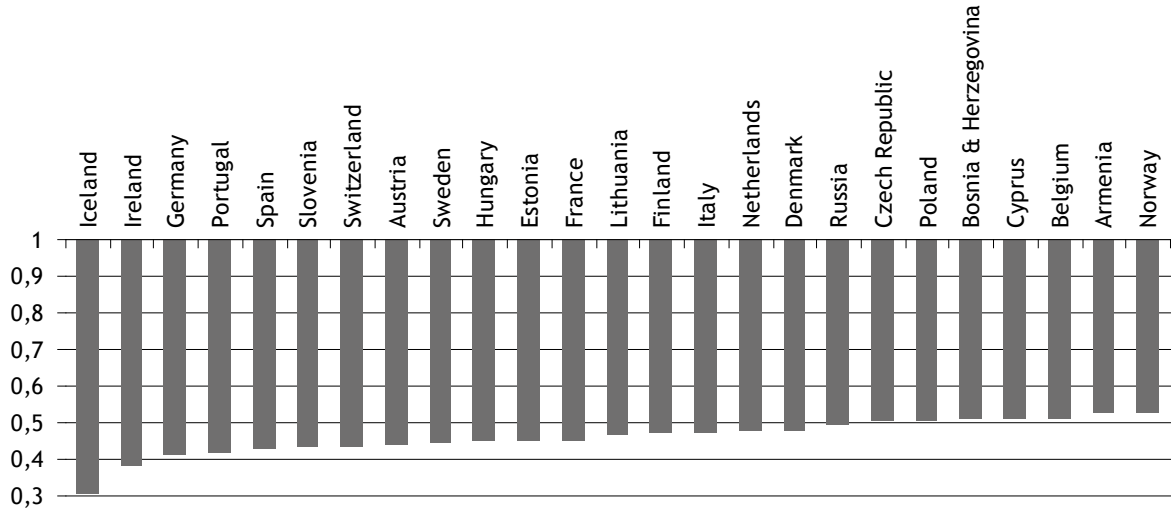
Note: All effects are statistically significant (p<0.001). Source: ISRD-2

Figure 10.7: Odds ratios of binge drinking last time for self-control by country (controlled for grade, gender and migrant status)



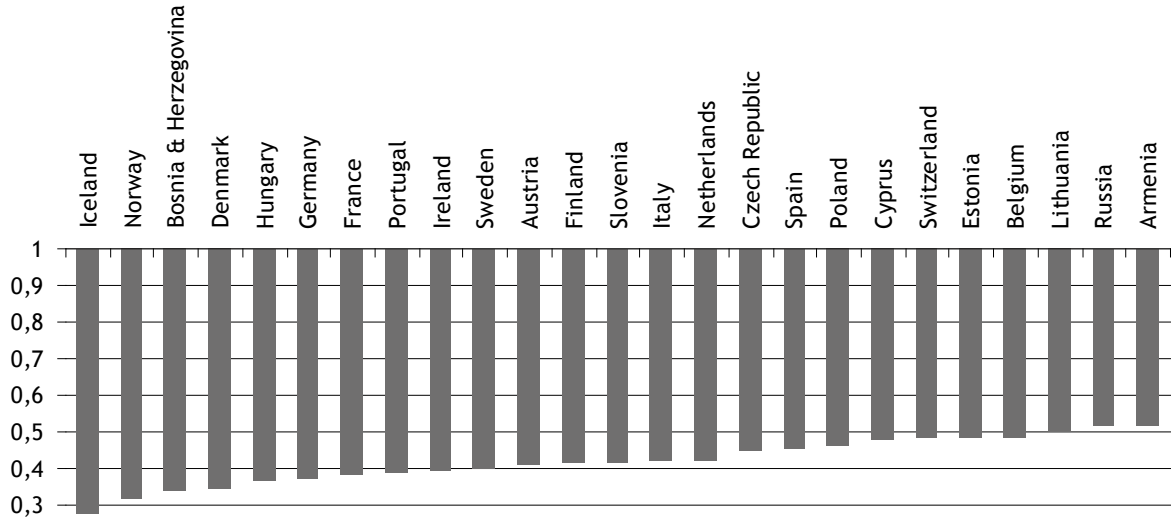
Note: All effects are statistically significant (p<0.001). Source: ISRD-2

Figure 10.8 Odds ratios of ever got drunk for self-control by country (controlled for grade, gender and migrant status).



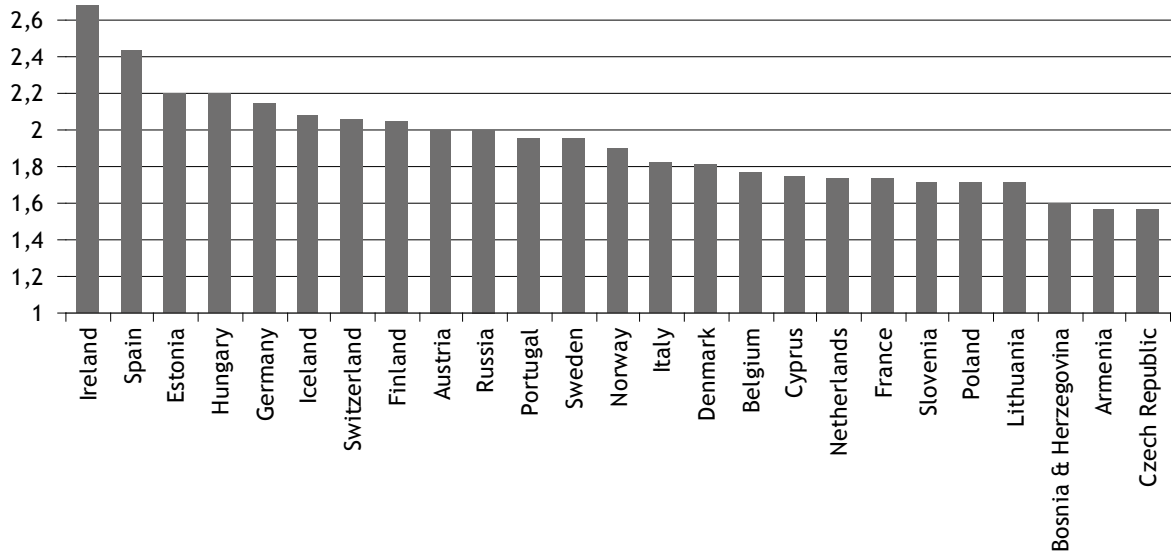
Note: All effects are statistically significant (p<0.001). Source: ISRD-2

Figure 10.9 Odds ratios of life-time prevalence of marihuana use for self-control by country (controlled for grade, gender and migrant status).



Note: All effects are statistically significant (p<0.001). Source: ISRD-2

Figure 10.10: Odds ratios of abstinence for self-control by country (controlled for grade, gender and migrant status).



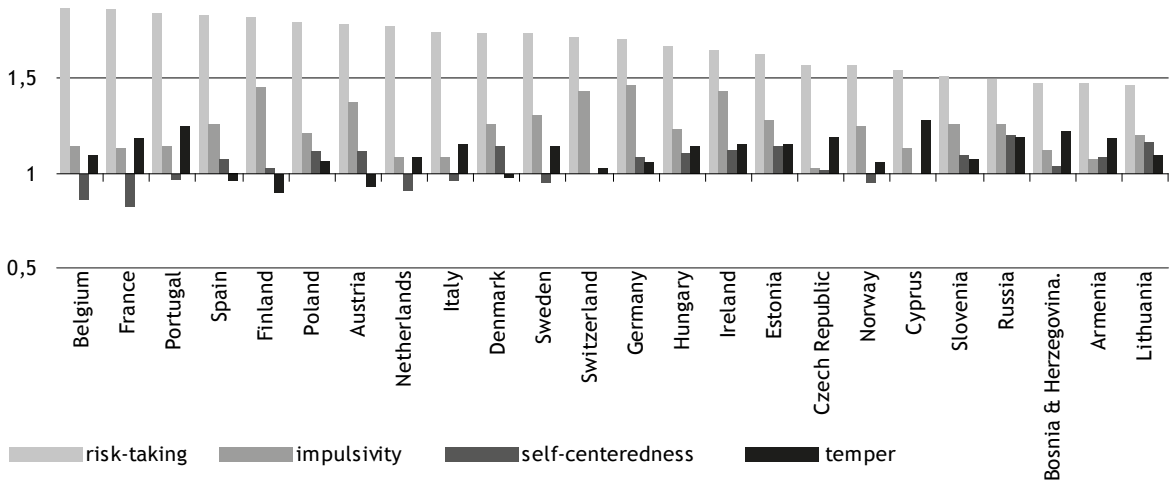
Note: All effects are statistically significant (p<0.001). Source: ISRD-2

Finally, we also present outcomes for selected variables when the four dimensions of self-control are used together in multivariate analysis while controlling for grade, gender and migrant status.[2] Figure 10.11 shows results for alcohol last month prevalence. It is obvious that risk-taking has always the strongest effect (odds ratios in range from 1.5 to 1.9), but impulsivity has a substantial odd ratio (1.4-1.5) in several countries as well, especially in some Northern European countries (Finland and Ireland) and in German-speaking countries. Effects of the other two dimensions are weak or even statistically insignificant. Noteworthy are, however, significant negative effects of self-centeredness in France and Belgium which indicate that being the other three dimensions equal, self-centered children are less likely to drink during the last month in these countries. This finding can be related to the fact that drinking is typically a group activity in this age and self-centered children might be less sociable.

Very similar results can be observed for binge drinking as well (see Figure 10.12). Risk-taking takes the role of the most important component of self-control in most countries, except for Lithuania and Bosnia & Herzegovina where impulsivity has a stronger effect. In addition, impulsivity has again relatively substantial effect in German-speaking countries and Finland. Eventually, we can again find a significant negative effect of self-centeredness, in this case in Finland.

Finally, results for marihuana life-time prevalence (Figure 10.13) indicate even stronger effect of risk-taking than in case of alcohol use (odds ratios 1.5-2.7), except for Cyprus which is the only country where impulsivity seems to play more important role (odds ratio 1.6). Impulsivity has further stronger effect (odds ratio close to 1.5) again in German-speaking countries and Finland, but also in Denmark, Sweden, Norway, Lithuania, and Slovenia. Furthermore, we can also find a substantial effect for temper in several countries, especially Norway (odds ratio 1.7). No negative effect is statistically significant in this case.

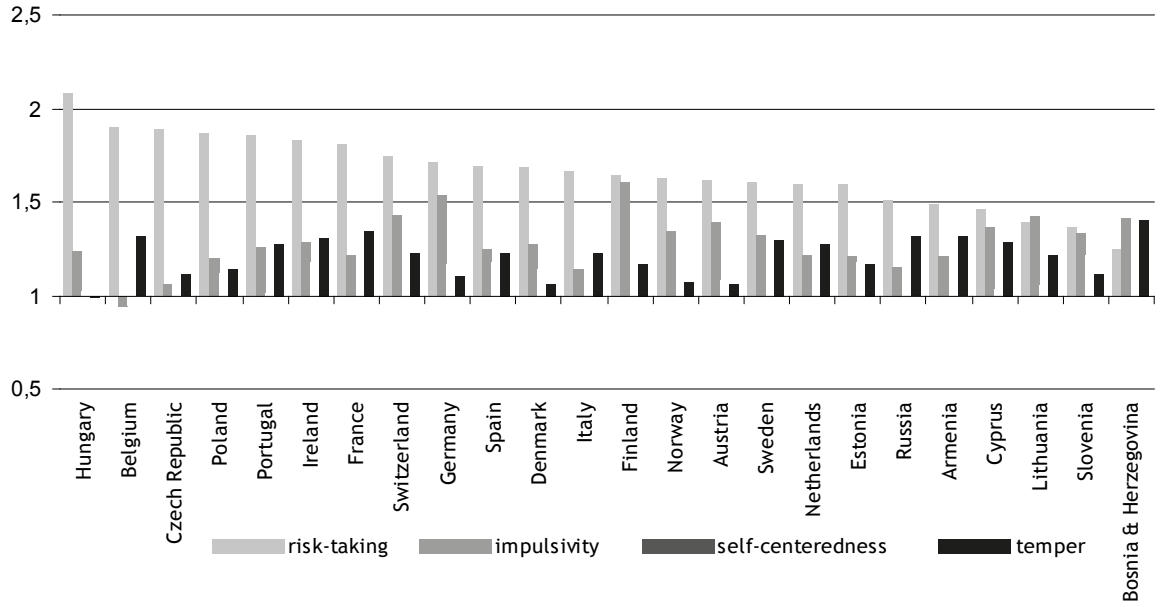
Figure 10.11 Odds ratios of last month prevalence of alcohol use for four self-control dimensions by country (controlled for grade, gender and migrant status)



Note: Effects of risk-taking are always statistically significant ($p<0.001$), negative effect of self-centeredness significant for Belgium and France ($p<0.05$). Source: ISRD-2

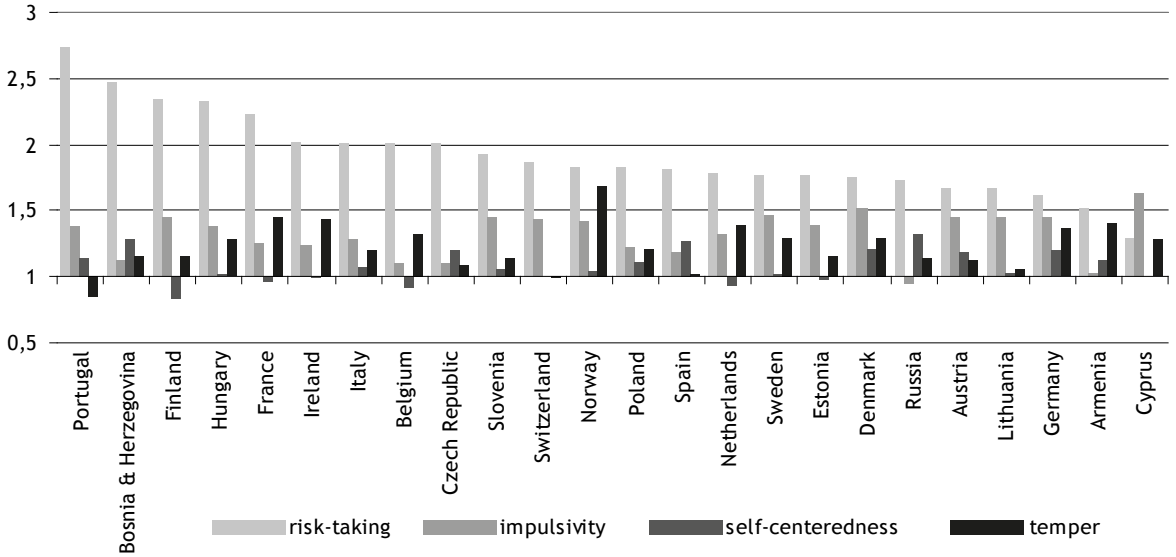
2 Iceland was omitted from these analyses due to the small sample size (N=557).

Figure 10.12 Odds ratios of binge drinking for four self-control dimensions by country (controlled for grade, gender and migrant status)



Note: Effects of risk-taking are always statistically significant ($p<0.05$), negative effect of self-centeredness significant for Finland ($p<0.01$). Source: ISRD-2

Figure 10.13 Odds ratios of marihuana life-time prevalence for four self-control dimensions by country (controlled for grade, gender and migrant status)



Note: Effects of risk-taking are statistically significant ($p<0.05$) except for Armenia and Cyprus, no negative effect is significant ($p<0.05$). Source: ISRD-2

10.4 Conclusions

Our results clearly show that there is also a strong relationship between low self-control and risky behaviour among juveniles involved into our study and, therefore, the basic assumptions pointed out by Gottfredson and Hirschi (1990) are confirmed. Personal inclinations and regulative potentials represent a substantial cause of both risk behaviour and delinquency, nevertheless the role of peers and risky leisure activities should not be underestimated here (Buriánek, 2008). If compared with other delinquency theories, the self-control theory seems to be productive enough when explaining and

interpreting delinquent and risky behaviour. The survey confirmed the efficiency of the use of the self-control scale put forward by Grasmick et al. (1993). The self-control scale therefore can be applied as an efficient tool for risk screening.

Although the distinctions in particular factors are observable and statistically significant, the general level of self-control varies less apparently and it offers a solid base for the international comparison. The basic effects have relatively universal character. On the other hand, it could be possible that the content of particular items has been affected slightly by the translation or by other cultural aspects, for details see Buriánek (2008). The greater emphasis on one's self could reflect the less collectivist tradition in western countries if compared with the post-communist countries. Self-control can attribute to the use of quite different (mostly strong external) resources in authoritarian regimes, whereas in an open society the regulation exercise is mediated by the family. These traditional agents may clash with a new myth of unlimited freedom or uncontrolled liberty (or hedonism) which was typical of a fairly anomic situation during the period of social transition in post-communist countries, and it might still be playing a role in the generation of juveniles we investigated.

10.4.1 Policy recommendations

The huge inter-individual differences in self-control level are important from the point of potential preventive actions which should focus on the adolescents with extremely low self-control. However, the formation of self-control is a long term process that starts in early childhood. Just as many other psychological dispositions, it can be substantially supported and even trained, but it is difficult to rely on some direct and simple preventive interventions among teenagers. The supportive activities at both the family level and the school level could cover programmes supporting or promoting to develop:

- Communicative skills and conflict solving abilities.
- Emotional intelligence and maturity, empathy, self-regulation.
- Personal promotion, career planning, time management.
- Ability to deal properly with culturally accepted risks (alcohol, soft drugs and so on).

We could think about a broader cognitive back-ground of the appropriate attitudes as well:

- Broader understanding of modern society and its social differentiation, for the effects and problems of mass culture, the media-literacy.
- Multi-cultural approach in education, etc.

The special task for the family upbringing is to help juveniles with the evaluation of their peers and with an appropriate selectivity in their interpersonal relationships, to look after friends and lifestyles not only from the position of external control but from the point of both internalised independency and responsibility. Our experience derived from a study of self-control among adults has shown that the question of the optimal level of self-control remains still open because the lower level was typical also of the higher middle class.

On the community level, we have to stress the importance of the leisure time activities especially if they are regular, organized and competitive (this should support self-control as a permanent disposition, as an instrumental tool). This concept covers many activities assuming active involvement or participation (sport, culture, community, societal events). The particular challenge is to consider how to substitute the former role of serving in the army in the life of post-adolescents.

10.5 References

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11 A combined model

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11.1 Theoretical framework

Research in the socio-medical discourse has traditionally focused on psycho-individual risk factors of behaviour, starting with the assumption that health and lifestyle behaviour is the result of individual choice in the first place (Cockerham, 2005). Increasingly, however, there is agreement that the aetiology of adolescent alcohol and drug use is complex, and that risk factors are situated in different domains and at multiple structural levels. Epidemiological research clearly shows that non-random patterns of alcohol and substance use exist across different geographical entities (e.g. communities, neighbourhoods) and different social groups as defined by characteristics such as gender, race, socio-economic background, and so on (Wilcox, 2003). When non-random patterns of alcohol and substance use exist at the population level, it is unlikely that psycho-individual characteristics can fully account for the observed variation; thus, at least part of the variation is explained by variables that capture aspects of the varying social contexts. In the International Self-Report Delinquency-2 (ISRD-2) study, with its anchoring in criminological research, attention is paid exactly to this complex ecology, and many of the variables presented in the dataset measure concepts from theories that bring these social contexts to the foreground.

A social ecological perspective of adolescent alcohol use suggests that adolescents inhabit different social contexts simultaneously (e.g. families, peers, schools, neighbourhoods) and are also part of social contexts that are more distal to their everyday lives (e.g. cities, regions, countries). These social contexts are characterized by mutual interdependencies and complex interactions (Bronfenbrenner, 1979; Cook, 2003; Duncan, Connell, & Klebanov, 1997; Gottfredson & Hirschi, 1990; Hirschi, 1969; Petraitis, Flay, & Miller, 1995; Vettenburg, 1988; Wikström, 2010). Also, individuals' relations with each of these social contexts changes over the life course (Giordano, 2003). For instance, the family is considered the most influential socialization force during infancy, while peers are more influential in adolescence than at any other time of life. In this chapter we examine in an explorative way the relative importance of risk factors in five different but interconnected domains: the neighbourhood, the school, the family, the peer/lifestyle domain, and the psycho-individual domain. We will also investigate whether the relative importance of these risk factors differs between European regions, thus enhancing the external validity of the findings.

In the previous chapters we illustrated how each of these different social contexts has its own causal power in predicting alcohol and drug use among adolescents. The predictive power of these single-domain analyses is, however, somewhat restricted because risk factors in one domain are often correlated with risk factors in other domains (Cook, 2003; Duncan et al., 1997). The correlation between different social contexts has implications for researchers who want to draw conclusions about single-domain contextual effects (e.g. neighbourhoods). More particularly, the correlation between different contexts raises the question of whether the observed contextual effect, for instance of schools, is not the result of confounding with correlated but unmeasured characteristics in other contexts (e.g. family, neighbourhood). This situation is referred to as selection bias or omitted variable bias. Are the conclusions we draw about school effects due to family effects, since families with different social backgrounds send their children to different kinds of schools? Are the results for school effects not explained by neighbourhood characteristics, since different types of schools are often situated in different types of neighbourhood? If this is the case, then ignorance about the correlation between different social contexts might lead to an overestimation of single-domain risk factors.

Both from a theoretical and empirical point of view, there is the expectation that risk factors in different domains are correlated with each other. Research in the tradition of social disorganization theory (Shaw & McKay, 1942) posits that disorganized neighbourhoods are more frequently populated by less educated families, broken and disrupted families, single parent families, and so on. But families living in these neighbourhoods also differ in other ways from their peers in more affluent families and neighbourhoods. For instance, the former often differ in literary, emotional health, and psycho-individual characteristics such as self-control, self-esteem, and so on (Leventhal & Brooks-Gunn, 2000). Family and neighbourhood characteristics also determine the kinds of schools students will go to and the experiences they will have at these schools. With regard to societal vulnerability, Vettenburg (Vettenburg, 1988, 1998), for instance, posited that children from lower social strata are more likely to have negative experiences of school, since what they learn at home bears little relation to what they are taught at school. These weak bonds with conventional socializing agents make them in turn more vulnerable to deviant peer groups. Furthermore, Gottfredson and Hirschi (1990) posited that the psycho-individual trait of self-control impacts upon the ability to form prosocial bonds with conventional socialization agents, and in his earlier social control theory Hirschi (1969) claimed that people who have weak social bonds in one domain (e.g. family) are likely to have weak bonds in other domains as well (e.g. school). Thus, risk factors and protective factors in different contexts are often correlated, and these contexts can impact directly upon both group and individual level behaviour (e.g. main effects) or they can condition the effects of other contexts (e.g. moderating effects).

In criminological research, social control theory (Hirschi, 1969) and its successor self-control theory (Gottfredson & Hirschi, 1990), are the most widely used and tested theories for explaining variations in minor delinquency and substance use, and these theories have also guided the inclusion and operationalization of variables in the ISRD-2 data. Social control theory holds that strong prosocial bonds with conventional socializing agents (e.g. parents, school, church) generate the necessary control that prevents people from drinking alcohol or using drugs. According to this theory, weak social bonds—as measured by poor attachment to significant others, low involvement in conventional activities, lack of commitment to a conventional lifestyle, low acceptance of the value and validity of societal rules—decrease the anticipated costs of deviance, making deviance or rule-breaking behaviour a more likely outcome. Most of the variables that we study in this chapter are indicators of one or several of the four bonding dimensions denoted by Hirschi: *attachment* refers to the affective ties between adolescents and significant others, including parents, school, and friends; *commitment* refers to a young person's aspirations for, and behaviour consistent with, attending college later on, obtaining a prestigious job, getting married, and so on; *involvement* refers to participation in conventional activities such as attending school regularly, spending time on school work, doing sport, and so on; and, *belief* relates to the degree to which an adolescent accepts and abides by the rules of society. Whereas Hirschi considered weak social bonds are the primary explanatory factors for deviant conduct in social control theory, he later shifted his attention towards self-control as the primary factor in explaining variation in deviance (Gottfredson & Hirschi, 1990). In doing so, the focus of control was redirected from external forms of control (social environment factors) to internal forms of control (the individual self-control factor established in early childhood). Moreover, Hirschi argued that associations between external social control indicators and, for instance, underage drinking or substance use, are not causal but spurious. This is because self-control not only directly influences deviant behaviour, but also because it impacts upon the ability to form prosocial bonds and to succeed in social institutions. According to Hirschi, both are thus products of the same causal factor (i.e. low self-control).

To conclude, if persistent and long-term changes in behaviour are required to achieve prevention, then it is necesssary to diminish susceptibility to risk factors and as well as enhance protective factors. In this chapter we estimate a multivariate model that incorporates risk and protective factors in five different but interconnected domains (the school, family, peer/lifestyle, and psycho-individual domain). In doing so, we will be able to compare these domains in terms of their relative importance in explaining variations of lifetime alcohol prevalence on the one hand, and heavy episodic drinking on the other hand.

11.2 Data and methods

11.2.1 Data

The data used is from the ISRD-2 study, a cross-national survey of students in the seventh, eighth and ninth grades of secondary school (12- to 15-year-old students). ISRD-2 is a cross-national study on youth crime and victimization that also includes questions on other problem behaviours, such as alcohol use or other substance abuse. We restricted our sample to youngsters living in one of the 25 European countries and excluded youngsters from six non-European countries (US, Venezuela, Surinam, Canada, Netherlands Antilles, and Aruba) that were included in the original sample. Moreover, we restricted the sample to the age group of 12- to16-year-olds. The sample for this study was constructed, as closely as possible, from a city-based random sampling of adolescents in 25 European countries. For the analyses of risk factors and the associations between alcohol use and risk factors we used the total sample (57,771). More detailed background information on the data and sampling strategy is provided elsewhere in this report.

11.2.2 Outcome variables

The associations of risk factors in these different domains were examined for two outcome variables: alcohol prevalence over the last month and heavy episodic drinking. *Last month alcohol prevalence* records whether students have drunk alcohol in the last four weeks (0 = no, 1= yes). *Heavy episodic drinking* is an overall indication of binge drinking and measures whether the student has consumed five or more glasses (or units) of alcohol on the last occasion (0 = no, 1= yes). While heavy episodic drinking can be considered an indicator of problematic alcohol drinking, last month alcohol prevalence can be considered an indicator of age of onset (i.e. the age at which teenagers started drinking alcohol for the first time). Given the very young adolescents in this study, and given that adolescence is the phase when behaviours such as alcohol use emerge (Boyer, 2006), we can assume that most of the students who reported that they had already drunk alcohol, started doing so in this life stage. Although measuring the prevalence of drinking alcohol or alcohol drunkenness (i.e. have they drank alcohol yet/been drunk yet) is not the same as measuring the age of onset, a higher prevalence rate also implies an earlier onset of drinking on average (especially given the relative age homogeneity of seventh, eighth and ninth grade students).

11.2.3 Independent variables

The independent variables used in the multivariate analyses consisted of variables measuring risk or protective variables in five domains: neighbourhood, school, family, peers and lifestyle, and psycho-individual variables.

Neighbourhood variables

Neighbourhood disorganization measures a youth's perception of his/her neighbourhood. This variable consists of five items evaluated on a 4-point scale (1 = I completely agree, 4 = I completely disagree). The items included were the following statements: "There is a lot of crime in my neighbourhood", "There is a lot of drug selling in my neighbourhood", "There is a lot of fighting in my neighbourhood", "There is a lot of graffiti in my neighbourhood", "There are a lot of empty and abandoned buildings in my neighbourhood". All items were summed, with higher scores indicating greater neighbourhood disorganization.

School variables

Four variables were included that measure aspects of school bonding (commitment, attachment, involvement) or school disorganization. *Time spent on homework* is based on an item that asks students how much time they spend doing their homework on an average school day (1 = none, 2 = half an hour, 3 = one hour, 4 = two hours, 5 = three hours, 6 = more than four hours). *Truancy* is measured by asking students if they have ever stayed away from school for at least a whole day without a legitimate excuse in the last 12 months (1 = never, 2 = one or two times, 3 = three or more times). *Attitude towards school* is measured by asking students the whether they usually like school (1 = not at all, 2 = not very much, 3 = quite a lot, 4 = a lot). Finally, *school disorganization* measures the students' perception of crime at school. This variable consists of four items (1 = I completely agree, 4 = I completely disagree) which were evaluated on the basis of the following statements: "There is a lot of

stealing in my school", "There is a lot of fighting in my school", "Many things are broken or vandalized in my school", and "There is a lot of drug use in my school".

Family variables

Three variables were included in the analyses that measure different aspects of the adolescents' familial situation. *Parental supervision* is measured by asking students whether their parents (or the adults they live with) usually know who they are with when they go out (1 = rarely/never, 2 = sometimes, 3 = always). *Negative life events* concerning death/illness and family disruption consists of eight questions (1 = no, 2 = yes); namely, whether the adolescent has experienced the death of a sibling, parent, or someone else they love; a long or serious illness of their parents or themselves; problems with one of their parents with alcohol or drugs; repeated serious conflicts or physical fights between the parents; and separation/divorce of their parents. *Family bonding* is a combined variable which consists of four variables: the first two variables measure whether the adolescent gets along with the father and mother figure they live with and they are evaluated on a 4-point scale (1 = not at all, 2 = not very well, 3 = rather well, 4 = very well); the third variable measures how often students spend leisure time together with their parents (1 = never, 2 = once a year, 3 = a few times a year, 4 = once a month, 5 = once in a week, 6 = more than once a week); and the fourth variables measures how many days a week the student eats the evening meal with (one of) his/her parents (8-point scale from 1 = never to 8 = daily). The items are summed with higher values indicating stronger family bonding.

Peers and lifestyle variables

One variable was included that measures whether youngsters' have a family-oriented versus peer-oriented lifestyle . The scale *lifestyle* is based on the following items: frequency of going out at night (0 = never, 1 = one or two times, 2 = three times or more), spending a lot of time hanging out with friends (0 = less than one hour, 1 = one to two hours, 2 = three or more hours), spending time with family/friends (0 = family, 1 = on my own/with a small group of friends, 2 = with a large group of friends), and spending time with friends in public places (0 = no, 1 = yes). All items were summed afterwards with higher scores indicating a more peer-oriented lifestyle.

Deviant group behaviour measures what kind of activities the adolescent usually participates in when with friends. The scale is based on four items, namely, drinking a lot of alcohol, smashing or vandalizing for fun, shoplifting just for fun, and frightening and annoying people for fun. Each of the four items is scored on a 4-point scale (1 = never, 2 = sometimes, 3 = often, 4 = always) and all items were summed afterwards with higher scores indicating more deviant group behaviour.

Finally, measuring *delinquent friends* is often used as an alternative way of asking about a person's involvement in delinquent activities. This because respondents are often more willing to admit that they have friends who take part in deviant activities, rather than admitting to such activities themselves. In ISRD-2, a 5-item question on the delinquency of friends preceded the section on self-reported delinquency and substance use, partly as a way of neutralizing the social desirability effect. More specifically, this measure asks students about the number of friends they have who are involved in drug use, shoplifting, burglary, extortion, or assault.

Psycho-individual variables

The *self-control* scale includes 12 items from and covers four identified dimensions of self-control: impulsivity, risk-taking, self-centredness, and temper. Examples of these items are: "I act on the spur of the moment without stopping to think"; "I do whatever brings me pleasure here and now, even at the cost of some distant goal"; "I'm more concerned with what happens to me in the short run than in the long run"; "I like to test myself every now and then by doing something a little risky"; "Sometimes I will take a risk just for the fun of it"; and, "I try to look out for myself first, even if it means making things difficult for other people".

11.2.4 Statistical methods

To answer the question at hand, we investigated the relative importance of the different domains in explaining differences in alcohol use, with statistical controls for grade, sex, and ethnic background[1]. The selection of the independent variables for each domain was based on the relative strength of the

1 We used the full dataset whenever analysing causal relationships (i.e. analysing associations of school variables with the alcohol and drugs outcomes), and no weightings were applied.

different indicators in the previous, single-domain analyses. Also, variables with too many missing values (i.e. aspiration level after school) or variables that measure aspects that have no meaning in some countries (i.e. school level, repetition) were not included in the full model. Logistic regression techniques were used for the multivariate analysis. We used the *glm* package in R to conduct all analyses. All variables were semi-standardized before using them in the regression models so that the relative strength of the different risk factors *within* the model could be assessed.

11.3 Results

11.3.1 Associations between risk factors in different domains

First, the bivariate relationships between the different independent variables are presented, as shown Table 11.1. All correlations are significant at the .001 level. We can see from this table that not only are the risk factors within the same domain linked to each other, but the risk factors from different domains also have a clear association with each other. At the more distal level in the aetiology of alcohol use, we have neighbourhood disorganization. We can see from the table that living in a disorganized neighbourhood is linked with lower binding aspects in all other domains. Students growing up in such neighbourhoods more often dislike school, are more often truant, and they spend less time doing homework. Also the schools these students frequent are often more disorganized. These same students grow up in families where family bonding and parental supervision is in general less strong and where there is a greater prevalence of negative life events. Further, students living in disorganized neighbourhoods have a more peer-oriented lifestyle with more delinquent friends and more deviant group behaviour, and their self-control is also much lower. Second, the data suggests that students with low social binding with the school, and students who perceive their school to be rather disorganized, more often grow up in families characterized by a higher prevalence of negative life events where family bonding and parental supervision is lower.

Table 11.1 Correlation matrix between independent variables (N=57,771)

	Correlation		%										
	Spearman's rho	N	Missings	2	3	4	5	6	7	8	9	10	11	12
1	Neighborhood disorganization	56,660	1.90	-0.099	-0.167	0.222	0.347	-0.163	-0.195	0.136	0.203	0.307	0.313	-0.339
2	Doing homework	56,795	1.69		0.219	-0.139	-0.123	0.163	0.190	-0.019	-0.158	-0.206	-0.225	0.194
3	School attitude	57,279	0.85			-0.204	-0.176	0.191	0.203	-0.064	-0.183	-0.190	-0.246	0.282
4	Truancy	57,402	0.64				0.151	-0.184	-0.205	0.111	0.232	0.258	0.296	-0.275
5	School disorganization	56,765	1.74					-0.130	-0.164	0.114	0.153	0.270	0.284	-0.305
6	Family bonding	57,200	0.99						0.282	-0.210	-0.150	-0.241	-0.231	0.224
7	Parental supervision	57,052	1.24							-0.108	-0.297	-0.275	-0.330	0.306
8	Negative life events	56,701	1.85								0.112	0.201	0.142	-0.129
9	Lifestyle	57,729	0.07									0.287	0.369	-0.296
10	Delinquent friends	56,765	1.74										0.487	-0.319
11	Deviant group behavior	57,078	1.20											-0.450
12	Self-control	56,965	1.40											

All parameter estimates are significant at the $p < .001$ level

A final observation is that a peer-oriented lifestyle, in particular, a deviant lifestyle or friendship circle, as well as low self-control are more frequently observed among students living in families, schools and neighbourhoods characterized by lower social binding and social cohesion. The strong correlations of

self-control with the risk factors in the peer, family, school, and neighbourhood domain (with eight out of eleven correlations above .275) should be noted in particular.

11.3.2 Multivariate analyses

For the next step we conducted a stepwise regression model, in which the risk and protective factors linked to one of the five domains were added to the model, domain by domain. The results of these multivariate analyses are reported in Table 11.2 (for the prevalence of alcohol in the last month) and Table 11.3 (for heavy episodic drinking). First, the neighbourhood variables are added (Model 1), followed by school variables (Model 2). The expectation was that at least part of the relationship between neighbourhood and alcohol use is explained by the school variables, since schools often selectively attract students from particular kinds of neighbourhoods. In Model 3, the family variables were added to the model. Because some kinds of families are more often found in particular neighbourhoods, and because schools often selectively attract students from particular kinds of families, the relationship between neighbourhood and school variables and alcohol use was expected to be further weakened once the family variables were entered into the model. In a similar vein, part of the relationship between neighbourhood, family, and school variables and alcohol use is explained by the shared variation with the relationship between peers and alcohol use (Model 4). This because the bonding aspects in these three domains determine to a large extent the adolescents' relationship with peers as well as their lifestyle and deviant activities. In the final model (Model 5) we added the psycho-individual trait, self-control. Self-control is the most proximal determinant in the aetiology of adolescent alcohol and substance use, following Hirschi's theory (1990), and self-control is a trait that is much more common in adolescents with strong prosocial bonds with conventional socialization agents.

Model 1 of Tables 11.2 and 11.3 estimates the bivariate association of neighbourhood disorganization with alcohol use. We can see that neighbourhood disorganization increases the chances of last month alcohol prevalence and heavy episodic drinking by a factor of 1.335 and 1.399 respectively. As put forward in the theoretical section, the net effect of this, in this case neighbourhood disorganization, might be explained (at least partially) by the kind of schools that are found in these neighbourhoods. Model 2 indicates that this is clearly the case. The effect of neighbourhood disorganization is overestimated because teenagers living in such neighborhoods are more often from backgrounds that are less well connected to school, since what they learn at home bears little relation to what they are taught at school. As a result, these pupils are less committed to their school tasks, they are more likely to be truant, and not only their neighbourhoods but also their schools are more disorganized. This is illustrated in Model 2 of Tables 11.2 and 11.3. We can further see that, when controlling for the school characteristics of the student, the net effect of neighbourhood disorganization lowers to 1.149 for last month alcohol prevalence and 1.166 for heavy episodic drinking.

In Model 3, the family-related variables were entered into the regression equation. As expected, entering these variables lowers the net effects of both neighbourhood and school variables, because of their shared variation with the relationship between family and alcohol use. School and neighbourhood bonding is more prevalent among students living in intact families or families characterized by strong bonding and parental supervision, and this translates into somewhat overestimated effects of neighbourhood- and school-related risk factors if the family context is not taken into account. We can further see from Model 3 that of all family variables, parental supervision has the strongest protective effect, and that it has the second largest effect after the school variable 'truancy'.

In Model 4, we added the peer domain that measures whether adolescents have a more peer-oriented lifestyle than a parental-oriented lifestyle, and whether these peer circles are of a deviant nature or not. In terms of risk factors, we can see that three peer variables have a huge impact on alcohol use, and that when compared with the other variables in the model, these variables show by far the largest associations with alcohol use. For example, a peer-oriented lifestyle increases the chances of last month alcohol prevalence and heavy episodic drinking by a factor of 1.352 and 1.546 respectively. Consistent with correlational analyses, the neighbourhood, family, and school indicators that have strong correlations with peer lifestyle variables, show the largest decreases in their relative effects on alcohol use. On the other hand, we can see that the relationship between heavy episodic drinking and school disorganization (Table 11.3) is no longer significant, indicating that the relationship with school disorganization is explained by the deviant peer groups found in these social contexts.

In the final model (Model 5), the psycho-individual trait of self-control is entered in the equation. For clarity of presentation, the results of this full model are also visualized in Figures 11.1 and 11.2. Because of the strong correlation of self-control with almost all risk factors in the peer, family, school, and neighbourhood domains (see Table 11.1), the association of the risk factors entered in the earlier models again lowers substantially in Model 5. In terms of risk factors, low self-control is one of the most important risk factors after having a peer- and delinquent-oriented lifestyle. Of the school variables, doing homework and truancy are the most important predictors. Of the family variables, the most important predictor seems to be parental supervision, although for heavy episodic drinking all family variables are of equal importance. The effects of school disorganization is now non-significant in both models.

Table 11.2 Logistic regression models for alcohol last month prevalence and the impact of the different domains (N=51,699)

	Alcohol last month prevalence									
	Model 1: Neighborhood		**Model 2: School**		**Model 3: Family**		**Model 4: Peers**		**Model 5: Individual**	
	b (s.e.)	**OR**	**b (s.e.)**	**OR**	**b (s.e.)**	**OR**	**b (s.e.)**	**OR**	**b (s.e.)**	**OR**
Neighborhood										
Neighborhood disorganization	0.289	1.335	0.139	1.149	0.083	1.087	-0.077	0.926	-0.101	0.904
	(0.010)	***	(0.011)	***	(0.011)	***	(0.012)	***	(0.012)	***
School										
Doing homework			-0.267	0.766	-0.218	0.804	-0.122	0.885	-0.116	0.890
			(0.011)	***	(0.011)	***	(0.012)	***	(0.012)	***
School attitude			-0.223	0.800	-0.171	0.843	-0.104	0.901	-0.086	0.918
			(0.011)	***	(0.011)	***	(0.012)	***	(0.012)	***
Truancy			0.294	1.342	0.243	1.275	0.124	1.132	0.109	1.115
			(0.010)	***	(0.010)	***	(0.011)	***	(0.011)	***
School disorganization			0.135	1.144	0.102	1.107	-0.026	0.974	-0.047	0.955
			(0.011)	***	(0.011)	***	(0.012)	*	(0.012)	***
Family										
Family bonding					-0.121	0.886	-0.070	0.932	-0.062	0.940
					(0.011)	***	(0.012)	***	(0.012)	***
Parental supervision					-0.313	0.731	-0.146	0.864	-0.130	0.878
					(0.011)	***	(0.012)	***	(0.012)	***
Negative life events					0.145	1.156	0.077	1.080	0.075	1.078
					(0.011)	***	(0.011)	***	(0.011)	***
Peers										
Lifestyle							0.301	1.352	0.288	1.334
							(0.012)	***	(0.012)	***
Delinquent friends							0.337	1.400	0.332	1.394
							(0.013)	***	(0.013)	***
Deviant group behavior							0.510	1.665	0.468	1.596
							(0.013)	***	(0.013)	***
Psycho-individual										
Self-control									-0.186	0.830
									(0.013)	***

* p < .05, ** p < .01, *** p < .001.

Table 11.3 Logistic regression models for heavy episodic drinking and the impact of the different domains (N=51,856)

	Heavy episodic drinking									
	Model 1: Neighborhood		Model 2: School		Model 3: Family		Model 4: Peers		Model 5: Individual	
	b (s.e.)	OR	b (s.e.)	OR	b (s.e.)	OR	b (s.e.)	OR	b (s.e.)	OR
Neighborhood										
Neighborhood disorganization	0.336	1.399	0.154	1.166	0.099	1.104	-0.103	0.902	-0.119	0.887
	(0.012)	***	(0.013)	***	(0.014)	***	(0.015)	***	(0.015)	***
School										
Doing homework			-0.372	0.689	-0.316	0.729	-0.203	0.816	-0.198	0.820
			(0.015)	***	(0.015)	***	(0.016)	***	(0.016)	***
School attitude			-0.212	0.809	-0.161	0.852	-0.081	0.922	-0.067	0.935
			(0.014)	***	(0.015)	***	(0.015)	***	(0.016)	***
Truancy			0.319	1.376	0.267	1.305	0.124	1.132	0.115	1.122
			(0.012)	***	(0.012)	***	(0.013)	***	(0.013)	***
School disorganization			0.172	1.187	0.140	1.150	-0.005	0.995	-0.019	0.981
			(0.014)	***	(0.014)	***	(0.016)		(0.016)	
Family										
Family bonding					-0.156	0.856	-0.103	0.902	-0.099	0.906
					(0.013)	***	(0.015)	***	(0.015)	***
Parental supervision					-0.275	0.760	-0.087	0.917	-0.077	0.926
					(0.013)	***	(0.015)	***	(0.015)	***
Negative life events					0.150	1.162	0.072	1.075	0.072	1.074
					(0.013)	***	(0.014)	***	(0.014)	***
Peers										
Lifestyle							0.435	1.546	0.426	1.531
							(0.017)	***	(0.017)	***
Delinquent friends							0.355	1.426	0.351	1.421
							(0.014)	***	(0.014)	***
Deviant group behavior							0.481	1.617	0.452	1.571
							(0.015)	***	(0.015)	***
Psycho-individual										
Self-control									-0.132	0.876
									(0.018)	***

* p < .05, ** p < .01, *** p < .001.

Figure 11.1 Relative effect sizes of risk factors in different domains for last month alcohol prevalence (25 European countries)

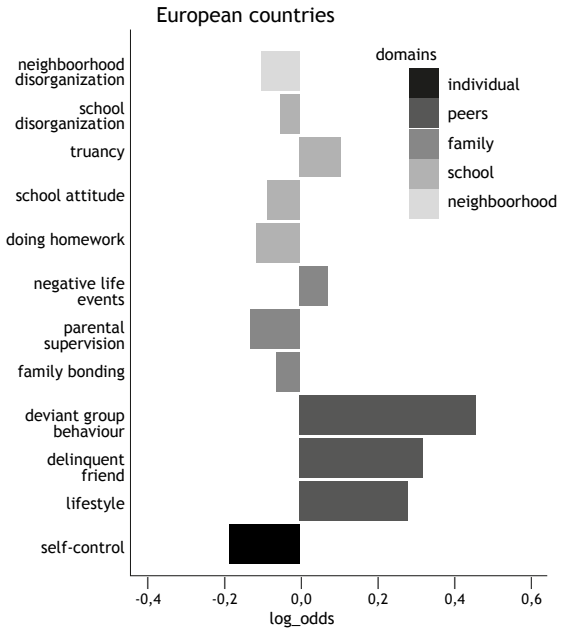
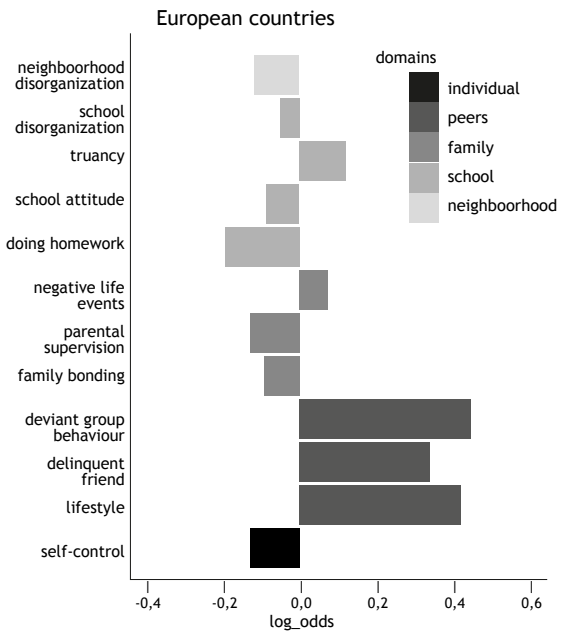


Figure 11.2 Relative effect sizes of risk factors in different domains for heavy episodic drinking (25 European countries)



In a final step, we investigated regional differences in the importance of the various risk factors linked to each of the five domains. Following the classification by Felson in his paper on alcohol cultures in Europe (Felson, Savolainen, Bjarnason, Anderson, & Zohra, 2011), we distinguished between four country clusters: Mediterranean countries, Central European countries, Eastern European countries, and Nordic countries. According to Felson's classification, all the countries that border the Mediterranean Sea are coded *Mediterranean*. Thus, we included Slovenia and Bosnia & Herzegovina in the Mediterranean cluster even though they could be coded as Eastern European countries. The other countries in this cluster are Portugal, France, Italy, Cyprus, and Spain. The *Central European* cluster of countries consists of Austria, Switzerland, Belgium, the Netherlands, Germany, Ireland, and the Czech Republic. In line with Felson's typology, the Czech Republic was coded as Central European instead of Eastern European because the Czechs' drinking patterns are similar to the drinking patterns of the Germans and the British (see also Popova, Rehm, Patra, & Zatonski, 2007). Countries defined as *Eastern European* are Russia, Estonia, Lithuania, Poland, Hungary and Armenia. The *Nordic* countries are Iceland, Denmark, Norway, Finland, and Sweden. The coding decisions as used by Felson are to certain extent arbitrary and discussable as some countries fit into more than one category. To address this issue, we also conducted analyses with alternative classifications (i.e. where the Czech Republic, Slovenia, and Bosnia & Herzegovina were coded as Eastern European countries). However, it turned out that these coding decisions did not affect the main conclusions.

To avoid repetition, we have reported the findings of these analyses in figure form only (see Figures 11.3 to 11.10). It should be noted that effect sizes can be compared within models but not between models, because standardization was conducted on the predictor side only. The key findings are almost the same across Europe as a whole. In all country clusters, family, school, and neighborhood variables have relatively modest effects when compared with the strong impact of self-control, and especially of having a peer-oriented or deviancy-oriented lifestyle. The latter are clearly the strongest correlates of alcohol use in all country clusters. With regard to self-control, only the Nordic countries seemed to deviate from the overall pattern of the results where it is observed that self-control has a weaker effect than family, school, and neighbourhood factors. However, the Nordic countries are the only countries where neighbourhood disorganization and truancy showed such strong effects – these are the second strongest correlates of alcohol use after having a delinquent or deviant lifestyle.

Figure 11.3 Relative effect sizes of risk factors in different domains on alcohol last month prevalence (Mediterranean countries)

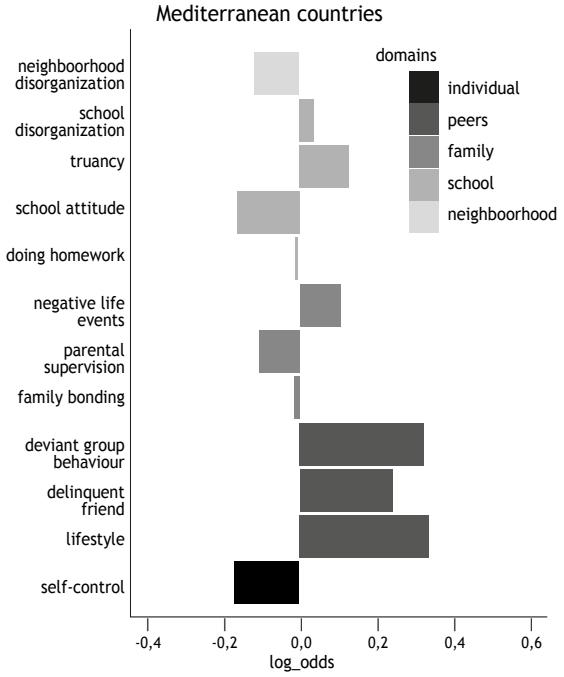


Figure 11.4 Relative effect sizes of risk factors in different domains on heavy episodic drinking (Mediterranean countries)

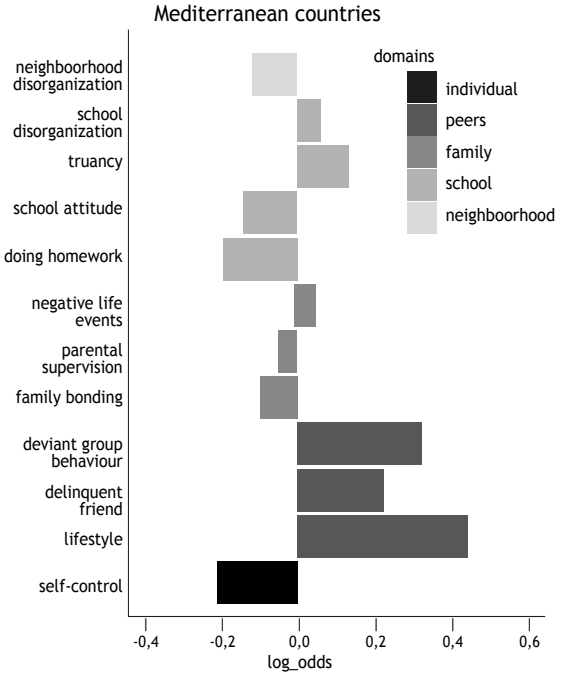


Figure 11.5 Relative effect sizes of risk factors in different domains on alcohol last month prevalence (Central European countries)

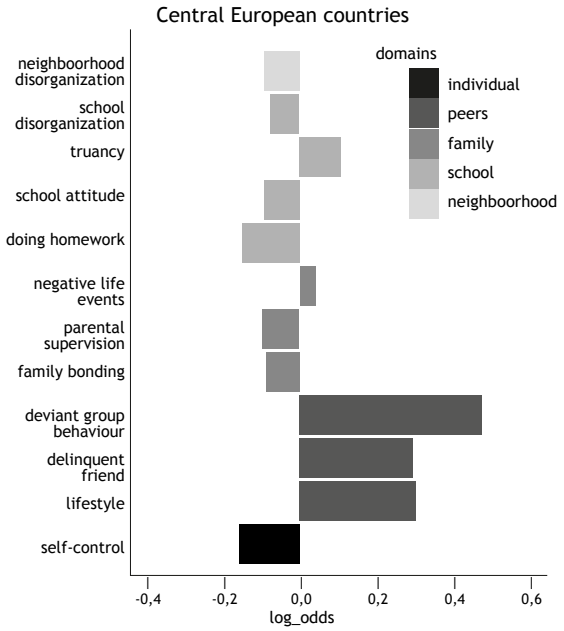


Figure 11.6 Relative effect sizes of risk factors in different domains on heavy episodic drinking (Central European countries)

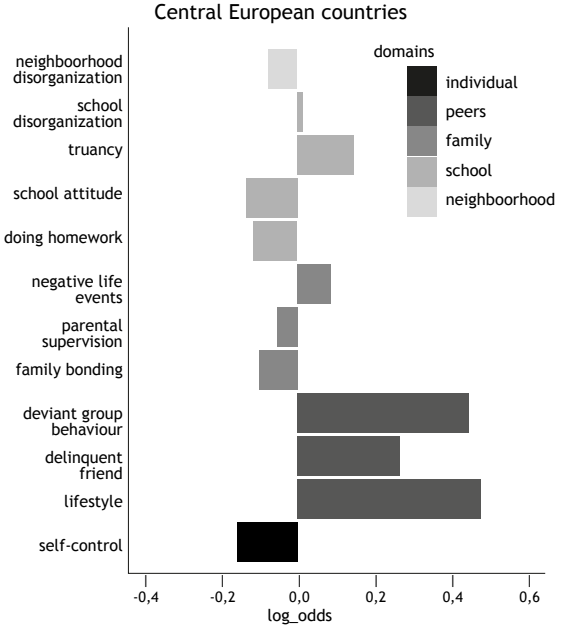


Figure 11.7 Relative effect sizes of risk factors in different domains on alcohol last month prevalence (Eastern European countries)

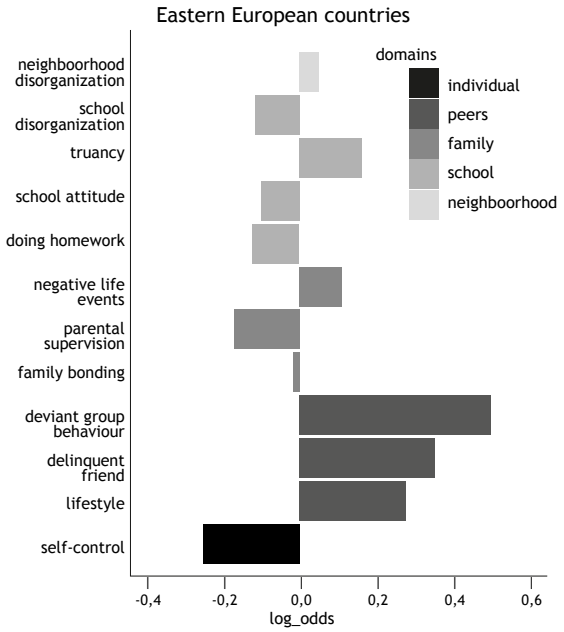


Figure 11.8 Relative effect sizes of risk factors in different domains on heavy episodic drinking (Eastern European countries)

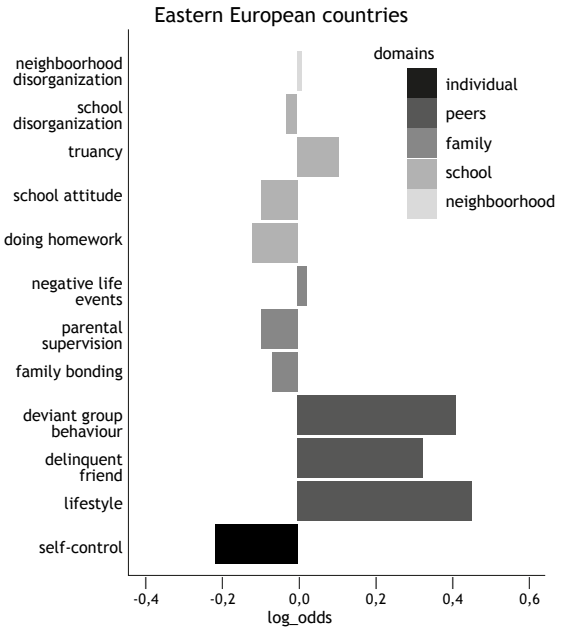


Figure 11.9 Relative effect sizes of risk factors in different domains on alcohol last month prevalence (Nordic countries)

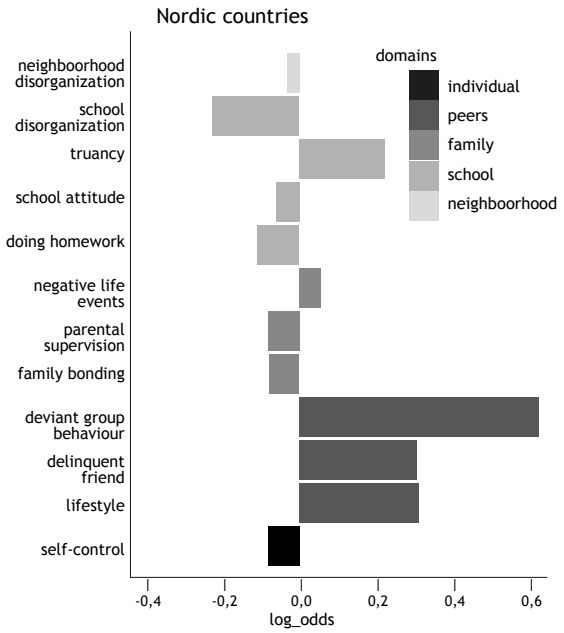
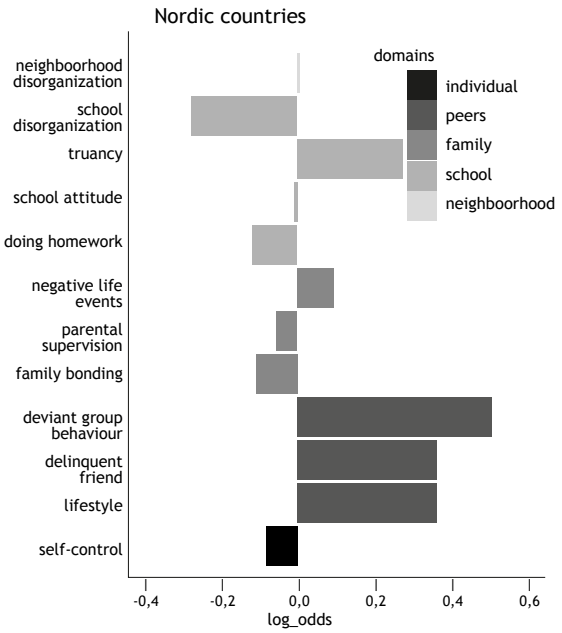


Figure 11.10 Relative effect sizes of risk factors in different domains on heavy episodic drinking (Nordic countries)



11.4 Summary and conclusions

In the present chapter we have evaluated the relative influence of risk and the protective factors for alcohol use in five domains. The findings have confirmed our expectation that the ecology of adolescent' alcohol use is multifactorial and that the risk and protective factors in different domains are correlated. Theoretically, we advanced that students are more likely to refrain from alcohol and substance use if they have strong prosocial bonds with the school, family, neighbourhood, and so on (i.e. external social control), and if they have a high level of self-control (i.e. internal social control). The basic assumptions of control theory (Gottfredson & Hirschi, 1990; Hirschi, 1969) turn out to have been supported by the analyses.

One of the salient findings is that a more peer-oriented lifestyle has the strongest association with alcohol use, and this is true for all analyses and country clusters. This finding makes sense, of course, because for many teenagers adolescence is a phase of experimentation and the most important reference group in this regard are peers (Giordano, 2003; Irwin, Igra, Eyre, & Millstein, 1997). Given that drinking is a largely social phenomenon, and given that adolescents often drink as a way of integrating themselves into groups and gaining status (Crosnoe, Muller, & Frank, 2004), it should not come as a surprise that a more peer-oriented lifestyle is strongly associated with alcohol use. The strong peer effects particularly make sense because one of the items in the lifestyle scale measures the frequency of going out at night, a behaviour that is strongly correlated with drinking alcohol (Piko & Vazsonyi, 2004). Not surprisingly, the strongest predictor of alcohol use is taking part in deviant activities in one's peer group. Teenagers who more often engage in deviant activities with their friends or who have friends who do so, are more prone to use alcohol in a problematic way. Also, we found that the effects of school disorganization are almost entirely explained by the deviant peer associations of the adolescents at these schools.

Another conclusion is that teenagers with low self-control have a much higher prevalence of drinking alcohol. That self-control showed such strong associations with alcohol use is in line with the literature. Hirschi (1990) explicitly argued that this psycho-individual trait is the single most important determinant of deviant behaviour. However, more important from a prevention perspective is the observation that low self-control is more prevalent in the more vulnerable social groups. More particularly, low self-control is much more common among students in disorganized schools and neighbourhoods, and among students living with disrupted families or families characterized by low bonding and weak parental supervision. Gottfredson and Hirschi (1990) studied the genesis of self-control and stressed the fundamental importance of socialization in the family. More particularly, these authors emphasized that self-control is a trait that is developed from early childhood onwards, and that it is developed through good parenting practices – parents must be able to supervise their children, recognize their deviant behaviour and punish them adequately for it. They further argue that self-control is a relatively stable trait once it is formed, and they stress the importance of early prevention efforts in this regard, especially in vulnerable social groups.

The findings regarding the effects of the different domains in predicting adolescent alcohol use should, however, be interpreted cautiously. For instance, a naïve interpretation of the results regarding family factors could lead one to conclude that this domain is much less important in the aetiology of adolescent alcohol use, and thus deserves less attention in prevention. However, this is not the case. Peers and self-control are highly predictive because they focus on the most immediate precursors of alcohol use. But these proximal variables do little to explain the long-term roots of self-control, deviant peer associations and, ultimately, problematic alcohol use (Petraitis et al., 1995). For instance, the correlational analyses in this chapter indicated that low self-control is much more prevalent in vulnerable social groups, which is a direct illustration of the complex pathways connecting these different risk factors.

Finally, concerning the cross-national part of the study, the relative importance of the different domains is more or less equal in the four country clusters. However, there is one exception that concerns the results for self-control, where we observed that the direct effects of this trait are much less strong (when compared to the other domains in the model) in Nordic countries than in Mediterranean, Western and, especially, Eastern European countries. Also, a quick glance at the univariate distributions for self-control across the various European countries points towards a remarkable finding. On the one hand, the countries that showed the weakest effects of self-control (i.e. the

Nordic countries) are also the countries that showed the highest overall levels of self-control in Europe; on the other hand, the countries with the highest effects of self-control on alcohol use (i.e. the Eastern European countries) are the countries that showed the lowest levels of self-control. More research and theoretical underpinning are needed, however, into what might possibly explain these divergent patterns in the relationship between self-control and alcohol use.

A limitation of this paper is that it uses a cross-sectional design to investigate the relationship between risk and protective factors in the neighbourhood, school, family, peer, and individual domains and adolescent alcohol use. Increasingly, there is agreement that this relationship is reciprocal rather than unidirectional. For instance, visible alcohol use by teenagers might also lead to weaker school and family bonding; the physiological effects of alcohol use might have important effects on study concentration and motivation; and parental relationships might become more stressed once parents become aware of their children's health behaviour. However, a longitudinal design is necessarily to investigate the complexity of these relationships and how they change over time.

11.4.1 Policy recommendations

Prevention programmes aimed at changing underage drinking patterns have traditionally focused on the development and consolidation of the necessary skills to manage emotiveness in interpersonal relationships and resist social pressures; in other words, on enhancing self-control. This psycho-individual approach to prevention has been popular in alcohol prevention for many years, and with good reason. Our results indicate that self-control is indeed one of the strongest correlates of alcohol use, and thus deserves a central place in any alcohol prevention programme. However, there is a growing consensus in the literature that to achieve a more complete understanding of how teenagers develop particular health behaviour patterns, such as drinking alcohol, account needs to be taken of the multiple and interconnected social contexts that teenagers inhabit. Our results have confirmed that social contexts can promote healthier development. This underlines the need to move beyond the individual level and bring these multifaceted contexts into play (Goris, Burssens, Melis, & Vettenburg, 2007; Thorlindsson, 2011). If prevention is to make any long-term changes to behaviour, integrality should be a central pillar in any prevention programme, with attention to neighbourhoods and to schools, families, and the broader cultural and structural context in which these students live.

The findings regarding self-control in particular have important implications. As mentioned earlier, self-control is a trait that is developed in early childhood which then remains relatively stable over the life course. Our results showed, however, that low-self-control is much more prevalent among teenagers from disadvantaged social backgrounds, putting them at increased risk. Although these elevated risks in terms of alcohol consumption patterns might not yet be visible during adolescence (West, 1997), studies have shown that there are clear differences in drinking behaviours between adults of different socio-economic backgrounds (Dias, Oliveira, & Lopes, 2011; Huckle, You, & Casswell, 2010; Van Oers, Bongers, Van De Goor, & Garretsen, 1999). The findings of our analyses have illustrated the importance not only of focusing prevention on more vulnerable social groups, but also of early prevention. If long-term changes in behaviour are to be achieved, then not only is integrality in *space* important (i.e. a combination of both personal and structural prevention efforts), but also integrality in *time* (also with attention to personal and structural factors). That means intervening not only before the problem arises (problematic alcohol use), but also at the moment when the causes of the problem emerge. In this process, one should be aware that vulnerable groups in society (i.e. students from lower socio-economic backgrounds and minority groups) are reached less efficiently through traditional prevention channels and methods (Bernaert, 2008). Therefore, a broad and intersectorial approach is imperative, with the involvement of the school, neighbourhood, and nightlife sectors, and also those services involved with the organization of communities such as youth work, social work, and justice. Most promising is when a more general population-based prevention policy is complemented by prevention programmes tailored to the specific needs of particular groups of teenagers.

Although having a peer-oriented lifestyle had the strongest impact upon alcohol use, these results are by no means a plea for problematizing teenagers with a peer-oriented lifestyle. A shift away from parental influence, with peers taking on greater importance, is a normal and inevitable transition in adolescence. However, several other measures can be pursued that indirectly influence this peer component. For instance, prevention can help to shape the structural conditions in which these peers meet each other. This can be done by informing all relevant intermediaries (families, schools, shops, nightclubs, bars, etc.) of the importance of forbidding any sale or consumption of alcohol by minors,

and persuading them of the relevance of these measures and – when applicable – supporting them in their implementation. By creating these structural barriers, adults in different domains and sectors can help influence and change the cultural climate concerning underage drinking. Lastly, given that drinking alcohol often serves as a means of facilitating interaction and achieving social standing in the peer group, attention should also be paid to the question of whether there are sufficient opportunities for interacting with mates of their own age in a non-alcoholic environment and for achieving social status in other domains. Examples of such alternatives could be providing sufficient sport , cultural, and youth activities at school and in the neighbourhoods where these students live.

Changing this cultural climate is also possible in other ways. Social influence theories (Bandura, 1977; Marsden & Friedkin, 1993) state that social influence is not limited to face-to-face interaction and that peers who are more distant can be quite influential given their sheer number relative to close friends. The only precondition for social influence to occur is the availability of information about the behaviour of others. However, research shows that what teenagers consider as acceptable and normal drinking behaviour is to a large degree based on false beliefs (Reid, Manske, & Leatherdale, 2008). This because students tend to systematically overestimate the alcohol and substance use of their peers. Adjusting these misperceptions through accurate and up-to-date social norm marketing campaigns might be one way of correcting these false beliefs and diminishing negative peer influences.

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Part IV

Risky or intense alcohol use from a multilevel perspective: Individuals within schools within countries

The importance of the context and environment cannot be underestimated as they strongly influence the development and behaviour of people. Country comparisons can be of particular value in understanding the different influences of domains and risk factors on adolescent drinking behaviours as a wide range of cultural differences with respect to alcohol use have been accounted for. This part will look at the same domains and risk factors as the previous section, but within a multi-level context to determine whether the associations between these risk and protective factors and risky alcohol use are similar if we take into account the influence of context (schools and countries).

In addition, this part also takes a closer look at different national alcohol policies and cultural and socioeconomic indicators, with regard to their impact on the variation of youngsters' average alcohol use in 25 European countries.

Part IV ends with an analysis of all risk and protective factors and country level predictors in one combined multilevel model to explain the variability of risky alcohol use within countries, and to investigate whether national indicators explain the variance of risky alcohol use between countries.

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12 The family

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12.1 Introduction

Alcohol use in adolescence is strongly influenced by social and environmental factors (Kendler, Schmitt, Aggen & Prescott, 2008). Several studies have examined which family factors can explain delinquency in adolescents. For example, factors which increase the risk of adolescent delinquency are related to a lack of warmth, low supervision, harsh punishment, a conflictual family climate and problems of parents within the family (Loeber & Dishion 1983; Loeber & Stouthamer-Loeber, 1986).

The nature of interaction between family factors and a youth's intensive alcohol use is complex. Hirschi's social control theory (1969) is one of the most influential theories concerning the role of family. Hirschi noted that young people who experience a strong bond with their parents would internalize the values and norms of their parents, which in turn would cause adolescents to behave in a norm conforming way. According to Luthar, Cicchetti and Becker (2000), family factors can act as protective buffers against the negative effects of a high-risk context (i.e. protective-enhancing effect). Schonberg and Shaw (2007) indicated that family protective factors are influential in high-risk contexts: according to their study, parental supervision varied in importance across contextual conditions. Furthermore, Cleveland, Feinberg and Greenberg (2010) noted that family-level factors offered less protection for students in high-risk school contexts (see also Simons et al., 2002; Knoester & Haynie, 2005).

In this chapter we are interested in which family factors are associated with intense juvenile drinking in different regions of Europe. We hypothesize that affluence and negative life events are related to more intensive alcohol use, whereas family structure and social control would result in less intensive alcohol use among juveniles. Thus, principles of clustered countries will be introduced first, followed by a closer examination of the effects of different family factors on alcohol use among adolescents.

12.2 Theoretical framework

12.2.1 Clustering countries

For both practical and theoretical reasons, we made use of an empirical method to cluster the 25 countries which participated in the Second International Self Report-Delinquency Study (ISRD-2). During the classification process, we made a distinction between different national welfare regimes (Esping-Andersen, 1990; Saint-Arnaud & Bernard, 2003). This method is based on the principle that all individuals provide for their needs by producing goods and services in three different ways: 1) they work on the market place and get paid; 2) they pay taxes to the state and they may expect important public services and income transfers in return, and; 3) civil society (charities) and the families offer services and support (Esping-Andersen, 1990; Saint-Arnaud & Bernard, 2003). Esping-Andersen (1990; 1999) categorized societies into three types of social organization: the social democratic model (Scandinavian countries); the liberal model (Anglo-Saxon countries); and, the corporatist model (continental Europe). Later on, the Latin or Southern model was added (Leibfried, 1992; Ferrera, 1996; Bonoli, 1997), along with the Post-Socialist model (see Lappi-Seppala, 2007; Smit et al., 2008).

Using the Esping-Anderson typology elaborated by Saint-Arnaud and Bernard (2003), we grouped the countries into four clusters: Western Europe (Germany, France, Belgium, the Netherlands, Austria,

Ireland and Switzerland); Northern Europe (Finland, Sweden, Norway, Denmark and Iceland); Mediterranean countries (Spain, Italy, Portugal and Cyprus); and finally Post-Socialist countries (Czech Republic, Poland, Hungary, Estonia, Lithuania, Slovenia, Bosnia & Herzegovina, Armenia, and Russia).

Besides extending the classification scheme of Saint-Arnaud and Bernard, we deviated from their classification of countries in four additional respects: (1) Iceland, which originally belongs to the cluster of liberal welfare regimes was placed into the Northern European cluster; (2) Ireland (also a liberal welfare regime) was added to the Western European cluster as it is the only Anglo-Saxon country in our study; (3) Switzerland, which was not part Saint-Arnaud's and Bernard's analyses was also placed within the Western European cluster, and; (4) Cyprus which was also lacking in their analyses took the position of Greece. We believe that the country clusters provide a useful organizing framework for analyzing a large number of countries simultaneously.

12.2.2 Family factors

Family structure

Family structure, i.e. whether the child has both parents present at home or not, has negative effects on the social behaviour of children and supervision at homes, and it is a major determinant of delinquency (Sampson & Laub, 1993; Junger-Tas, Marshall, & Ribeaud, 2003). Single parents often have fewer financial and coping resources compared to traditional two-parent families (Elder, Eccles, Ardelt, & Lord, 1995; Gabel, 1992; Norton & Click, 1986). Also, youngsters from single-parent families are more likely to make decisions without consulting a parent (Dornbusch et al., 1985).

Those adolescents living in one-parent households are more likely to be involved in risky alcohol use (Flewelling & Bauman, 1990). They reported that youths who live in single-parent households had higher rates of drinking alcohol, compared to those living in two-parent households. Bjarnason, Andersson, Choquet, Elekes, Morgan, & Rapinett (2003), noted that adolescents who live with both biological parents engaged less frequently in heavy alcohol use, than those living in any other arrangements. Oman, Vesely, Tolma et al. (2007), reported that youths who live in one-parent households are more likely to report using alcohol in the past thirty days. Only a few studies did not find any differences in regards to adolescent substance use in two-parent or single-parent families (Fawzy, Coombs, Simon, & Bownan-Terrell, 1987), or that single-mother families are no more likely to be at risk of alcohol and other drug abuse (Amey & Albrecht, 1998).

In our study we expect that family structure is associated with the intense alcohol use, namely that, living in single-parent households increases the probability of risky alcohol use among adolescents. Concerning the country clusters, it is hypothesized that in regions where the family structure is more complete, i.e. the adolescents are living with both parents, the adolescents are less involved in risky alcohol use.

Family social control

Research demonstrates that supervision and family control are strong predictors of delinquency (Junger-Tas, 1988; Loeber & Farrington, 1998). Junger-Tas et al. (2003), noted that family social control is based on two dimensions: indirect and direct control. Indirect control is affected by the quality of the relationship between a youngster and his parents (Loeber & Stouthamer-Loeber, 1986), whereas direct control in the family is applied by close supervision. For example, White & Halliwell (2010) found that family dinners have a positive effect on lowering the likelihood of alcohol use (see also Fisher, Miles, Austin, Camargo jr & Colditz, 2007). Furthermore, parental support has been associated with decreased alcohol consumption (Urberg, Goldstein, & Toro, 2005).

It is hypothesized that when social control is higher it lowers the intensity of alcohol use. In regards to the country clusters, it is expected that in regions where family social control is stronger, adolescents are less likely to be involved in risky alcohol use.

Family affluence

Another factor connected to youth alcohol consumption is affluence, i.e. whether the adolescent or his/her family have certain possessions (own room, PC, room, car). The concept of what we define as affluence differs from socioeconomic status (SES), although there is some overlap. Studies concerning parents' SES have found that it is positively related to alcohol intake (Pomerleau, Pederson, Ostbye et

al., 1997). Elgar, Roberts, Parry-Langdon and Boyce (2005) note that income inequality was associated with drinking frequency among 11- and 13-year olds and drunkenness among 11-year olds.
Some studies identified a higher risk of excessive adolescent drinking behaviour among lower SES groups (Lowry, Kann, Clooins & Kolbe, 1996; Lintonen, Rimpelä, Vikat & Rimpelä, 2000; Lemstra, Bennett, Neudorf et al., 2008), while others have found weak effects of SES on adolescent alcohol consumption (Tuinstra, Groothoff, Heuvel & van der Post, 1998; Vereecken, Maes & Backquer, 2003). Furthermore, two Finnish studies found a clear relationship between adolescents' own financial resources and drunkenness (Lintonen, Rimpelä, Vikat & Rimpelä, 2000; Kouvonen & Lintonen, 2002).

We hypothesize that higher affluence will increase the intensity of juvenile drinking behaviour. Concerning country clusters, it is hypothesized that in regions where the affluence is higher, the adolescents are more likely to be involved in risky alcohol use.

Negative life events

Negative life events (concerning parental conflicts and alcohol abuse) experienced by adolescents during their lifetime has a paramount effect on their behaviour. For example, Burt, Barnes, McGue and Iacono (2008), indicated that parental divorce predicts delinquency and other externalizing behaviours during childhood and adolescence. Otten, van der Zwaluw, van der Holst and Engels (2008), indicated that alcohol use of younger children was affected by the alcohol use of both parents.

Several studies examined the effects of parents on the onset, and also heavy and problematic drinking of their children. For example, greater alcohol use by parents is associated with earlier use of alcohol by adolescents (Jackson, 1997; Ellickson & Hays, 1991). Parental problematic alcohol use may disrupt normal social processes within the family, leading to increased levels of family disruption, family and marital conflict, financial strain, family alcohol and drug use, inadequate parenting practices and poorer outcomes for children (Johnston and Leff, 1999; Keller et al., 2008; Lynskey et al., 2002; Sher et al., 2005; Tolan et al., 2006; Gutman, Eccles, Peck, & Malanchuk, 2011). Seljamo, Aromaa, Koivusilta et al. (2006), found that a present fathers heavy drinking and early parental drinking were the best predictors of their own children's problematic alcohol use at the age of 15. In addition, children with a family history of alcoholism demonstrate a higher escalation of alcohol use (Lieb et al. 2002) and more often develop alcohol disorders and dependence (Hill et al., 2000) than children without a family history of alcoholic parents.

It is hypothesized that if a youngster experiences more negative life events, it will increase their drinking intensity. In regards to the country clusters, it is expected that in regions where youths experience more negative life events, more youths will also be involved in risky alcohol use.

12.3 Method

12.3.1 Dependent variable

Our outcome variable is intense (heavy/problematic) alcohol use. This variable is a dichotomous variable coded as "1" if an adolescent has an intense drinking pattern and "0" if not (see Chapter 4 for a more detailed description of intense alcohol use). Overall, 15.9% of the adolescents can be classified as intense alcohol users. When we examined the country clusters, we found that in Western Europe, the proportion of intense alcohol users was the highest (18.2%), followed by Post-Socialist countries and Northern Europe (15.3% and 14.6%, respectively). The lowest proportion was found in Mediterranean countries (12.7%).

12.3.2 Independent variables

For the individual-level analysis the variables were: family structure, bonding, affluence, parental supervision and negative life events.

Concerning *family structure,* 25.1% of the sample lived in a single-parent or step-parent household, and 74.9% lived with both parents at home. For the analysis, the sample living with single-parent or step-parent households were coded as "0", and those living with both parents at home were coded as "1". When we examined the differences in country clusters, we found that in Mediterranean countries, 84.1% (n = 7560) of adolescents lived with a complete family, in Post-Socialist countries the proportion was 76.4% (n = 19848), in Western Europe it was 73% (n = 17723) and in Northern Europe, 65.4% (n =

11934). When we examined individual countries, we found that in Armenia and Cyprus almost 90% of adolescents lived with both parents, whereas in Estonia, Finland and Sweden the proportion was the smallest (see Table 12.1).

Family bonding is a combined variable consisting of four items: (1) whether the adolescent gets along with their father (from 1 "not at all" to 4 "very well"); (2) gets along with their mother (from 1 "not at all" to 4 "very well"); (3) spends leisure time together with parents (from 1 "never" to 6 "more than once a week"), and; (4) has dinner with his/her family (from 1 "never" to 8 "daily"). In the analysis, family bonding was standardized. When we observed the differences in the country clusters, we found that in Mediterranean countries, 20.3% (n = 7565) of adolescents reported maximum bonding (getting along very well with their father and mother, spending leisure time together with parents more than once a week, and having daily dinners with the family). In other regions this proportion was lower, namely 14.9% (n = 19660) in Post-Socialist countries, 14.9% (n = 17674) in Western Europe, and 13.6% (n = 11906) in Northern Europe. When we looked at countries individually, we found that bonding was the strongest in Cyprus and Armenia and in Estonia, Czech Republic and Finland, bonding was the weakest (see Table 12.1).

Concerning *parental supervision,* 5.4% of the sample indicated that they were rarely or never supervised; 35.3% sometimes, and; 59.3% always (or they did not go out). In the analysis, parental supervision was alo standardized. When we examined the differences between country clusters, we found that parental supervision was most prevalent in Mediterranean countries (73.3%, n = 7520), followed by Western Europe (57.7%, n = 17446), Post-Socialist countries (55.2%, n = 19773) and Northern Europe (52.9%, n = 11951). Parental supervision was the strongest in Spain, Armenia and Bosnia & Herzegovina, whereas in Estonia, Czech Republic and Iceland it was the lowest (see Table 12.1).

Family affluence is a combined variable which consists of four variables: (1) whether the adolescent has their own room (yes or no); (2) their own PC (yes or no); (3) their own mobile phone (yes or no), and; (4) whether the family has a car (yes or no). In the analysis, family affluence was standardized. When we observed the differences in country clusters we found that the proportion of those adolescents who answered "yes" to all the questions about having their own room, PC, mobile phone and whose parents owned a car, was the highest in Northern Europe (80%, n = 12055), followed by Western Europe (64.4%, n = 17761), Mediterranean countries (59%, n = 7565) and Post-Socialist countries (49.9%, n = 19892). When countries were observed independently, we found that the proportion was the highest in Iceland and Norway, and the lowest in Armenia and Russia (see Table 12.1).

Negative life events concerning family disruption consisted of three variables: (1) whether the adolescent had experienced parents' use of alcohol and/or drugs; (2) violence of parents, and; (3) parents' separation or divorce. In the analysis, negative life events were standardized. The proportion of adolescents who experienced in any of the above-mentioned life events was the highest in Mediterranean countries, (81.0%, n = 7459); followed by Post-Socialist countries and Western Europe (74.3%, n = 19439 and 69.6%, n = 17525, respectively). The lowest proportion was found in Northern Europe (62.9%, n = 11949). In Denmark and Sweden the proportion of those who had not experienced any negative life events was the lowest, whereas in Armenia and Bosnia & Herzegovina it was the highest (see Table 12.1).

Table 12.1 *Proportion of prevalence of family factors in different countries* (%)

Country	Structure	Bonding	Parental supervision	Affluence	Negative life events
Armenia	89.8	30.5	74.7	20	93.5
Austria	71.6	15.1	57.9	72.3	67.6
Belgium	68.3	16.7	59.6	52	63.2
Bosnia & Herzegovina	83.1	25.2	74.2	38.8	90
Cyprus	89.6	36.3	72.9	62.8	80.9
Czech Republic	70.3	6.2	43.9	54.8	67.5
Denmark	65.5	14.3	56.4	77.3	54.1
Estonia	62	4.7	34.4	57.5	61.8
Finland	62.2	6.6	50.4	73.2	60.3
France	67.6	18.3	57.4	45.2	66.8

Country	Structure	Bonding	Parental supervision	Affluence	Negative life events
Germany	71.4	12.4	56.4	75.6	66.3
Hungary	75	12	52.6	58.2	66.8
Iceland	70.6	21.3	44.5	88.8	73.6
Ireland	80.8	12.2	49	65.2	79.3
Italy	83.9	19.9	71.3	53.8	80.3
Lithuania	74.9	12.7	49.5	53.2	67.8
Netherlands	75.1	16.7	63.3	77.9	72.7
Norway	66.4	14.6	56.1	82.8	67.2
Poland	82.1	12.9	54.9	54.7	75.1
Portugal	79.7	6.5	73	59.4	80.9
Russia	70.6	12.5	52.8	29.7	68.7
Slovenia	79.7	16.3	58.4	73.4	76.5
Spain	81.8	15.2	78.1	58.3	82.5
Sweden	62.1	11.4	57.3	77.6	59.3
Switzerland	76.2	13.6	62.3	75.2	68.3

12.3.3 Statistical analysis

In this study a multilevel logistic regression analysis was used to estimate the effects of family factors on the intensity of juvenile drinking. The analysis was conducted in R 2.15.0, and the package lme4 was used for carrying out all of the analyses. Laplace approximation was used to estimate the parameters of the models. The first level of the multilevel analysis was the individual level of the youngsters concerning intense alcohol use. These youngsters were clustered within schools (second level). The third level of the analysis was the country level. Explanatory variables included sociodemographic variables (grade, gender and migrant status), and five family factors (family structure, affluence, bonding, negative life events, and parental supervision).

In the analyses of the effect of family factors on alcohol use, we controlled for gender, grade and immigrant status. Concerning gender, females were coded as "0" and males as "1". Regarding immigrant status, the youngsters were divided into two groups: natives (coded as "1") and 1st/2nd generation (coded as "0"). Finally, grade was dichotomized in the model (the youngsters in the seventh grade were used as a reference group which were compared separately against eighth and nineth graders.

12.4 Results

12.4.1 Family structure

The results for family structure are presented in Table 12.2. In Model 0 we see that the proportion of intense alcohol users in the dataset is .16. In Model 1 we added the sociodemographic variables (gender, grade and migrant status) for which the model was controlled. In Model 2 we added family structure. When adolescents were living with both parents the likelihood of intense alcohol use (OR = .72) was lower, compared to single-parent households. The model including family structure fits better than model 1 ($x^2(1)=136$, $p<.001$).

In Model 3, random slope variance is estimated for the impact of family structure. This random slope variance was found to be significant ($x^2(2)=9$, $p<.01$), meaning that there are differences in terms of the impact of family structure across countries as well (see Table 12.3). The correlation between the intercepts and slopes of the countries is negative (-.554), which indicates that the higher the intercept, the smaller the impact of family structure on the intensity of alcohol use in a country.

In Models 4 and 5 we added country clusters to the analysis. We found that Model 4 was not significantly better than Model 3 ($x2(3)=4.3$, ns), although there was a difference between Northern and Western Europe in regards to intense alcohol use. Model 5 was found to be significantly better than Model 3 ($x2(6)=27.8$, $p<.001$), and there were differences present between clusters in regards to the impact of family structure on the intensity of alcohol use. Namely, in Northern Europe the impact of family structure on intense alcohol use was the strongest (i.e. complete families lowers alcohol use compared to incomplete families) compared to Western Europe, Mediterranean and Post-Socialist countries (where the effect of a complete family on alcohol use was the weakest).

Table 12.2 *The results of multilevel analysis concerning family structure (n individuals 53053 ; n schools 1344; n countries: 25)*

	Model 0: empty model	**Model 1: control variables**	**Model 2: family structure**	**Model 3: family structure random slope**	**Model 4: country cluster**	**Model 5: family structure x country cluster**
Fixed						
Intercept	.16 (.02)***	.10 (.01)***	.13 (.01)***	.13 (.01)***	.10 (.02)***	.14 (.02)***
Family structure			.72 (.02)***	.73 (.03)***	.73 (.03)***	.55 (.11)***
Western Europe (ref Northern Europe, NE)					1.68 (.44)*	1.34 (.29)
Mediterranean countries (ref NE)					1.10 (.33)	.63 (.36)
Post-Socialist countries (ref NE)					1.36 (.34)	.75 (.27)
Family structure x Western Europe (ref NE)						1.22 (.03)*
Family structure x Mediterranean countries (ref NE)						1.52 (.01)***
Family structure x Post-Socialist countries (ref NE)						1.56 (.01)***
Random						
Var School	.273	.254	.253	.254	.254	.255
Var Country	.246	.240	.234	.293	.273	.205
Var family structure				.024	.026	.001
Cor family structure, intercept				-.554	-.645	-1.000
LR test	c2(2)=1850***	c2(4)=317***	c2(1)=136***	(2(2)=9**	(2(3)=4.3ns	(2(6)=27.8***

Note: *** p<0.001; ** p<0.01; * p<0.05. Models 4 and 5 are compared to Model 3.

12.4.2 Family social control

This section will first discuss the results concerning bonding (see Table 12.4), followed by parental supervision (see Table 12.5). Models 0 and 1 were described in detail in the previous section, therefore in this section and for those that follow, they will not be reviewed. In Model 2 we added bonding to the model. When bonding with parents is higher it lowers the presence of intense alcohol drinking (OR = .68). The model including bonding is a better fit than model 1 ($x^2(1)=1020$, p<.001).

In Model 3 we examined the interaction effect between country and bonding. There are differences in regards to the impact of bonding across countries (see Table 12.3). The correlation between the intercepts and slopes of the countries is negative (-.185). The model including bonding fits better than model 2 ($x^2(2)=48$, p<.001).

In Models 4 and 5 we added country clusters to the analysis. Model 4 was not significantly better than Model 3 (x2(3)=5.2, ns). Yet, model 5 was significantly better than Model 3 (x2(6)=29.0, p<.001), and there were differences present between clusters in regards to the impact of bonding on intense alcohol use. Namely, in Northern Europe the impact of bonding on intense alcohol use was the strongest (i.e. strong bonding lowered alcohol use) compared to Western Europe, Post-Socialist countries and Mediterranean countries (where the effect of bonding on alcohol use was the weakest).

Next, the results concerning parental supervision will be examined. In Model 2 we added parental supervision to the model which lowered the likelihood of intense alcohol use (OR = 0.62). The model including parental supervision is a better fit than model 1 (x^2 (1)=1592, p<.001). In Model 3 we examined the interaction effect between the individual countries and parental supervision. There was a significant association, which indicated that there are differences in terms of the impact of supervision across countries (see Table 12.3). The correlation between the intercepts and slopes of the countries is positive (.204), which indicates that the higher the intercept, the higher the impact of supervision in a country. The model including supervision fits better than model 2 ($x^2(2)=20$, p<.001).

In Models 4 and 5 we added country clusters to the analysis. Model 4 was not significantly better than Model 3 (x2(3)=4.6, ns). However, model 5 was significantly better than Model 3 (x2(6)=13.5, p<.05) and there were differences present between clusters in regards to the impact of parental supervision on intense alcohol use. Namely, in Northern Europe the impact of parental supervision on intense alcohol use was the strongest (i.e. strong parental supervision lowered alcohol use) compared to Post-Socialist and Mediterranean countries and Western Europe (where the effect of parental supervision on alcohol use was the weakest).

Table 12.3 Adjusted odds ratios for family variables by country (controlled for gender, grade, and migrant status)

Country	Family structure	Family bonding	Parental supervision	Affluence	Negative life events
Armenia	1.95	0.90	0.72	1.18	1.08
Austria	0.63	0.64	0.68	1.24	1.25
Belgium	0.68	0.70	0.65	1.25	1.21
Bosnia & Herzegovina	1.51	0.66	0.58	1.19	1.18
Cyprus	0.95	0.74	0.52	1.12	1.30
Czech Republic	0.88	0.80	0.64	1.12	1.10
Denmark	0.54	0.57	0.57	1.17	1.31
Estonia	0.85	0.72	0.61	1.11	1.19
Finland	0.64	0.54	0.46	1.18	1.37
France	0.63	0.68	0.71	1.27	1.26
Germany	0.67	0.66	0.66	1.76	1.29
Hungary	0.79	0.65	0.59	1.10	1.06
Iceland	0.35	0.55	0.47	0.58	1.74
Ireland	0.55	0.62	0.52	0.83	1.45
Italy	0.76	0.73	0.66	1.18	1.20
Lithuania	0.72	0.77	0.61	1.02	1.16
Netherlands	0.79	0.68	0.70	1.58	1.31
Norway	0.67	0.64	0.61	1.20	1.31
Poland	0.71	0.74	0.54	1.10	1.21
Portugal	0.92	1.00	0.66	1.17	1.09
Russia	0.77	0.59	0.57	1.24	1.17
Slovenia	0.72	0.68	0.54	0.91	1.19
Spain	0.87	0.79	0.69	1.21	1.26
Sweden	0.51	0.65	0.51	1.21	1.42
Switzerland	0.75	0.59	0.59	1.27	1.32

Table 12.4 *The results of multilevel analysis concerning bonding (last model: n individuals 52724 ; n schools 1344; n countries: 25)*

	Model 0: empty model	Model 1: control variables	Model 2: bonding	Model 3: cross-level interaction bonding random slope	Model 4: country cluster	Model 5: family structure x country cluster
Fixed						
Intercept	.16 (.02)***	.10 (.01)***	.10 (.01)***	.10 (.01)***	.10 (.02)***	.09 (.02)***
Bonding			.68 (.01)***	.68 (.02)***	.68 (.02)***	.57 (.06)***
Western Europe (ref Northern Europe, NE)					1.40 (.35)	1.49 (.27)
Mediterranean countries (ref NE)					.69 (.20)	.84 (.32)
Post-Socialist countries (ref NE)					.82 (.20)	.96 (.25)
Bonding x Western Europe (ref NE)						1.12 (.02)*

	Model 0: empty model	Model 1: control variables	Model 2: bonding	Model 3: cross-level interaction bonding random slope	Model 4: country cluster	Model 5: family structure x country cluster
Bonding x Mediterranean countries (ref NE)						1.37 (.01)***
Bonding x Post- Socialist countries (ref NE)						1.26 (.01)***
Random						
Var School	.271	.252	.252	.249	.250	.250
Var Country	.244	.239	.223	.224	.182	.177
Var bonding				.013	.013	.002
Cor bonding, intercept				-.185	.227	.167
LR test	c2(2)=1830***	(2 (4)=315***	(2(1)=1020***	(2 (2)=48***	(2 (3=5.2ns	(2 (6)=29***

Note. *** p<0.001; ** p<0.01; * p<0.05. Models 4 and 5 are compared to Model 3

Table 12.5 The results of multilevel analysis concerning parental supervision (n individuals 52564 ; n schools 1344; n countries: 25)

	Model 0: empty model	Model 1: control variables	Model 2: parental supervision	Model 3: parental supervision random slope	Model 4: country cluster	Model 5: family structure x country cluster
Fixed						
Intercept	.16 (.02)***	.10 (.01)***	.10 (.01)***	.10 (.01)***	.09 (.02)***	.09 (.02)***
Parental supervision			.62 (.01)***	.61 (.01)***	.61 (.01)***	.53 (.07)***
Western Europe (ref Northern Europe, NE)					1.52 (.39)	1.59 (.27)
Mediterranean countries (ref NE)					.93 (.27)	.97 (.33)
Post-Socialist countries (ref NE)					.95 (.23)	.99 (.25)
Parental supervision x Western Europe (ref NE)						1.20 (.02)**
Parental supervision x Mediterranean countries (ref NE)						1.17 (.01)*
Parental supervision x Post-Socialist countries (ref NE)						1.14 (.01)*
Random						
Var School	.277	.258	.258	.257	.257	.257
Var Country	.248	.242	.220	.225	.178	.181
Var parental supervision				.007	.007	.004
Cor parental supervision, intercept				.204	.019	.083
LR test	c2(2)=1868***	c2(4)=313***	c2(1)=1592***	c2 (2)=20***	c2(3)=4.6ns	c2 (6)=13.5*

Note: *** p<0.001; ** p<0.01; * p<0.05. Models 4 and 5 are compared to Model .

12.4.3 Affluence

Next, we will examine family affluence (see Table 12.6). In Model 2 we added affluence to the model which increased the likelihood of intense alcohol use (OR = 1.17). This implies that for those adolescents who are more affluent (according to our definition), the odds of intense drinking is much higher. The model fits better than model 1 ($x^2(1)=103$, $p<.001$). In Model 3 we examined the interaction effect between country and affluence, which was also significant (OR = 1.18). This indicates that there are differences in regards to the impact of affluence across countries (see Table 12.3). The correlation between the intercepts and slopes of the countries is slightly positive (.025), which implies that the higher the intercept, the higher the impact of affluence in a country. The model fits better than model 2 ($x^2(2)=26$, $p<.001$).

In Models 4 and 5 we added country clusters to the analysis. Model 4 was not significantly better than Model 3 (x2(3)=5.4, ns). Model 5 was significantly better than Model 3 (x2(6)=12.8, p<.05), however, there were also no differences between clusters in regards to the impact of affluence on intense alcohol use.

Table 12.6 *The results of multilevel analysis concerning affluence (n individuals 53136 ; n schools 1344; n countries: 25)*

	Model 0: empty model	**Model 1: control variables**	**Model 2: affluence**	**Model 3: affluence random slope**	**Model 4: country cluster**	**Model 5: family structure x country cluster**
Fixed						
Intercept	.16 (.02)***	.10 (.01)***	.10 (.01)***	.10 (.01)***	.10 (.02)***	.10 (.02)***
Affluence			1.17 (.02)***	1.18 (.04)***	1.18 (.04)***	1.19 (.12)*
Western Europe (ref Northern Europe. NE)					1.54 (.38)	1.45 (.26)
Mediterranean countries (ref NE)					.82 (.23)	.82 (.32)
Post-Socialist countries (ref NE)					1.02 (.24)	1.07 (.24)
Affluence x Western Europe (ref NE)						1.10 (.03)
Affluence x Mediterranean countries (ref NE)						.99 (.01)
Affluence x Post-Socialist countries (ref NE)						.92 (.01)
Random						
Var School	.274	.256	.251	.245	.246	.245
Var Country	.246	.240	.216	.208	.172	.171
Var affluence				.015	.015	.009
Cor affluence, intercept				.025	-.245	-.233
LR test	c2(2)=1859***	c2(4)=318***	c2(1)=103***	c2 (2)=26***	c2(3)=5.4ns	c2 (6)=12.8*

Note: *** p<0.001; ** p<0.01; * p<0.05. Models 4 and 5 are compared to Model 3

Negative life events

Finally, we examined the effect of negative life events on juvenile alcohol use (see Table 12.7). In Model 2 we added negative life events to the model. The increase in negative life events increased the likelihood of intense alcohol use (OR=1.25). This model fits better than model 1 ($x^2(1)=358$, $p<.001$). In Model 3 we examined the interaction effect between individual countries and negative life events. It was again confirmed that there are differences in regards to the impact of negative life events across countries (see Table 12.3). The correlation between the intercepts and slopes of the countries is positive (.128). The model fits better than model 2 ($x^2(2)=2$, $p<.01$).

In Models 4 and 5 we added country clusters to the analysis. Model 4 was not significantly better than Model 3 (x2(3)=5.9, ns). However, Model 5 was significantly better than Model 3 (x2(6)=34.2, p<.001), and there were differences present between clusters in regards to the impact of negative life events on intense alcohol use. Namely, in Northern Europe the impact of negative life events on intense alcohol use was the strongest (i.e. negative life events increased alcohol use) compared to Western Europe, Mediterranean and Post-Socialist countries (where the effect of negative life events on alcohol use was the weakest).

Table 12.7 The results of multilevel analysis concerning negative life events (n individuals 52386 ; n schools 1344; n countries: 25)

	Model 0: empty model	**Model 1: control variables**	**Model 2: negative life events**	**Model 3: negative life events random slope**	**Model 4: country cluster**	**Model 5: family structure x country cluster**
Fixed						
Intercept	.16 (.02)***	.10 (.01)***	.10 (.01)***	.10 (.01)***	.11 (.02)***	.09 (.02)***
Negative life events			1.25 (.02)***	1.25 (.02)***	1.26 (.02)***	1.39 (.04)***
Western Europe (ref Northern Europe, NE)					1.33 (.32)	1.55 (.27)
Mediterranean countries (ref NE)					.63 (.18)	.89 (.32)
Post-Socialist countries (ref NE)					.67 (.16)	1.06 (.25)
Negative life events x Western Europe (ref NE)						.93 (.01)*
Negative life events x Mediterranean countries (ref NE)						.86 (.01)***
Negative life events x Post-Socialist countries (ref NE)						.82 (.01)***
Random						
Var School	.273	.254	.251	.251	.251	.251
Var Country	.248	.242	.220	.221	.210	.179
Var negative life events				.004	.004	.001
Cor negative life events, intercept				.128	-.637	-1.000
LR test	c2(2)=1833***	c2(4)=305***	c2(1)=358***	c2(2)=11**	c2(3)=5.9ns	(2(6)=34.2***

Note: *** p<0.001; ** p<0.01; * p<0.05. Models 4 and 5 are compared to Model 3

12.5 Discussion

In this chapter we examined the intensity of alcohol use among youngsters from 25 European countries, and to what extent the intensity of alcohol use was associated with different family factors, i.e. structure, bonding, supervision, affluence, and negative life events. The differences between country clusters were also observed. The analysis was controlled for similar background information, i.e. gender, grade and migrant status.

Our hypotheses were confirmed for family structure. Those adolescents who came from two-parent households were less likely to be intense alcohol users than those from single-parent households, confirming some previous findings (Elgar et al., 2005; Flewelling & Bauman, 1990; Oman et al., 2007). Multilevel analysis demonstrated that there were differences between countries and also between country clusters. Namely, in Northern Europe, the impact of family structure on intense alcohol use was stronger compared to other regions (Western Europe, Mediterranean and Post-Socialist countries). Thus, on the one hand, in Northern Europe the proportion of adolescents who lived with both parents was the smallest, yet the effect of living with both parents on the intensity of alcohol use was the

strongest. Interestingly, in Mediterranean and Post-Socialist countries, the impact of family structure on the intensity of alcohol use was similar; however, in Mediterranean countries the proportion of adolescents living with both parents was higher.

Regarding social control, adolescents who experienced a higher degree of bonding with their families and were supervised more often were less involved with intense alcohol use, which also supports previous research (White & Halliwell, 2010; Fisher et al., 2007; Urberg et al., 2005). The differences concerning intensive alcohol use emerged between countries and also between country clusters. In Northern Europe, the impact of bonding and parental supervision on intense alcohol use was the strongest compared to other regions (i.e., strong bonding and parental control lowered the intense alcohol use). Interestingly, strong bonding was most prevalent in Mediterranean countries; however, the impact of bonding on intense alcohol use there, was the weakest (similar results but to a lesser extent emerged for parental supervision). One possible reason for this finding could be that in Mediterranean countries, the proportion of intense alcohol users is the lowest compared to other regions.

Although the scale of affluence has already been used in international research (Boyce et al., 2006), the analysis of ISRD-2 data questions the value of this scale. Marshall & Enzmann (2011) proposed that in affluent societies, the scale measures the propensity to consume instead. As this scale was the best available indicator for SES it was used in the analysis, however, the results must be interpreted with care. Our study indicated that affluence was related to intense alcohol use, i.e. when adolescents were from more affluent families they were also more intense alcohol users which confirms previous findings (Pomerlau et al., 1997; Lintonen et al., 2000; Kouvonen & Lintonen, 2002). There were differences in affluence between countries, i.e. in some countries, affluent youngsters were more intense alcohol users than in other countries, which confirms Marshall & Enzmann's (2011) hypothesis. However, there were no differences between country clusters in regards to the impact of affluence on intense alcohol use. This finding is interesting because the differences in affluence were relatively large, ranging from 49.9% in Post-Socialist countries to 80% in Northern Europe.

Finally, we found support for our hypothesis that when adolescents experience more negative life events, it would increase the intensity of their drinking behaviour (see also Otten et al., 2008; Lieb et al., 2002). There were differences in regards to the association of negative life events and intense alcohol use between countries and country clusters. In Northern Europe, where the proportion of adolescents who experienced more negative life events was the highest, the impact of negative life events on intense alcohol use was stronger than in other regions (i.e. negative life events increased the alcohol use). One important factor influencing this result can be the divorce rate which is relatively low in Mediterranean and Post-Socialist countries compared to Northern Europe.

Overall, we can conclude that all family factors were strongly associated with intense alcohol use among adolescents. Family structure and social control lower the intensity of alcohol use whereas negative life events and affluence increase the intensity of a youngsters' alcohol use. Differences between country clusters were present for all family factors except affluence.

12.5.1 Policy recommendations

The results demonstrate that family factors are important in relation to the intensity of alcohol use among adolescents. The following recommendations are based on the results of this study. Due to the fact that family social control was related to less intense alcohol use, intervention programs, which aim to strengthen the parents' supervision skills, are highly recommended. Furthermore, the programs should also focus on other health-harming activities, besides risky alcohol use.

According to our results, adolescents who experienced negative life events are more vulnerable to risky alcohol use. Both parents and adolescents can play an important role in deterring the effects: parents in terms of how to solve conflicts effectively without harming their offspring, and adolescents as of how to maintain control over their behaviour in less supportive environments. This can be achieved by making use of school-based interventions. A targeted approach can also be used (i.e. special support for families in the process of divorce). For example, parents going through a divorce may be offered communication or problem solving skills, which would aid adolescents throughout the divorce process. This is also important regarding to family structure, as the results demonstrated that when adolescents live with both of theirs parents they are less likely to be involved in risky alcohol behaviour.

12.6 References

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13 The School

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13.1 Introduction

Building on theoretical models such as the health belief model (Hallinan, 1994; Janz & Becker, 1984; Van Houtte & Stevens, 2008; Wikström, 2010) or the theory of reasoned action (Ajzen, 1991), research in the socio-medical discourse is characterized by an assumption that health and lifestyle behaviour is the result of individual choice, and that the risk factors of these behaviours are related to psycho-individual characteristics in the first place (Cockerham, 2005). In sociological and criminological sciences, on the other hand, examining the influence of contextual variables on individual-level outcomes has long been common practice. Increasingly, however, there is general agreement that the aetiology of adolescent alcohol and drug use is multifactorial, and that the risk factors are situated in different domains and at different structural levels, and characterized by complex interactions that are not always well understood (Cleveland, Feinberg, & Greenberg, 2010; Petraitis, Flay, & Miller, 1995). Not only do alcohol and drug use vary in different contexts (i.e. schools, neighbourhoods, countries, etc.), but so do the risk factors that are associated with them (Bloomfield, Grittner, Kramer, & Gmel, 2006; Chuang, Ennett, Bauman, & Foshee, 2009; Cleveland et al., 2010; Henry, Stanley, Edwards, Harkabus, & Chapin, 2009), and alcohol policies vary depending on these contexts (Brand, Saisana, Rynn, Pennoni, & Lowenfels, 2007; Felson, Savolainen, Bjarnason, Anderson, & Zohra, 2011). Although there has been quite a lot of research into the cross-national differences in the associations between risk, protective factors, and adolescent substance use (Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Farhat et al., 2012; Felson et al., 2011), little attempt has been made to study risk factors at different levels simultaneously, and research that examines the interactive effects of individual-level risk factors with contextual variables is non-existent. This is remarkable, especially because, since the development of multilevel modelling techniques in the nineties, researchers can simultaneously assess the influence of both individual and contextual influences, while also considering possible cross-level interaction mechanisms. In that vein, the ISRD-2 study, with its built-in multilevel framework and cross-national character, provides an excellent context for studying the complex aetiology of alcohol and substance use.

In this chapter we focus on two different issues and investigate school-related risk factors from a multilevel analysis perspective. First, we examine whether the variation in the effect sizes of truancy (as examined in chapter 5) can be explained by a country's overall truancy culture. Specifically, we hypothesize that in countries where truancy is more prevalent, truancy should be more socially accepted and thus less deviant, and this may translate into a weaker relationship between truancy and alcohol use. Second, we pay attention in this chapter to a structural characteristic that relates to educational stratification. More particularly, we focus attention on countries that are known to have a "tracking" (also known as "streaming") system in education from early in secondary school education, and how this practice relates to differences in heavy episodic drinking and cannabis use. We used heavy episodic drinking as the alcohol outcome because this measure captures most clearly "problematic" drinking patterns, especially given the age distributions within these countries.

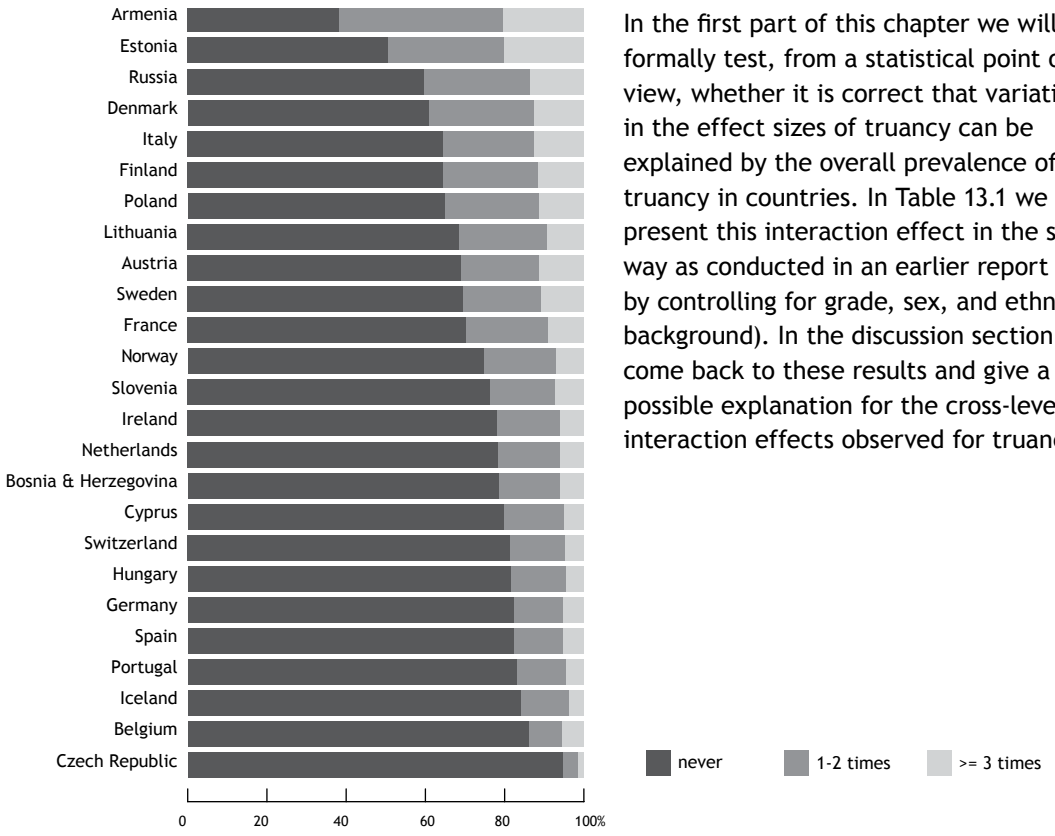
13.2 Explaining cross-national variations in truancy by association with alcohol use

One of the most striking observations that came out of Chapter 6 was that truancy showed a wide variation in its relative effects across European countries. This variation is remarkable, not only when

compared to the variability in effect sizes of the other school risk factors (see Table 6.9, Chapter 6, WP3), but also when it was compared with the variability in the effect sizes of truancy at the school level. Further analyses (results not shown) indicated that the variability in effect sizes of truancy at the school level is not even significant (x2 [2] = 4.59, p = ns). This finding raises the question of what could possibly explain this large variation at the country level, and one possible candidate in this regard might be the truancy culture in these countries.

Despite truancy being increasingly recognized as an important risk factor for several school-related outcomes (Miller & Plant, 1999; Petraitis et al., 1995), cross-national studies on the rates of prevalence of truancy, and specifically on truancy cultures, are to our knowledge non-existent. However, there are studies showing that cross-national variations in the cultures of alcohol and substance use exist (Beyers et al., 2004; Farhat et al., 2012; Felson et al., 2011), so one may reasonably expect that this also holds for truancy. The rates of the prevalence of truancy in the 25 European countries (Figure 1) teaches us that such variations do exist in the ISRD-2 study (M = 27.04%, SD = 12.32). In some countries truancy is almost twice as common as in other countries, as it ranges from a minimum of 5.2% in the Czech Republic to a maximum of 61.6% in Armenia. Also, a quick glance at the relative effects of truancy on heavy episodic drinking in these countries points us towards a remarkable finding. It seems that high prevalence rates of truancy have come together with low effects of truancy on alcohol use in some countries, while in other countries low prevalence rates of truancy were accompanied by strong effects of truancy on alcohol use.

Figure 13.1 Prevalence of unauthorized absenteeism from schools in 25 European countries



In the first part of this chapter we will formally test, from a statistical point of view, whether it is correct that variations in the effect sizes of truancy can be explained by the overall prevalence of truancy in countries. In Table 13.1 we present this interaction effect in the same way as conducted in an earlier report (i.e. by controlling for grade, sex, and ethnic background). In the discussion section we come back to these results and give a possible explanation for the cross-level interaction effects observed for truancy.

13.2.1 Data and methods

Data used for this investigation is from the ISRD-2 study, a cross-national survey among students in the seventh, eighth and ninth grades of secondary school (12- to 15-year-old students). The outcome variable used for the analyses is heavy episodic drinking. This variable measures whether the student has consumed five or more glasses (or units) of alcohol on the last occasion. Because cluster sampling methods were used to collect the data and the dependent variables are dichotomous, multilevel logistic regression techniques were used for the multivariate analysis. We used the lme4 package in R to conduct all multilevel analyses (Bates, Maechler, & Bolker, 2012).

To answer the question being posed, we investigated whether variations in the slopes of truancy can be explained by structural characteristics at the country level. Truancy was measured here by asking students if they had ever stayed away from school at least a whole day without legitimate excuse in the last 12 months (1 = never, 2 = one or two times, 3 = three or more times). The structural context of truancy is measured as an aggregated version of truancy prevalence at the country level. Because cross-level interaction terms are included in the model, predictors at both the individual and country level were grand mean centred to make interpretation of the coefficients more straightforward (Hox, 2002).

13.2.2 Results

The results of the multilevel analyses are reported in Table 13.1. As the table shows, variables at two levels of analyses were investigated (see *fixed part* of the model). At the individual level, the control variables (grade, sex, and ethnic background) are added together with a variable that measures the truanting behaviour of the adolescent. At the country level, only one variable is entered into the model, namely, country prevalence rate of truancy. The *random part* of the model shows the different variance components. Because no variance parameter is estimated at the individual level in logistic regression models, only two variance components are reported: one at the school level and one at the country level. The random part of the model also shows that only the slope for the truancy predictor is allowed to vary across the countries. This in order to estimate whether there is a cross-level interaction effect with truancy prevalence.

In line with our expectations, the results confirmed that an interaction effect exists with truancy culture (OR = 0.713, $p < .05$). The relationship of truancy with heavy episodic drinking is stronger in countries where truancy is less prevalent than in countries where truancy is a more common phenomenon. Note further that the main effect for truancy prevalence at the country level is not significant, meaning that the odds of heavy episodic drinking will not be higher because one lives in a country where truancy is more prevalent.

Table 13.1 Logistic multilevel regression models for heavy episodic drinking: truancy prevalence (N = 53,806)

	b	s.e.	OR
Fixed part			
Individual level variables			
Intercept	-3.083***	0.133	0.046
Male	0.453***	0.028	1.572
1st generation migrant	-0.368***	0.061	0.692
2nd generation migrant	-0.229***	0.041	0.795
Grade 8	0.769***	0.042	2.157
Grade 9	1.422***	0.041	4.147
Truancy	0.586***	0.026	1.796
Country level variables			
Truancy prevalence (aggregated)	-1.131	0.774	0.323
Cross-level interaction			
Truancy * truancy prevalence	-0.338*	0.159	0.713
Random part			
Var (Intercept/school)	0.270		
Var (Intercept/country)	0.395		
Var(Truancy/country)	0.012		
Loglikelihood	-18857		
df	13		

*: p < .05, **: p < .01, ***: p < .001

13.2.3 Discussion and conclusion

Our analyses indicated that the relationship between truancy and heavy episodic drinking is weaker in countries where truancy is more prevalent than in countries where truancy was rather rare. We also showed that it is not because truancy is more prevalent in a country that there are higher prevalence rates of heavy episodic drinking at the country level. To some, this finding will not come as a surprise. A possible explanation could be that when truancy is more prevalent in a country it is also more socially accepted by schools and parents, or that teenagers are truant for *reasons* that are more socially accepted. If truancy is more socially accepted, and thus less deviant, the relationship between truancy and alcohol use is expected to be weaker.

A culture that is more tolerant towards truancy may reflect this in several ways. For instance, definitions of truancy (e.g. the number of unexcused absences at which a student is considered legally truant) not only vary by region or type of school, but may also vary between countries. In some countries a student may be considered legally truant from the moment of absence without legitimate excuse for one day in a year, while in other countries the threshold which triggers legal action by schools may be much higher. Or it may be that the school administration in some countries keeps good records of who is present at school and communicates unauthorized absenteeism instantly with the students' parents, while other countries may follow this up to a much lesser degree. If truancy is tolerated more and sanctioned less, then a logical consequence of this is that more people will be truant, but not for reasons that relate to deviance in other domains per se (e.g. alcohol and drug use, delinquency). This reasoning is in line with the results showing that no significant main effect was observed for truancy prevalence at the country level, meaning that higher prevalence rates of truancy in a country do not necessarily equate to more problematic drinking patterns. On the other hand, in countries where truancy is a rather rare phenomenon, this might mean that it is more strongly disapproved of, negatively labelled, or more severely sanctioned. Consequently, the costs of breaking these rules may be higher, and so truant youngsters are more likely to be the ones that are also deviant in other domains. In such circumstances, the relationship between truancy and heavy episodic drinking is expected to be stronger. However, it should be stressed that our data did not allow us to conduct a solid test for this hypothesis, as data on truancy cultures, definitions of truancy, and tolerance towards truancy are not available from a cross-national perspective. We tested this hypothesis by using the overall prevalence rates of truancy as rough indicators of this truancy culture. Thus, more research is needed to captures these cross-national differences in cultural norms regarding truancy, motivations for truancy, legal definitions of truancy, and so on.

13.3 Tracked education systems and substance use

An educational system characterized by a high degree of stratification in secondary schools is characteristic of European countries. While in most countries this stratification manifests itself only from the upper stage of secondary schooling onwards, in other countries such a stratification is visible already from the first year of (lower) secondary school. Educational stratification is the practice of grouping pupils according to their intellectual abilities, whether by tracking, streaming, or some other approach (Van Houtte & Stevens, 2008). Broadly speaking, such a tracking system differentiates between "general education", which provides students with a firm theoretical foundation of knowledge for going into higher education, and "vocational education", which provides students with a technical training that prepares them to enter the job market directly, with other education types falling somewhere in between these two extremes. The practice of educational stratification makes sense of course, as students are expected to have different futures and consequently need to learn different things. Also, teaching a homogeneous group of students is considered more efficient as it allows teachers to direct lessons towards the specific ability level of the students in each class (Hallinan, 1994; Van Houtte & Stevens, 2008). However, despite these good intentions, there is a growing body of research showing that tracking also has detrimental effects. For instance, studies (e.g. Hallinan, 1994; Van Houtte & Stevens, 2008) indicate that belonging to a higher track positively influences academic achievement, while the reverse holds true for those belonging to a lower track. Other research illustrates that students in lower educational tracks use alcohol in a more problematic way than their

counterparts in the upper tracks (Berten, Cardoen, Brondeel, & Vettenburg, 2012; Hagquist, 2006; Kinable, 2010; Vereecken, Maes, & De Bacquer, 2004).

More problematic is that the probability of these negative side-effects occurring are unequally distributed over society, as the inflow of students of these education types is strongly determined by the students' socioeconomic background. Middle class students are tracked into the higher status types of education, while pupils who lack the "*right cultural capita*l", such as lower class students and students from ethnic minority groups, get entangled in what is described as a "*waterfall mechanism*", and they often end their education career in the vocational education (Nicaise, 2008; Van Rossem, Berten, & Van Tuyckom, 2010; Vettenburg, 1988, 1998). However, these selection effects are only one part of the story. According to Bourdieu and Passeron (1977) and Vettenburg (1988; 1998), schools also socialize students into particular cultures: higher status education types socialize students towards the dominant middle class cultures, while lower status education types socialize them towards lower class cultures. Thus, schools are important agents of cultural reproduction (Bourdieu & Passeron, 1977), and this reproduction of inequalities is accomplished by means of the processes of both selection and socialization.

According to societal vulnerability theory (Vettenburg, 1988; 1998), youngsters from lower socio-economic backgrounds are projected into a "*downward spiral of societal vulnerability*" during their socialization in school, caused by the cultural gap that exists between their familial background on the one hand and the middle class school culture on the other hand (see also Bourdieu & Passeron, 1977). This cultural gap influences the attitudes and expectations teachers have about pupils of lower socio-economic backgrounds and thwarts the development of a positive connection between both parties. More importantly, it explains to a large degree why students from a lower social class often end up in the lower educational tracks (i.e. "*waterfall mechanism*"). Researchers have shown that teachers of lower status educational types often think of their pupils as "educational failures" and "*unruly*", and they have lower expectations of them and give fewer positive stimuli (Bowles & Gintis, 1976; Pelleriaux, 2001; Rosenthal & Jacobson, 1968; Vettenburg, 1988, 1998). This fosters an overall school climate of vocational programmes characterized by little or no interest in academic studies or school, feelings of being held back with bleak future prospects, strained relations with teachers and school administration, and also poor study motivation, boredom, a sense of futility, eroded self-esteem, and so on (Pelleriaux, 2001; Schafer & Olexa, 1971; Van Houtte, 2005, 2006; Vettenburg, 1988, 1998). These students then associate with and seek support from similarly stigmatized youngsters. In doing so, they develop a system of anti-values and a rebellious approach. The cultures that emerge under these circumstances strongly emphasize masculinity and social status as core elements of pupils' identity (Askew & Ross, 1990; Epstein, 2009; Mac an Ghaill, 1994; Willis, 1977). To compensate for their lack of status in domains related to academic achievement, they seek alternative ways of achieving social status. Possible candidates for this are risky behaviour, delinquent behaviour, and alcohol and drug use. However, substance use may also function as a coping strategy for handling their state of vulnerability and the strain that comes with their negative school experiences (Elliott, Huizinga, & Menard, 1989; Vettenburg, 1988, 1998). This societal vulnerability and the cultures that unfold as a consequence of it further alienate these students from the dominant school culture (Vettenburg, 1988, 1998). That way, the existing social divisions are perpetuated and social inequalities are reinforced.

To conclude, in this chapter we pay attention to a structural characteristics that relate to educational stratification. More particularly, we focus attention on countries that are known to have a tracking-based education system, and consider how such a school practice relates to differences in heavy episodic drinking and cannabis use. The expectation is that education type affects students' alcohol and cannabis use, and this is regardless of students' socioeconomic background. We investigate this relationship from a cross-national perspective; that is, in four Western European countries (the Netherlands, Belgium, Germany, and Austria) and two Eastern European countries (the Czech Republic and Lithuania). These countries were selected because they have a tracked educational system from the first year of secondary school onwards. This in contrast to most other European countries where this choice is postponed till the later years (e.g. upper secondary school). Two other countries in the dataset (Italy and Hungary) also have data on educational stratification but only from the third year of secondary school onwards. However, the lower secondary school (i.e. the first two years of secondary school) in these countries consists of a single-structure system, and therefore these two countries

were not included in the analyses. The cross-national research design allows us to look how the effect of education type on teenage substance use varies over the six countries.

13.3.1 Data and methods

The data used is from the ISRD-2 study, a cross-national survey of students in the seventh, eighth, and ninth grades of secondary school (12- to 15-year-old students). For the analyses a subsample of four Western- and two Eastern European countries (N = 10,345) was used. The countries and their sample sizes are Belgium (N = 2,202), the Netherlands (N = 2,207), Germany (N = 2,988), Austria (N = 2,948), the Czech Republic (N= 3,241), and Lithuania (N = 2,169). More detailed background information on the data and sampling strategy is provided elsewhere in this report.

The outcome variable used for the analyses described in this chapter is heavy episodic drinking and the lifetime prevalence of cannabis use. *Cannabis use* was measured here as the lifetime prevalence of consumption of this substance (0 = no, 1 = yes).

Education type: Although placing students into different groups according to their abilities – commonly referred to as "tracking" or "streaming" – is a common educational practice in upper secondary schools in many European countries; however, in the lower secondary school it is rather rare. The European Commission-funded organization *Eurydice* provides information on the way education in Europe is structured and organized. According to *Eurydice,* there are only a few European countries where a multilayer tracking system manifests itself from the first year of secondary schooling onwards[1]. The countries with the strongest education inequality are the Netherlands, Germany, and Austria.

Examples of education types that correspond with "general or academic education" are *General Secondary Education* (ASO) in Belgium, *Preparatory Scientific Education* (VWO) and *Higher General Continued Education* (HAVO) in the Netherlands, and *Gymnasium* in Germany, Austria, the Czech Republic, and Lithuania. School types that correspond to "vocational education" are *Vocational Secundary Education* (BSO) in Belgium, *Preparatory Vocational Secundary Education* (VMBO) in the Netherlands, *Primary School* (*Hauptschule*) in Germany and Austria, and *Primary School (Pagrindine)* in Lithuania. Within these two extremes there also some intermediate education types that are more country-specific. Therefore, a dichotomous categorization was used, where students in general or academic education (A-track) are compared with students in all other tracks or streams together (B-track).

Because tracking is strongly linked to the socioeconomic background of students – lower educational tracks recruit disproportionally more students from lower socioeconomic backgrounds – we also controlled for the socioeconomic background of these students. That way, we were able to estimate the effects of education type as true influences of the school environment, independent of selection effects related to the socioeconomic status of the students families. The *Family Affluence Scale* consists of four items and measures whether the student: has (1) a room of his/her own; (2) his/her own mobile phone; (3) a computer to use at home, and; (4) whether the students' family has a car. *Parental work status* measures whether: (1) neither parent; (2) one parent; or (3) both parents is/are employed waged job (i.e. a steady job or own business). *Neighbourhood disorganization* was used as a third indicator of students' socioeconomic background, and is measured by items such as, "This is a close-knit neighbourhood", "People in this neighbourhood can be trusted", "There is a lot of graffiti", "There are a lot of empty and abandoned buildings", "There is a lot of crime in my neighbourhood", "There is a lot of fighting", and so on.

For the descriptive analyses (see Table 13.2) we also investigated whether the education types differ in terms of school climate, school disorganization, and truancy. *School climate* is an expression of the general school climate and consists of the following four items, which were rated (1 = "I completely agree", 4 = "I completely disagree"): "If I had to move I would miss my school", "Teachers notice when I am doing well and let me know", "I like my school", and "There are other activities in school besides lessons (sports, music, theatre, discos)". *School disorganization* measures the students' perception of crime at school. This variable consists of four items which were evaluated (1= "I completely agree", 4= "I completely disagree"): "There is a lot of stealing in my school", "There is a lot of fighting in my school", "Many things are broken or vandalized in my school", and "There is a lot

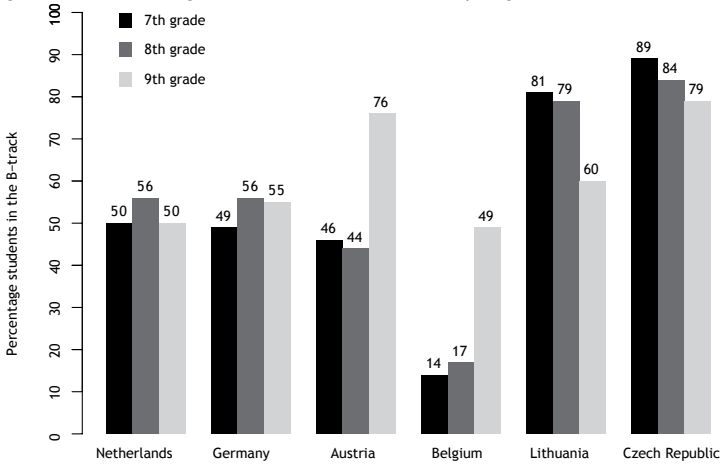
1 For Belgium, the first two years of secondary school consist of only two tracks: lower general education and lower vocational education (*Beroepsvoorbereidend onderwijs*).

of drug use in my school". Finally, *truancy* is defined as having ever stayed away from school for at least a whole day without a legitimate excuse in the last 12 months (1 = "never", 2 = "one or more times").

13.3.2 Results

We first looked at the relative distribution of the students in the ISRD-2 data over both educational tracks. The results in Figure 13.2 show that this distribution was roughly equal in Germany and the Netherlands, where about 50% of the students are in classes in the highest track, and this number remains constant over the three grades. In Austria we also observed a relatively equal distribution in the first two grades, but in the third year of secondary school a large group of students (about 30%) leaves the academic track, and we can see that only 24% of the students are ascribed to the highest track in the third year. In Belgium, the large majority of students in the first and second year of secondary school follow classes in the upper track (respectively 86% and 83%). In the third year of secondary school a large shift is observed, as about 30% of the students leave the highest track for one of the lower educational tracks. In contrast to the Western European countries, only a small minority of "gifted" students follow *Gymnasium* in the Czech Republic and Lithuania, and an opposite trend is observed here. The number of students in the A-track increases slightly over the grades.

Figure 13.2 Percentage of students in the B-track per grade



Concerning the inflow of students into these educational tracks, there is clear indication of selection according to the students' socioeconomic background (see Table 13.2), although some unexpected results emerged. x2-tests for categorical variables and *t*-tests for continuous variables indicate whether the differences between the educational types are significant. In all countries except Belgium, family affluence is significantly higher in the A-track than in the B-track. According to the *t*-values these differences seem to be less pronounced in Eastern European countries. Students in the B-track come disproportionally from disorganized neighbourhoods compared to their counterparts in the A-track. For Western European countries, we can also see that the proportion of students whose parents are both unemployed is significantly higher in the B-track than in the A-track, while students with parents who are both in waged employment are over-represented in the A-track. For migrant students we observed a similar trend: the highest percentage of migrant students are in B-track education. This differential according to parental work status and migrant status is not observed in the two Eastern European countries. It should also be noted that the overall degree of employment is highest in the Eastern European countries: compared to Western European countries, the percentage of students whose parents both have waged employment is much higher in Lithuania and the Czech Republic.

Finally, the results in Table 13.2 point to significant structural differences in the school environment and school experiences of students in different tracks. Students in the B-track reported that their schools are more disorganized and that the overall school climate is perceived to be less satisfactory. Unauthorized absenteeism is a more common phenomenon for students in these lower tracks, but only in the Western European countries, not in Eastern European countries.

Table 13.2 Control variables by type of education

	Belgium			Netherlands			Germany		
	A-Track	B-Track		A-Track	B-Track		A-Track	B-Track	
Gender									***
Boys	50.99%	54.42%		50.19%	51.98%		47.74%	54.00%	
Girls	49.01%	45.58%		49.81%	48.02%		52.26%	46.00%	
Minority group			***			***			***
Majorities	79.18%	67.01%		83.40%	63.54%		84.60%	69.54%	
Minorities	20.82%	32.99%		16.60%	36.46%		15.40%	30.47%	
Parental work status			***			***			***
No parents working	6.62%	11.70%		3.76%	8.11%		1.67%	6.36%	
One parent working	27.30%	34.42%		27.82%	33.77%		27.27%	33.45%	
Two parents working	66.08%	53.87%		68.42%	58.11%		71.06%	60.20%	
Family affluence	3.361	3.364		3.811	3.675	***	3.811	3.622	***
Neighbourhood disorganization	7.302	9.180	***	7.214	8.429	***	6.863	7.416	***
School disorganization	31.545	42.038	***	27.387	40.097	***	29.437	47.265	***
School climate	67.783	56.208	***	72.619	64.252	***	69.238	65.434	***
Truancy	8.04%	30.57%	***	20.00%	23.44%	*	12.41%	20.75%	***

*: p < .05, **: p < .01, ***: p < .001

In the next step, multilevel logistic regression was used to estimate the effects of education type, controlling for other student *familial* background characteristics (Table 13.3). Taking into account the data structure, a three-level model was necessary (i.e. students within schools within countries). However, because only six countries were investigated at the highest level, and because parameter estimates may be unreliable for models with few higher level groups, we opted for a two-level model (i.e. students within schools). To control for variation in heavy episodic drinking and cannabis use at the country level, we added the country variable as an indicator at the school level. In a second step, we added the two-way interaction terms of education type and the country variable, to look at whether the effects of education type differ among the six countries. Model 1 in Table 13.3 confirms that education type has an effect on both heavy episodic drinking and lifetime prevalence of cannabis use, and that these effects prove robust for the effects of other student background characteristics. With A-track students as a reference group, the prevalence of heavy episodic drinking and cannabis use is higher among students in lower educational tracks compared to students in the upper track. Most other student characteristics proved also to be important predictors. Concerning the effects of other socioeconomic background characteristics, adolescents who live in rather disorganized neighbourhoods have higher prevalence rates of heavy episodic drinking and cannabis use. The relationship between family affluence and alcohol use is however in the opposite direction. Students who live in affluent families use more alcohol and cannabis. The same holds for students who live in a family where both parents have paid employment, although here no differences were observed for lifetime prevalence of cannabis use.

continued Table 13.2

	Austria			Czech Republic			Lithuania		
	A-Track	B-Track		A-Track	B-Track		A-Track	B-Track	
Gender			***			*			
Boys	43.32%	53.21%		45.87%	50.83%		46.23%	47.82%	
Girls	56.68%	46.79%		54.14%	49.17%		53.77%	52.18%	
Minority group			***						
Majorities	83.16%	62.77%		94.74%	95.97%		87.84%	89.09%	
Minorities	16.84%	37.24%		5.26%	4.03%		12.16%	10.92%	
Parental work status			***						
No parents working	1.65%	5.77%		1.32%	1.85%		1.38%	1.02%	
One parent working	27.30%	30.76%		15.60%	18.84%		21.21%	21.15%	
Two parents working	71.04%	63.47%		83.08%	79.31%		77.41%	77.83%	
Family affluence	3.797	3.548	***	3.540	3.414	***	3.475	3.326	***
Neighbourhood disorganization	6.838	7.125	**	8.282	9.236	***	8.825	8.553	
School disorganization	46.301	43.407	**	24.588	40.018	***	21.430	32.812	***
School climate	69.253	62.555	***	62.354	65.859	***	71.931	67.522	***
Truancy	27.22%	33.46%	***	4.52%	5.33%		29.38%	32.22%	

To investigate whether the effects of education type differ between the six countries an interaction term was added to the model (Model 2). The likelihood ratio test indicates that the effect of education type on heavy episodic drinking differs significantly between the four countries (x2 [5]= 20.67, $p <$ 0.001). Because interaction effects in logistic regression models are easier to interpret when visualized, we plotted the interaction effects for each alcohol outcome measure, as shown in Figure 3. In regression analysis the magnitude of an effect is determined by its slope (horizontal lines indicate no effects, while very steep lines indicate strong effects). As one can see from Figure 3, the effects of education type on heavy episodic drinking are clearly present in Germany, Austria, and the Netherlands. The slopes of these three countries are parallel, indicating no interaction effects. The other three countries deviate from this pattern, where the slope is much less steep (Lithuania and the Czech Republic) or almost flat (Belgium), indicating little or no difference between educational tracks. The *z*-tests in Table 13.1 also point to the same conclusion. The effects of education type for Germany, Austria, and the Netherlands are significantly different from Belgium (i.e. the reference category). The effects for Lithuania and the Czech Republic are not significantly different from the reference category.

Table 13.3 Multilevel logistic regression results for heavy episodic drinking and cannabis use

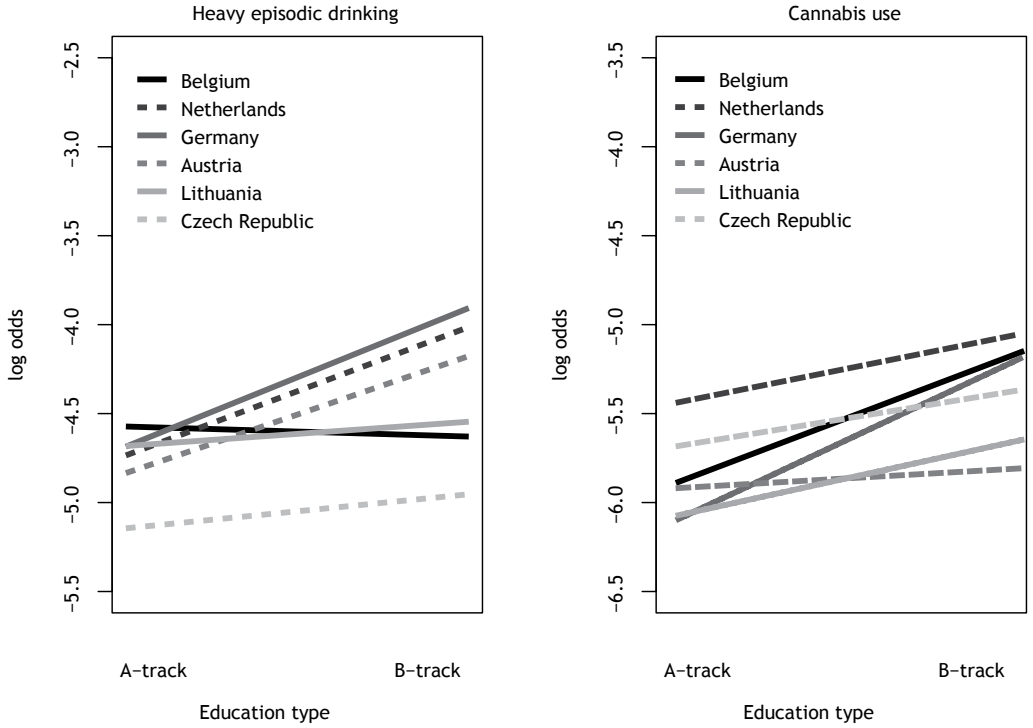
	Heavy episodic drinking				Cannabis use			
	Model 1		Model 2		Model 1		Model 2	
Constant	-4.734	***	-4.573	***	-5.555	***	-5.644	***
Land								
Netherlands	0.181		-0.162		0.281		0.448	*
Germany	0.262	*	-0.113		-0.064		-0.209	
Austria	0.089		-0.262		-0.424	*	-0.034	*
Lithuania	-0.145		-0.110		-0.343	*	-0.187	
Czech Republic	-0.596	***	-0.572	**	-0.057		0.202	
Grade								
Grade 8	0.873	***	0.871	***	0.830	***	0.830	***
Grade 9	1.504	***	1.514	***	1.425	***	1.421	***
Girls	-0.237	**	-0.234	***	-0.156	**	-0.156	**
Minority group	-0.561	***	-0.575	***	-0.311	***	-0.313	***
Parental work status								
One parent working	0.186		0.191		0.145		0.146	
Two parents working	0.366	**	0.373	**	0.210		0.215	
Family affluence	0.241	***	0.243	***	0.161	***	0.160	***
Neighbourhood disorg.	0.126	***	0.126	***	0.186	***	0.185	***
B-track	0.434	***	-0.056		0.500	***	0.731	**
B-track*Netherlands			0.778	**			-0.345	
B-track*Germany			0.835	***			0.175	
B-track*Austria			0.714	**			-0.620	
B-track*Lithuania			0.193				-0.308	
B-track*Czech Republic			0.248				-0.416	
Variance components								
schoolid (Intercept)	0.157		0.148		0.298		0.282	

Controls: country (Ref: Belgium), grade (Ref:7th grade), sex (Ref: boys), ethnicity (Ref: majority group), parental work status (Ref: no parents working)

*: p < .05, **: p < .01, ***: p < .001

Concerning the effects of education type on cannabis use, the likelihood ratio test indicates that adding this interaction term to the model does not significantly improve the fit of the model (x2 [5]= 7.61, p = ns). This implies that the effects of education type on cannabis use are relatively constant over the six countries. Although the overall test for the interaction term is not significant, Figure 3 also indicates that the differences in lifetime prevalence of cannabis use are the lowest in Austria, and further analyses (results not shown) showed that the effect of education type for Austria is significantly different only from the country with the largest effect of education type (i.e. Germany, $p < 0.05$).

Figure 13.3 Effects of education type on prevalence of heavy episodic drinking and cannabis use



13.4 Discussion and conclusion

This chapter has attempted to evaluate how an educational practice such as tracking leads to gradients in adolescents' social alcohol and drug use. We expected that in countries with a tracked school system, the lower educational tracks would have higher incidence rates of both alcohol and cannabis use. By focusing on a cross-national sample of six European countries, characterized by formal tracking in their educational system, we expected to enhance the external validity of our findings.

The results have shown that students in lower educational tracks have higher lifetime prevalence rates of cannabis use than students in upper educational tracks. For heavy episodic drinking, such gradients were also present in Germany, Austria, and the Netherlands. In the other three countries, small or no differences were observed for heavy episodic drinking. We have demonstrated that these school effects proved robust when controlling for other socio-demographic background characteristics. By holding constant the differences in students' socioeconomic backgrounds, the estimated effects of education type represent the true influences of the school environment, independent of selection effects that relate to the student families socioeconomic status. The findings presented here are (at least partially) congruent with studies on drinking patterns in adulthood, indicating that people from lower social strata drink alcohol less often but in larger amounts and in a more harmful manner (Dias, Oliveira, & Lopes, 2011; Droomers, Schrijvers, Stronks, van de Mheen, & Mackenbach, 1999; Huckle, You, & Casswell, 2010; Van Oers, Bongers, Van De Goor, & Garretsen, 1999). The observation that youths in lower educational tracks have, on average, higher prevalence rates of heavy episodic drinking and cannabis use than those in higher educational tracks is in line with theories that emphasize the role of the educational system in the reproduction of inequalities (Bourdieu & Passeron, 1977; Vettenburg, 1988, 1998).

The cross-national comparisons indicated that the effects of education type on substance use were relatively consistent over the different analyses and across the countries, in particular for cannabis use. However, we observed however some variability for heavy episodic drinking. Remarkably, the effects of education type were most pronounced in countries that not only have some of the highest levels of binge drinking in Europe, but these countries also have the most hierarchical and multi-layered tracking structure in Europe (*Eurydice* Network), and this from very early in secondary school.

The finding that education type has no effect in Belgium is remarkable and at odds with results of other research in this country (Berten et al., 2012; Vereecken et al., 2004). These studies found clear differences in alcohol use between students in different tracks, independent of familial socioeconomic background characteristics. A possible explanation may relate to the peculiar organization of the educational system in in this country. The aforementioned studies have focused on the upper grades of secondary school (ninth to twelfth grade), and it is only from the ninth grade onwards that the full tracking structure unfolds in Belgium (i.e. general, artistic, technical and vocational secondary education). However, the first two grades only distinguish between two official tracks (i.e. A-track and B-track), but the B-track in these grades falls under a very specific statute, since it is intended only for a small percentage of students who have fallen behind in primary school (Nicaise, 2008). In theory, these students can reconnect with their counterparts in the upper track, although in reality this rarely happens. The definitive choice about following a particular education type is more or less postponed till the ninth grade of secondary school, and this explains the high percentage of students in the A-track in the first two grades. A consequence of this is that the composition of the A-track population is still very heterogeneous in the first two grades, and the "waterfall" mechanism has yet to manifest itself. Once the full tracking structure unfolds in the ninth grade, the social mixture will move further apart and the unequal distribution of these education types according to socioeconomic status will be more pronounced. This in turn may lead to the earlier discussed processes (negative school experiences, status loss, strain, etc.) and outcomes (i.e. heavier drinking patterns), which are a consequence of these students' shared experiences and socialization. However, these cultures do not necessarily crystallize themselves immediately but may develop over the years.

The results of the multilevel analysis also indicated that the relationship between education type and heavy episodic drinking is much weaker in the two Eastern European countries (Lithuania and Czech Republic), although differences were observed for cannabis use. No explanation was found for these divergent findings. However, it should be remarked that the selection effects according to socioeconomic background were much less pronounced in Eastern European countries. If the inflow of these education types is less dependent on socioeconomic background characteristics, the cultural backgrounds of these education types will be more equal. A consequence of this might be that there is simply not much inequality to reproduce within these schools, and this might be related to a weaker association between education type and alcohol use. However, more research is needed to reveal the precise nature of the relationship between education type and health behaviours such as substance use.

13.4.1 Policy recommendations

In this chapter we have shown that there are clear differences in heavy episodic drinking and cannabis use between students in different educational types. Such a finding is of course not a reason to support the idea of abolishing the tracking system in secondary schools. As noted earlier, these types of education can have important functions. However, other recommendations for policy can be formulated. For instance, investing in prevention strategies that target adolescents' coping mechanisms might be a fruitful approach (i.e. the psycho-individual approach to prevention), but this neglects the different structural contexts in which teenagers are embedded. In this chapter we have highlighted a specific aspect of this structural context: the different types of education that exist in some countries and the inequalities that they tend to (re)produce.

Given that adolescents spend most of their time in school, investment in the structural aspects of these school environments is of crucial importance, especially when these school experiences determine students' well-being, and following from that, their alcohol and substance use. For some students, alcohol use might be a coping mechanism to handle the stress that comes with negative school experiences such as strained relationships with school staff, perceived school failure, lower status, sense of futility, and so on. These structural influences are amplified by the strong segregation that exists between students in different tracks. Negative role models who are seen to promote alcohol and drug use are more salient for some groups of students than for others. We have already illustrated in chapter 10 that investing in the structural environment directly impacts on alcohol use. This chapter adds to these findings by demonstrating that students in lower-ranked education types and students from lower socioeconomic backgrounds are particularly at increased risk. This arises from their social backgrounds, as they are recruited disproportionally from minority groups and families with a disadvantaged socioeconomic status, and from their school environment, students are socialized into

particular youth cultures at these schools. Moreover, we have illustrated that students of the non-academic education types follow classes in schools that are more disorganized, and that they perceive their school climate to be worse. Hence, it should not come as a surprise that the prevalence of unauthorized absenteeism is higher in the lower tracks. Students in different tracks are thus exposed to different structural environments, and these environments are linked with varying probabilities of alcohol and cannabis use.

From a prevention perspective, different suggestions can be made about targeting the structural environment of the school. For example, there is a need for a better appreciation of studies of the "lower" tracks, such as those concerning vocational education, and to decrease the segregation between students of different tracks (see also Van Houtte, 2005). Given the overall negative school climate about vocational programmes of study, prevention programmes should also work on aspects that affect the "feel" of a school; that is, all kinds of structural aspects that can directly influence the students' feelings of connectedness and well-being in school (see for instance Tableman & Herron, 2004). Examples of actions that can create a better physical and psycho-social school environment for these students can include increasing student involvement and commitment by starting up and supporting a student council, promoting positive contacts between students and school administration, and so on (see Chapter 10).

A second recommendation, that also has been put forward by OESO (Organisation for Economic Cooperation and Development) over many years (Jacobs, 2012), is to postpone the definitive choice of a particular track till the upper secondary school, such as for instance occurs in Scandinavian countries (Finland is a classic example of a country that combines high PISA scores with low educational inequality). Research on PISA data indicates that in countries where tracking starts very early in secondary school, social differences in academic outcomes are larger than in countries where this choice is postponed till upper secondary school (Jacobs & Rea, 2011). Concerning recommendations for health education, attention should specifically be paid to students in vocational education types. Although health education is part of the curricula for all education types, it is crucial to tailor health education to the specific learning styles of the students in these tracks. While programmes in the higher tracks may present health knowledge in a more academic fashion, health classes in the lower tracks need to be oriented more towards the everyday practices of their students, with attention also on the information seeking and processing skills of the students (Van Rossem et al., 2010). Related to this, fostering the development of life skills in order to resist social pressures may be in particularly important in vocational tracks, as students in vocational tracks are often more vulnerable to negative role models.

The results regarding unauthorized absenteeism also have implications for policy. Although, at the individual level it clearly holds that truancy is linked to alcohol use, our results show that if truancy is rare in a country this will not translate automatically into less problematic drinking behaviours. Combating truancy is only part of the story. More important is to ask why these students are truant in the first place, and as suggested, the answer to this question might lie in the personal experiences these students have with the school as an institution. However, our analyses have indicated that it is also necessary to take into account the different truancy cultures that exist in various European countries. If being absent from school is more accepted or part of the culture of a country, combating truancy may not be an urgent priority for prevention programmes in that country. Thus, prevention strategies should always be tailored to the country-specific structural context.

13.5 References

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14 Peers and deviant group behaviour

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14.1 Introduction

Country comparisons can be of particular value in understanding drinking behaviour and the influences on drinking behaviour since there can be wide cultural differences with respect to alcohol use. One of the topics concerning alcohol use among juveniles is the influence of peers in relation to other factors like the influence of parents. Especially in this age that friends become more important we want to look if friends do matter in all countries the same way or can it be much less important in another culture or country.

The adolescents involved in this survey vary enormously in terms of their lifestyles and the way they spend their leisure time, and it is these factors, which influence their use of alcohol and drugs. When youngsters spend more time with their friends, they are more likely to drink alcohol. Being with friends as a leisure time activity is also related to other forms of substance use, such as cannabis and hard drugs. Adolescents who spend more time engaging in individual activities (e.g., reading books, doing homework) are less likely to drink alcohol.

Alcohol use is strongly related to going out at night. Thus, juveniles who go out more frequently also tend to use more alcohol. Adolescents who are going out once or twice a week are more likely to drink than those who stay at home. Going out increases this probability even more. There are differences between countries with respect to the relationship between going out and drinking behaviour. In many of the Eastern European countries (e.g., Bosnia & Herzegovina, Czech Republic and Russia), the relation between going out and drinking is less strong than in most Western European countries. However, differences can be found in Western Europe as well. For example, countries such as Sweden, Germany, Finland and the Netherlands show stronger associations than Italy, Poland and France.

Youngsters who are more peer-oriented have a higher probability of drinking more alcohol than youngsters who are more family-oriented. We also found that drinking with the family acted as a protective mechanism for problematic alcohol behaviour, while drinking with friends has a large impact on last month alcohol use. If adolescents spend more time with a larger group of friends they are more likely to show excessive alcohol use. There is also a strong relation between having friends who are delinquent, or being a member of a group who commit illegal acts (gang membership), and the use of alcohol.

We formulated four hypotheses where we would expect differences between the countries concerning peers and lifestyle of adolescents and its influence on the problematic drinking behaviour of young people. According to the literature, drinking alcohol is a part of a youngsters' social life. Hanging out and especially going out with friends provides them with the opportunity to drink alcohol. One of the outcomes of this study shows that having the opportunity to drink outside the house indeed is relevant, as there is a relationship between going out frequently and drinking alcohol. Juveniles who go out more frequently are more likely to drink alcohol. There are differences between countries with respect to the relationship between going out and drinking behaviour. In many of the Eastern European countries (e.g., Bosnia & Herzegovina, Czech Republic and Russia), the relation between going out and drinking is less strong than in most Western European countries. However, differences can be found in Western Europe as well. For example, countries such as Sweden, Germany, Finland and the Netherlands show stronger associations than Italy, Poland and France. In the south European- also called wet countries - such as Italy, Spain, Portugal- it is more common to drink alcohol at home

during a meal than in the Nordic or Western European countries where it is much more common to drink outside the home (Steketee, 2011; Felson, 2004). There is a large debate taking place about the role of the parents in adolescents' alcohol use (Dusenbury, 2000; Perry et al., 2000; Spoth et al., 2007; Van der Vorst et al., 2010). Should parents be strict and focus on delaying the age that adolescents start to drink and forbid their children to drink at all. Or should parents supervise the drinking of their adolescent children at home, so that parents can socialize their children's alcohol use and therefore limit their drinking behaviour in other situations. Several studies showed that extensive drinking will occur more often in situations without parental supervision (Forsyth and Barnard, 2000; Wells et al., 2005). Others suggest that drinking at home also has negative outcomes, like earlier age at first drinks (Warner and White, 2003), more frequently drinking inside as well as outside the house (Foley et al., 2004).

There is a large number of studies that show that youth drink more with their friends than with their parents. So we expect that having a more friends-oriented lifestyle than a more family oriented lifestyle would increase the likelihood of being a problematic drinker and that this factor is of a larger influence in those countries where it is more common to drink outside than those countries where it is more common to drink alcohol at home with their parents.

The first hypothesis is: *In Northern and Western European countries, the lifestyle of adolescents has more impact on alcohol use than in countries where it is more common to drink alcohol at home.*

There are several studies that show that the influence of friends is not that large as everyone would expect on the drinking pattern of juveniles (Van der Vorst & Engels, 2007). Parents still have a large influence, but it depends on the kind of friends you have. Research has shown that self-reported delinquency of friends is strongly correlated to an adolescents' own substance use (Mulvey et al., 2010, Richardson & Budd, 2003; Steketee, 2012). We know that adolescent substance use is associated with other problem behaviours, such as delinquency and risky behaviour, which – in turn – are predictors of later alcohol and drug dependence (Gottfredson & Hirschi, 1990; Junger-Tas et al., 1992; Franken, 2003; Monshouwer et al., 2004). Belonging to a deviant group of friends, who drink a lot or behave in an anti-social way, has stronger negatively influences on the alcohol use and anti-social behaviour of the juveniles than when your friends are socially well integrated (Pusztay, 2009; Silverman & Calwell, 2008; Junger-Tas et al., 2008). Peer pressure and group norms may lie at the basis of problematic alcohol consumption. From the desire of belonging to a group or being seen as 'cool', it is difficult to withstand drinking within a group context. Some studies indicate that the extent to which a youngsters conduct is influenced by the problematic behaviour of their friends is great, as they often mirror those behaviours, by committing similar offenses, using the same substances, or even imitating suicidal behaviours (Steketee, 2012, Prinstein et al., 2000).

So we know that deviant group behaviour and delinquent behaviour of friends has a negative influence on problematic drinking of juveniles, but we expect that this will differ between countries, because in some cultures drinking is less deviant behaviour than in other countries (Felson, 2011). According to Felson et al. (2011) it is common to distinguish between 'wet' and 'dry' cultures. In countries with wet cultures, alcohol is consumed regularly, but in moderation. The consumption of alcohol is integrated in the daily conduct of social life. This culture type is especially common in the Mediterranean countries of Southern Europe. In dry cultures, on the other hand, people drink less frequently, but when they drink they consume large amounts with the purpose to become intoxicated. This drinking pattern is often found in Northern and Eastern European countries. As a result, Felson et al. conclude, in dry countries, alcohol is more likely to be seen as a social problem.

In addition to Felson et al. our expert's distinguished so called alcohol determined cultures like Germany, Austria, Switzerland and the Netherlands. In alcohol determined cultures many everyday situations are linked to consuming alcohol (e.g. after-work pint, celebrating a birthday et cetera) and there is (hardly) no limit to frequency or quantity of consuming alcohol. Characteristic for these countries are the big cultural events, like country fairs and carnival, which are traditionally strongly connected with alcohol consumption. So we assume that the influence of deviant group behaviour and delinquent behaviour of friends on alcohol use differ between countries because is some cultures consuming large amounts of alcohol is more excepted than in others.

The second hypothesis is: *That deviant group behaviour is of influence on intense alcohol consumption and has more impact on alcohol use in countries where it is more common to drink alcohol.*

Having delinquent friends is also related to problematic alcohol use like binge drinking and being drunk (Junger Tas et al., 1992; Franken, 2003; Monshouwer et al., 2004; Steketee, 2012). Being a member of a delinquent youth group, such as a gang, play an important role in the pattern of alcohol consumption (Blaya & Gatti, 2012). The presence of socially well integrated peers has a positive influence on alcohol use. If, however, the group is of a delinquent type, all forms of alcohol use increases significantly. The crime rates among the members of such groups are higher, especially for serious and violent crimes (Haymoz and Gatti, 2010; Weerman & Esbesen, 2005). Just as for deviant behaviour, the expectation is that if heavy drinking is not accepted within the culture of the country, intense drinking will be stronger related to having delinquent friends. In those countries where there is a strict policy toward alcohol use among 12 to 16 year old teenagers heavy drinking we expect that having delinquent friends has a stronger association with problematic drinking pattern. Being a gang member means that it is really deviant behaviour and the assumption is that the impact on alcohol will be larger in those countries where there is a strict policy on alcohol use among juveniles than in those countries who are more tolerant toward alcohol use.

The third hypothesis is: *There is also a difference between countries in the impact of having delinquent friends on alcohol use. The impact of having delinquent friends on alcohol use will be higher in countries that have a strict policy on alcohol than in countries that are more tolerant towards alcohol use*

The fourth hypothesis is: *The impact of gang membership on alcohol use will be higher in countries that have a strict policy on alcohol than countries that are more tolerant towards alcohol use*

14.2 Multilevel analysis

In this research we used multilevel analysis to take the clustered nature of our data into account. Our aim is to explore the relationship between the binary variable 'intense drinking' and four peer-related variables. These variables are the *lifestyle of the adolescent* (range: -4 – 4), the *degree of deviant group behaviour* (range: 0-4), *peer delinquent friends* (range: 0-5) and the binary variable *gang membership*.

A significant portion of the questionnaire asked about leisure time activities of the students (questions 23 to 37). Routine activities and other opportunity perspectives stress the importance of unstructured and unsupervised activities. We tried to capture this in the *lifestyle* scale, comprised of four questions: Frequency of going out at night (item 23); time spent hanging out with friends (item 24.5); most free time spent with large group of friends (item 26); and having groups of friends who spend a lot of time in public places (item 29) (Cronbach's Alpha = 0.63). More details on this scale are presented in Chapter 7.

Deviant group behaviour was measured by a subscale created from four items (37.3, 37.4, 37.5, 37.8) asking what kind of activities usually were happening when hanging out with one's friends (drinking a lot of alcohol, smashing or vandalizing for fun, shoplifting just for fun, frighten and annoying people for fun). The questionnaire also included six items to measure *gang membership* (items 27, 29,30,31,32, and 33). These items were developed by the Eurogang (Decker & Weerman, 2005), with the explicit objective of measuring gang membership in a comparative context. This is discussed in more detail in Chapter 9. A number of interesting analyses have meanwhile been conducted on this measure (see Gatti et al., 2010). Translation of the term 'gang' proved to be problematic, for instance in France, one speaks of a 'bande criminelle' rather than a 'bande' (see also Chapter 9).

Closely related to lifestyle/leisure is whether or not the youth has friends involved in deviant or illegal behaviour. Admitting to having *delinquent friends* is often used as an alternative way of asking about one's own involvement in delinquency: Respondents are often more willing to admit that they have friends who do undesirable things, rather than admitting to these things themselves. Research has shown that the self-reported delinquency of friends is strongly correlated with a youth's delinquent

involvement (Warr, 2002). In the ISRD-2 questionnaire, a 5-item question on the delinquency of friends preceded the section on self-reported delinquency and substance use, partly as a way of neutralizing the social desirability effect. This question asks about the number of friends one has who are involved in drug use, shoplifting, burglary, extortion, or assault.

All variables of interest, except for gang membership, were standardized before including them in the model sequence.

Multilevel logistic regression analysis is necessary to model the dichotomous outcome variable in our research. We used R 2.15.0 to perform all data manipulations and analysis. The package lme4 (Bates, Maechler, and Bolker, 2011) was used to carry out all multilevel analyses. We used Laplace approximation to estimate the parameters in the models.

There are three levels of clustering that will be modeled in the analyses: the individual, school, and country level. The main interest in these analyses is the individual (what is the impact of peer-variables on the probability of intense drinking of an adolescent?) and the country level (are there differences in the relation between peer-variables and intense drinking between countries?). School-level intercept variance will be modeled, but we do not look at random slope variance on the school level.

The analyses are carried out for each hypothesis (each corresponding to one explanatory variable) of interest separately: lifestyle, deviant group behaviour, delinquent friends and gang membership. We will use a bottom-up modeling approach in which first the fixed part will be build up, followed by the random part. The following modeling sequence will be applied:

1. *Null model*. By estimating this model the total variance can be partitioned into three components: individual, school, and country. The proportions of variance on each level can be calculated by the intra-class correlation coefficient and it gives a baseline deviance to which the other models can be compared.
2. *Explanatory variable*. The peer-variable is included in the model to estimate its impact on intense drinking. This regression coefficient represents the relationship between the peer-variable and the outcome variable on the individual level. The slopes for the peer-variable are fixed in this model, which reflects the assumption that the effects do not differ across countries. The target of this second model is explaining the within-group variance. In this model and subsequent ones we controlled for the demographic variables gender (base: female), grade (dichotomized to grade 8 and 9, grade 7 is the reference group) and migrant status (dichotomized, nonnative is the baseline). The interest is not in the impact of these variables, but they are included to control for there effects (i.e., spuriousness). For this reason the coefficients of the control variables are not presented in the tables.
3. *Higher-level explanatory variables*. In this model country-level explanatory variables are added to the model. In these analyses we only use the aggregated versions of our individual-level explanatory variables in our model to investigate whether there are between-country, or contextual, effects of the peer-variables on the outcome variable intense drinking.
4. *Random slopes*. In the next step we will investigate whether the relationships between the peer-variables and intense drinking differ across countries. We will not estimate the associations for each country, but just the variance in impact across countries.
5. *Cross-level interactions*. The final model includes predictor variables for the random slopes, which are added to the model as cross-level interactions. The main aim is to explain variance in the slopes across countries.

At each step in this modeling sequence likelihood ratio test will be carried out to assess whether model fit improves. To make a fair comparison between countries, it is necessary to keep the number of observations constant across the models. Listwise deletion was used to remove the observations that had missing data on the variables that were used in these analyses. After removing missing data, the total sample consists of 51,659 individuals, 1,344 schools, and 25 countries.

All predictor variables that were measured on the interval/ratio scale were centered around their grand mean before including them in the models.

14.3 Results

In Table 14.1 the results of the multilevel regression analysis of intense drinking on lifestyle are presented. Model 0 (the null model) shows the variance components on the country and school-level. The variance on the individual level is not shown, because in multilevel logistic regression models the scale of the latent variable needs to be standardized to identify the model (Hox, 2010). In logistic regression the standard logistic distribution has a mean of zero and a variance of $\pi^2/3 \approx 3.290$. In each estimated model, the underlying latent variable is rescaled in such a way that the individual-level residual variance is again 3.290. This means that the values of the regression coefficients and school- and country level variance components are also rescaled from model to model in such a way that the individual-level residual variance stays 3.290. This troubles the comparison of estimated regression coefficients over models. Furthermore, higher-level variance components can become larger from model to model instead of becoming smaller when variables are added.

The estimates for the null model reveal that the intra-class correlation coefficient (ICC) for school is .073, which means that 7.3% of the total variance is on the school-level. For the country level an ICC of .066 was found (6.6%). From these numbers it can be concluded that most variance is on the individual level. A likelihood ratio test was carried out to assess whether the random intercept variance was significant. This can be achieved by comparing the null model to an ordinary logistic regression model in which the nested structure was not modeled. Comparing the deviances showed that the null model improves the model fit ($\chi^2(2)=1834$, $p<.001$), and therefore the intercept variance caused by the clustering should be considered in the analyses.

Hypothesis 1

In model 1 the variable lifestyle was added to the model. The variable has a strong positive impact on intense drinking, meaning that a more peer oriented lifestyle higher the probability of intense drinking. With each standard deviation increase in the variable lifestyle, the odds of intense drinking increases (OR = 2.21). The model including lifestyle of the adolescent fits better than a model that includes demographic variables only ($\chi^2(1)=3105$, $p<.001$).

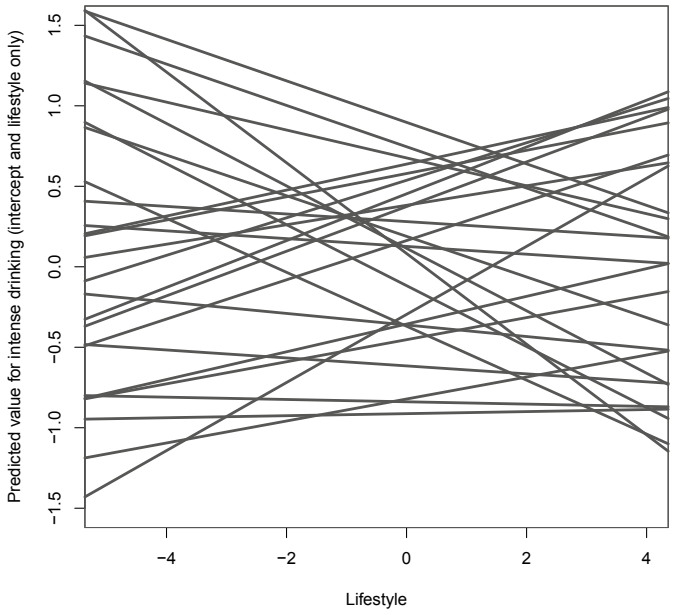
Table 14.1 Multilevel analysis to explain intense drinking by lifestyle of adolescents (*n* individuals: 51,659 ; *n* schools: 1,344 ; *n* countries: 25)

	Model 0: empty model		**Model 1: lifestyle**		**Model 2: lifestyle random slope**		**Model 3: cross-level interaction**	
Predictor	b (se)	OR	b (se)	OR	b (se)	OR	b (se)	OR
Fixed								
Intercept	-1.83 (.10)***	0.16	-2.41 (.12)***	0.09	-2.53 (.12)***	0.08	-2.53 (.11)***	0.08
Lifestyle			0.79 (.02)***	2.21	0.82 (.04)***	2.26	0.82 (.03)***	2.26
Lifestyle aggregated							-0.62 (.43)	0.54
Lifestyle x lifestyle aggregated							0.25 (.13)*	1.29
Random								
Var School	0.28		0.28		0.28		0.28	
Var Country	0.25		0.29		0.30		0.28	
Var lifestyle					0.02		0.02	
Cor lifestyle, intercept					-0.07		0.05	
LR test	x2 (2)= 1834***		x2 (1)=3105***		x2 (2)=64***		x2 (2)=6ms	

Note: in model 1 to 3 was controlled for gender, migrant status and grade; likelihood ratio test reported for model 1 compares fit to model with demographic variables only; * = p<.05 , ** = p<.01, ***=p<.001, ms = p<.10p<.10

The impact of the aggregated version of lifestyle was not found to be significant, and the model (not shown) did not improve significantly ($\chi^2(1)=1.31$, p=.25). In model 2 random slope variance is estimated for the impact of lifestyle. This random slope variance was found to be significant ($\chi^2(2)=64$, p<.001), meaning that there are differences in the impact of lifestyle across countries. The correlation between the intercepts and slopes of the countries is -.07, which indicates that the higher the intercept, the smaller the impact of lifestyle in a country. However, this correlation applies to the relation across countries; the relation between intercept and slope of lifestyle for a specific country can be either negative or positive. Figure 1 shows the intercepts and slopes for the 25 countries. Italy, Cyprus and Armenia demonstrate the most negative slopes. The most positive slopes were found for Sweden, Finland and Lithuania. In model 3 the hypothesis is tested that countries in which culture is more friends-oriented versus family oriented, show a stronger positive impact of lifestyle on intense alcohol use. The analysis demonstrates a positive impact of the lifestyle culture of the country.

Figure 14.1 Intercepts and slopes of lifestyle for the 25 countries



We can draw the conclusion that lifestyle is of influence on problematic drinking pattern of intense drinking. Adolescents who are more outgoing and spent a lot of time with their friends have a higher probability of heavy drinking. But we didn't find a strong contextual effect of lifestyle. Lifestyle doesn't explain the baseline differences between the countries. There is very low variance between the countries in the relationship between lifestyle and alcohol use. The more the juveniles in a country are peer oriented, the bigger the impact of a peer-oriented lifestyle on intense alcohol use. In countries like Cyprus, Italy and Armenia, where there is a strong family tradition, a peer oriented lifestyle has a smaller impact on the drinking pattern of youngsters.

Hypothesis 2

In the next sequence of multilevel analyses the relationship between deviant group behaviour and intense drinking will be investigated (See Table 14.2). Model 1 demonstrates that the more deviant group behaviour is shown, the higher the probability of intense drinking (OR=2.34). There is a strong relationship between the two variables; one unit increase in deviant group behaviour is associated with an increase of the odds by over hundred percent.

We also examined whether there are significant between-country effects of deviant group behaviour by adding the country aggregated values for this variable. This model did not show a significant improvement ($\chi^2(1)=2$, p=.15) indicating that there is no contextual effect of deviant group behaviour.

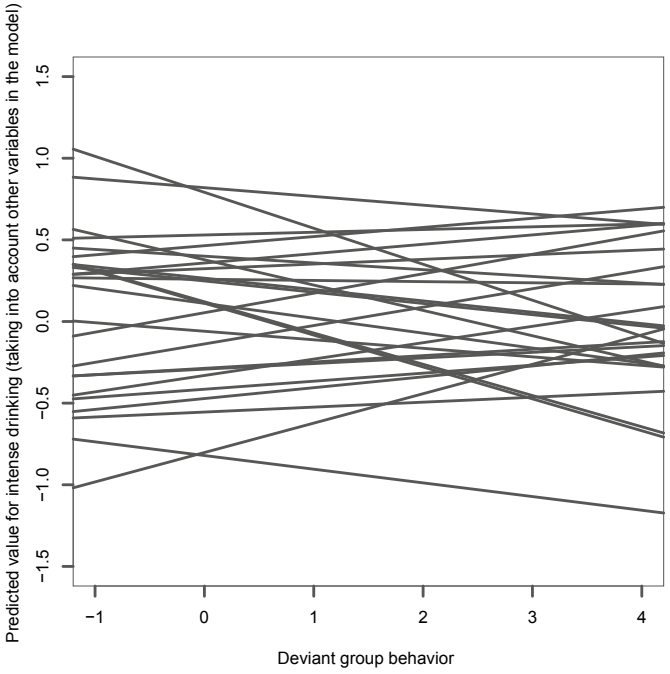
Differences were found between countries in the effects of deviant group behaviour on the probability of intense drinking ($\chi^2(2)=64$, p<.001). This finding was contradictory to our expectations. There is a moderate negative correlation between the intercept and slope across countries (r = -0.40) which indicates that the larger the intercept of a country, the smaller the slope for that country. Figure 14.2 presents the intercepts and slopes for deviant group behaviour for each country. The most negative relations between the two was found for Czech Republic, Italy and Armenia. A positive relation between intercept and slope is shown for Bosnia & Herzegovina, Poland and Iceland.

Table 14.2 Multilevel analysis to explain drinking pattern by deviant group behaviour (*n* individuals: 51,659 ; *n* schools: 1,344 ; *n* countries: 25)

	Model 0: empty model		**Model 1: deviant group behaviour**		**Model 2: deviant group random slope**	
	(se) b	**OR**	**b (se)**	**OR**	**b (se)**	**OR**
Fixed						
Intercept	-1.83 (.10)***	0.16	-2.21 (.10)***	0.11	-2.21 (.10)***	0.11
Deviant group behaviour			0.85 (.01)***	2.34	0.88 (.03)***	2.41
Random						
Var School	0.28		0.23		0.23	
Var Country	0.25		0.21		0.22	
Var deviant group behaviour					0.02	
Cor deviant group behaviour, intercept					-0.40	
LR test	x2 (2)= 1834***		x2 (1)=4982***		x2 (2)=64***	

Note: in model 1 to 3 was controlled for gender, migrant status and grade; likelihood ratio test reported for model 1 compares fit to model with demographic variables only; * = p<.05 , ** = p<.01, ***=p<.001, ms = p<.10

Figure 14.2 Intercepts and slopes of deviant group behaviour for the 25 countries



The hypothesis was that deviant group behaviour is of influence on intense alcohol consumption and has more impact on alcohol use than in countries where it is more common to drink alcohol. Deviant group behaviour has a strong positive impact on alcohol use, but there is no contextual effect of deviant group behaviour. Deviant group behaviour explains variance on the school and country level. There is a small differences in the impact of deviant group behaviour across countries. The higher the baseline probability of intense alcohol use is in a country, the smaller the impact is of deviant group behaviour in that country. That is consistent with our hypothesis in which we expected that in countries where it is more common to drink large amounts of alcohol the impact of deviant behaviour would be lower.

Hypothesis 3

Table 14.3 demonstrates whether there is an impact of level of delinquency of friends and the probability of intense alcohol consumption. The fixed effect of delinquent friends was found to be significant and positive; Higher levels of delinquency of friends are associated with a higher probability of intense drinking (OR=2.09). The analyses showed no contextual effect of this variable ($\chi^2(1)=.94$, p=.33, not shown).

The impact of delinquency of friends was found to differ across countries ($\chi^2(2)=37$, p<.001). Again, we find a moderate negative correlation between the intercepts and slopes across countries (r = -0.41). Our expectation is that the stricter the policies of a country the higher the impact of delinquency in that country. The variable strictness was built by dichotomizing the four ordered clusters of structural indicators regarding alcohol policy (Van den Toorn, Jonkman, Steketee, 2012) (strict policy=1; less strict policy=0). In Model 3 the country-level variable strictness of policy in a country is included as

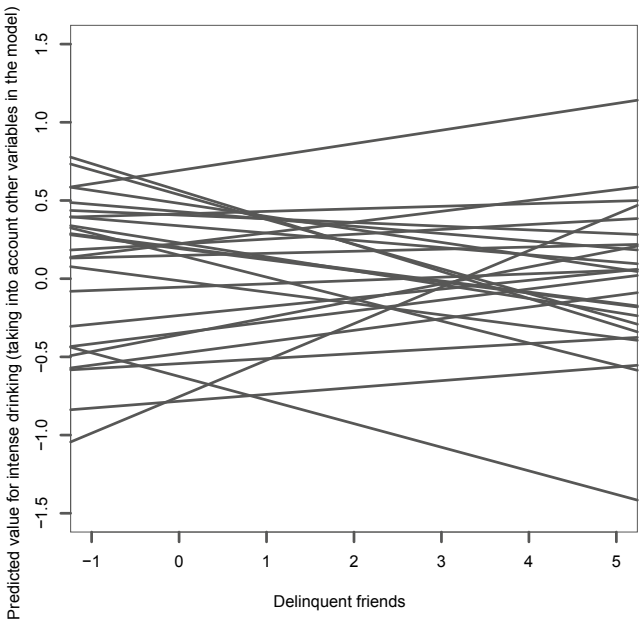
well as the cross-level interaction between delinquency of friends and strictness. The results show that the impact of delinquent friends on intense drinking could not be explained by the strictness of policy of a country. Figure 14.3 shows the association between intercept and slope for each country. The most negative slopes were found for the Netherlands, Czech Republic and France. The figure shows the highest positive impacts for peer delinquent friends for Iceland, Poland, and Austria.

Table 14.3 Multilevel analysis to explain drinking pattern by delinquent friends
(*n* individuals: 51,659 ; *n* schools: 1,344 ; *n* countries: 25)

	Model 0: empty model		**Model 1: delinquent friends**		**Model 2: delinquent friends random slope**		**Model 3: cross-level interaction**	
	b (se)	**OR**	**b (se)**	**OR**	**b (se)**	**OR**	**b (se)**	**OR**
Fixed								
Intercept	-1.83 (.10)***	0.16	-2.30 (.10)***	0.10	-2.30 (.10)***	0.10	-2.21 (.13)***	0.11
Delinquent friends			0.74 (.01)***	2.09	0.76 (.03)***	2.14	0.72 (.04)***	2.05
Strictness							-0.26 (.18)	0.77
Delinquent friends x strictness							0.08 (.05)	1.08
Random								
Var School	0.28		0.25		0.25		0.25	
Var Country	0.25		0.19		0.20		0.19	
Var delinquent friends					0.01		0.01	
Cor delinquent friends, intercept					-0.41		-0.33	
LR test	x2 (2)= 1834***		x2 (1)=3637***		x2 (2)=37***		x2 (2)=3 ns	

Note: in model 1 to 3 was controlled for gender, migrant status and grade; likelihood ratio test reported for model 1 compares fit to model with demographic variables only; * = p<.05 , ** = p<.01, ***=p<.001, ms = p<.10

Figure 14.3 Intercepts and slopes of delinquent friends for the 25 countries



The conclusion is that having delinquent friends has a strong positive impact on probability of heavy alcohol use. There is no contextual effect of having delinquent friends. Having delinquent friends explains variance on the school and country level, but there is only a small differences in the impact of having delinquent friends across countries. The higher the baseline probability of heavy alcohol use in a country, the smaller is the impact of having delinquent friends on alcohol use in that country. That is consistent with our hypothesis stating that in countries where it is more common to drink large amounts of alcohol the impact of delinquent friends would be lower. The policy, strict or more tolerant does not explain the variance between the countries.

Hypothesis 4

Our last hypothesis states that the impact of gang membership is higher for countries with a stricter policy on alcohol than for countries that have a less stricter policy. Being a gang member has a strong positive impact on heavy alcohol use; members of a gang have an odds that is over 400% higher than non-gang members. Including the country aggregated version of gang membership to the model showed no contextual effect of this variable ($\chi^2(1)=.94$, p=.33, not shown).

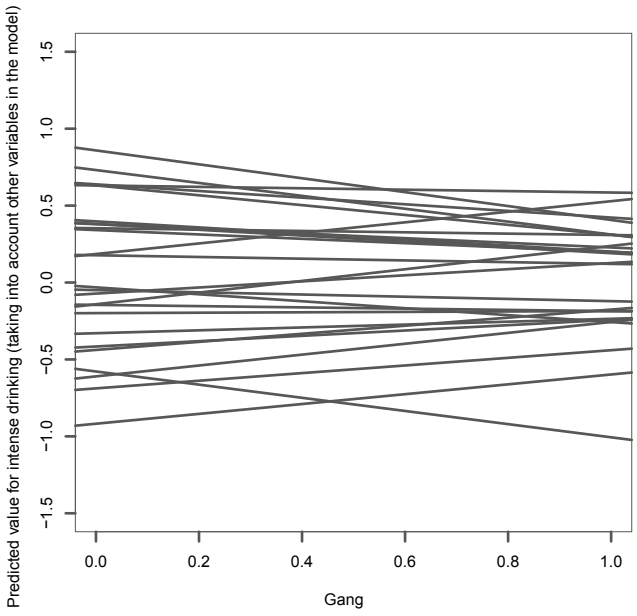
Model 2 shows that the association between being a gang member and intense drinking differs between countries ($\chi^2(2)=11$, p<.01). These differences between countries cannot be explained by strictness of alcohol policy (see Model 3). Figure 14.4 shows the intercepts and slopes for gang membership for each country. The figure presents the highest positive slopes for Poland, Russia, and Bosnia & Herzegovina. Negative impacts of gang membership were found for France, the Netherlands, and Denmark.

Table 14.4 Multilevel analysis to explain drinking pattern by gang membership (*n* individuals: 51659 ; *n* schools: 1344 ; *n* countries: 25)

	Model 0: empty model		**Model 1: gang**		**Model 2: gang random slope**		**Model 3: cross-level interaction**	
	b (se)	**OR**	**b (se)**	**OR**	**b (se)**	**OR**	**b (se)**	**OR**
Fixed								
Intercept	-1.83 (.10)***	0.16	-2.41 (.11)***	0.09	-2.41 (.11)***	0.09	-2.30 (.15)***	0.10
Gang			1.70 (.05)***	5.45	1.74 (.08)***	5.71	1.71 (.12)***	5.53
Strictness							-0.13 (.20)	0.88
Gang x strictness							0.06 (.16)	1.06
Random								
Var School	0.28		0.25		0.25		0.25	
Var Country	0.25		0.24		0.24		0.24	
Var gang					0.08		0.08	
Cor gang, intercept					-0.48		-0.47	
LR test	x2 (2)= 1834***		x2 (1)=1085***		x2 (2)=11 **		x2 (2)=0.43 ns	

Note: in model 1 to 3 was controlled for gender, migrant status and grade; likelihood ratio test reported for model 1 compares fit to model with demographic variables only; * = p<.05 , ** = p<.01, ***=p<.001, ms = p<.10

Figure 14.4 Intercepts and slopes of gang membership for the 25 countries



We found that indeed being a member of a gang has a strong relationship with intense alcohol use. Our hypothesis was that the impact of gang membership on alcohol use will be higher in countries that have a strict policy on alcohol than countries that are more tolerant towards alcohol use. Having a strict or a tolerant policy doesn't explain the variance between countries. There is no contextual effect of being a gang member, but small variance in the impact of gang membership across countries was estimated. The correlation between the intercepts and slopes across countries revealed that the higher the baseline probability of heavy alcohol use in a

country, the smaller the impact of having delinquent friends in that country. That is consistent with our hypothesis where we expected that in countries where it is more common to drink large amounts of alcohol the impact of being a gang member would be lower.

Combining variables of interest in one model

After estimating separate models to explore the relationship between our variables of interest and the probability of intense drinking, a sequence of models were estimated in which all variables are included. In this way we can investigate whether all variables still have a large significant impact.

The first model (Model 1) includes all variables of interest. The results show that gang membership is no longer a significant predictor for intense drinking when all other variables are also included. Deviant group behaviour has the strongest impact of all variables (OR=1.74). Lifestyle (OR=1.57) and having delinquent friends (OR=1.48) still have a substantial positive, but a somewhat smaller, impact compared to the models where they were included separately.

The next step is to estimate a model in which random slope variance for all variables is estimated. This model (2) results in a significant better fit ($\chi^2(14)=141$, $p<.001$). Including all cross-level interaction terms in Model 3 shows that these variables are not significant anymore when included all at once.

Table 14.6 presents the correlations between the intercepts and slopes of all variables of interest. It shows that the intercepts correlate negatively with the slopes of all variables of interest. Furthermore, it reveals that the slopes of delinquent friends are most strongly associated with lifestyle (r=0.83) and deviant group behaviour (r=0.83).

Table 14.5 Multilevel analysis of intense drinking pattern on peer variables (*n* individuals: 51,659 ; *n* schools: 1,344 ; *n* countries: 25)

	Model 1: all main effects	**Model 2: all random slopes**	**Model 3: all cross-level interactions**
	Exp(b) (se)	**Exp(b) (se)**	**Exp(b) (se)**
Fixed			
Intercept	0.10 (.10)***	0.09 (.11)***	0.12 (.13)***
Lifestyle	1.57 (.02)***	1.61 (.03)***	1.61 (.03)***
Deviant group behaviour	1.74 (.01)***	1.78 (.02)***	1.78 (.02)***
Delinquent friends	1.48 (.01)***	1.51 (.02)***	1.48 (.03)***
Gang	1.08 (.06)	1.10 (.10)	1.00 (.13)
Lifestyle aggregated			1.66 (.31)
Strictness			0.59 (.16)**
Lifestyle x lifestyle aggregated			1.00 (.10)
Delinquent friends x strictness			1.04 (.04)
Gang x strictness			1.18 (.18)
Random			
Var School	0.26	0.25	0.25
Var Country	0.21	0.26	0.24
Var lifestyle		0.01	0.01
Var deviant group behaviour		0.01	0.01
Var delinquent friends		0.01	0.01
Var gang		0.13	0.10
LR test	x2 (4)= 6769***	x2 (14)=141***	x2 (5)=7

Note: in model 1 to 3 was controlled for gender, migrant status and grade; likelihood ratio test reported for model 1 compares fit to model with demographic variables only; LR test: model 5 compared to model 1; * = p<.05 , ** = p<.01, ***=p<.001, ms = p<.10

Table 14.6 Correlations between random slopes and intercept (model 6)

predictor	Intercept	Lifestyle	Deviant group behaviour	Delinquent friends	Gang
Intercept	1.00				
Lifestyle	-0.10	1.00			
Deviant group behaviour	-0.80	0.39	1.00		
Delinquent friends	-0.47	0.83	0.83	1.00	
Gang	-0.37	0.38	0.01	0.13	1.00

14.4 Conclusion

Regarding intense drinking there is variance between the countries. In this chapter we have looked if variables related to lifestyle and type of friends does explain this variance between the countries. The conclusion is that indeed lifestyle, deviant group behaviour, having delinquent friends and belonging to a delinquent group of friends is highly related to intense drinking. For all four variables we found small differences in the impact across countries and the higher the baseline probability of heavy alcohol use in a country, the smaller the impact of deviant behaviour, having delinquent friends or being a gang member is in that country. That is consistent with our hypothesis where we expected that in countries where it is more common to drink large amount of alcohol the impact of deviant behaviour or delinquent friends would be lower.

For lifestyle we found that for the more traditional family oriented countries like Italy, Cyprus and Armenia, the influence of a peer oriented lifestyle is smaller than in other countries. It would be interesting to have a closer look at the interaction on the domain of family, especially the variables family bonding, drinking with parents and parental supervision.

For deviant and delinquent behaviour of friends we found a difference between the countries. In some countries there is a negative association and in other countries a positive association. This holds true for all three variables showing that there is a high intercorrelation between deviant group behaviour, delinquent friends and belonging to a delinquent group of friends.

The hypothesis was that in countries where drinking large amount of alcohol is more accepted the relationship with deviant behaviour is less strong and having delinquent friends would have less influence. This distinction between wet en dry countries is not found in this analysis. Also we didn't found any influence of the strictness of the policies on the alcohol pattern. Strictness of alcohol policy of the country doesn't explain the difference in intense alcohol use of juveniles between the countries.

Based on these outcomes we can draw the conclusion that alcohol use among juveniles is strongly related to their lifestyle. If they are more peer oriented, going out frequently they are more likely to have a risky alcohol pattern. Especially in the Western European counties it is quite common to drink alcohol when they go out with your friends in the weekend or if they go to a party.

- It is very important that parents are aware of the lifestyle of their children and supervise that. Parents should make rules about when they are allowed to go out, and at what time they have to be home at night. And when they go out, parents should talk about the risks of alcohol use and make an agreement about the alcohol use of their children (set a limit) and check this.

Another conclusion is that in some countries it is quiet common to use large amount of alcohol when they go out to a pub or a party. It is not deviant to drink too much alcohol and become drunk. This cultural attitude should be changed. The experts in the Southern European countries say because the children start to drink at home, they have learned to drink in a responsible manner. Excessive alcohol use in these countries still shameful behaviour that should be avoided.

- The organization of Alcohol free parties should be more supported and stimulated by the government; especially within the schools when there is a party, these parties should be alcohol free.

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15 Neighbourhood disorganization

Harrie Jonkman, Jessica van den Toorn, Claire Aussems & Majone Steketee

15.1 Introduction

Compared to the influence that families, schools or peers have on adolescent alcohol consumption, the impact of various neighbourhood factors have been studied far less (Kask, 2012; Berten et al., 2012; Steketee et al., 2012; Tobler et al., 2009; Ennet et al., 2008). Nevertheless, findings from a growing body of research, collected in the past ten years, provide evidence for its importance. Especially because this neighbourhood influence can be seen as societal and cultural influence and can tell us something about legal, normative and moral expectations for behavior of youngsters (Stock et al., 2010).

The most studied neighbourhood characteristics include the neighbourhood socioeconomic status (SES) (Stock et al., 2010; Chuang et al., 2009; Trim and Chassin, 2008). Stock et al. (2010), for example, investigated how school district-level factors, such as a low occupational and educational level, affect the initiation of alcohol consumption in Danish adolescents. They hypothesized that pupils from more social deprived districts were more likely to start alcohol drinking at an early age and indeed found this effect. However, when controlling for individual factors such as peer and parental drinking, these effects disappeared. They assume that these individual factors may confound the district level socio-economic effect and the composition of the district may affect alcohol initiation. According to these authors, another potential reason for this result could be the relatively high level of tax-funded governmental investments in these areas of Denmark. Socially deprived school districts are compensated by extra state investments in facilities, services and infrastructure. Living in socially deprived areas in strong welfare states may have less influence on health inequity.

Other studied environmental characteristics include urban-rural differences (Donath et al., 2011; De Haan & Boljevac, 2010; De Haan, Boljevac and Schaefer, 2010; Chuang et al., 2009; Jonkman et al., 2012) of alcohol use among adolescents. In their study, Donath et al. (2011) found that adolescents in rural areas drink higher amounts and more frequently than adolescents in urban areas. They give several possible reasons for this result. First of all, they state that rural areas provide adolescents with fewer alternatives for engaging in interesting leisure activities than urban areas. Furthermore, Donath et al. (2011) also mention cultural traditions, such as country fairs, which are traditionally strongly associated with alcohol consumption. Events such as these are celebrated more often and have stronger roots in rural areas.

Studies on the neighbourhood and alcohol use among adolescents not only emphasize a direct influence, but they also indicate an interaction between environmental and other factors (for example the influence on parental management style). Most studies which research the effect of a given neighbourhood on adolescent alcohol consumption also test a wide range of possible interaction effects between the neighbourhood and, for example, individual characteristics, family, school and peer factors. Tobler et al. (2009), for example, longitudinally examined the direct and indirect relations between an alcohol-related neighbourhood context, home and family management practices and alcohol use. This study illustrates the importance of multifaceted efforts to minimize alcohol-related risk by addressing both the community and the family. Parents in this study, simply, 'buffer' the effects of risky environments. When neighbourhood risk increases, for example by increased access to commercial alcohol, protective family management practices also increase. This means parents start in this case to communicate more with their children, both in general and specifically about alcohol consumption. This is especially the case during the early years of adolescence. Chuang et al. (2009)

examined this 'buffer-effect' of parents in risky environments more closely by comparing rural and urban neighbourhoods. The results of this study suggest that parental monitoring is only an effective strategy in white urban neighbourhoods with a high social economic status (SES) where parents have more resources and opportunities to influence their adolescents when they are more exposed to alcohol (for example by a greater variety of beliefs and values held by neighbors) compared to rural neighbourhoods. (Chuang et al., 2009).

According to our knowledge so far, the majority of research concerning the neighbourhood effect on alcohol use among adolescents has been conducted within one country. There are some bi-national comparison studies which also convey the importance of the rural area on (especially heavy) alcohol use among youngsters (Jonkman et al., 2011, in revision). However, multinational studies that highlight the influence of the neighbourhood on alcohol consumption among youngsters remain scarce. Considering the various theories which may support our deeper understanding of the relationship between neighbourhood characteristics and adolescent alcohol consumption, we have chosen to focus on the neighbourhood disorganization/collective efficacy theory (Kornhauser, 1978; Sampson et al., 1997). The cross-national data of our study provides the opportunity to examine to what extent these predominantly American theories may be valid in other countries than the Anglo-Saxon ones only. The neighbourhood disorganization/collective efficacy theory came into play with the renewed interest in the possible impact of neighbourhood factors on delinquent behavior, such as alcohol use (Kubrin, 2003; Sampson & Laub, 1993; Sampson et al., 1997; Wikström, 1998; Junger-Tas et al., 2012). Kornhauser (1978), for example, pointed out that disorganized neighbourhoods could not transmit shared norms and values because they lack social control on (adolescent) residents. Sampson et al. developed this idea further by introducing the concept of collective efficacy, which links social cohesion in a neighbourhood as a function of mutual trust and solidarity, to the willingness of people to enforce social norms of behavior (Sampson et al., 1997, 1999). The capability of neighbourhoods to realize a positive social climate is variable. Disorganized neighbourhoods in particular, with their concentration of poverty, minorities, and single parent families, lead to isolation and to social problems. In addition, Sampson and Laub argue that the environment and living conditions of families have a great influence on parents' management skills in raising their children (Sampson & Laub, 1993) and on social behaviour. We know there is influence of the environment on the use of alcohol of youngsters but if and how neighbourhood disorganization theory explains partly the variation in risky alcohol use is less clear. Based on restricted literature we research in this innovative study the influence of neighbourhood disorganization on risky alcohol use of young adolescents. For the stepwise multilevel analysis we use the following tentative hypotheses:

1. First, we expect that neighbourhood disorganization increases the likelihood of risky alcohol use of youngsters.
2. Second, we expect no differential effects of neighbourhood disorganization between countries on alcohol use (so we expect no interaction effect between country and neighbourhood disorganization).
3. Third, we expect a small contextual influence of neighbourhood disorganisation on risky alcohol use (so we expect that the higher the means on country level of neighbourhood disorganization the higher risky alcohol use).
4. Fourth, we do not expect that country characteristics attribute to differential effects of neighbourhood disorganization between countries on alcohol use (so we expect no cross level interaction between neighhourhood disorganization on the individual and country level).

This study, which uses data from 25 countries and 57,771 adolescents (ISRD-2 study), greatly contributes to the existing knowledge on the relation between alcohol use of youngsters and the influence of the neighbourhood disorganization.

15.2 Method

15.2.1 Measures

Risky use of alcohol is used as a proxy for the heavy (risky) alcohol use among youngsters. The dependent variable in this study is a dichotomous variable coded as "1" if a adolescent has an risky drinking pattern and "0" if not (see Chapter 2).

The existing studies on the influence of neighbourhood factors on risky behavior tells us that the assessment of these effects is by no means easy. Junger-Tas et al. (2011) distinguish two important problems: how do you define a 'neighbourhood' and how do you deal with the possible selection bias in the sense that certain neighbourhoods may attract certain families? Therefore, in the ISRD-2 study these problems were considered carefully.

In the study a frequently used measure of the youth's perception of his/her neighbourhood is adapted (Sampson et al., 1997; Sampson et al., 1999). This neighbourhood scale consisted of thirteen items. Based on these items different scales are constructed from which we use one subscale for this study: *neighbourhood disorganization*. Neighbourhood disorganization is measured with the following five items: There is: (1) a lot of crime in my neighbourhood; (2) a lot of drug dealing; (3) a lot of fighting; (4) a lot of graffiti and; (5) a lot of empty and abandoned buildings. The internal consistency of the scale yields a Cronbach's alpha of 0.82.

The analyses of the effect of neighbourhood characteristics on alcohol use were controlled for gender, grade and immigrant status. *Gender*. We asked the respondents the question "are you male or female?" Female was coded as 0 and male as 1. *Migrant status*. We divided the youngsters into two groups: native (0) and 1st/2nd generation (1). *Grade*. Youngsters were seventh grade (0), eighth grade (1) and nineth (2) grade students of secondary schools and we used seventh grade students as reference group.

15.2.2 Statistical analysis

Our outcome variable is risky (heavy/problematic) alcohol use (no/yes), which is a binary outcome reflecting whether a young adolescent is a risky drinker. For this analysis multilevel logistic regression is used. All preparation and descriptive analyses are done in STATA (11.2). Multilevel analysis on three levels was undertaken within STATA using the MLwin multilevel software package (Runmlwin 24.2) (Leckie and Charlton, 2011). Estimations were obtained by second order PQL-procedures as recommended (Twisk, 2007; Hox, 2010). The first level is the individual level of the young adolescents without missing on risky alcohol use. These youngsters are clustered within schools which influences the use of alcohol of the youngsters. That is the reason why we took school as second level in our analysis. The third level is the level of the country. The youngsters and the schools are part of the 25 countries. Explanatory variables include social demographic variables (grade, gender and migrant status) and neighbourhood disorganization (individual measured and centered mean on country level). By using both neighbourhood disorganization measures we could research not only individual attribution of neighbourhood disorganization but also societal attribution.

Five models were estimated. Model 0 is an empty model in which the variance in alcohol use of youngsters is partitioned in three components (individual, school, country). In Model 1 we add social demographic variables at the individual level and in Model 2 we add neighbourhood disorganization to test our research hypothesis 1 (there is influence on risky alcohol use). Thereupon, in Model 3 we research the interaction between neighbourhood disorganization and the country in which the youngsters live and we test hypothesis 2 (differential effects between countries, random slope). In Model 4 the contextual influence of neighbourhood disorganization on alcohol use of youngsters is estimated (hypothesis 3). Model 5 is the last model in which we research hypothesis 4: the interaction between neighbourhood disorganization on individual and country level (cross-level interaction).

15.3 Results

15.3.1 Descriptives

The multilevel logistic regression was implemented on the total sample of 57,771 young adolescents without missings on risky alcohol use. Table 15.1 shows the descriptives for these data. Because of missing data on the outcome variable risky alcohol use, 4,411 youngsters (7,6%) were excluded from the original sample. The average country sample size is 2,134 youngsters. The lowest sample size we found in Iceland (n=546) and the highest is Italy (n=4,886). The table also describes the risky drinking percentages of the adolescents in the different countries. Of the European adolescents, 15,93% uses alcohol in a risky manner. The lowest percentage we found in Bosnia & Herzegovina (5,42%) and the highest we found in Denmark (25,51 %). We looked also at the mean of neighbourhood disorganization in each of the 25 participating countries and found the lowest value for Switzerland (12.61) and the highest in France (33.51), and an overall mean of 20.54. The last column of Table 15.1 shows the ddjusted odds ratio's, defined as odds ratio's of neighbourhood disorganization on risky adolescent alcohol use controlled for gender, grade and migrant Status. Neighbourhood disorganization increases the chance on risky alcohol use by 1% in general (in Russia, Hungary and Austria by 3%).

Table 15.1 Descriptive analysis

	N	% Risky drinking	Mean Neighbourhood Disorganization (SD)	Neighbourhood Disorganization AOR(95% CI)
Armenia	1.926	9,03	21,06 (0.43)	1.01 (1.00-1.02)
Austria	2.745	20,3	13,29 (0.37)	1.03 (1.03-1.03)
Belgium	2.022	18,6	18,35 (0.53)	1.01 (1.01-1.02)
Bosnia & Herzegovina	1.843	5,42	17,71 (0.52)	1.02 (1.01-1.02)
Cyprus	1.970	13,98	16,62 (0.51)	1.02 (1.02-1.03)
Czech Republic	2.929	23,57	26,91 (0.43)	1.02 (1.01-1.02)
Denmark	1.189	25,51	20,54 (0.68)	1.02 (1.02-1.03)
Estonia	2.240	20,65	21,17 (0.43)	1.02 (1.02-1.03)
Finland	1.314	18,87	17,64 (0.54)	1.02 (1.01-1.02)
France	2.195	7,56	33,51 (0.65)	1.01 (1.00-1.02)
Germany	3.184	23,51	14,83 (0.36)	1.02 (1.01-1.02)
Hungary	1.806	14,97	18,80 (0.46)	1.03 (1.02-1.03)
Iceland	0.546	7,49	13,1 (0.75)	1.04 (1.03-1.05)
Ireland	1.382	22,05	25,24 (0.78)	1.02 (1.02-1.03)
Italy	4.886	15,59	26,44(0.37)	1.01 (1.01-1.01)
Lithuania	1.884	18,75	23,69 (0.51)	1.02 (1.01-1.02)
Netherlands	2.178	23,66	19,39 (0.50)	1.01 (1.01-1.02)
Norway	1.481	10,77	15,20 (0.52)	1.02 (1.01-1.03)
Poland	1.306	12,86	32,18 (0.67)	1.03 (1.02-1.03)
Portugal	2.417	7,86	19,86 (0.45)	1.01 (1.01-1.02)
Russia	2.205	8,82	16,43 (0,39)	1.03 (1.02-1.04)
Slovenia	2.019	17,94	18,12 (0.49)	1.02 (1.02-1.02)
Spain	1.598	9,97	22,48 (0.59)	1.02 (1.01-1.02)
Sweden	1.979	10,51	14,84 (0.43)	1.02 (1.01-1.03)
Switzerland	3.345	17,84	12,61 (0.33)	1.02 (1.02-1.03)
Total	53.360	15,93	20,54 (0.1)	1.01 (1.01-1.02)

Note. AOR is Adjusted Odds Ratio and are controlled for gender, grade and migrant status.

Table 15.2 Multilevel models

PQL MLWIN									
Model		**Model 0 (Empty)**		**Model 1 (Social dem. variables)**		**OR**	**Model 2 (Neighbourhood)**		**OR**
Dependent variable= Consumgr 5									
		Coeff.	(s.e.)	Coeff.	(s.e.)		Coeff.	(s.e)	
Fixed									
Intercept		-1.87***	(0.10)	-2.30***	(0.17)		-2.31-***	(0.17)	
Neighbourhood									
Neighbourhood disorganization							0.02***	(0.00)	1.02***
Interaction									
Nhoodmean*Nhooddo									
(Crosslevel interaction)									
Random									
Country	var (cons)	0.25	(0.07)	0.25	(0.06)		0.27	(0.08)	
	Cov (cons, nhooddo)								
	Var (nhooddo)								
School	var (cons)	0.28	(0.02)	0.26	(0.02)		0.29	(0.02)	

Model		**Model 3 Neigh-bour-hood with country, random slope)**		**OR**	**Model (Contextu-al analysis)**		**OR**	**Model 5 (Cross-level interac-tion)**		**OR**
		Coeff.	**(s.e.)**		**Coeff.**	**(s.e)**		**Coeff.**	**(s.e)**	
Fixed										
Intercept		-1.96***	(0.11)		-1.96	(0.11)		-1.96	(0.11)	
Neighbourhood										
Neighbourhood disorganization		0.02***	0.00	1.02***	0.02***	(0.00)	1.02***	0.02	(0.00)	1.02***
Neighbourhood do-mean					-0.02ns	(0.02)	0.98ns			
Interaction										
Nhooddo*Nhooddomean								-0.00ns	(0.00)	1ns
(Crosslevel interaction)										
Random										
Country	var (cons)	0.27	(0.08)		0.25	(0.07)		0.27	(0.09)	
	Cov (cons, nhooddo)	0.00ns	0.00		0.00ns	(0.00)		-0.00ns	(0.00)	
	Var (nhooddo)	0.00	0.00		0.00	(0.00)		0.00	(0.00)	
School	var (cons)	0.28	(0.02)		0.28	(0.02)		0.28	(0.02)	

Note. ** p<0.001; ** p<0.01; * p<0.05

As indicated earlier, we used multilevel logistic regression models to estimate the effects of neighbourhood disorganization to test our four hypotheses. The multilevel modeling results are presented in Table 15.2.

In Model 0 we see that the proportion of risky alcohol users in the data set is .154. The variance on school (ICC= 7,8%) and country (ICC=7,6%) are comparable.

In Model 1 we added the socio-demographic control variables (gender, grade and migrant status). The table conveys that boys are more likely consume alcohol in a risky manner than girls (OR=1.43). Youngsters with a migrant status (first or second generation) are less likely to have consumed alcohol compared to the natives (OR=0.73). Finally, adolescents in the eighth are less (OR=0.90) and the ninth grade are more likely to have been drinking in the last month than the seventh grade students (OR=1.08). In Model 2 we added the neighbourhood disorganization risk factor to the model. This variable increases the likelihood of risky alcohol use with 2%. (OR=1.02). Compared to the previous model, we see a decrease in the effect of gender (OR=1.31), an increase for grade eight (OR= 0.89) and a non-significant influence for grade nine compared to grade seven. We see an increase of the effect of the migrant status on risky alcohol use (OR=0.68). Although PQL2 doesn't give us model fit indices we know from the use of other estimators (lower DIC-indices in using Bayesian version of RunMLwin, for example), that adding this neighbourhood variable improves the model fit. In Model 3 we research the interaction effect between country and neighbourhood disorganization. We see nearly any change in the fixed part of the model nor on the random part. In Model 4 we add the contextual influence of neighbourhood disorganization by adding the aggregate country variable neighbourhood disorganization to the model. But also here, we see no significance. In the last model (Model 5) we add cross level interaction of neighbourhood disorganization (interaction between this variable on individual and on country level). Also this interaction doesn't show any influence. Model 2 (three level model with control variables and neighbourhood disorganization on individual level as part of the model) shows the best results in this analysis.

15.4 Conclusion and discussion

In this study, we researched the level of risky alcohol use and sought out to what extent this activity was influenced by different neighbourhood variables. This study was carried out, drawing on data from 25 European countries. We researched risky alcohol use of youngsters and the influence of neighbourhood disorganization and controlled for similar background variables (gender, grade and migrant status). Our study illustrates that neighbourhood disorganization has a positive (enlarging) effect on risky alcohol use. When youngsters describe their neighbourhood as disorganized they show a significant higher level of intensive alcohol use.

If we look at the 25 countries separately, we found that different levels of influence of neighbourhood disorganization on risky alcohol use of youngsters. Neighbourhood disorganization increases the likelihood of risky use in all countries. But the differences between countries are small (non-significant):the AOR of neighbourhood disorganization is 1% in general when the results are controlled for gender, migrant status and grade.

Thereupon, in this study we also performed a multilevel logistic analysis. The differences between countries were significant when we researched risky alcohol consumption from a multilevel perspective (ICC=7,6%). Here, the influence of neighbourhood disorganization was apparent, as we expected (hypothesis 1). But, this variable hardly influences the variation between countries. Differential effects of neighbourhood disorganization (random slope effects to find out interaction effects between neighbourhood disorganization and the country you live) we could not find, as we expected (hypothesis 2). Different from what we expected, we could not find contextual influence at all (hypothesis 3). And, indeed, we did not find any cross level interaction between neighbourhood disorganization on individual (level 1) and country level (level 3) in this study (hypothesis 4). At the end, we have to conclude that neighbourhood disorganization has significant (increasing) influence on risky alcohol use. But, this influence is small. The influence of neighbourhood disorganization on alcohol use is, for example, smaller compared to the influence of neighbourhood disorganization on delinquency of young adolescents (Junger-Tas et al., 2011).

Throughout this study we only looked at the relationship between neighbourhood disorganization and risky alcohol use. This created, of course, certain limitations for our study, as human actions and development take place within multiple changing environments which influence each other and thereby shape the behavior of individuals (Bronfenbrenner, 1977). Future studies, therefore, should have a closer look at the interaction effect between neighbourhood factors and variables in other domains, such as family, school, peers and the individual. In addition, we may expect that

neighbourhood variables influence variables in these domains as is found in other studies (indirect effects). We also will look if neighbourhood disorganization interacts better with an other structural variable on country level (for example poverty of the Human Development Index).

Nonetheless, what we may conclude from this study is that the influence of the neighbourhood can play a role in alcohol prevention strategies aimed at adolescents. Programs should especially focus on the decrease of neighbourhood disorganization, by combating crime, drug dealing, fighting, graffiti and empty and abandoned buildings. In addition, programs could promote healthy development by targeting the attachment between neighbors, involvement in the neighbourhood, and focusing on the norms and values of individual.

Policy messages

- Neighbourhoods influence alcohol use of youngsters but this influence is relatively weak (for example when compared to family or school). Within the neighbourhood the variable neighbourhood disorganization is the most important one for risky alcohol use of youngsters.
- This is true for all the European countries separately. Politicians of different countries and the EU should be aware of this.
- Neighbourhood disorganization is important but doesn't explain the variation of alcohol use between countries. European policy should target this homogenously.
- We need to look at the interaction effect between neighbourhood and variables from other domains. Neighbourhood disorganization might moderate the culture and climate in which youngsters are grown up, in the family for example. We still have to look at this.

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16 Delinquency and alcohol use

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16.1 Introduction

The existence of a correlation between alcohol use and juvenile delinquency has long been acknowledged in the scientific literature (Felson et al., 2009). However, the dynamics of this relationship and its temporal ordering remain unclear.

In general, four competing theoretical explanations have been proposed for the relationship between alcohol use and delinquent behaviour (Xue et al., 2009).

According to the first model, alcohol use causes delinquency, owing to psychopharmacological effects or a criminal subculture (Goldstein, 1985). The second model postulates that alcohol use is caused by delinquent behaviour and is a consequence of a delinquent lifestyle, because offenders are more likely to select or be pushed into social situations that encourage heavy drinking (Kandel 1978). The third model combines the first 2 models and argues that alcohol use and violence reinforce each other; in other words, alcohol use causes violence, and vice versa (White et al., 1999). The final model postulates that the relationship between alcohol use and violence is spurious. Both behaviours are predicted by the same common set of risk factors and cluster together as a result of a single general problem behaviour syndrome (White et al., 1993).

On the whole, the relationship between adolescent alcohol use and delinquency is a complex issue, the understanding of which requires the accumulation of knowledge garnered from multiple sources by means of a variety of methods.

Focusing more specifically on the role that delinquency has on adolescent alcohol consumption, evidence exists for the notion that delinquency leads to alcohol use. It has been shown that adolescents who display anti-social or violent behaviour are more likely than other adolescents to indulge in problematic alcohol use (Farrington & Loeber, 2000), excessive alcohol use or drunkenness (Eklund & Klinteberg, 2006).

In some of these studies, however, alcohol use and delinquency have been assessed at a single time-point and lead-lag effects (one variable correlating with another variable at a subsequent point in time) could not be studied. In the few studies that have examined longitudinal associations, researchers have found that delinquent behaviours, such as violence and vandalism, are strong positive predictors of alcohol use among teens (Stice et al., 1998).

The prominent mechanism proposed for this relationship is that delinquency provides both a context and peer group which are conducive to involvement in substance use (Van den Bree & Pickworth 2005).

Nevertheless, little research has addressed the question of whether differences in drinking culture may influence the delinquency-alcohol relationship and, if so, how. It is common in the literature to distinguish between “wet” and “dry” cultures (Room, 2007). In “wet” cultures, alcohol is consumed frequently, but in moderation, and consumption is integrated into the daily conduct of social life. For example, people drink a glass or two of wine with dinner at home. The Mediterranean countries of Southern Europe have been characterized as having this type of drinking pattern. In the “dry” cultures of Northern- and Eastern European countries, on the other hand, people drink less frequently, but when they do, their purpose is often to become intoxicated. They are likely to attend parties where people drink beer or liquor to excess. For adolescents, this is likely to involve drinking with friends rather than drinking at home with their parents. As a result of these drinking patterns, alcohol is more

likely to be viewed as a social problem in "dry" countries, and these countries are also likely to have more restrictive laws on teenage drinking.

Recently, Felson et al., (2011) published research in which they examined whether differences in the alcohol–violence relationship exist among more economically developed countries and whether these differences vary by region. They also used multilevel models to examine whether regional differences occur because adolescents in some regions are more likely to drink to intoxication, because they are more likely to drink in the company of intoxicated peers, because they drink in settings unsupervised by adults, or because of their expectations about the effects of alcohol. According to these aims, Felson et al. found that alcohol has strong effects on violent behaviour in some countries but not in others, and that its effects are conditioned by the social context in which drinking occurs.

In the light of this evidence, the aims of the present chapter are to examine the nature and characteristics of the relationship between different kinds of delinquency and alcohol use, and to investigate whether, and how, different drinking cultures may influence the relationship.

16.2 Materials and methods

16.2.1 Measures

Delinquency and related variables

In the present chapter, we refer to "last year" prevalence of the following offenses: property offenses (shoplifting, stealing from a car, car theft, bicycle theft and burglary) and violent offenses (group fighting, carrying a weapon, assault, extortion and snatching.) We also distinguish between serious property crime, including stealing from a car, car theft, and burglary, and serious violent crime, including serious assault, extortion and snatching.

Moreover, we analyzed another variable, which measures gang membership according to six questions developed by the Eurogang Network ([1]); this considered youths who scored affirmatively on the first five items to be gang members. In the present study, we decided to regard as gang members all youths who answered "yes" to the six questions, preferring to include a subjective criterion of self-definition linked to the question "Do you consider your group of friends to be a gang?", which is evaluated as descriptive but not essential by the Eurogang Network.

Alcohol use

Alcohol use was measured by means of questions concerning lifetime alcohol consumption, age on first use, whether or not the respondent had ever got drunk, and consumption during the last month. We also attempted to measure the amount of drinking, whether the respondent drank alone, whether drinking had come to the attention of adults (parents, police, teachers, or others), and whether or not the respondent had been punished.

In this chapter, we mainly used 5 variables as indicators of alcohol involvement: lifetime consumption of alcohol, consumption within the last 4 weeks, getting drunk at least once, consumption of 5 or more units of alcohol on the last occasion of drinking, and risky alcohol use. This latter is measured as a dichotomous variable with the response alternatives non-risky (0) and risky (1) use. Adolescents are treated as risky users if they are younger than 14 years old and currently drink alcohol, and if they are at least 14 years old and currently drink alcohol (beer or spirits) more than five times a month or drank more than five units of alcohol (beer or spirits) on the last occasion of drinking. Students are treated as non-risky users if they have never drunk alcoholic beverages before; if they have drunk alcohol before but do not drink currently; or if they have drunk alcohol before, do so currently, are at least 14 years old and use any alcoholic beverage five times a month or less and drank five units of alcohol or less on the last occasion.

1 The Eurogang Network uses the following six questions: 1) Do you have a group of friends? 2) How long has this group existed (> 3 months)? 3) Does this group spend a lot of time together in public places? 4) Is doing illegal things accepted by your group? 5) Do people in your group actually do illegal things together? 6) Do you consider your group of friend to be a gang?

Country level information

At the country level, we established a set of dummy variables representing four groups of countries: Nordic, Eastern-, Western European and Mediterranean, according to the drinking culture ("wet" or "dry") (see Felson et al., 2011 for reference). We distinguish between four country clusters: the wet cultures are Mediterranean countries, while the dry cultures are the Central European countries, Eastern European countries, and Nordic countries. In Felson's classification, all countries that border the Mediterranean Sea are coded *Mediterranean*. Thus, we include Slovenia in the Mediterranean cluster even though they could be coded as Eastern European countries. The other countries in this cluster are Portugal, France, Italy Cyprus, and Spain. The *Central European* cluster consists of the countries Austria, Switzerland, Belgium, the Netherlands, Germany, Ireland and Czech Republic. In line with Felson's typology, Czech Republic was coded as Central European instead of Eastern European because the Czechs' drinking patterns are similar to the drinking patterns of the Germans and the British. Countries defined as *Eastern European* are Russia, Estonia, Lithuania, Poland, Hungary, Bosnia & Herzegovina and Armenia. The *Nordic* countries are Iceland, Denmark, Norway, Finland, and Sweden.

Table 16.1 Drinking Cultrue within Europe

Dry			**Wet**
Nordic	**Central**	**Eastern**	**Mediterranean**
Denmark	Austria	Estonia	Cyprus
Finland	Belgium	Hungary	Slovenia
Iceland	Czech Republic	Lithuania	France
Norway	Germany	Russia	Spain
Sweden	Netherlands	Bosnia & Herzegovina	Italy
	Switzerland	Poland	Portugal
	Ireland	Armenia	

16.2.2 Statistical analysis

In order to investigate the influence of the national drinking culture on the relationship between delinquency and alcohol use in adolescence, multilevel analysis (MLA) techniques were used.

Taking into account the nested data structure, multilevel analysis serves as an extension of the general linear model (GLM), and allows simultaneous estimation of regression coefficients on different levels and considers the fact that individuals within groups share the same conditions and their responses are dependent (Eid et al., 2011). The advantages of this approach are that it yields fewer wrong conclusions – such as, for example, ecological fallacies – an adequate estimation of standard errors and therefore correct test statistics. In addition, multilevel modeling enables fixed and random effects to be estimated simultaneously, interactions between predictors on different levels (so-called cross-level interactions) to be identified, and nested models within the stepwise analysis procedure to be compared by means of a likelihood ratio test (Kreft & Leeuw, 1998; Snijders & Bosker, 2000; Hox 2010; Eid, Gollwitzer & Schmitt, 2011).

In the present study, a two-level hierarchy of individual and country level is modeled by means of the software package HLM 7 (Raudenbush et al., 2011). For the MLA, the software reduced the dataset to 52,618 owing to missing data.

Regarding the dichotomous outcome variable, logistic multilevel regression analyses were performed in the following modeling sequence. First, the empty model was estimated to calculate the intra-class correlation as an indicator of the outcome variance among the 25 European countries. In the second step, the control variables were entered on the individual level in a random intercept model. Thirdly, a random intercept model was again made, including the level 1 predictor that describes the deviant behaviour, e. g. "gang membership". In the fourth step, the random slope variance was estimated for the relationship between delinquency and alcohol use. In the fifth step, the level 2 predictor "alcohol drinking culture" was included to explain the intercept's variance of risky alcohol use on the individual level. Finally, in a sixth step, "alcohol drinking culture" on level 2 was used to explain the variation of the slopes at the individual level in a cross-level interaction model. A

Bernoulli distribution of the outcome variable was assumed and full maximum likelihood estimation was used in combination with the laplace iteration method. Deviance tests allowed the statistical comparison of the nested models (Hox, 2010).

16.3 Results

In the first step, we looked at the relative distributions of delinquency and alcohol use among juveniles.

Table 16.2 shows the prevalence rates of alcohol use among young people who, during the last year: had not committed any offences; had committed a least one offence; had committed at least one serious violent offence against persons (assault, robbery, snatching) or at least one serious property offence (theft from a car, motor vehicle theft, burglary), or had committed three or more kinds of offence.

Table 16.2 Prevalence rates of alcohol use by delinquency (N=38,292)

	No offence	1 or more offences	1 or more serious violent offences	1 or more serious property offences
Alcohol lifetime	58%	86.8%	90.8%	90.9%
Alcohol last month	23.8%	54.7%	69.8%	69.3%
Drunkenness lifetime	19.2%	52.9%	67.6%	64.5%
Binge drinking last time	10.6%	36.1%	53.4%	54.3%
Alcohol risky use	11.7%	37.4%	54.9%	54.2%

As can be seen, the youths who had not committed any offences displayed lower prevalence rates of alcohol consumption, particularly of risky alcohol use. By contrast, the values proved to be higher among youths who had committed at least one offence and higher still among those who had committed one or more serious offences against persons or property.

Table 16.3 shows that alcohol consumption is more common among gang members, with particular regard to the most intense use.

Table 16.3 Prevalence rates of alcohol use by gang (N=38,292) – Source ISRD-2

	No gang member	Gang member
Alcohol lifetime	63.6%	86.9%
Alcohol last month	29.2%	63.8%
Drunkenness lifetime	25.2%	63.6%
Binge drinking last time	15%	46.5%
Alcohol risky use	16.1%	46.8%

In the next step, multilevel logistic regression was used to estimate the effects of delinquency on risky alcohol use, controlling for age, gender and migration. As indicators of delinquency, we used being a gang member, having committed 1 or more offences last year (prevalence), 1 or more serious violent offences last year (prevalence) and 1 or more serious property offences (prevalence).

Table 16.4 shows the results regarding the effects of belonging to a gang. First of all, it can be seen that gender (male), age (highest grade) and non-immigrant (native) status proved to be significantly associated with the indicator of alcohol abuse (see Model 1).

Moreover, gang membership markedly increased the probability of risky alcohol use (see Model 2). This is in line with the results of several previous studies, including longitudinal research, which have demonstrated that becoming a member of a youth gang increases not only the frequency of delinquency but also that of alcohol and drug use (Esbensen, & Huizinga, 1993; Battin et al., 1998; Gatti et al., 2005), and that peer delinquency is the strongest predictor of youth substance abuse even on controlling for other major risk factors of a familial or environmental nature (Ferguson & Meehan 2011).

On adding the variable regarding drinking culture (“dry” or “wet” countries), it will be noticed that residence in a country of Northern-, Western- or Eastern -Europe is associated with a higher risk of

alcohol abuse (see Model 4) than residence in a cultural setting of the Mediterranean type, though the significance of the relationship is borderline (p <.10).

Finally, in Model 5, we tested the hypothesis that the variable "gang membership" had a differential impact on risky alcohol use according to whether the subjects lived in a "wet" or "dry" country. On adding the interaction between the two variables, it can be seen that the type of culture plays a moderating role, in that living in a Mediterranean country reduces the impact of gang membership on alcohol abuse. In sum, gang membership increases the frequency of risky alcohol use in all countries, but this effect is greater in "dry" countries, where the daily consumption of alcohol in the family context is not part of the culture of the country and where alcohol consumption is more usually sporadic and intense.

Tab. 16.4 The results of multilevel analysis concerning alcohol culture (wet/dry) as a predictor for the relationship between gang membership and risky alcohol use – Source ISRD-2

	Model 0: empty model	**Model 1: random intercept control variables**	**Model 2: random intercept**	**Model 3: random slope**	**Model 4: main effect**	**Model 5: cross level**
Fixed						
proportion	0.167***	0.103***	0.093***	0.092***	0.063***	0.072***
predictor	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)
gang membership			5.39*** (5.013, 5.773)	5.71*** (5.333, 6.111)	5.83*** (5.451, 6.226)	4.80*** (4.233, 5.446)
alcohol culture					1.67+ (0.953, 2.926)	1.40n.s. (0.751, 2.626)
gang membership x alcohol culture						1.29** (1.105, 1.513)
Random						
τ00 countries	0.24724	0.24466	0.24064	0.24477	0.22850	0.22328
τ slopes				0.10423	0.11424	0.09954
τ as r (slope, intercept)				-0.518	-0.723	-0.733
ICC	6.99%	6.92%	6.82%	6.92%	6.49%	6.36%
Test						
deviance	141387.567121	141000.583855	139860.040127	139839.753259	139833.723002	139831.978476
estimated parameters	2	6	7	9	10	11
LR test		X^2 (4) = 386.98327***	X^2 (1) = 1140.54373***	X^2 (2) = 20.28687***	X^2 (1) =6.03026*	X^2 (1) =1.74453n.s.

Note + p < .10, * p < .05, **p< .01, *** p < .001

Table 16.5 reports the MLA regarding the connection between violent behaviours and alcohol abuse. This relationship has been the subject of a great many studies (Felsonet al., 2011), although generally violence has been analyzed as a dependent variable and not as a predictor. In the present analysis, by contrast, the perspective was that of violence as a possible risk factor with respect to alcohol abuse.

The fact of having committed a least one serious violent crime in the last year proved to be closely associated to risky alcohol use (see Model 2). However, this association was not moderated by the "wet" or "dry" culture of the country. Thus, on the basis of these data, it can be claimed that the relationship between violence and alcohol abuse is not differentially influenced by the cultural model of drinking.

Table 16.5 The results of multilevel analysis concerning alcohol culture (wet/dry) as a predictor for the relationship between serious violent offences and risky alcohol use

	Model 0: empty model	**Model 1: random intercept with control variables**	**Model 2: random intercept**	**Model 3: random slope**	**Model 4: main effect**	**Model 5: cross level**
Fixed						
proportion	0.167***	0.103***	0.095***	0.095***	0.074***	0.07***
predictor	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)
serious violent offences			6.15*** (5.570, 6.787)	6.51*** (5.121, 8.273)	6.50*** (5.008, 8.420)	7.03*** (4.670, 10.572)
alcohol culture					1.40n.s. (0.689, 2.797)	1.40n.s. (0.680, 2.889)
serious violent offences x alcohol culture						0.90n.s. (0.567, 1.432)
Random						
τ00 countries	0.24724	0.24466	0.23830	0.23952	0.21759	0.21743
τ slopes				0.11009	0.10999	0.11003
τ as r (slope, intercept)				-0.039	0.005	0.015
ICC	6.99%	6.92%	6.75%	6.79%	6.20%	6.20%
Test						
deviance	141387.567121	141000.583855	139903.628481	139893.720222	139891.551435	139891.313754
estimated parameters	2	6	7	9	10	11
LR test		X^2 (4) = 386.98327***	X^2 (1) = 1096.95537***	X^2 (2) = 9.90826**	X^2 (1) =2.16879n.s.	X^2 (1) =0.23768n.s.

Note + p < .10, * p < .05, **p< .01, *** p < .001

Similar results emerged on considering the fact of having committed a serious property offence as a predictor (Table 16.6). Specifically, the existence of a relationship between property offences and alcohol consumption can be confirmed. However, this association did not prove to be conditioned by the culture of the country in question.

Table 16.6. The results of multilevel analysis concerning alcohol culture (wet/dry) as a predictor for the relationship between property offences and risky alcohol use

	Model 0: empty model	**Model 1: random intercept with control variables**	**Model 2: random intercept sproplyp**	**Model 3: random slope sproplyp**	**Model 4: main effect (alccult for intercept)**	**Model 5: cross level (alccult for intercept and slope)**
Fixed						
proportion	0.167***	0.103***	0.098***	0.098***	0.074***	0.075***
predictor	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)
property offences			6.02*** (5.517, 6.574)	6.37*** (5.389, 7.539)	6.41*** (5.323, 7.719)	6.29*** (4.467, 8.859)
alcohol culture					1.43n.s. (0.820, 2.500)	1.42n.s. (0.715, 2.813)
property offences x alcohol culture						1.03n.s. (0.699, 1.505)
Random						
τ00 countries	0.24724	0.24466	0.23112	0.23493	0.21194	0.21197
τ slopes				0.05254	0.05187	0.05119
τ as r (slope, intercept)				-0.420	-0.489	-0.497
ICC	6.99%	6.92%	6.56%	6.66%	6.05%	6.05%
Test						
deviance	141387.567121	141000.583855	139963.703034	139959.374605	139956.580108	139956.560459
estimated parameters	2	6	7	9	10	11
LR test		X^2 (4) = 386.98327***	X^2 (1) = 1036.88082***	X^2 (2) = 4.32843n.s.	X^2 (1) =2.79450+	X^2 (1) =0.01965n.s.

Note + p < .10, * p < .05, **p< .01, *** p < .001

Similar results emerged when the fact of having committed at least one offence, even non-serious, in the last year was analyzed as a predictor (Table 16.7). This predictor also proved to be associated with alcohol abuse, though the relationship did not appear to be influenced by the cultural context.

Table 16.7 The results of multilevel analysis concerning alcohol culture (wet/dry) as a predictor for the relationship between total offences and risky alcohol use

gang - risky use	Model 0: empty model	Model 1: random intercept control variables	Model 2: random intercept totallyp	Model 3: random slope totallyp	Model 4: main effect (alccult for intercept)	Model 5: cross level (alccult for intercept and slope)
Fixed						
proportion	0.167***	0.103***	0.074***	0.072***	0.057***	0.057***
predictor	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)
total offences			4.75*** (4.561, 4.944)	4.94*** (4.740, 5.147)	4.94*** (4.711, 5.186)	4.94*** (2.896, 8.418)
alcohol culture					1.38n.s. (0.515, 3.690)	1.38n.s. (0.504, 3.761)
total offences x alcohol culture						1.00n.s. (0.604, 1.659)
Random						
τ00 countries	0.24724	0.24466	0.22881	0.25682	0.23763	0.23764
τ slopes				0.03898	0.03903	0.03904
τ as r (slope, intercept)				-0.453	-0.479	-0.479
ICC	6.99%	6.92%	6.50%	7.24%	6.74%	6.74%
Test						
deviance	141387.567121	141000.583855	137712.169981	137683.219794	137680.954241	137680.954055
estimated parameters	2	6	7	9	10	11
LR test		X^2 (4) = 386.98327***	X^2 (1) = 3288.41387***	X^2 (2) = 28.95019***	X^2 (1) = 2.26555n.s.	X^2 (1) =0.00019n.s.

Note + p < .10, * p < .05, **p< .01, *** p < .001

16.4 Conclusions and recommendations

In this chapter, we examined the relationship between delinquency and alcohol use among youngsters from 25 European countries, to determine whether, and how, different cultures of drinking may play a role as a risk factor.

The results provide evidence of a close relationship between involvement in delinquency and alcohol abuse. This association emerged with regard to both serious and non-serious offences, and concerned all types of delinquency, be it violence or property offences.

On controlling for gender and grade (strictly linked to age), youths who admitted committing any type of offence in the last year were seen to have a 4.75-fold higher probability (odds ratio) of risky alcohol use than the other youths in the sample. Among those who had committed at least one serious violent offence, the probability proved to be 6.15-fold higher. Intermediate values were observed among subjects who had committed at least one serious property offence (6.02) or who belonged to a gang (5.39).

Our data, which are of a cross-sectional nature, do not enable us to establish the causal direction of influence between delinquency and alcohol abuse. However, several studies have shown that delinquency often precedes and facilitates substance abuse (Windle, 1990; White, 1992; Harford & Muthen,

2000), and that anti-social behaviour constitutes an important pathway towards the onset of alcohol abuse (Zucker, 1994; Pardini, White & Stouthamer-Loeber, 2007; Mason et al., 2010). This means that it is practically impossible to establish the direction of any cause-effect relationship between the two phenomena. Nevertheless, the relationships that emerge clearly confirm the existence of a close link between alcohol use and juvenile delinquency, which seems to be reciprocal rather than one-directional (White et al., 1999; D'Amico et al., 2008).

Interesting and complex results emerged with regard to the influence of cultural variables on the relationships between juvenile delinquency and alcohol abuse. In a previous study, Bye and Rossow (2010) noted that the prevalence of alcohol-related aggression varied considerably from one country to another and was significantly higher in drinking cultures where intoxication was relatively more prevalent. Identifying specific cultural aspects, such as attitudes towards alcohol and consumption patterns, may help to better understand adolescent drinking and the perception of its effects. Thus, research is needed in order to identify cultural mechanisms which may account for these differences, and efforts should be made to develop indicators that represent relevant characteristics of the country.

In the present study, as in that of Felson et al., (2011), it was hypothesized that the relationship between delinquency and alcohol abuse was stronger in the countries of Northern-, Western- and Eastern Europe than in Mediterranean countries. Indeed, in the former, so-called "dry" countries, alcoholic beverages are consumed less frequently but more intensively, and more often with the intention of getting drunk. In the latter, so-called "wet" countries, by contrast, the consumption of alcohol, particularly wine, is learnt in the family, is more widespread and less frequently results in excess.

Our results confirmed this hypothesis, but only partially. Indeed, it emerged that gang membership increased the probability of alcohol abuse to a greater degree in Northern-, Western- and Eastern European countries, while involvement in delinquency *per se* proved to be associated with alcohol abuse to a similar degree in the various countries considered.

A possible explanation of this phenomenon may lie in the different perception of alcohol use in the two different categories of country. In "wet" countries, alcohol consumption may not always be regarded as transgressive, on account of the frequent alimentary use of alcoholic beverages. In "dry" countries, by contrast, adolescent drinking may well be perceived by society as being more transgressive (as if drinking were more closely equated with substance abuse in "dry" countries than in "wet" ones). However, the gang environment is linked to transgression and delinquency in all countries; it may therefore be the case that gang members in "dry" countries regard the pattern of alcohol consumption typical of their country (drinking to get drunk) as a deviant behaviour in which they can easily indulge, given the general propensity of gangs to transgress: hence, the greater influence of gang membership on the probability of excessive alcohol use in "dry" countries than in "wet" ones.

These results also have some implications for prevention. In "dry" countries in particular, a protective effect may be exerted by interventions that target deviant youth groups, membership of which, as we have seen, facilitates alcohol abuse.

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17 Self-control

Zuzana Podaná & Jiří Buriánek

17.1 Introduction

Low self-control is a relatively strong risk factor of alcohol consumption among juveniles; however, the strength of the association is not the same within European countries as has been already demonstrated in Chapter 9. To explain these differences, we will try to follow propositions of the general theory of crime (GTC) elaborated by Gottfredson & Hirschi (1990), in which self-control is a key concept, and derive hypotheses which could help to explain these cross-cultural variations. Subsequently, these hypotheses will be tested with data from the ISRD-2 survey using a multilevel modelling approach, which is highly suitable for this task.

According to GTC, low self-control is the essential disposition which can lead people to commit a crime. However, it is not just crime, but any deviant activity which gives them immediate, easy-to-obtain pleasure: "(...) people lacking self-control will also tend to pursue immediate pleasures that are *not* criminal: they will tend to smoke, drink, use drugs, gamble, have children out of wedlock, and engage in illicit sex." (Gottfredson & Hirschi, 1990, p. 90). Although low self-control is an important precondition of deviant behaviour, the relationship is not deterministic.

Many research studies have been conducted since the introduction of GTC, which intended to empirically test some parts of the theory. A meta-analytical research carried out by Pratt & Cullen (2000) identified 21 studies testing GTC and found support for the proposition that low self-control is an important predictor of crime and analogous acts. Many studies focused directly on alcohol use as a form of an analogous act, also assumed to be caused by low self-control, and this assertion was confirmed (e.g. Benda, 2005; Gibson, Schreck, & Miller, 2004; Piquero, Gibson, & Tibbetts, 2002; Vazsonyi et al., 2001) even though the association was usually somewhat lower when compared with results for delinquency (Vazsonyi et al., 2001; Benda, 2005).

Another key aspect of GTC is the situational context and the role of a suitable window of opportunity for the given type of deviance. Some authors suggested that according to GTC, there should be an interaction effect between self-control and the opportunity to commit deviant behaviour, and empirical evidence was often found to support this claim (e.g. Grasmick et al., 1993; Pratt & Cullen, 2000). However, Gottfredson & Hirschi (2003) rejected such an interpretation. Nevertheless, Hay & Forrest (2008) were committed to integrate self-control and routine activity theory which would suggest that the relationship between self-control and crime should be stronger when associated with a larger window of opportunity. Although their research found some evidence for this assertion, another cross-cultural study by Marshall & Enzmann (2012) only found evidence to support this theory in some regions.

Following the propositions of GTC, we can derive two general hypotheses concerning a differential effect of self-control on intense juvenile drinking in various cultural settings. The first hypothesis results from the assertion that low self-control is strongly associated with *deviant* behaviour. However, there is a large variation among countries in what is perceived as acceptable or tolerable with respect to juveniles' consumption of alcohol. For instance, it is more common for children to drink alcohol with their families in Mediterranean countries, whereas children from Nordic countries drink, generally less often, with peers and have higher levels of intoxication (see, e.g., Felson et al., 2011). Therefore, we can also assume that intense juvenile drinking is not perceived as deviant to the same extent in all European countries, and self-control should be classified as a more relevant predictor of this type of behaviour in those societies where drinking is considered to be less acceptable.

Hypothesis 1:
The greater the social acceptance of juvenile drinking, the lower the effect of self-control on intense drinking.

The second hypothesis concerning intense juvenile drinking, which can be derived from GTC, employs the concept of the opportunity necessary to engage in any deviant behaviour. If the access to alcoholic beverages is limited for juveniles, even children with low self-control have less opportunities to engage in risky drinking.

Hypothesis 2:
The higher the availability of alcohol for juveniles, the higher the effect of self-control on intense drinking.

17.2 Methodology

These two hypotheses will be tested with the dataset from ISRD-2, using multilevel logistic models with cross-level interactions, enabling us to take into account differences in cultural and policy contexts of European countries. There are two levels included in the models that correspond to the multistage sampling procedure: country level and school level.[1] The statistical programme R and its procedure "lme4" have been employed for this purpose (Bates, Maechler, & Bolker, 2011).

The dependent variable in all analyses is "intense drinking" which is described in detail in Chapter 11. The variable measuring low self-control[2] was centred to the grand mean and subsequently standardized. Three control variables are included in the models as well: gender, grade (7^{th}-9^{th}), and migrant status (native born vs. non-natives). The effects of three contextual variables on the relationship between self-control and intense drinking will be tested: 1) age restriction of purchasing alcohol; 2) proportion of juveniles who drank beer or wine with their parents during the last occasion, and; 3) alcohol availability for juveniles. The first two measures are taken as proxies for social acceptance of juvenile alcohol consumption –the former on the level of social policy and the letter reflecting the cultural context of drinking–, and the third as a proxy for the opportunity of alcohol consumption.

Regulations which set the minimum age at which youngsters are legally allowed to purchase alcohol is far from uniform across Europe, varying from low restrictions (16 years or no limit) in some Southern-European countries to a stricter approach in Scandinavia where the sale of spirits is usually not allowed to be sold to youngsters under 20. For the purpose of this analysis, the age limits were recoded into four levels: 1-less than 16 or no limit; 2-16; 3-18; 4-20 or more and a single indicator of *age restriction of selling alcohol to juveniles* was comprised of four variables indicating the limit for the sale of beer/wine and spirits and on/off premise, obtained from the World Health Organization (WHO, 2011). The second context variable *proportion of juveniles who drank beer or wine with their parents during the last occasion* comes directly from ISRD-2 data, and only accounts for those children who have already consumed alcohol before. The last indicator, *alcohol availability for juveniles,* is taken from the ESPAD-survey from 2006 in which children were asked how difficult it would be for them to obtain beer, wine, alcopops (breezers), and spirits (Hibell et al., 2009). The indicator reflects the maximum proportions of children claiming good availability (very or fairly easy) for each type of alcoholic beverage.

The analysis employed a hierarchical approach in which (blocks of) variables and/or cross-level interaction terms are added one by one into the model, evaluating their relative contributions. The best fitting random effect models are further compared to corresponding fixed-effect models to estimate if a significant variation in the slope for self-control can still be accounted for.

1 Level of individual classes was excluded from the models since it is in most cases identical with school level.
2 See Chapter 2 for the construction of the self-control scale.

17.3 Results

Table 17.1 presents the first set of models starting from the empty (null) Model 0, which only includes the intercept. This model enables us to estimate ICC for country and school level which reached 0.065 and 0.072 respectively. The χ^2-test comparing the deviance of Model 0 with the deviance of a model, which does not take the clustering within schools and countries into account, confirms the relevance of a multilevel perspective. Model 1 was created by including all of the control variables (grade, gender, and migrant status), and Model 2 was created by also including the low self-control measure as a fixed parameter; each is significantly better than the previous one. Finally, Model 3 allows low self-control to act as a random parameter and the significance level of the χ^2-test confirms that the relationship between self-control and intense drinking varies between European countries. The value of the correlation between the intercept and low self-control (r=0.24) indicates that the higher the intercept, the stronger the association between self-control and intense drinking.

Table 17.1 Multilevel analysis to explain intense drinking by self-control (n individuals: 52,707; n schools: 1,344; n countries: 25)

	Model 0: empty model	**Model 1: control variables**	**Model 2: low self-control**	**Model 3: low self-control random slope**
Predictor	Exp(b) (se)	Exp(b) (se)	Exp(b) (se)	Exp(b) (se)
Fixed				
Low self-control			2.038(.027)***	2.042 (.053)***
Random				
Var School	0.273	0.255	0.252	0.251
Var Country	0.248	0.242	0.255	0.243
Var low self-control				0.011
Cor low self-control, intercept				0.236
LR test	x2 (2)=1845***	x2 (4)=317***	x2 (1)=2972***	x2 (2)=38***

* p<.05, ** p<.01, *** p<.001; models are controlled for gender, grade, and migrant status Source: ISRD-2

The next Table 17.2 aims to test the first hypothesis and, therefore, includes two contextual indicators as proxies for social acceptance of juvenile alcohol consumption: age restriction of selling alcohol to juveniles and the proportion of juveniles who drank beer or wine with their parents during the last occasion. The last Model 3 from Table 17.1 is used as a baseline model to compare the results. Model 4a includes the age restriction of selling alcohol to juveniles and its interaction with self-control. The interaction term is statistically significant and in conformity with our hypothesis: the association between self-control and risky drinking is higher in countries that have higher age limit of legal alcohol consumption. Evidently these countries are also less tolerant in regards to juvenile alcohol consumption. Model 4b adds the variable that measures drinking with parents and its interaction with self-control to Model 3, and the interaction term is also statistically significant. The odds ratio suggests that the higher the proportion of juveniles who drank beer of wine with their parents during the last occasion, the lower the effect of self-control on risky drinking: a result which is in accordance with the hypothesis as well. When we compare the results of Model 4a and 4b: Model 4b seems to fit better[3] and the variance in the random slope of self-control is reduced to a greater extent.[4]

The last Model 4c in Table 17.2, includes both contextual variables and their two-way interactions with self-control. Whereas the interaction term for drinking with parents remains significant, the cross-level interaction with age restriction on juvenile drinking is no longer significant at the 5% level. The χ^2-tests also confirm that Model 4c is not significantly better than Model 4b, but it would be better that Model 4a. Therefore, Model 4b can be considered as best fitting.

3 BIC for Model 4a is 41288 and for Model 4b 41279.

4 Even though the variance in the random slope is only 0.004 in Model 4b, x2-test still confirms its better fit when compared with a fixed effect model for the same independent variables.

Table 17.2 Multilevel analysis to explain intense drinking by self-control (n individuals: 52,707; n schools: 1,344; n countries: 25)

	Model 3: low self-control random slope	**Model 4a: cross-level interaction**	**Model 4b: cross-level interaction**	**Model 4c: cross-level interaction**
Predictor	Exp(b) (se)	Exp(b) (se)	Exp(b) (se)	Exp(b) (se)
Fixed				
Low self-control	2.042 (.053)***	2.024 (.047)***	2.026 (.038)***	2.021 (.037)***
Age restriction		1.069 (.169)		1.088 (0.185)
Low self-control x age restriction		1.108 (.042)**		1.058 (0.034)+
Drinking w/ parents			1.022 (1.200)	1.277 (1.602)
Low self-control x drinking w/ parents			0.366 (.078)***	0.418 (.092)***
Random				
Var School	0.251	0.251	0.251	0.251
Var Country	0.243	0.240	0.244	0.240
Var low self-control	0.011	0.008	0.004	0.003
Cor low self-control, intercept	0.236	0.210	0.367	0.337
LR test				
vs. Model 3		x2 (2)=7*	x2 (2)=15***	x2 (4)=19***
vs. Model 4a				x2 (2)=12**
vs. Model 4b				x2 (2)=3 n.s.

+ p<.10, * p<.05, ** p<.01, *** p<.001; models are controlled for gender, grade, and migrant status. Source: ISRD-2

Model 5 in Table 17.3 was designed to test the second hypothesis and, therefore, included the indicator of alcohol availability for juveniles in each country – as a proxy measure of opportunity for alcohol consumption – and the interaction term with self-control. Both effects are statistically significant and the odds ratio for the interaction term suggests that the association between self-control and risky drinking is stronger in countries where alcohol is more easily accessible to juveniles. This result is in accordance with the second hypothesis derived from GTC.[5]

Table 17.3 Multilevel analysis to explain intense drinking by self-control (n individuals: 52,707; n schools: 1,344; n countries: 25)

	Model 3: low self-control random slope	**Model 5: cross-level interaction**	**Model 4b: cross-level interaction**	**Model 6a: cross-level interaction**	**Model 6b: cross-level interaction**
Predictor	Exp(b) (se)	Exp(b) (se)	Exp(b) (se)	Exp(b) (se)	Exp(b) (se)
Fixed					
Low self-control	2.042 (.053)***	2.049 (.049)***	2.026 (.038)***	2.033 (.033)***	2.030 (.028)***
Availability		1.035 (.011)***		1.035 (0.011)***	1.035 (0.011)***
Low self-control x availability		1.006 (.003)*		1.006 (0.002)**	1.006 (0.002)**
Drinking w/ parents			1.022 (1.200)	1.090 (1.071)	1.010 (1.070)
Low self-control x drinking w/ parents			0.366 (.078)***	0.367 (.067)***	0.363 (.055)***
Random					
Var School	0.251	0.251	0.251	0.251	0.252
Var Country	0.243	0.162	0.244	0.166	0.162
Var low self-control	0.011	0.009	0.004	0.002	
Cor low self-control, intercept	0.236	-0.066	0.367	-0.284	
LR test					
vs. Model 3		x2 (2)=13**	x2 (2)=15***	x2 (4)=32***	
vs. Model 5				x2 (2)=19***	
vs. Model 4b				x2 (2)=16***	
vs. Model 6b				x2 (2)=1.6 n.s.	

* p<.05, ** p<.01, *** p<.001; models are controlled for gender, grade, and migrant status. Source: ISRD-2

In the last step of our analysis, we attempted to combine Model 5 with the best fitting model from Table 17.2 (Model 4b) to assess whether the inclusion of both cross-level interactions of self-control and alcohol availability, and drinking with parents into one model would result in a better fit. The resulting Model 6a (Table 17.3) clearly confirms this assertion. In addition, this model is not a significantly better fit of the data than a fixed effect model with the same variables (Model 6b), which leads us to the conclusion that after the inclusion of the two cross-level interactions, the effect of self-control on risky drinking is no longer variable among European countries.

A similar analysis (not presented here) was repeated with different dependent variables, namely binge drinking during the last occasion and regular drinking (at least four times during last four weeks), to reveal whether the findings are robust. The results were largely in agreement: 1) both interactions between self-control and drinking with parents were significant; 2) the interaction between self-control and age restriction was only significant in the model for regular drinking, and; 3) alcohol availability did not interact with self-control in these models but the main effects of availability were significant.

5 However, a further analysis (not presented here) revealed that the significant cross-level interaction was caused by a single country, namely Armenia. If Armenia is removed from the model, the interaction is no longer significant.

17.4 Conclusions

The aim of this chapter was to use the propositions of Gottfredson & Hirschi's general theory of crime (1990) to explain differences in the strength of association between self-control and intense juvenile drinking in different European countries. The results indicate several important findings, all of which are partially in accordance with the proposed hypotheses, and emphasize the importance of the overall cultural context for researching the effects of risk factors on juvenile alcohol consumption.

The first hypothesis which claimed that "the greater the social acceptance of juvenile drinking, the lower the effect of self-control on intense drinking" was supported by our data. Social acceptance of juvenile drinking was comprised of the cultural acceptance of juvenile drinking and policy strictness with respect to setting minimum age limits for selling alcohol to youngsters. Overall, the former indicator performed very well in the analysis. This finding highlights the relevance of the cultural context for risk factor research as previously suggested by Vazsonyi et al. (2004). The strictness of policy also affected the strength of the association between self-control and intense juvenile drinking, but its explanatory power seems to diminish when compared to the cultural acceptance indicator. However, the weak effect of policy strictness is not surprising given the fact that policy regulations do not necessarily reflect community or social attitudes towards juvenile drinking. Rather, policies are often based on tradition or simply reflect (recent or past) political efforts to change public attitude to this phenomenon.

The second hypothesis, which suggested that "the higher the availability of alcohol for juveniles, the higher the effect of self-control on intense drinking" is only weakly supported by our results due to the fact that the identified interaction effect for intense drinking, was mainly caused by an outlier. Nonetheless, juvenile alcohol availability definitely affects the degree of juvenile problematic alcohol use in European countries and it is, therefore, an important contextual characteristic.

17.4.1 Policy recommendations

Our research indicates that there are two important conclusions which are relevant for social policies which strive against juvenile alcohol abuse in Europe. First, the age at which juveniles are legally permitted to buy alcohol, affects the importance of low self-control as a risk factor of intense alcohol use. Specifically, in countries where these limits are strict (e.g. North Europe), self-control is more strongly associated with intense drinking and it is, therefore, more important to incorporate strategies to enhance self-control among juveniles (see chapter 9) into general preventive efforts in these countries. However, we cannot conclude from our results that lower or higher age limits are preferable or have a more positive influence in regards to juvenile problematic alcohol use. Existing policies that set these age limits are closely interconnected with the specific cultural context of each country where alcohol consumption has a different cultural significance.

Second, it seems that those countries where alcohol consumption is a part of everyday life (e.g. some Mediterranean countries) not only have lower incidences of juvenile binge drinking (Kuntsche, Rehm, & Gmel, 2004) but according to our results, self-control is less strongly associated with problematic alcohol use as well. We can tentatively interpret our findings that in so-called "wet" countries (Felson et al., 2011; Room, & Mäkelä, 2000), in which children are often allowed to drink alcohol with the family during meals and moderate alcohol consumption is highly common among adults, this "socialization" of juveniles to use alcohol moderately has positive results. Nevertheless, this effect is most likely an outcome of an overall cultural tradition of these countries and no direct implications can be drawn concerning countries in which the cultural significance of alcohol is different.

This debate may also highlight the problem of lower levels of self-control identified in many post-communist countries. Perhaps, these countries require more time to culturally adapt, and it could be suggested that following a period of social change, the social climate in these countries is currently defined by an over exhaustion of principles of individualism and unrestricted freedom.. Furthermore, the transition towards democracy may have produced some false ideas influencing child rearing and education. Nevertheless, the lower levels of self-control are mostly interconnected with the cultural acceptance of alcohol, thus it would be difficult to provide any country-specific recommendations.

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18 *Country level predictors of alcohol use: The impact of alcohol policy, drinking culture characteristics and socioeconomic conditions of alcohol use*

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18.1 Introduction

Focusing on alcohol use, the relationship between country characteristics and individual behaviour seems obvious. International epidemiological studies like the *European School Project on Alcohol and Other Drugs* (ESPAD) or *Health Behaviour in School-aged Children* (HBSC) show a quite divergent pattern of youngsters' substance use over the different European countries, but the reasons for these variations in use are not clear (Popova, Rehm, Patra, & Zatonski, 2007). Often differences in the countries' characteristics are discussed as potential explanations (Felson, et al., 2011; Ritter, 2007). Regarding the use of alcohol policy, alcohol culture and socioeconomic indicators have been assumed so far to possibly explain these differences in alcohol use on a national level.

Alcohol policies are expected to have an impact on individual alcohol use, e.g. directly by restraining the availability of alcoholic beverages in public by sale restrictions or indirectly by increasing taxes (Anderson & Baumberg, 2006; Brand, Saisane, Rynn, Pennoni, & Lowenfels, 2007).

By approving laws or taxes, social norms with respect to the use of alcohol are installed too. They reflect the acceptance of drinking alcohol in a certain country. However, social norms are not only based on laws, but also on culture and tradition. Alcohol culture is conceived as the way alcohol is integrated in everyday life. Is it, for example, common to drink alcohol while celebrating a birthday in the workplace? Is alcohol a leisure time drug or is an accompaniment to dinner? Is it associated with fun, masculinity or hedonism and expertise? These national *cultures of alcohol use* might be more significant in explaining the current use patterns in youth than laws are.

Alcohol drinking is associated with the *socioeconomic status* of a country too, e.g. income, education and employment status (Bloomfield, Grittner, Kramer & Gmel, 2006). As was shown in Sweden, an increasing strength of the national economy went along with a decrease of youngsters' alcohol use (Svensson & Hagquist, 2009). The distribution of wealth in a society may indirectly affect young people and the amount of alcohol being used. Research on the direction of the association between alcohol use and income has proved to be very inconsistent. Some studies found a positive relationship which means that a higher income also increases the odds of reporting hazardous use behaviour, because with the economic means the opportunities to use alcohol in a hazardous manner also increase (Keyes & Hasin, 2008). Different kinds of research supported a negative relationship by which adolescents living in a family with low affluence report higher rates of substance use than more affluent adolescents (Elgar, Roberts, Parry-Langdon, & Boyce, 2005). Education is another indicator influencing alcohol use, with inconsistent results regarding the direction of the association. A negative association between educational level and heavy drinking has been found to exist only in some countries, while in others a positive association between educational attainment and heavy drinking has been evident (Kuntsche, et al., 2006). The unemployment rate of a country, another indicator worth exploring in this field, is also ambiguous (Hammer & Vaglum, 1990). Some results indicate that unemployment is related to a decrease in the use of substances due to the economic situation (less income), while others have shown an increase in consumption of alcohol when unemployed (Ettner, 1997). The lack of occupation may increase alcohol use because of the increased stress associated with losing one's job and the availability of more leisure time which might lead to drinking. Conversely, reductions in employment may actually discourage the abuse of alcohol, e.g. persons living in areas of high unemployment are more fearful of losing their jobs and drink less (due to expected reductions in income) (Ettner, 1997).

Any of those indicators need further research to obtain a clearer picture of this association with alcohol use.

Whether and how those socioeconomic indicators affect the consumption of alcohol is relevant for public policy. For example, the income distribution can be influenced by taxation, tax benefits and other economic policies (Kuntsche, et al., 2006). A better allocation of government public health resources could be determined if the direction of the relationship between unemployment and alcohol use were clearer (Ettner, 1997).

This chapter deals with the questions of whether and how country characteristics influence the individual drinking habits of adolescents. For that reason, different national alcohol policy,and cultural and socioeconomic indicators are studied regarding their impact on the variation of youngsters' average alcohol use in 25 European countries.

18.2 Methods

18.2.1 Statistical analyses

Multilevel analysis serves as an extension of the general linear model (GLM) for data with a hierarchical structure (Eid, Gollwitzer, & Schmitt, 2011). After performing regression analyses on an individual level, variables from higher levels are included that characterize the units into which individuals are grouped. Thus, the dependency of responses from students of one sample unit is respected and an adequate estimation of standard errors and test statistics is possible (Hox & Kreft, 1994; Willms, 1999). Consequently, fewer wrong conclusions are made like, for example, the ecological fallacy (i.e. when a relationship of higher-level units is transferred to and interpreted on an individual level) (Hox & Kreft, 1994). Other benefits are the simultaneous estimation of fixed and random effects, the modelling of interactions between predictors on different levels (cross-level interactions) and the possibility of comparing differently restricted or nested models by a likelihood ratio test (Hox, 2010; Hox & Kreft, 1994; Kreft & Leeuw, 1998; Snijders & Boskers, 2000). Within this project there are three levels of clustering modelled. The alcohol use of individuals (level 1) and its association with various risk factors are explained by characteristics of the countries (level 3) the youngsters belong to (the school level is included without explanatory variables). In each section of this report, specific hypotheses will be derived and tested. For that reason, the following general modelling sequence will be applied and adapted if needed:

1. *Empty model:* By estimating the null model the total variance of the dependent variable can be divided into the individual, school and country variance. The proportions of variance on each level can be calculated by the respective intraclass correlation coefficient and a baseline deviance is given to which the other models can be compared.
2. *Random intercept model with control variables:* In the second model the demographic variables gender (ref.: male), eight^{h} and nineth grade (dummy coded, ref.: seventh grade) and migrant status (dichotomized, ref.: native) are added. The interest is not in the impact of these variables, but they are included to control for their effects before including the explanatory variables.
3. *Random intercept model with explanatory variables:* Here, the interesting independent variable on level 1 is included in the model to estimate its impact on alcohol use, i.e. explaining the within-group variance. The slopes are fixed, which reflects the assumption that the effects do not differ across countries.
4. *Random slopes model:* In the next step, it is investigated whether the relationship between the predictor on the individual level and the critical alcohol use variable differ across countries by estimating the variance of the associations across all included countries.
5. *Model with higher-level explanatory variable:* In this model, country-level explanatory variables are added to the model as higher-level indicators that might explain the intercept variance.
6. *Model with cross-level interactions:* The final model includes country-level predictor variables to explain the variance of the slopes on the individual level. The focus of the interpretation is on the explanation of the variation of the slopes across countries.

For the LR test of model comparison it is required to keep the number of cases constant within the modelling sequence by listwise deletion of those cases that have missing data on the variables that are used in the modelling process. R 2.15.0, STATA, HLM6 and MLWin are statistical software packages that are used for performing multilevel analysis within the AAA-prevent project. The analysis for this chapter was conducted with HLM6.

In this first section of the report of multilevel analyses' results, two kinds of three-level models are built:

1. An *empty model* to calculate the intraclass correlation of risky alcohol use within the 25 countries and the proportion of risky users in the sample, and;
2. a higher-level *random intercept model with the control variables and a level-3 predictor* included for explaining the variation of the level-3 intercept. For each country variable we build a random intercept model with the respective level-3 variable as predictor.
3. Bernoulli distribution of the dichotomous outcome variable is assumed and the Laplace iteration method is the estimation setting of choice. Deviance tests allow the statistical comparison of the nested models.

18.2.2 Sample

This present study is conducted with subsamples with complete information on all variables which are relevant on an individual and country level in each respective hypothesis. For the multilevel models about policy, culture and socioeconomic indicators, a subsample of 52,775 cases from 25 countries (in 1,344 schools) is used consisting of 26,916 (51%) female and 25,859 (49%) male youngsters with a proportion of 21.8% (11.482) adolescents with a migration background. 18,216 (34.5%) of these students are seventh graders, 17,827 (33.8%) are in grade eight and 16,732 (31.7%) in ninth grade. Table 18.1 shows the distribution of the control variables per country.

Table 18.1 Sample characteristics of the subsample for the multilevel analyses of policy and culture indicators (N=52,775)

country	N	male	grade 8	grade 9	native
Armenia	1933	0868	721	580	1762
Austria	2762	1354	694	1379	1784
Belgium	2054	1039	672	671	1412
Bosnia & Herzegovina	1897	939	974	-	1700
Cyprus	1995	926	735	696	1626
Czech Republic	2897	1443	955	958	2651
Denmark	1182	571	499	185	978
Estonia	2233	1120	803	646	1790
Finland	1307	646	335	573	1108
France	2239	1118	655	609	1058
Germany	3196	1616	1071	961	2189
Hungary	1792	896	583	532	1723
Iceland	547	249	547	-	501
Ireland	1394	738	481	496	1172
Italy	4930	2387	1559	1762	4344
Lithuania	1857	870	607	585	1713
Netherlands	2186	1109	708	707	1432
Norway	1504	734	488	457	1036
Poland	1305	600	618	687	1275
Portugal	2434	1180	909	556	2087
Russia	2199	1051	768	714	1938
Slovenia	2014	971	-	906	1436
Spain	1604	824	575	518	1382
Sweden	1982	954	728	536	1298
Switzerland	3332	1656	1142	1018	1898
Total	52.775	25.859	17.827	16.732	41.293

18.2.3 Measures

A. Individual level

Apart from the control variables *gender (ref.: female)*, *grade (dummy coded, ref.: seventh grade)* and *native (ref.: non-native)* in these multilevel analyses, there is only one more variable on the individual level included: the outcome variable non-risky respectively risky *alcohol use* (see Chapter 11). All individual variables are scaled dichotomous with the response categories "0=no" and "1=yes".

B. School level

The second level of analysis within the project is the school level. Because we focus on country characteristics and their impact on risky alcohol use here, no school characteristics are included in the following modelling process.

C. Country level

On the country level a variety of indicators was collected to illustrate the political, cultural and socio-economic situation in the 25 European nations studied. The quotient of the real disposable income index and the relative alcohol price index multiplied by 100 is used as an indicator of the *affordability* of alcohol in a country ranging from 0 to 5 (M=3.35, SD=0.57) and is a marker of a nation's alcohol policy because of the association with tax regulations (RAND, 2009).

Another alcohol policy factor is the *availability* of beer respectively spirits that is illustrated as the percentages of individuals responding that beer or spirits are "fairly easy" or "very easy" to obtain (beer: M=79.32, SD=8.97; spirits: M=54.93, SD=9.12). Here, the laws regulating the options to purchase as well as to be offered alcoholic beverages are illustrated. An index variable with the categories "very tolerant", "tolerant", "neither tolerant nor restrictive", "rather restrictive" and "very restrictive" was built to illustrate the *restrictions on juvenile drinking* in each country combining several indicators like, for example, legal age restrictions. On average, in Europe the restrictions are neither tolerant nor restrictive (M=1.82, SD=1.04). Information about legally binding regulations on sales promotion was treated as the alcohol policy indicator *sale restrictions* (WHO, 2011). In 15 out of the 25 countries there are regulations about sale promotion (N=28.629, 58.8%). The index about the *severity* of a nation's alcohol policy is derived from Anderson & Baumberg (2006). Here, data about an action plan or coordinating body for alcohol, school-based education, drink-driving restrictions, sales of alcoholic beverages, alcohol marketing and taxation are combined into a single scale that can possibly range from 0 to 20 points. Higher points stand for a more severe alcohol policy and for the present study the scale was categorized afterwards (0="least strict" [25.1%], 1="less strict" [29.6%], 2="more strict" [19.0%], 3="most strict" [26.3%]). Last but not least, the national *legal blood alcohol concentration limit* when driving a vehicle was used as an indicator of a country's alcohol policy (M=.04, SD=.01) (WHO, 2011).

In the following analyses, a nation's alcohol use culture is described by the *average alcohol use* respectively the average litres of pure alcohol that were consumed by the adult population (15 years old and older) between 2003 and 2005 (M=12.59, SD=2.43) (WHO, 2011). By doing so, the average drinking habits of a nation are pictured. The *percentage of alcohol use disorders* of females and males aged 15 years and more in a country (M=3.21, SD=2.36) is another explanatory variable on the country level and should indicate the acceptance of substance use disorders in a country by illustrating the awareness of such problems (WHO, 2011). The third alcohol culture characteristic is derived from the World Values Survey: the mean rating of the *importance of friends* in the adult population of a country ranging from 0 to 100 (M=77.97, SD=6.27). It is assumed that alcohol use by youngsters is a behaviour predominantly shown in groups. An aggregated variable indicating the *proportion of youngsters who drink spirits on their own* is also used as a marker of alcohol use culture. This variable reflects the common sense that youngsters who drink on their own instead of in groups/with their peers show a more risky and unhealthy substance use pattern. In this sample, on average 7.4% (SD=3.48) of students reported drinking spirits on their own.

The differentiation between Mediterranean countries (Cyprus, Slovenia, France, Spain, Italy and Portugal) and other European countries (Nordic: Denmark, Finland, Iceland, Norway and Sweden; Central: Austria, Belgium, Czech Republic, Germany, the Netherlands, Switzerland, Ireland; Eastern: Estonia, Hungary, Lithuania, Russia, Bosnia & Herzegovina, Poland and Armenia) is done by the indicator *drinking culture*. This variable is based on the categorization of "wet" and "dry" drinking cultures (Felson et al., 2011). Overall, 15.216 (28.8%) respondents of this sample live in a "wet" and 37.559

(71.2%) in a “dry” country. According to Felson et al. (2011), “dry” countries are characterized by people who drink less frequently than in “wet” countries but with the purpose of getting intoxicated when they do. Furthermore, in “dry” countries youngsters tend to drink more with their friends instead of with their parents as happens in “wet” countries. Consequently, in “dry” countries juvenile drinking is seen as more of a social problem than in “wet” countries and the alcohol policies are more strict.

The socioeconomic status of a country is described by six country-level variables. The Human Development Index (HDI), which consists of the Life Expectancy Index, Education Index and Gross Domestic Product (GDP) Index (Gaye, 2007), monitors the social and economic development of a country. All three components were also integrated separately into the model. The life expectancy indicates the average number of years a person can expect to live if in the future they experience the current age-specific mortality rates in the population. The Education Index measures the adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio. The GDP refers to the market value of all officially recognized final goods and services produced within a country (Gaye, 2007).

Another country-level variable containing educational information about a country is the Global Competitiveness Index, a highly comprehensive index for measuring national competitiveness consisting of 12 different pillars. One pillar measures the quality of higher education and training in each country and ranks them according to eight components: secondary education enrolment rate, tertiary education enrolment rate, quality of the educational system, quality of maths and science education, quality of school management, Internet access in schools, local availability of research and training services, and extent of staff training (Sala-I-Martin, et al., 2007). The unemployment rate is a measure of the prevalence of citizens actively seeking employment and willing to work. Worth mentioning is the fact that none of the national indicators show a normal distribution but only a small variation across countries. Table 18.2 presents the overview on all included country indicators.

Table 18.2 List of policy, socioeconomic status and culture indicators on country level

Alcohol policy	National culture	Socioeconomic conditions
Affordability	Per capita consumption	Human Development Index (HDI)
Availability (beer, spirits)	Proportion of alcohol disorders	Life expectancy
Restrictions on juvenile drinking	Importance of friends	Gross Domestic Product (GDP)
Sale restrictions	Percentage of youngsters drinking spirits alone	Education Index
Severity of alcohol policies	Drinking culture	Global competitiveness index – quality of higher education and training
Legal blood alcohol limit (driving a vehicle)		Unemployment rate

18.3 Results

18.3.1 Alcohol policy

In the first two columns of Table 18.3, the empty model and the random intercept model with the three control variables for the multilevel analyses of the policy and culture indicators are shown. 17% of youngsters in the analysed sample (N=42,337 in 1,048 schools in 18 countries with missing data on seven countries) are risky alcohol users, i.e. 11% of all sampled female seventh graders with a migration background. Being in ninth grade, male and native born increases the chance of showing a risky alcohol consumption pattern. The intraclass correlations (ICC) are above 5% within schools (6.5%) and above 3% within countries (4.7%) – even when controlling for grade, gender and migration status.

Table 18.3 Empty model, random intercept model with control variables and random intercept models for policy indicators

country - use	Model 0: empty model	Model 1a: random intercept with control variables and l3-predictor "affordability"	Model 1b: random intercept with control variables and l3-predictor "availability of beer"	Model 1c: random intercept with control variables and l3-predictor "availability of spirits"
Fixed				
Proportion	0.17			
Predictor		OR (CI)	OR (CI)	OR (CI)
L3 country-level predictor		0.82n.s. (0.322, 2.099)	1.01n.s. (0.970, 1.063)	0.97n.s. (0.929, 1.024)
Random				
ττ schools	0.25802	0.24066	0.24062	0.23957
τβ countries	0.17466	0.17671	0.17453	0.15699
τ slopes				
τ as r (slope, intercept)				
ICCL2				
ICCL3				
Test				
deviance	114790.120083	114541.407287	114541.124794	114539.605204
estimated parameters	3	8	8	8
LR test		$X^2(1)$=0.44588n.s.	$X^2(1)$=0.72837n.s.	$X^2(1)$=2.24796n.s.

Note *p<.05, **p<.01, ***p<.001

In the latter three columns of Table 18.3, random intercept models with level-3 predictors are presented. In each case a different level-3 predictor is added to the random intercept model with control variables to explain the variance of the intercept. Neither the affordability of alcoholic beverages (OR=.82) nor the availability of beer (OR=1.01) or spirits (OR=0.97) has a significant impact on adolescents' risky alcohol use (p>.10). In Table 18.4, the results of the random intercept models with level-3 alcohol policy indicators are continued. Neither the restrictions especially on juvenile drinking (OR=1.12) nor the general sale promotion restrictions (OR=.93) have a significant influence on risky alcohol use during adolescence (p>.10). The extent of the alcohol policy's severity has no remarkable impact on juvenile alcohol use (OR=1.00, p>.10). Not even the legal blood alcohol limit when driving a vehicle explains the variance of the proportion of risky users in the sample (OR=1.04, p>.10).

Table 18.4 Random intercept models for policy indicators (continuation)

country-use	Model 1d: random intercept with control variables and l3-predictor "restrictions on juvenile drinking"	Model 1e: random intercept with control variables and l3-predictor "sale promotion restrictions"	Model 1f: random intercept with control variables and l3-predictor "severity of alcohol policies"	Model 1g: unemployment rate random intercept with control variables and l3-predictor "legal blood alcohol limit"
Fixed				
proportion				
predictor	OR (CI)	OR (CI)	OR (CI)	OR (CI)
L3 predictor	1.12n.s. (0.708, 1.794)	0.93n.s. (0.591, 1.478)	1.00n.s. (0.794, 1.250)	1.04n.s. (0.837, 1.282)
Random				
ττ schools	0.23930	0.23961	0.23940	0.23929
τβ countries	0.15261	0.17181	0.18318	0.17496
Test				
deviance	114540.953870	114541.768758	114541.893003	114541.585141
estimated parameters	8	8	8	8
LR test	$X^2(1)$=0.89930n.s.	$X^2(1)$=0.08441n.s.	$X^2(1)$=0.03984n.s.	$X^2(1)$=0.26802n.s.

Note * p<.05, **p<.01, ***p<.001

18.3.2 Alcohol culture

The random intercept models with different level-3 predictors are continued in Table 18.5 for the drinking culture indicators. No significant results were found for the indicators per capita consumption of pure alcohol (OR=1.00), proportion of alcohol use disorders (OR=.98), importance of friends (OR=.99), and percentage of youngsters drinking spirits alone (OR=.96, p>.10). Only living in a "dry" alcohol-drinking culture has a significant increasing effect on the proportion of risky users in the sample (OR=1.77, p<.05).

Table 18.5 Random intercept models for culture indicators

country - use	**Model 2d: random intercept with control variables and l3-predictor "per capita consumption of pure alcohol"**	**Model 2e: random intercept with control variables and l3-predictor "proportion of alcohol use disorders"**	**Model 2f: random intercept with control variables and l3-predictor "importance of friends"**	**Model 2g: random intercept with control variables and l3-predictor "percentage of youngsters drinking spirits alone"**	**Model 2h: random intercept with control variables and l3-predictor "alcohol use culture"**
Fixed					
proportion					
predictor	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)
L3 predictor	1.00n.s. (0.865, 1.149)	0.98n.s. (0.861, 1.118)	0.99n.s. (0.942, 1.042)	0.96n.s. (0.861, 1.081)	1.77* (1.042, 3.019)
Random					
τπ schools	0.23963	0.23856	0.23984	0.24039	0.23898
τβ countries	0.18862	0.17226	0.18897	0.17635	0.10954
Test					
deviance	114541.899901	114541.727571	114541.880309	114541.409795	114533.810825
estimated parameters	8	8	8	8	8
LR test	$X^2(1)$=0.04674n.s.	$X^2(1)$=0.12559n.s.	$X^2(1)$=0.02714n.s.	$X^2(1)$=0.44337n.s.	$X^2(1)$=8.04234**

Note +p<.10, * p<.05, **p<.01, ***p<.001

18.3.3 Socioeconomic status

Table 18.6 shows the multilevel results for the socioeconomic indicators Education Index, life expectancy, Human Development Index, Gross Domestic Product, quality of higher education and training as well as unemployment rate. No significant results were found for the country indicators Education Index and life expectancy. The result for the Human Development Index shows a tendency for significance (OR=1.21, p = .057). Significant results were found for the country indicators, with very small effects for Gross Domestic Product (OR=1.000017, p=.042) and quality of higher education and training (OR=.98, p=.042), while a bigger effect was found for the unemployment rate (OR=.92, p=.014) decreasing the likelihood of risky use.

Table 18.6 Random intercept models for socioeconomic indicators

	Model 2h: random intercept with control variables and l3-predictor "education index"	**Model 2i: random intercept with control variables and l3-predictor "life expectancy"**	**Model 2j: random intercept with control variables and l3-predictor "human development index"**	**Model 2k: random intercept with control variables and l3-predictor "GDP"**	**Model 2l: random intercept with control variables and l3-predictor "higher education / training"**	**Model 2m: random intercept with control variables and l3-predictor "unemployment rate"**
Predictor	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)
Fixed						
Intercept						
LEVEL III country-level Predictor	1.25n.s. (0.966,1.623)	1.02n.s. (0.960,1.084)	1.21+ (0.994,1.481)	1.00* (1.000, 1.000)	0.98* (0.976,1.000)	0.92* (0.865,0.981)
Random						
Var School	0.24107	0.24142	0.24121	0.24129	0.24111	0.24156
Var Country	0.17714	0.22496	0.19060	0.19599	0.15252	0.17590
Deviance	141029.47	141034.82	141031.07	141031.64	141026.17	141029.25
	8	8	8	8	8	8
LR Test	$X^2(1)=5.96$*	$X^2(1)=0.60$	$X^2(1)=4.36$*	$X^2(1)=3.79$	$X^2(1)=9.26$**	$X^2(1)=6.19$*

Note +p<.10, *p<.05, **p<.01, ***p<.001

18.4 Conclusions

The multilevel analyses with policy indicators as predictors of the variation of youngsters' risky alcohol use showed no significant association between national policies and individual behaviour. As Ritter (2007) has already mentioned, data collected on the national level go along with some problems that might explain this lack of significant results (Ritter, 2007). For example, there are comparability problems worth mentioning along with the lack of shared methodology between researchers of whom data on different levels are used. However, it is often not even possible to get the necessary information for each country (Ritter, 2007). Another difficulty pointed out by several authors is the fact that one index on the national level does not fully represent the variance within the countries, e.g. because of a federal governmental structure or regional habits (Eisenbach-Stangl, 2011; Ritter, 2007). In addition, a trend can be observed that the alcohol use relevant policies get more and more similar in the European Union, e.g. because of harmonization of taxes (Oerter & Montada, 2008). This leads to small variances of structural indicators on the country level with an important methodological implication for multilevel analyses. The absence of significant policy predictors thus might be due to the small variation of these countries with regard to policy measures too. Beyond that, it is questionable whether laws and restrictions on the national or even European policy level might be too far away from the individual's living reality. In particular, teenagers have to cope with their physical and mental development and deal with manifold changes in their lives and those regulations might not reach them (Oerter & Montada, 2008). Those uniform rules might underestimate the complexity and variety of adolescents' daily life and might be far too abstract to be of importance. Notwithstanding these methodological issues, it can be concluded that national efforts to positively influence youngsters' alcohol use by policy cannot be supported empirically.

According to the multilevel analyses of national drinking culture characteristics as predicting variables, it was shown that the alcohol drinking culture of the countries studied was the only culture indicator that had a significant influence on the risky alcohol use of 12-to-16-year-olds. Living in a "dry" country, which is characterized by seldom but excessive alcohol use, increases the chance of developing a risky alcohol use pattern.

A problem with the national culture indicators that were used in this study is that they mainly characterize the situation of the adult population, e.g. the per capita consumption, and are not

indicators of youth culture. In addition, they are not empirically based, but rather theoretically derived (Felson, Savolainen, Bjarnason, Anderson, & Zohra, 2011). Further research should focus on variables that picture the social surrounding of teenagers more accurately. A possible way to do so might be an evaluation of social norms about alcohol use on a school or community level by aggregating youngsters' responses about frequency or amount of consumed alcoholic beverages.

The results of the multilevel analyses for the socioeconomic country indicators were only partly significant. The average years of schooling of the population in a country has no significant effect on the alcohol consumption of youngsters. The Human Development Index of a country shows a tendency to be significantly related to alcohol use, i.e. a higher living standard in a country is related to a higher probability for youngsters to consume alcohol in a risky manner. The Human Development Index (HDI) is measured by three components including the Education Index, life expectancy and the Gross Domestic Product. As seen in the previous analyses, the Education Index and life expectancy of a country had no influence on adolescents' alcohol intake, however the relationship between the Gross Domestic Product (GDP) and alcohol use proved to be significant, even though only very minimally. These findings lead to the assumption that the purchasing power of a country could be the relevant indicator leading to an almost visible relationship between HDI and alcohol consumption.

The educational level of a country was not associated with alcohol use, however the quality of education seems to be a factor contributing to risky drinking, though with only a small effect. Countries with a lower quality of higher education and training show a lower likelihood of adolescent risky drinking. Employment rates are associated with alcohol use: in countries with a higher unemployment rate adolescents have a lower likelihood of risky drinking, probably due to having less income and consequently less money to purchase alcohol.

In summary, only the alcohol-drinking culture and the unemployment rate of a country have an obvious significant impact on adolescents' consumption of alcohol. As a conclusion of the results reported in this chapter, we raise the question of whether it is better to enforce more regional regulations which try to reflect the conditions and needs of the adolescents within a community instead of equal rules for a country's whole population. Given that nearly no national policy indicator is associated significantly with youngsters' behaviour, multilevel analyses of regional indicators might detect opportunities to influence alcohol use in adolescence by changing regulations or rules. Furthermore, the findings underlie the thesis that different countries with different social norms about alcohol use (wet/dry) and therefore alcohol consumption in youth show differences in the amount of risky alcohol use. Finally, the analyses show that policy measures might not be able to influence youngsters' substance use directly by laws on drugs but indirectly by promoting economy and education.

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19 *Testing the cross national influences of the risk and the protective factors and national characteristics on the drinking pattern of juveniles.*

Claire Aussems, Majone Steketee & Harrie Jonkman

19.1 Introduction

One of the conclusions of this research is that youths from different countries exhibit different drinking patterns and behaviours. The majority of juveniles who drink moderately live in the Mediterranean countries, while most of the juveniles who do not drink at all, the so-called abstainers, live in the Northern European countries. Excessive drinking, such as binge drinking or other risky alcohol consumption behaviours, are patterns which pertain to youngsters living in Western en Central Europe, including the Netherlands, Denmark, Ireland and the Czech Republic. In the more Eastern European countries many juveniles who consume alcohol, have been intoxicated, but not as frequently as the youths from Central Europe. These outcomes support the findings of Felson et al. (2011) concerning the different alcohol cultures in Europe.

These findings support the assumption of this research: that juvenile alcohol use is not only the result of the choices of one individual, rather drinking behaviours are also influenced by the social context in which an individual is born and raised. The environment where one lives has an influence on the degree of a persons' social or anti-social behaviour. Thus, while many problem behaviours, such as substance use, are universal problems among adolescents, affecting rural, urban, and suburban adolescents at a relatively constant rate, there are certain risk factors for these behaviours that are directly related to location (Kosterman et al., 1997; O'Donnell, Michalak & Ames, 1997). Catalano & Hawkins (1996) hypothesize in their social development theory that children adopt the beliefs and behavioural patterns of the social unit —such as family, peers, or neighbourhood— to which they are most firmly bonded. If the social unit has pro-social attitudes, then the child adopts a pro-social orientation; if the social unit is anti-social, then the child often manifests problem behaviours (Catalano, Kosterman, Hawkins, Newcomb, & Abbott, 1996).

In explaining problematic juvenile alcohol consumption we analysed potential risk factors and protective factors within the different domains on the individual level (see part 2). We found that certain risk and protective factors within the different domains had causal power in predicting adolescent alcohol consumption.

An important aspect of the analyses in the preceding chapters was to determine whether the associations between these risk and protective factors and risky alcohol use were similar across countries (i.e. testing the generalizability of the findings). We wanted to analyse whether the variability of problematic alcohol use between countries could be explained by differences within these associations between the countries. Therefore, we analysed the country differences on the association between risky juvenile alcohol use and risk and protective factors within the separate domains (see part 3). Our results indicated that these risk and protective factors within the different domains were somewhat universal, and no significant differences were detected between the countries with regard to the associations between predicting factors and problematic juvenile alcohol use.

In this chapter we will combine all of the individual level variables (sociodemographic factors, risk and protective factors) into one model, to see if this full model can explain the variability of risky alcohol use within countries. The second goal of this analysis is to examine the effects of the macro (country) level national characteristics (e.g., alcohol culture, the restriction of the policies; the unemployment rate or availability of alcohol, see Chapter 18), and to explore whether these macro level characteristics may explain the variance of risky drinking behaviours between the countries and the

differences of the effects of individual level predictors. In other words: Can national indicators explain the variance of risky juvenile alcohol use between countries?

19.2 Analysis

In chapters 12-18 multilevel analyses were carried out to explain risky drinking in each of the domains: self-control, family, school, peers, delinquency, and neighbourhood. However, in those analyses, the relationship between risky drinking and the individual-level variables of the domains were analysed in isolation. The aim of this chapter is to formulate one integrative full model to explain risky drinking that incorporates relevant variables across the domains, both on the individual- and country level. This full model will represent the risk- and protective factors for heavy drinking among youngsters within countries, as well as explain differences in risky drinking between countries by policy and cultural indicators.

In the following paragraphs the undertaken endeavour to build such a full model will be described. First the initial selection of the relevant variables for inclusion in the modelling strategy is presented. These variables were the starting point for formulating a model across domains. Second, the analysis techniques and software will be briefly described. Finally, a brief summary of the model building strategy of the multilevel analyses will be discussed, and a proposal of a full model will be presented.

19.2.1 Selection of the variables

As a starting point for building an integrative model to explain risky drinking, a selection of variables from the domains was made. This set of variables was only considered for the construction of a full model. We restricted ourselves by selecting individual- and country level variables from the subsets of indicators that were used in the multilevel analyses for the separate domains. Furthermore, country-level indicators were used from sources as the World Health Organisation, the European Commission, ESPAD, RAND and the European Values Study. We only selected those national indicators which we knew could potentially influence juvenile alcohol use, such as policy regulation, availability or affordability of alcohol, adults alcohol consumption (see chapter 18).

Individual-level variables in each domain analysis were selected on this basis of whether their association with risky drinking was significant at the 0.05 level. In cases where many individual variables were proven to be theoretically strong within one domain, only the most relevant variables were included in the model building process. We did not consider statistical associations between the variables within one domain as a selection criteria; most multilevel analyses reported in chapters 12-18 only considered relationships between risky drinking and one individual-level variable from the domain at a time.

Policy and cultural indicators were selected on the basis of the magnitude of effect size and theoretical grounds. Significance at the 0.05 level was not a selection criterion. The small number of countries (n=25) in this dataset typically causes standard errors of country-level variables to be low. As a consequence, it is more difficult to find significant relationships between risky drinking and country-level variables in these types of datasets.

Table 19.1 presents an overview of the selected variables. All variables are categorized based on the level (individual or country) on which they were measured.

19.2.2 Method

The statistical analyses were performed using the statistical software R 2.13.1. The package lme 4 was used to estimate multilevel logistic regression models. Multilevel analysis is used because youngsters are nested in schools, and schools are nested in countries. Neglecting this structure in the analysis would lead to an overestimation of standard errors and a higher probability of falsely rejecting null hypotheses. The partitioning of variance to the levels of clustering (school and country) makes it possible to explain variance on both levels of clustering. However, in this chapter we will only focus on explaining variances at the country level, but we will model school-level variances as well. The outcome variable that will be used in all the analyses is the dichotomous variable ‘risky drinking’ (see Chapter 2 and 4 for its construction). For a more elaborate explanation of multilevel logistic regression analysis, see Chapter 2.

In order to assess the model fit by the likelihood ratio test, the models should be comparable. This was achieved by keeping the sample size constant across models. Youngsters that had missing data on one of the variables presented in Table 19.1 or the outcome variable risky drinking, were removed from the dataset. The analyzed sample includes 47,670 individuals, 1,343 schools, and 25 countries. All predictor variables (individual- and country-level) measured on the interval scale or higher were standardized before they were added to the models.

Table 19.1 Selection of variables for model building

Individual-level variables	**Country-level variables**
Self-control	*Alcohol use culture*
Self-control	Unemployment rate
	Global competitive index – quality of higher education and training
Family	*Human Development Index (HDI)*
Family structure	Education index
Family bonding	Gross Domestic Product (GDP)
Parental supervision	Family structure
Family affluence	Lifestyle
Experience with parents taking drugs/alcohol	Drinking beer/wine with parents
Experience with parents using violence	
Delinquency	
Property offenses	
Violent offenses	
Gang membership	
Neighbourhood	
Neighbourhood disorganisation	
Peers	
Lifestyle	
Deviant group behaviour	
Delinquent friends	
School	
Doing homework	
School disorganisation	
Truancy	

Although we know that risk factors in one domain are often correlated with risk factors in other domains (Cook, 2003; Duncan et al., 1997), we did not test the interactions between the variables. This was due to the large scope of factors of the five different domains. The complexity of the analysis would have made it impossible to include all of the interactions between all of the individual and country level variables. Thus, we only selected those variables that showed the largest significant random slope variation for interaction analyses between individual level and country level variables.

19.2.3 Results

In this paragraph, the results of the model building strategy will be described. First, the empty model will be presented, which is a model without any predictor variable. Second, the results of the analyses per domain will be discussed. These analyses differ from the multilevel models in Chapters 12-18, as they combine several individual-level variables from each domain into one model. Third, in-country differences concerning the associations between risky drinking and important predictor variables will be modelled. Fourth, we will attempt to explain between-country differences of risky drinking and its relationship with individual-level variables, by policy and cultural variables. Finally, a full model will be proposed based on our findings.

Empty model

First, we created an *empty model*, which is a baseline without predictor variables with the aim of only separating the total variance into portions that can be assigned to school- and country levels.

The proportion of variances present on both levels can be represented by the intra-class correlation coefficient (ICC). The ICC's demonstrate that 0.066 (6,6%) of the total variance belongs to the country level, and 0.073 (7,3%) is associated with the school level. Both ICC's are higher than 0.05 percent, a criteria often used to justify multilevel analysis (Hox, 2010). Comparing the empty model with a random intercept to an empty model where the clustered structure of the data is ignored, resulted in the finding of significant differences of the intercepts between countries (χ^2 (2)= 1697, p<.001). The empty model is presented as Model 0 in Table 19.2.

Domain analyses

All of the selected variables of one domain (see Table 19.1) were added simultaneously to a model which was controlled for gender, nativeness and grade. Likelihood ratio tests were performed by comparing the domain models with a model that only included control variables. For each of the variables that were found to be significant in the domain analyses, a random slope variance was estimated, leaving all other domain variables in the model. The analyses were carried out for the domains: self-control, family, delinquency, neighbourhood, peers, and schools.

Self-control. The domain, self-control, only comprises of one selected variable: the self-control scale. We added this variable to the model, which indicated that it was significantly related to risky drinking (OR=0.49). The relation between self-control and risky alcohol consumption differed significantly between countries (var=.012).

Family. All of the selected individual-level variables from the family domain were added to the model simultaneously. The model indicated that: family structure (OR=0.85), family bonding (OR=0.76), parental supervision (OR=0.67), family affluence (OR=1.24), having experienced parents' use of alcohol and/or drugs (OR=1.29), and having experienced parents' use of violence (OR=1.16) have a significant impact. Significant random slope variances were found for family bonding (var=.009), family affluence (var=.016), and having experienced parents' use of alcohol/drugs (var=.060).

Delinquency. Three selected variables from the delinquency domain were added to a model only controlled for background variables. The results showed significant associations between risky drinking and property offenses (OR=3.35), violent offenses (OR=3.76), and gang membership (OR=3.67). Significant random slope variances were estimated for violent offenses (var=.138) and gang membership (var=.151).

Neighbourhood. Neighbourhood disorganization was the only variable selected from the neighbourhood domain; it has a significant negative impact (OR=1.56), meaning that the more disorganized the neighbourhood, the higher the probability of risky drinking. The impact of this variable significantly differs between countries (var=.009).

Peers. The three variables: lifestyle of the adolescent (OR=1.58), deviant group behaviour (OR=1.76), and delinquent friends (OR=1.46) were all significantly related to risky drinking. Furthermore, the associations were found to differ across countries for lifestyle of the adolescent (var=0.018), deviant group behaviour (var=.019), and delinquent friends (var=.019).

School. The three selected variables from the school domain were selected and integrated into the model. The results of the analyses indicated that doing homework (OR=0.72), school disorganization (OR=1.38), and truancy (OR=1.56) were all significantly related to risky drinking. The associations between risky drinking and doing homework (var=.015), school disorganization (var=.006), and truancy (var=.015) were found to be significantly different between countries.

The individual-level variables that had a significant impact in these domain-specific analyses were combined into one model simultaneously. After controlling for demographic variables such as gender, native, grade, and the domain variables, we found that some variables were no longer significant. The variables removed from the model for this particular reason were: family structure, having experienced parents' use of alcohol and/or drugs, having experienced parents' use of violence, gang membership, and neighbourhood disorganisation. The final model with individual-level variables is presented in Model 1.

The predictor variables included in Model 1 show similar regression coefficients as in the domain analyses of Chapters 12-18, both in magnitude and direction. Self-control, family bonding, parental supervision, and doing homework act as protective factors, while family affluence, property- and violent offenses, lifestyle, delinquent group behaviour, peer delinquent friends, school disorganization, and truancy are risk factors for juvenile risky alcohol use.

Random slope variance

Next, a random slope was estimated to explore whether the relationship between risky alcohol use and individual-level variables varied significantly across countries. We added a random slope for that variable to Model 1 in Table 19.2, and checked whether there was significant random slope variance when all relevant individual-level variables are included. Because the number of countries is rather low, only one random slope will be modelled to prevent over-fitting due to a relatively large parameter-to-observations ratio.

A random slope was modelled for the variable that had the largest significant random slope variation in the domain analysis. In these analyses, we found that gang membership demonstrated the largest variance across countries. However, this variable was no longer significant after it was controlled for the other individual-level variables (see Model 1). The next largest random slope variance in the domain analyses was estimated for violent offenses. Adding a random slope of that variable to Model 1 did not result in a significantly better fit. Other individual-level variables that had a substantial random slope variance in the domain analyses were: deviant group behaviour and delinquent friends. Modelling a random slope for delinquent friends or deviant group behaviour both resulted in a significant improvement of the model fit. The estimated variance for delinquent friends (var=.021) was somewhat higher than the variance for deviant group behaviour (var=.019), and therefore the first was included in the model (Model 2).

Table 19.2 Multilevel analysis to explain risky drinking (*n* individuals: 47,670 ; *n* schools: 1,343 ; *n* countries: 25)

	Model 0: empty model		**Model 1: individual-level variables**		**Model 2: random slope peer delinquent friends**		**Model 3: cross-level interaction alcohol culture**	
	b (se)	**OR**	**b (se)**	**OR**	**b (se)**	**OR**	**b (se)**	**OR**
Fixed								
Intercept	-1.83 (.10)***	0.16	-3.00 (.14)***	0.05	-3.00 (.14)***	0.05	-3.00 (.14)***	0.05
Self-control								
Self control (z-score)			-0.19 (.02) ***	0.83	-0.19 (.02) ***	0.83	-0.19 (.02)***	0.83
Family								
Family bonding (z-score)			-0.11 (.02) ***	0.90	-0.11 (.02) ***	0.90	-0.11 (.02)***	0.90
Parental supervision (z-score)			-0.09 (.02)**	0.91	-0.09 (.02)**	0.91	-0.09 (.02)***	0.91
Family affluence (z-score)			0.17 (.02) ***	1.18	0.17 (.02) ***	1.18	0.17 (.02)***	1.18
Delinquency								
Property offenses			0.22 (.07) **	1.24	0.24 (.07) *	1.27	0.24 (.07)***	1.27
Violent offenses			0.40 (.07) ***	1.49	0.41 (.07) ***	1.50	0.41 (.07)***	1.50
Peers								
Lifestyle (z-score)			0.37 (.02) ***	1.45	0.38 (.02) ***	1.46	0.38 (.02)***	1.46

	Model 0: empty model		Model 1: individual-level variables		Model 2: random slope peer delinquent friends		Model 3: cross-level interaction alcohol culture	
	b (se)	OR	b (se)	OR	b (se)	OR	b (se)	OR
Deviant group behaviour (z-score)			0.41 (.02) ***	1.51	0.41 (.02) ***	1.51	0.41 (.02)***	1.51
Delinquent friends (z-score)			0.27 (.02) ***	1.31	0.29 (.03) ***	1.33	0.34 (.03)***	1.40
School								
Doing homework (z-score)			-0.14 (.02) ***	0.87	-0.15 (.02) ***	0.86	-0.15 (.02)***	0.86
School disorganisation (z-score)			0.05 (.02)**	1.05	0.05 (.02) **	1.05	0.05 (.02)**	1.05
Truancy (z-score)			0.17 (.01) ***	1.19	0.17 (.02) ***	1.18	0.17 (.02)***	1.18
Delinquent friends (z-score) x alcohol use culture (ref: wet)							-0.21 (.06)***	0.81
Random								
Var School	0.25		0.28		0.27		0.27	
Var Country	0.28		0.21		0.22		0.22	
Var Peer delinquent friends					0.02		0.01	
LR test	x2 (2)= 1697***		x2 (12)=6898***		x2 (2)=49***		x2 (1)=9**	

LR test model 1 compared to a model with control variables only; * = p<.05 , ** = p<.01, ***=p<.001, ms = p<.10

Explaining country differences in risky use and its relation with delinquent behaviour

In this stage of the analysis, country-level variables are added to the model to explain between-country differences in the baseline probability of juvenile risky drinking and its association with delinquent behaviour. The selected country-level variables (policy and cultural indicators) presented in Table 19.1 were added to Model 2 one at a time. None of the country-level variables was significantly related to the mean-levels of risky drinking across countries, which could therefore explain the intercept variance.

Theoretically plausible cross-level interaction terms were added to Model 2 to explain the different effects of peer delinquent friends across countries. These terms included: interactions between peer delinquent friends and drinking beer/wine with parents, quality of higher education, lifestyle aggregated, family structure, and alcohol culture. Only interaction terms between peer delinquent friends and drinking beer/wine with parents, and alcohol culture were found to be significant. However, the cross-level interaction term between peer delinquent friends and alcohol culture showed the largest impact, but combining both interaction terms in one model annihilated the significance of the interaction between peer delinquent friends and drinking beer/wine with parents. The proposed full model therefore includes a cross-level interaction term between peer delinquent friends and alcohol culture only, representing a significant smaller impact of peer delinquent friends in dry countries.

Figure 19.1 The intercepts for risky drinking (at x=0) and the slopes representing the relationship between delinquent friends and risky drinking for 25 countries (controlling for all variables in Model 3)

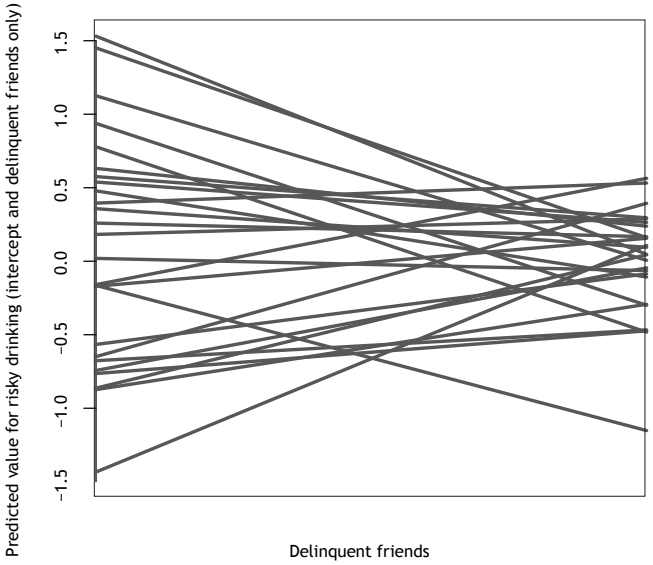

Figure 19.1 shows the intercepts and slopes for peer delinquent friends for each country in the sample. The highest baseline probabilities of juvenile risky drinking were found in the Czech Republic, the Netherlands and Belgium, while Iceland, France and Bosnia & Herzegovina had the lowest probabilities. Figure 19.1 also demonstrates that there are differences in magnitudes and direction of the impact of peer delinquent friends across countries. The largest positive impacts of delinquent friends were found in Iceland, Spain and Poland, while the largest negative regression coefficients were found for the Netherlands, the Czech Republic and Hungary.

19.3 Conclusion for the multi-level analysis of the full model

Regarding intense drinking, variances were found between the participating countries. The previous analyses indicated that all variables used to test the influence of these risk and protective factors for the different domains are significant predictors of risky alcohol use. The majority of the effects of risky alcohol use predictors were similar across countries. However, when combining all individual level predictors into one model (Table 19.1), there still remains a substantial unexplained variability of risky alcohol use on country levels (*var country*= 0.21). The strongest effects were observed for delinquent friends (var=.021) and for deviant group behavior (var=.019). When we also include the interaction between delinquent friends and the country level variable 'alcohol culture' to the model, we can identify a strong association. This implies that in those countries were risky alcohol consumption is more likely to be considered as problematic behaviour, the association with having delinquent friends is stronger than in those countries where there is a more tolerant attitude toward juvenile alcohol use. In those countries such as the Netherlands, the Czech Republic and Hungary were there is high amount of juvenile excessive drinking there is a negative association with having delinquent friends.

Additional to this analysis, we also looked at the influence of the number of risk factors (variable Riskcount) on risky drinking. Here, we dichotomized all of the risk factors to binary independent variables with the median as cutoff point. Some risk factors were inversed. In a normal logistic regression (grade, male and nativeness are control variables) the OR of the Riskcount was 1.56 (95% CI: 1.54-1.58) which means that for every risk factor the odds increase with 56%. When we separated this analysis between wet (among them Southern countries) and dry countries (among them the Nordic countries), we see that the influence of the number of risk factors is higher in dry countries (OR=1.61) than in wet countries (OR=1.45). When we not only control for grade, male, and nativeness but also for the higher levels of school and country, the OR amounts to 1.64. This analysis clarifies the clustering effects of risk factors.

19.4 Bayesians analysis of the full model

Besides our extensive analyses it still remains interesting why the country level indicators, introduced in Chapter 18, do not explain the variance between the countries. This may be caused by the fact that only a small number of countries (25) participated in our sample. Considering our small number of

units on the country-level we also applied techniques that can adjust to such a situation. In Bayesian statistics all the parameters of the model are viewed as unobserved realizations of the random processes. The uncertainty of the parameters in this sequential learning process plays a central role and is evaluated at the hand of posterior distributions of the parameters: given the data, the model as well as what we know about the quantities before we start analysing. Using Bayesian statistics has some advantages such as its ability to deal with complexities, as well as a small number of clustering units (Albert, 2011; Kruschke, 2011; Lynch, 2009; Browne et al., 2009; Gelman & Hill, 2007). We decided to use this method to re-examine the country level variables. We also thought that perhaps it would be interesting to not only look at risky juvenile alcohol use, but also at those who don't drink alcohol at all (abstainers). A comparison study between the Netherlands and the United States, and Australia and the United States indicated that due to the zero tolerance policy of the United States, more students between the ages of 12 and 18 years old are abstainers: in comparison to the Netherlands and Australia, were there is a harm reduction policy and the number of juveniles who drink is much higher (Oesterlee, 2012; Beyers et al., 2004; Hemphill et al., 2011). However, we may ask if this would still hold true if we compared more countries simultaneously?

First, we re-examined the country level indicators for risky drinking and abstinence. We used MLwiN (2.26) for Bayesian modelling, which uses Markov Chain Monte Carlo (MCMC) procedures for this (Browne, 2012). We modelled the binary responses of risky drinking first, controlling for gender, grade and nativeness, and researched different structural indicators on alcohol policy, national culture and socioeconomic conditions subsequently (see Chapter 18). For each of the structural indicators we used chains of 5000 iterations and a burn-in period of 500. In the table (Table 19.3), we defined the credibility intervals of the structural indicators, indicating 95% accuracy that the score of the structural indicator falls within this Interval. After risky drinking we followed the exact same procedure for abstinence.

In contrast to Chapter 18, where the national indicators were researched with the classical-frequentist method, we see that with the use of Bayesian statistics there are indeed some national level factors associated with risky alcohol use as well as with abstinence. Sales restriction, for instance, increases the probability that juveniles do not drink at all (OR= 1.79), and its lowers the likelihood of risky alcohol drinkers (OR 0.93). Furthermore, the severity of alcohol policies has the same effect. By using this method, one can draw the conclusion that strict national policies do have an effect by lowering risky juvenile alcohol use and promoting more abstinence amongst youths. However, at the same time, we must take into account that the restriction of juvenile drinking hardly has any effect. The reason for this is that, perhaps, there are hardly any differences between the 25 European countries in terms of the age that juveniles are legally eligible to buy alcohol (see chapter 20).

National drinking cultures influences alcohol consumption patterns, which we saw in Chapter 18, and here, at the hand of the Bayesian method. The more likely it is within the national culture to drink, the less abstainers (OR 0.38) and the more risky alcohol drinkers there are (OR 1.38). The amount of alcohol consumed by adults and the number of youngsters drinking strong alcohol also has an influence on risky alcohol use. For example, juveniles are more likely to exhibit risky drinking behaviours if it is common for adults to drink alcohol and for juveniles to drink hard liquor. Thus, it is not only policies that matter but also the general attitude and norms of adults that influence juvenile alcohol consumption.

Table 19.3 The influence of structural indicators on risky drinking and abstinence defined as AOR and controlled for male, grade and nativeness

Structural Indicators (nr of countries)	**Bayes Risky Drinking 95% Credibility Interval**	**Odds**	**Bayes Abstinence 95% Credibility Interval**	**Odds**
ALCOHOL POLICY				
Affordability (16)	-0,10 (-0,21/-0,00)	0.90 (0.81/1)**ns**	0.37 (-0,52/-0.18)	0.69 0.59/0.84
Availability of beer (22)	0,03 (0,02/0,31)	1.03 (1.02/1.04)	-0.00 (-0,00/0,01)	1.01 (1.00/1.02)
Availability of spirits (22)	0,01 (0,00/0,02)	1.01 (1.0/1.02)**ns**	0,02 (0,01/0,02)	1.02 (1.01/1.02)
Restrictions on juvenile drinking (20)	0,11 (0,04/0,18)	1.12 (1.04/1.20)	-0,04 (-0,26/0,07)	0.96 (0.77/1.07)**ns**
Sale promotion restrictions (23)	-0,07 (0,35/0,30)	0.93 (1.42/1.35)	0,58 (0,25/1,04)	1.79 (1.28/2.83)
Severity of alcohol policies (20)	-0,33 (-0,48/-0,20)	0.72 (0.62/0.82)	0,36 (0,17/0,51)	1.43 (1.19/1.67)
Legal blood alcohol limit (24)	-	-	0.04 (-11.0/12.34	1.04 (0.00/28661) **ns**
NATIONAL CULTURE				
Per capita consumption of pure alcohol (25)	0,06 (0,04/0,08)	1.06 (1.04/1.08)	-0,1 (-0,2/-0,03	0.90 (0.82/0.97)
Proportion of alcohol use disorders (25)	-0,01 (-0,07/0,04)	0.99 (0.93/1.04)**ns**	-0,1 (-0,2/-0,03)	0.90 (0.82/0.97)
Importance of friends (24)	-0,00 (-0,00/0,01)	1,0 (1,0/1.01)**ns**	0,05 (0,04/0,05)	1.05 (1.04/1.05)
Percentage of youngsters drinking spirits alone (25)	0,26 (0,09/0,45)	1.30 (1.09/1.57)	-0,08 (-0,23/0,07)	0.92 (0.79/1.07)**ns**
Alcohol use culture (25)	0,32 (0,03/0,69)	1.38 (1.03/1.99)	-0,97 (-1,32/-0,49)	0.38 (0.27/0.61)
SOCIAL ECONOMIC CONDITIONS				
Human development index (25)	3,41 (3,19/3,79)	30.27 (24.29/44.26)	2,70 (2,40/3,10)	14.88 (11.0/22.20)
Life expectancy (25)	0,02 (0,01/0,03)	1.02 (1.01/1.03)	0,08 (0,08/0,08)	1.08 (1.08/1.08)
Gross Domestic Product (25)	0,00 (0,00/0,00)	1,0 (1,0/1,0)**ns**	0,00 (0,00/0,00)	1.0 (1.0/1.0) **ns**
Education Index (25)	-	-	-0,99 (-1.38/-0,67)	0.37 (0.25/0.51)
Global competitiveness index – higher education/training (25)	-0,01 (-0,07/-0,00)	0.99 (0.93/1.0)	0,00 (-0,01/0,01)	1.0 (0.99/1.01)**ns**
Unemployment rate (25)	-0,10 (-0,14/-0,07)	0.90 (0.87/0.98)	-0,01 (-0,05/0,03)	0.99 (0.95/1.03)**ns**

ns: not significant; -: model did not converge;

Nonetheless, the relationships are not always that straightforward. For example, country indicators can influence one specific drinking pattern but not another. Affordability and availability, for example, are considered factors that promote alcohol use. In our data, we found that the affordability (implying the ease at which youngsters obtain alcohol) does not have an influence on risky alcohol use. However, the less affordable the alcohol, the greater the likelihood that juveniles do not drink at all.

The more general environmental indicators (defined as socioeconomic condition) such as the Human Development Index, life expectancy, the Education Index, do not have a relationship with juvenile alcohol patterns, regardless of the methodology used. Only unemployment lowers the probability of risky drinking patterns, which is perhaps due to the fact that juveniles cannot afford to drink alcohol on a more frequent basis.

19.4.1 The full model

	Model 3: cross-level interaction alcohol culture (Frequentist)	**Model 3: cross-level interaction alcohol culture Bayes**	**Model 4: Structural Indicator Alcohol Culture Bayes**
	Exp(b) (se)	**Exp (b) se**	
Fixed			
Intercept	0.05 (.14)***	0.09 (0.09)	0.07 (0.11)
Self-control			
Self-control (z-score)	0.83 (.02)***	0.83 (0.02)	0.83 (0.02)
Family			
Family bonding (z-score)	0.90 (.02)***	0.90 (0.02)	0.90 (0.01)
Parental supervision (z-score)	0.91 (.02)***	0.91 (0.02)	0.91 (0.02)
Family affluence (z-score)	1.18 (.02)***	1.18 (0.02)	1.19 (0.02)
Delinquency			
Property offenses	1.27 (.07)***	1.26 (0.07)	1.25 (0.07)
Violent offenses	1.50 (.07)***	1.48 (0.07)	1.48 (0.07)
Peers			
Lifestyle (z-score)	1.46 (.02)***	1.46 (0.02)	0.38 (0.02)
Deviant group behaviour (z-score)	1.51 (.02)***	1.52 (0.02)	1.51 (0.02)
Delinquent friends (z-score)	1.40 (.03)***	1.14 (0.03)	1.14 (0.03)
School			
Doing homework (z-score)	0.86 (.02)***	0.86 (0.02)	0.86 (0.02)
School disorganisation (z-score)	1.05 (.02)**	1.05 (0.05)	1.05 (0.02)
Truancy (z-score)	1.18 (.02)***	1.20 (0.02)	1.19 (0.02)
Cross-level Interaction			
Delinquent friends (z-score) x alcohol culture (ref: wet)	0.81 (.06)***	1.26 (0.04)	1.23 (0.04)
Structural indicators			
Alcohol use culture			1.26 (0.16)
Random			
Var School	0.27	0.32 (0.03)	0.31 (0.03)
Var1 Country	0.22	0.28 (0.09)	0.28 (0.09)
Var2 Peer delinquent friends	0.01	0.01 (0.01)	0.01 (0.01)
Interaction Var1*Var2		-0.05 (0.02)	-0.05 (0.02)
LR test/DIC	x2 (1)=9**	32886.288	32896.359

We also ran the Full model using Bayesian techniques. For the fixed parts we hardly saw any differences between Model 3 (Frequentist) and Model 3 (Bayes). However, for the random parts the differences were bigger. We then proceeded to add structural indicators to the full model, but adding these indicators did not produce any effects, when predictors were already present in the model. They did not provide any extra information and the model indices (DIC) did not decline. Note the example for the alcohol culture indicator, a strong structural indicator, which we added in model 4. Based on these results, we concluded that model 3 was the best fit.

19.5 Conclusions

The results of our analysis indicated that there were differences concerning juvenile intense drinking between the 25 European countries. However, the effects of the predictors (i.e. risk and protective factors within the domains of our study (individual, family, school, peers and neigbourhood) were similar across countries. When we combined all of the individual predictors into one model, we saw strong effects for peer-related factors, such as delinquent friends and deviant group behaviour. Nonetheless, a substantial amount of the variability of risky alcohol use on the country level remains unexplained. We then proceeded to use different country variables, and detected a strong relation between the individual variable, delinquent friends, and the country level variable 'alcohol culture'. The results indicated that in countries where risky alcohol use is likely be considered problematic behavior, the association with having delinquent friends is stronger than in those countries where there is a more tolerant attitude towards juvenile alcohol use.

Because we determined a high level of variability between countries on youth alcohol use, we studied a broad range of country level indicators, which (based on theory) might influence risky alcohol use. In succession, we looked at the influence of the following variables on risky alcohol use: alcohol policy (affordability, availability (beer, spirits), restrictions on juvenile drinking, sale restrictions, severity of alcohol policies, legal blood alcohol limit (driving a vehicle)), national policy (per capita consumption, proportion of alcohol disorders, importance of friends, percentage of youngsters drinking spirits alone, drinking culture) and socioeconomic conditions (Human Development Index (HDI), life expectancy, Gross Domestic Product (GDP), Education Index, Global Competitiveness Index (GCI), unemployment rate).

Although a strong variability of risky alcohol use between countries was detected, these structural indicators were barely able to explain these differences. Perhaps these indicators were too cursory, and were not capable of taking the variability within the countries into account. It is also possible that we were not able to find the right indicators to explain underage drinking. A third possibility is that the similarities between the countries on these indicators were too strong. A finally possibility could be that the number of countries (25) was not large enough to analyze this influence.

Due to the complexity of the model and relatively low number of countries used in this study, we also used Bayesian statistics to deal with this complexity more efficiently. With the use of Bayesian statistics, we were able to detect some national level factors that were associated with risky alcohol use as well as with abstinence. Here, one can draw the conclusion that strict national policies do have an effect, as they lower risky alcohol use, by communicating a message that says that juveniles should not drink alcohol at all. In effect, sale restrictions and strict policies lower the probability of risky alcohol use among juveniles and increases the number of abstainers. However, when risk and protective factors are added into the model: the influence of these country variables decreases.

We may also conclude that the norms and attitudes of adults towards alcohol use influence the way that juveniles use alcohol. From a larger perspective, it is the drinking culture of a country which essentially influences alcohol use. For example, the more likely it is within a culture to drink more excessively, the less abstainers and more risky alcohol drinkers there are within that country. The amount of alcohol consumed by adults and the number of youngsters who drink strong alcohol (as indicators of culture) also have an influence on risky alcohol use. It is simply more likely that juveniles will exhibit risky drinking behaviours when it is more common for adults to consume alcohol and juveniles to drink spirits. Thus not only are national policies of influence:, the attitude and norms of the adults also play a significant role when it comes to matters such as juvenile alcohol consumption.

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Part V

Practice: policies and programs

Besides the empirical knowledge about the initiation of alcohol use as discussed in the previous parts, it is important to have clear insight into the wide range of alcohol prevention policies and programmes aimed at influencing youth alcohol consumption in Europe. Policies ,practices and national attitudes towards youth alcohol and drug consumption not only differ between countries but also within the countries. This section provides an inventory of the current environmental strategies which are used by the European countries involved in the ISRD-study.

Next to an overview of alcohol policies, this part also elaborates on the effective prevention programs and interventions available in the 25 European countries under study. These programs and interventions are also presented on the website of the project: www.aaaprevent.eu. This database provides policymakers and practitioners with an overview of which effective strategies may be used regarding the different domains (families, school, peers, peers and communities), different age-groups and different risk and protective factors. Finally, this part also reflects on the discussions held amongst practitioners, policymakers and researchers about this overview.

Verwey Jonker Instituut

20 Paper on policies toward alcohol among juveniles in Europe

Drs. Jessica van den Toorn, dr. Majone Steketee & dr. Harrie Jonkman

20.1 Introduction

Alcohol plays an important role in de economy of Europe. The continent produces a quarter of the world's alcohol and over half of the world's wine production. Furthermore, Europe is the heaviest drinking region of the world, with about 11 litres of pure alcohol drunk per adult each year. These alcoholic beverages are most often consumed with the afternoon/evening meal (40%). (Anderson & Baumberg, 2006)

This great use of alcohol, however, increases the risk of individual and social harms, like addictions, injuries, diseases, crime, violence and abuse. Often, the higher the level of alcohol consumption, the more serious these harms are. Consequently, 'alcohol places a significant burden on several aspects of human life in Europe, which can broadly be described as 'health harms' and 'social harms'' (Anderson and Baumberg, 2006; p.15). Often these harms go hand in hand with high economic costs.

Through multiple policies European governments try to limit the consumption and therewith the harms of alcohol use. In this paper these policies are discussed in more detail. As this paper is written within the AAA-Prevent project, which used data from 2006, policies after 2006 are not included. To have an overview of these policies across the different participating countries we asked experts from these countries to write a national report about this, exclusively for AAA-Prevent project. A synthesis report of these findings can be found in appendix 2.

However, even though a large number of the policy indicators described in these reports were originally collected, not all of them are usable from various reasons. Firstly, some indicators were found to be too subjective by many experts and their cross-cultural comparability would be highly questionable. This was, unfortunately, the case especially for items by which we intended to measure the implementation of policy in everyday life, i.e. how strictly are norms grounded in policy enforced. Even though this issue is of great importance, its reliable estimation would have to be based on opinions from a larger group of experts and on precisely defined criteria. Secondly, some indicators were not reported by a number of countries and this fact hinders their use in further analysis.

Therefore we decided to collect more objective and comparable data from sources as the World Health Organisation, the European Commission, ESPAD, RAND and the European Values Study. These indicators will be described in paragraph three, after a more broader overview of alcohol policy in Europe in paragraph two. The information of the national reports is used as more illustrative material.

20.2 Policies

In general, in alcohol policy, four approaches can be distinguished: zero tolerance, supply reduction, demand reduction and harm reduction (Roeg et al., 2007). *Zero tolerance* policy means that any use of substances is eliminated as much as possible and policy is focused on abstinence of substance use. In *supply reduction*, the aim is to influence the supply of alcohol and to decrease the availability of alcohol. Laws and regulations exist with respect to the sale of alcohol, the legal age for purchasing alcohol, and advertising (spelled out in the Licensing and Catering Act, and a code of advertising and agreements in the alcoholic beverage industry). *Demand reduction* aims to influence the demand side. Education is of importance here. Programs often are aimed at drinking norms, beliefs and attitudes. A fairly permissive stance toward alcohol use among adolescents can also reflected in school policies.

The *harm reduction* approach ('the prevention and management of the risks to individual and society arising from drug use') is not directed to drinking itself but to the prevention of alcohol related problems. Examples are related to alcohol use in traffic, to the use of toughened glasses in bars, 'coma drinking' of youngsters. Harm reduction tries to achieve significant reduction in levels of alcohol problems.

The reports about national policy, written within this project by experts, show that all countries focus in any case on harm reduction. Supply and demand reduction is often a goal over national governments as well. However, the degree and strictness of policies in this approach vary greatly. Zero tolerance policy is much less common and is especially dominant in the Scandinavian countries.

In addition to the different approaches of Garretsen & van der Goor, Anderson & Baumberg (2006) argue that alcohol policies can be grouped within five types: policies that: 1) reduce drinking and driving; 2) support education, communication, training and public awareness; 3) regulate the alcohol market; 4) support the reduction of harm in drinking and surrounding environments, and; 5) support interventions for individuals.

Especially the first type of policies, including for example breath testing and administrative license suspension, turns out to be highly effective. Also, the third type of policies, including taxation and managing physical availability of alcohol, receives strong evidence for its effectiveness. Especially alcohol taxes influence the drinking behaviour of youngsters. In contrast, the impact of the second type of policies is found to be quite low. The fourth type of policies turn out to be mainly useful in bars and restaurants and only if rules and laws are adequately enforced. As for the last category of policies, brief advice, especially in primary care setting, seem to be reducing harmful alcohol consumption.

20.2.1 Aims and objectives

Following Anderson & Baumberg (2006; p.365) the aim and objectives for alcohol policy in the European region are:

1. The existence of both European and national strategies and action plans, with the capacity to both implement measurements and monitor and follow-up the plans.
2. Alcohol-free groups and situations, like young people and their environments, the road, the workplace and pregnancy.
3. Short, understandable and easy accessible drinking guidelines.
4. Raising awareness of preventing alcohol-related problems.
5. Increased knowledge through further research and an Expert Group on Alcohol Policy.
6. Harmonized measures of consumption and risk within a common monitoring system. Here fore the Alcohol Information System should be expanded.
7. Training and capacity building, with a platform for national initiatives to support regional actions as key tool.
8. Advocacy, networking and policy development by improving the popular communication of public health advocates.

20.2.2 Sales and marketing controls

Policies in European member states are nowadays not developed within a vacuum. Policies dealing with alcohol must relate to international and European legal obligations (like the General Agreement on Tariffs and Trade and the General Agreement on Trade in Services), other policies dealing with alcohol as an economic commodity (like the trade law of the European Union) and international actions to reduce the harm done by alcohol (like initiatives of the World Health Organization) (Anderson & Baumberg, 2006).

Consequently, sales of alcohol are generally subject to restrictions in most EU countries. Often through licenses or the restrictions of places where alcohol can be sold. Also, all countries have a minimum legal age for alcohol sales (about 18 years in the Northern countries and 16 in the southern countries). In a third of the EU member states hours of sale are restricted as well. Restrictions on the days of sale or the density of off-premise sale are far less common (Anderson & Baumberg, 2006)

With respect to the marketing, in over half of Europe television beer adverts are restricted. Billboards and print media are far less regulated. One out of three countries has no controls at all when it comes to this type of marketing. Only seven countries have legal restrictions on sports sponsorship (Anderson & Baumberg, 2006).

Finally, all countries make use of the taxations of alcoholic beverages. However, the rates differ considerably between countries. The average effective tax rate is highest in northern Europe, and weakest in southern and parts of central and Eastern Europe. This is not surprising, since the Northern countries are overall stricter when it comes to sales and marketing controls of alcohol than the other parts of Europe (Anderson & Baumberg, 2006).

20.2.3 National vs. Local policies

Although multiple controls and regulations are developed on the national level, often the local level is equally important. In Austria, for example, each municipality has its own competencies and the power to make their own decision, which causes great differences in alcohol policy between regions. In the Netherlands, municipalities can make their own rules on the selling of alcohol to under aged children. And, Spain does not even have a national legislation for distribution or alcohol consumption. Autonomic Communities are the ones that regulate almost all that is related to distribution or consumption of alcohol. Last but not least, we have the example of Belgium. Belgium's two largest regions are the Dutch-speaking region of Flanders in the north and the French-speaking southern region of Wallonia. In opposition to Flanders, the French Community and the Walloon Region have not isolated drugs and alcohol issues from other social and health matters. The argument is that problems experienced by individuals are often intertwined. Nevertheless, this choice complicates the political management of the issue. That's why, in the French part of the country, the abilities of different political contributors are not well defined, up until now.

20.3 Alcohol regulation by law

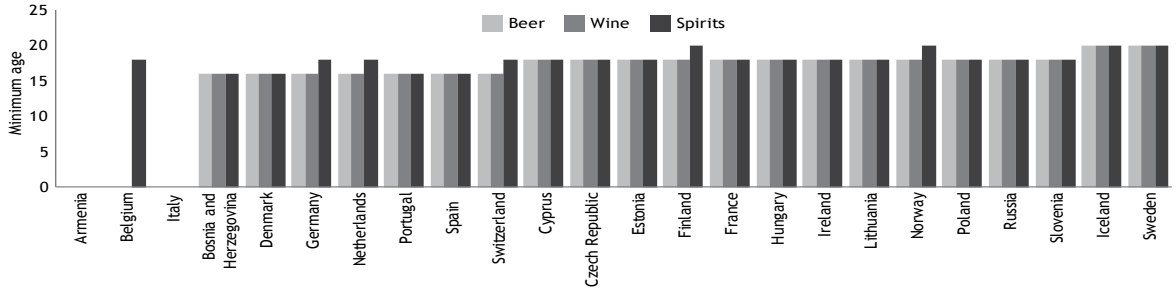
This paragraph will describe the specific structural indicators used in the AAA-Prevent study to investigate the influence of the national level on the alcohol consumption of adolescents. The first paragraph describes national policy regulations, the second paragraph describes other more cultural structural indicators, like the perceived availability and affordability of alcohol.

20.3.1 Policy regulations

Restrictions in off- and on- premise sales of alcoholic beverages

The World Health Organization defines off-premise sale as follows (WHO, 2004, p. 15): 'Off-premise retail sale refers to the selling of alcoholic beverages for consumption elsewhere and not on the site of sale. Off-premise sale takes place, for example, in state monopoly stores, wine shops, supermarkets, and petrol stations or kiosks, depending on the regulations of the country.'

Figure 20.1 National legal minimum age for off-premise sales of alcoholic beverages



* Data of Austria not available/ Source: WHO (available at:http://www.who.int/countries/en/)

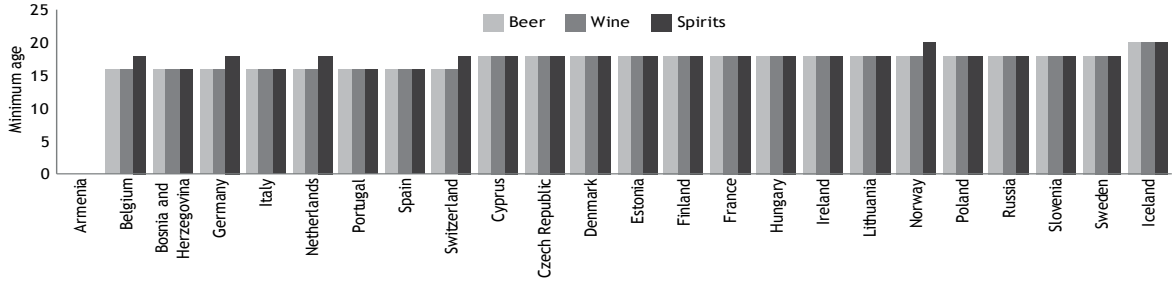
Figure 20.1 shows that the difference between countries are rather small when it comes to legal minimum age for off-premise sales, they range between 16 and 20. From this figure it seems that Armenia and Italy do not have a legal minimum age for off-premise sale of alcoholic beverages what so ever. At least not in 2006. Belgium only sets a minimum age for spirits.

Furthermore, all countries using a legal minimum age use the same criteria for beer and wine. In most countries this is also the case for spirits. In only five countries (Germany, the Netherlands, Switzerland, Finland and Norway) the minimum age for spirits is higher than the minimum for beer and wine.

Overall we see that Iceland and Sweden are most strict in their off-premise sale policy. For all alcoholic beverages a minimum age of 20 years is applicable. According to our experts, in Iceland, while there has always been a consensus on the restrictions of spirits, there have been growing debates on the legal drinking age and the abolition of the state monopoly of wine and lighter alcoholic beverages. Numerous proposals on the lowering of the drinking age to 18 years and to allow grocery stores to sell wine and lighter liquor have been put before the Icelandic parliament in the past few years. None of these proposals have been passed as law. These debates generally centre on the left/ right axis in politics. Right wing activists are (mostly) in favour of the abolition of the state monopoly while left wing/centre activists are against it. The drinking age issue is not as clear cut as the state monopoly, at least not when it comes to ideology. The fear that youth will drink more heavily once the drinking age has been lowered, has overruled the efforts to changes.

The World Health Organization defines on-premise sale of alcoholic beverages as follows (WHO, 2004, p. 15): '**On-premise retail sale** refers to the selling of alcoholic beverages for consumption at the site of the sale, generally in pubs, bars, cafes or restaurants.'

Figure 20.2 National legal minimum age for on-premise sales of alcoholic beverages



* Data of Austria not available/ Source: WHO (available at:http://www.who.int/countries/en/)

When we compare the minimum age for on-premise sale (figure 20.2) with that for off-premise sale we more or less find the same pattern. The rage is still from 6 to 20 years. It is interesting to see that Italy does have a legal minimum for on-premise sale, in contrast to Armenia. Furthermore, Belgium has a legal minimum age for on-premise sale of all alcoholic beverages, while it only has a legal minimum age for off-premise sale of spirits. Also remarkable is that Sweden has a lower minimum age (18) for on-premise sale, than for off-premise sale (20).

The previous figures provided us with information about the legal minimum age for the sale of alcoholic beverages. Table 20.1 gives a summary of the restriction of sales with respect to hours, days, places and density

Table 20.1 Restrictions for on/off premise sales of alcoholic beverages

Country	Hours	Days	Places	Density
Armenia	no	no	yes	no
Austria	no	no	no	no
Belgium	yes	no	yes	no
Bosnia & Herzegovina	no	no		
Cyprus			yes	yes
Czech Republic	no	no	no	no
Denmark	yes	no	yes	yes
Estonia	yes	yes	yes	no
Finland	yes	yes	yes	yes
France	yes	yes	yes	yes

Country	Hours	Days	Places	Density
Germany	no	no	no	no
Hungary	no	no	no	no
Iceland	yes	yes	yes	yes
Ireland	no	no	yes	no
Italy	yes	no	no	no
Lithuania	yes	no	no	no
Netherlands	yes	yes	yes	no
Norway	yes	yes	yes	yes
Poland	no	no	yes	no
Portugal	no	no	yes	no
Russia	yes	yes	yes	yes
Slovenia	yes	no	yes	no
Spain	yes	no	yes	no
Sweden	yes	yes	yes	no
Switzerland	yes	no	no	no

Source: WHO (available at:http://www.who.int/countries/en/)

Hours of sale can vary across the days of the week and can also include banning the sale of alcoholic beverages at certain places during specific hours. For example, France and Germany ban alcoholic beverage sales at highway petrol stations between 10 p.m. and 6 a.m. (Rehn, Room & Edwards, 2001).

Frequently, a restriction on days of sale means that it is not allowed to sell alcoholic beverages off the premises on Saturdays and/or Sundays.

Density of outlets is often limited by controlling the number of retail outlets in a specific area, e.g. allowing only a certain number of outlets for a certain number of inhabitants.

Restrictions on the place of sale include a multitude of options, from regulating factors like the size or location of the outlet, to where and how the beverages must be shelved. In general, restrictions on places of sale probably refer mostly to the kind of store in which off-premise sales are allowed, e.g. whether in kiosks, supermarkets or only in specific liquor stores. Some restrictions on location, e.g. not close by a school or religious place of worship may also be included. (http://www.who.int/substance_abuse/publications/en/Alcohol%20Policy%20Report.pdf)

Based on this table we can make a clustering of countries. That is:

1. The most restricted countries (yes on all): Cyprus, Finland, France, Iceland, Norway and Russia
2. Countries in between (some yes, some no): Armenia, Belgium, Denmark, Estonia, Ireland, Italy, Lithuania, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden and Switzerland.
3. Less restricted countries (no on all): Austria, Bosnia Herzegovina, Czech Republic, Germany and Hungary.

Legally binding regulations on alcohol advertising and promotion

The next table provides us with a summary of the legally binding regulations on alcohol advertising, alcohol product placement, alcohol sponsorship and sales promotion.

Table 20.2 Legally binding regulations on alcohol advertising, alcohol product placement, alcohol sponsorship and sales promotion

Country	Alcohol advertising	Product placement	Alcohol sponsorship	Sales promotion
Armenia	yes	no	no	no
Austria	yes	yes	no	no
Belgium	yes	no	no	no
Bosnia & Herzegovina	yes			

Country	Alcohol advertising	Product placement	Alcohol sponsorship	Sales promotion
Cyprus	yes	no	no	no
Czech Republic	yes	no	no	no
Denmark	yes	yes	no	no
Estonia	yes	yes	yes	yes
Finland	yes	yes	yes	yes
France	yes	yes	yes	no
Germany	yes	yes	no	no
Hungary	yes	yes	yes	no
Iceland	yes	yes	yes	yes
Ireland	yes	no	no	yes
Italy	yes	yes	yes	yes
Lithuania	yes	yes	yes	yes
Netherlands	yes	yes	yes	yes
Norway	yes	no	yes	yes
Poland	yes	no	yes	yes
Portugal	yes	yes	yes	yes
Slovenia	yes	no	yes	yes
Spain	yes	no	no	yes
Sweden	yes	no	yes	yes
Switzerland	yes	yes	yes	yes

* Data of Russia not available/ Source: WHO (available at:http://www.who.int/countries/en/)

Alcohol advertising is the promotion of alcoholic beverages by alcohol producers through a variety of media, such as national TV, private TV, national radio, local radio, print newspapers/magazines, billboards, points of sale, cinema and internet. Along with tobacco advertising, it is one of the most highly-regulated forms of marketing. As table 2 shows, indeed all countries have some legally binding restrictions on alcohol advertising.

Product placement is a form of advertisement, where branded goods or services are placed in a context usually devoid of ads, such as movies, music videos, the story line of television shows, or news programs. More than half of the countries (13) restrict this type of alcohol promotion.

Sponsorship indicates industry sponsorship of sporting events and youth events. Again, more than half of the countries (14) has legally binding regulations for this from of alcohol promotion.

Finally, sales promotion is about the sales promotion by producers, retailers in the form of sales below cost, by bars in the form of serving alcohol for free. Fourteen countries formulated regulations for sales promotion.

As we did for the previous table, we can make a clustering of countries for this one as well. That is:

1. Countries with the most legally binding regulations (yes on all): Estonia, Finland, Iceland, Italy, Lithuania, Portugal, the Netherlands, and Switzerland.
2. Countries in between (yes on two or three): Austria, Denmark, France, Germany, Hungary, Ireland, Norway, Poland, Slovenia, Spain and Sweden
3. Countries with the least legally binding regulations (yes on one): Armenia, Belgium, Bosnia & Herzegovina, Cyprus and the Czech Republic.

There are no countries without any form of legally binding regulations with respect to alcohol advertising and promotion.

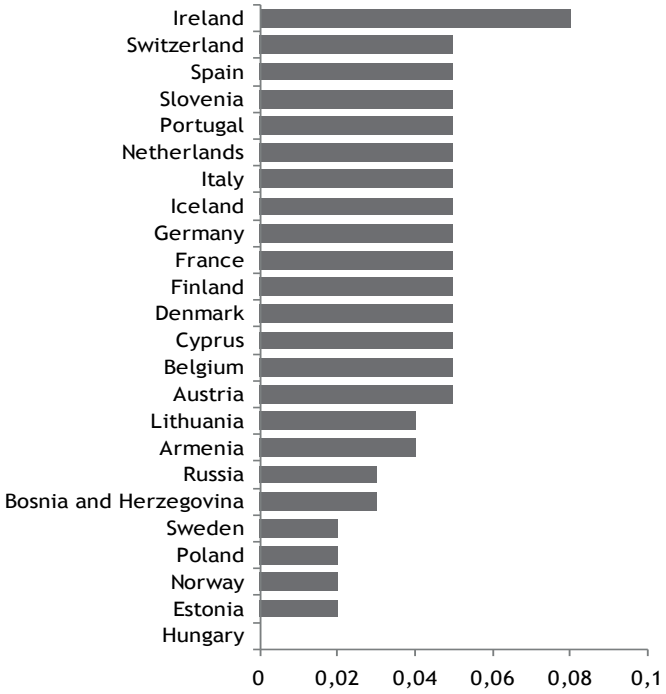
National maximum legal blood alcohol concentration when driving a vehicle

Figure 20.3 shows the national legal maximum blood alcohol concentration people are allowed to have when they are driving. In most countries this allowed concentration is 0.05. The strictest countries,

with a legal maximum blood alcohol concentration of 0.02 are Sweden, Poland, Norway and Estonia and especially Hungary and the Czech Republic with zero tolerance for drinking and driving.

Ireland has a relative high maximum, namely 0.08. This could be due to the fact that drinking alcohol is an integral part of social and cultural activities with the 'pub' (licensed premises) the hub of most social life. In addition, Alcohol policies in Ireland focus on encouraging individual responsibility and follow a liberal free-market agenda which had included the deregulation of alcohol licences, reductions in excise duty, the removal of price controls, and permitting the self-regulation of sales outlets and advertising bodies.

Figure 20.3 National maximum legal blood alcohol concentration when driving a vehicle



* Data of Czech Republic not available/ Source: WHO (available at: http://www.who.int/countries/en/)

Severity of alcohol policy

Table 20.3 completes the picture of the previous figures and tables. The scale is based on a major Commission-funded project, the ECAS study (Karlsson & Österberg 2001). The original scale runs from 0 (no restrictions) to 20 (all restrictions). The scale takes into account: the control of production and wholesale, control of distribution, personal control, control of marketing, social and environmental controls and public policy.

Table 20.3 Severity of alcohol policy

Less than 9	Between 9 and 12	More than 12
Austria, Czech Republic, Germany, Portugal	Belgium, Denmark, Estonia, Hungary, Ireland, Italy, Netherlands, Russia, Spain, Switzerland	Finland, France, Lithuania, Norway, Poland, Sweden

* Data of Armenia, Bosnia Herzegovina, Cyprus, Iceland and Russia not available/ Source; Alcohol in Europe report, chapter 9: alcohol policy in the countries of Europe, available at: http://ec.europa.eu/health-eu/news_alcoholineurope_en.htm and http://www.ias.org.uk/btg/conf0604/presentations/osterbergpp.pdf

Unfortunately, data is not available for all countries. Comparing this table with the previous tables shows both similarities and differences. Some countries consequently belong to one category, while others are interchange. In summary we see the following pattern:

- Certain: high restricted countries: Finland and Iceland
- Certain: low restricted countries: Armenia
- In between: Portugal, Poland, Belgium, Denmark, Estonia, Hungary, Ireland, Italy, the Netherlands, Russia, Spain and Switzerland
- Interchanging countries but mostly low restricted: Austria, Czech Republic and Germany
- Interchanging countries but mostly high restricted: France, Lithuania, Norway and Sweden

Clustering based on all policy indicators described in this paragraph

Based on the structural indicators described above and the analyses of national reports written by experts we propose the following clustering:

Least strict	Less strict	More strict	Most strict
Austria, Germany Czech Republic, Portugal, Armenia	Denmark, Belgium, Netherlands, Italy, Spain, Bosnia & Herzegovina, Hungary	Cyprus, Switzerland, Poland ,Slovenia, Ireland	Sweden, Iceland, Lithuania, Norway, Finland, France, Estonia, Russia

We can ascertain that Iceland is the most restricted country of all. It has the highest minimum age for both off- and on premise sale and for all types of alcoholic beverages and it has restrictions with respect to the hours, days, places and density of the sale. In addition, Iceland had legally binding regulations on alcohol advertising, alcohol product placement, alcohol sponsorship and sales promotion. These strict policies are a response to the large increase in substance use among adolescents during the 1990s.

In contrast, Armenia is the less restricted country when it comes to the sale of alcoholic beverages. Is has no legal minimum age for the sale of these drinks what so ever and no restrictions when it comes to hours, days and density. The only restriction is the place where these beverages are sold. And finally, Armenia knows only binding regulations on alcohol advertising and not on alcohol product placement, alcohol sponsorship or sales promotion. Over the last decades Armenian policy with respect to alcohol hasn't changed significantly. It is more focused on harm reduction and not that much directed at preventing every use of alcohol, as many people believe in the benefits of moderate alcohol consumption (especially of red wine) for the health.

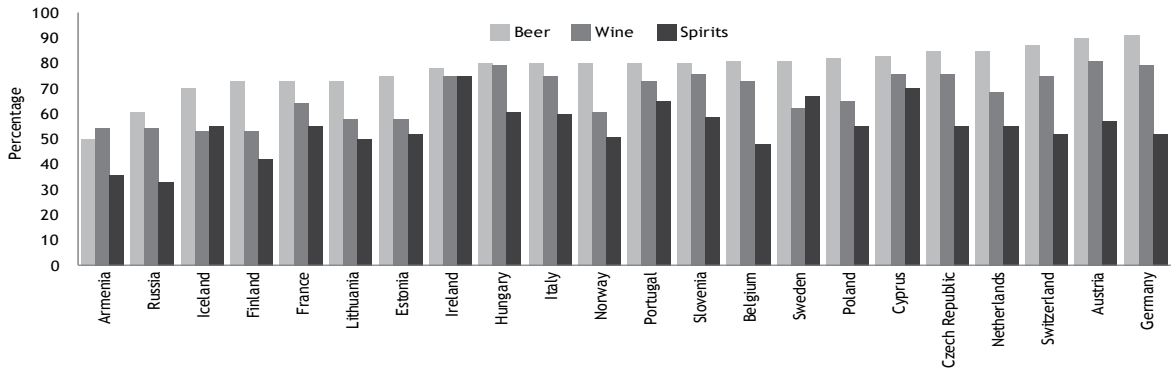
20.3.2 Cultural context indicators

To understand and explain the drinking behaviour of adolescents this report focuses on the national context in which these adolescents live. The previous paragraph focused on the policy context. However, we believe that the cultural context adolescents grow up in is just as important. Is it easy to get alcoholic beverages? Is drinking culturally accepted in their country? What are the norms and values with respect to alcohol? Does the use of alcohol cause many problems? And: what is the drinking behaviour of adults? This paragraph shines it light on these questions.

Availability and affordability of alcohol

Figure 20.4 gives an impression of the perceived availability of alcohol in the different countries. With four data collections in 1995, 1999, 2003 and 2007, the ESPAD project provides a reliable overview of trends in licit and illicit drug use among European adolescents (15-16 year olds) between 1995 and 2007 as well as a comprehensive picture of young peoples' use of tobacco, alcohol, cannabis and other substances in Europe. The students were asked how difficult they would find it to get hold of beer, wine and spirits if they wanted to.

Figure 20.4 Perceived availability of alcohol (percentages responding “fairly easy” or “very easy” to obtain)



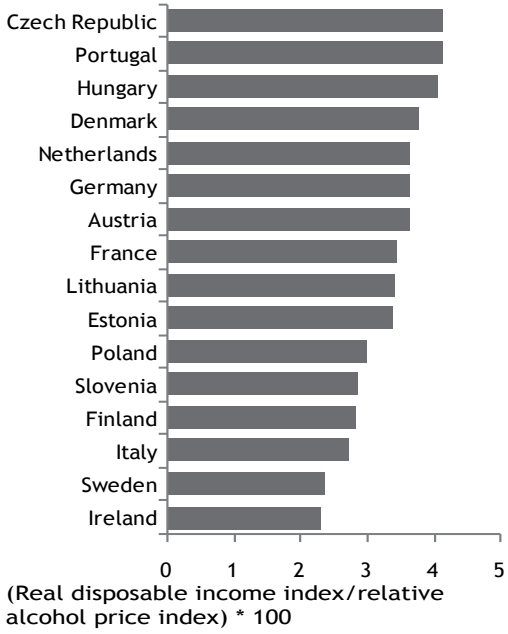
* Data of Bosnia and Herzegovina, Denmark and Spain not available/ Source: ESPAD (2007) http://www.espad.org/documents/Espad/ESPAD_reports/2007/The_2007_ESPAD_Report-FULL_091006.pdf

The percentages reproduce the number of people who think alcohol is fairly or even very easy to obtain. Very interesting is the fact that Armenian people, who live in the country that is the least restricted in her policy, perceive the lowest alcohol availability compared to people in other countries. It is even lower than people from Iceland, the most restricted country, experience.

The affordability index captures how ‘affordable’ the consumption of alcoholic beverages is for an average citizen. By dividing the real disposable income index by the relative alcohol price index and multiplying this by 100 RAND gives an overview of the availability of alcohol per country (figure 20.5).

To provide further insight into how the affordability index summarizes a variety of economic indicators, we should note that real disposable income can alter due to changes in total household income, income tax and other taxes, social contributions, other transfers, and inflation/deflation. Similarly, the relative price of alcohol can alter due to changes in the price of alcohol and/or changes in the price of other goods. The usefulness of the affordability index is that it summarises all these different indicators into one convenient measure, which can then be used to make comparisons over time or, with certain limitations, between geographical regions or socioeconomic groups.

Figure 20.5 Affordability of alcohol



We see that alcohol is the most affordable in the Czech Republic, Portugal and Hungary, while it is the least affordable in Ireland and Sweden.

Tolerance toward (heavy) drinking

According to Felon et al. (2011) it is common to distinguish between ‘wet’ and ‘dry’ cultures. In countries with wet cultures, alcohol is consumed regularly, but in moderation. The consumption of alcohol is integrated in the daily conduct of social life. This culture type is especially common in the Mediterranean countries of Southern Europe. In dry cultures, on the other hand, people drink less frequently, but when they drink they consume large amounts with the purpose to become intoxicated. This drinking pattern is often found in Northern and Eastern European countries. As a result, Felson et al conclude, in dry countries, alcohol is more likely to be seen as a social problem.

Source: RAND (2009)
http://www.rand.org/content/dam/rand/pubs/technical_reports/2009/RAND_TR689.pdf

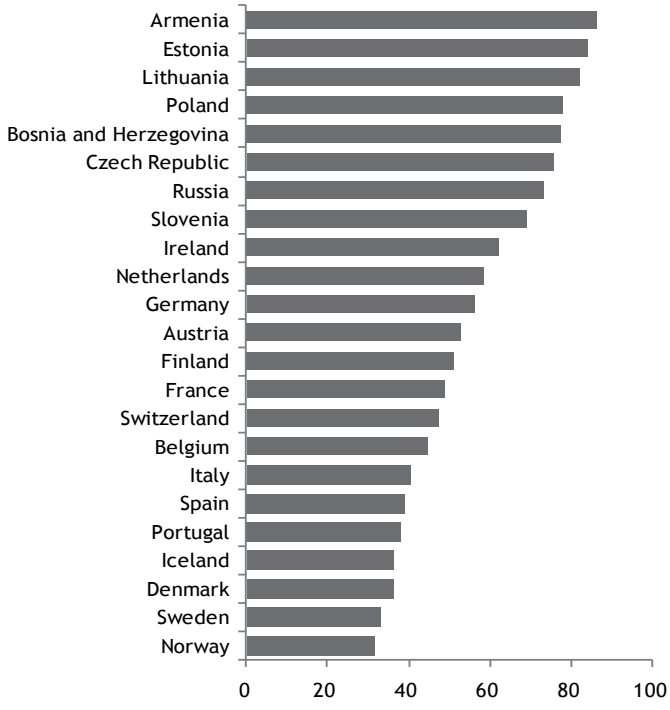
In addition to Felson et al. our expert’s distinguished so called alcohol determined cultures like Germany, Austria, Switzerland and the Netherlands. In alcohol determined cultures many everyday

situations are linked to consuming alcohol (e.g. after-work pint, celebrating a birthday etc.) and there is (hardly) no limit to frequency or quantity of consuming alcohol. Characteristic for these countries are the big cultural events, like country fairs and carnival, which are traditionally strongly connected with alcohol consumption.

Figure 20.6 provides data from the European Values Study. This study is a large-scale, cross-national, and longitudinal survey research program on basic human values. It provides insights into the ideas, beliefs, preferences, attitudes, values and opinions of citizens all over Europe. Figure 20.6 shows the response on the following question: *On this list are various groups of people. Could you please sort out any that you would not like to have as neighbours?* The figure shows the percentage of people who answered 'heavy drinkers'.

The figure illustrates that the Scandinavian countries are the most tolerant towards heavy drinking. This is inconsistent with the theory of Felson et al., for these are all dry countries. We would have expected to find the wet countries Portugal, Spain and Italy at the bottom. The figures also show that Armenia, Estonia and Lithuania are the least tolerant towards heavy drinking. This is consistent with the opinion of the experts of Armenia. They describe Armenia as a society which is rather tolerant to alcohol consumption in small amounts. At the same time, it is considered a disgrace to show in public while being drunk. Mainly due to this cultural attitude, one can rarely meet people affected by alcohol to the extent of loosing control over his/her behaviour in the streets or other public places. The first experiments with the alcohol use take place during the social events, in the presence of the parents and family, when the juvenile is close to the age 12. It is a so-called introduction to the "culture of drinking", when the juvenile is taught that only moderate consumption of alcohol can be acceptable while getting drunk can bring only to the public disgrace.

Figure 20.6 Tolerance towards heavy drinking



Data of Cyprus and Hungary not available/ Source: European values study http://zacat.gesis.org/webview/index.jsp?object=http://zacat.gesis.org/obj/fCatalog/Catalog5

An explanation for this inconsistence might very well be the blurred borders between moderate and heavy drinking. What is considered moderate or heavy is on itself dependent on the norms and values in a particular culture. In for example Austria, similar to most European countries, a permissive alcohol and tobacco-culture exists. Alcohol is part of the everyday life. Therefore, the experts state that the borders between moderate consumption (enjoyment), abuse and dependence are fuzzy and difficult to recognize.

Another striking example is Spain. In this country, drinking youngsters is a controversial and mass media attention topic recently known as "botellón". Botellón is often referred to as a final mean to get drunk on the cheapest way either just for fun or to escape problems society imposes on the younger generations. Change of values is a recurrent argument. Discussions are most frequent because of the discomfort that noise, waste or disturb cause on neighbours. Consequently, general social tolerance traditionally shown towards alcohol follows today two separate tendencies. On the one hand mass media and a big part of public opinion are more concerned with public order problems, and discussions about values of younger generations, especially those that have to do with leisure. On the other hand experts and most policy makers are more concerned with health related problems with alcohol use and abuse.

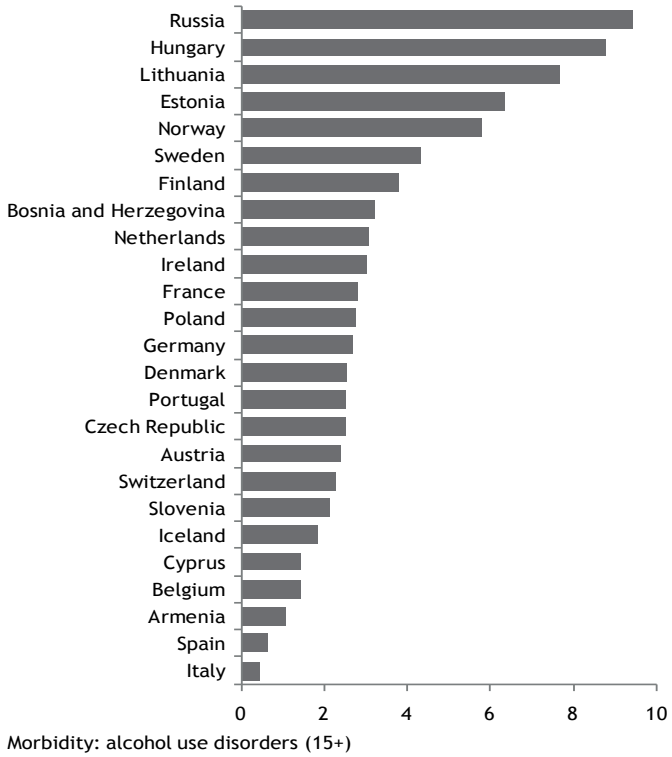
These examples show the complexity of norms and values and how careful we must be in the interpretation of cultural indicators.

Morbidity and alcohol use of adults

Figure 20.7 illustrates the prevalence rates of alcohol use disorders among drinkers. Alcohol use disorders comprise alcohol dependence and the harmful use of alcohol. Global estimates for alcohol use disorders are based on epidemiological studies which assess these disorders through diagnostic assessment instruments and define alcohol use disorders through international disease classification systems such as the International Classification of Diseases (ICD) and the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Kehoe, Rehm & Chatterji, 2007; Rehm et al., 2009b).

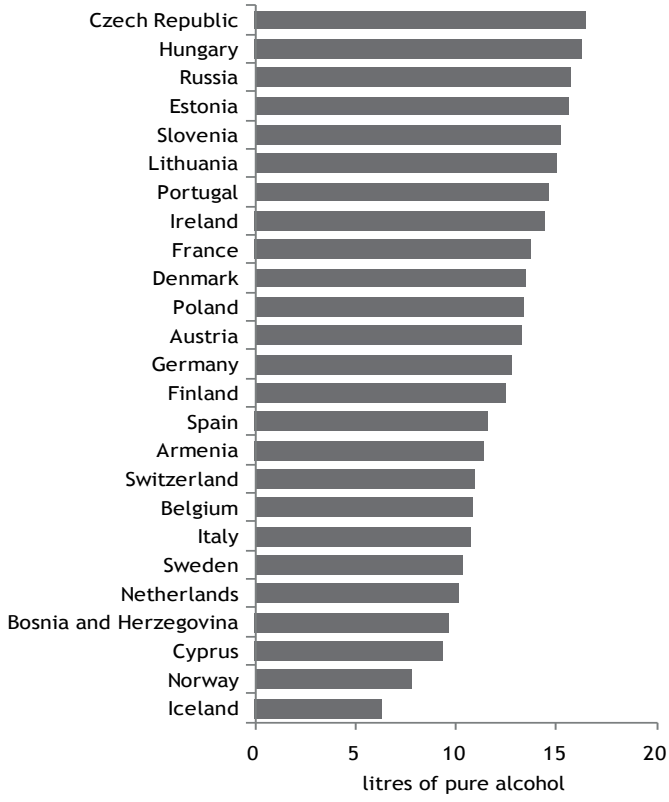
Global prevalence rates of alcohol use disorders were estimated to range from 0% to 16% (rates of alcohol use disorders among drinkers), with the highest prevalence rates to be found in Eastern Europe. (http://www.who.int/substance_abuse/activities/msbatlaschone.pdf)

Figure 20.7 Morbidity: alcohol use disorders (15+)



Data of Armenia, Belgium Bosnia & Herzegovina, Cyprus, Iceland, Norway, Russia, Spain and Switzerland not available/
Source: WHO (available at:http://www.who.int/countries/en/)

Figure 20.8 Adult (15+) per capita consumption, average 2003-2005 (in litres of pure alcohol)



Source: WHO
(available at:http://www.who.int/countries/en/)

Figure 20.8 shows the litres of pure alcohol per capita, computed as the sum of alcohol production and imports, less alcohol exports, divided by the adult population (aged 15 years and older). It is the estimated amount of pure ethanol in litres of total alcohol, and separately, beer, wine and spirits consumed per adult (15 years and older) in the country during a calendar year, as calculated from official statistics on production, sales, import and export, taking into account stocks whenever possible.

When we compare these results with figure 20.7, the alcohol use disorders per country, we see a quite similar picture. Roughly speaking: in the countries were alcohol consumption is high, which are mainly the Eastern European countries with 15 litres of pure alcohol and above per capita, the rate of disorders are high as well. Let us focus on the country with the most alcohol use disorders: Russia. As the experts describe it, people in Russia prefer strong alcoholic beverages to others: the share of spirits is 60 percent of all alcohol drinking in Russia. Furthermore, the increase of teenage alcoholism and alcoholic psychosis was marked fairly rapid during the period 2000-2005. In 2006-2008, it decreased, but nevertheless this adverse phenomenon persisted Because of the high numbers of alcohol use disorders the use of alcohol and (soft) drugs in the Russian Federation is mainly seen as an undesirable behaviour, a kind of social problem constraining the development of the country.

In Hungary the explanation for the high amount of alcohol consumption and high number of disorders can be found in the general permissive attitude towards alcohol. The majority of Hungarian society with a Christian-Jewish cultural heritage have a permissive attitude towards alcohol, which classifies as a legalised drug, while strict legal and moral norms are in place for substances listed as drugs. Due to the socio-cultural function of alcohol consumption, society's attitudes towards heavy drinking may actually be more tolerant, than towards the use of illicit drugs, despite the fact that alcohol poses an incomparably more severe problem in Hungary both from a public health and criminology point of view, than illicit drugs. The overly permissive attitude towards alcohol is coupled with a dismissive and disapproving attitude towards addictions, and this dichotomy undermines all efforts for effective preventive measures at the level of society as a whole.

In Iceland, the country that is most restrictive in its alcohol policy, the least litres of pure alcohol are consumed (6.3) and the number of disorders is fairly low. It seems that all the restrictions and regulations in this country are effective. However, we should also take into consideration that in the 1990s, in addition to the stricter regulations, a group of Icelandic social scientists at the Icelandic Centre for Social Research and Analysis (ICSRA), along with policy makers and practitioners in the field, began collaborating in an effort to better understand the societal factors influencing substance use among adolescents and potential approaches to prevention. This resulted in the development of an evidence-based approach to adolescent substance use prevention that involved a broad range of relevant stake holders who worked together on this community-based, socially embedded and highly participatory effort. ICSRA has been in the forefront in collecting data on alcohol and substance use among youth in Iceland. Since these data were collected, Iceland has seen a steady decline in adolescent substance use. It is believed that the decline is in large part due to the assiduous efforts by

Icelandic authorities to both reduce risk factors and strengthen a broad range of parental, school and community protective factors.

Clustering based on all cultural indicators described in this paragraph
Based on the cultural indicators described above and the analyses of national reports written by experts we propose the following clustering:

	1	2	3	4	5
Availability	**low**	**middle**	**high**	**high**	**middle**
Consumption	**high**	**high**	**high**	**middle**	**low**
Morbidity	**high**	**high**	**low**	**low**	**middle**
Tolerance	**low**	**low**	**middle**	**high**	**high**
	Armenia, Russia	Estonia, Lithuania, Poland	Austria, Czech Republic, Germany, Ireland, Netherlands, Slovenia, Hungary	Belgium, France, Italy, Portugal, Sweden, Switzerland, Spain, Denmark	Finland, Iceland, Norway

When we compare this clustering with the clustering based on the policy indicators (p.11) we see a quite different pattern. It shows us that policies do not automatically follow the national attitude towards alcohol and the other way around. Multiple examples illustrate the complex interplay between the two.

20.4 Conclusions

The closer examination of national policies and cultures in Europe with respect to alcohol consumption has shown great diversity and shed more light on the possible ways in which the national context might affect the drinking behaviour of its citizens.

As for policy. All countries try to reduce the harm alcohol might cause, but their methods and regulations differ considerably. Some focus mainly on the reduction of supply through laws and regulation with respect to the sale of alcohol, the legal age for purchasing alcohol, and advertising. Others try to reduce the demand, mainly through education. Even some countries try to reach abstinence of substance use as much as possible via a so called zero tolerance policy. European countries also differ in their conceptualization of alcohol use and therewith the links that are made with other policy domains. Some isolate the drugs and alcohol issues from other social and health matters, while others believe that problems experienced by individuals are often intertwined. Based on the different policy indicators described in this report we can distinguish four clusters, with Austria, Germany, the Czech Republic, Portugal and Armenia being the least strict and Sweden, Iceland, Lithuania, Norway, Finland, France, Estonia and Russia begin the strictest.

We also investigated cultural differences between countries looking at the availability and affordability of alcohol and at the norms and values with respect to alcohol use, with indicators as the tolerance towards (heavy) drinking, the morbidity and the alcohol consumption of adults. This paragraph showed us the complexity of cultural aspects and the caution that is needed in interpreting them. In most countries people are quite permissive towards moderate drinking, but dismissive and disapproving towards addictions. However, borders between what is considered as moderate consumption (enjoyment), abuse or as dependence are fuzzy, blurred and hard to recognize. What might be seen as social drinking for one might be disturbing for another. These blurred borders often undermine efforts for effective preventive policy. As a result of this complexity we found no clear, linear relationship when we compared the strictness of policy and cultural aspects of countries.

In this report, however, we did not solely focus on the drinking behaviour of adolescents, which might show a different picture. Future analyses within the AAA prevent project, will study the possible relation between the above described structural, national indicators and the drinking behaviour of adolescents in more detail.

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21 *Practices and interventions for prevention of alcohol use among young people in Europe: Synthesis report and identification of effective programmes*

Gabriele Rocca, Alfredo Verde, Uberto Gatti, Anna Markina & Kristjan Kask

21.1 Introduction

Underage drinking is seen as a significant problem worldwide, since it has a serious impact on public health, society and economy. The European Union (EU) is the heaviest-drinking region of the world and alcohol is linked to multiple health and social problems (Anderson & Baumberg, 2006). Health-related conditions include cancer, injury, liver cirrhosis and cardiovascular disease (Herring et al., 2010); it is estimated that in the EU alcohol is responsible for 7.4% of all disabilities and premature deaths (Anderson & Baumberg, 2006). At a global level, it is estimated that 3.8% of all deaths and 4.6% of disability-adjusted life years are attributable to alcohol (Rehm et al., 2009). There are also a broad range of societal harms associated with alcohol consumption, including crimes, violence, unemployment and absenteeism, which place a significant burden on societies and economies (WHO, 2008).

Young people (aged 15–24 years) are responsible for a high proportion of this burden, with over 25% of youth male mortality and approximately 10% of young female mortality being due to alcohol use (Anderson & Baumberg, 2006). In many countries, heavy episodic or binge drinking is prevalent among young people and is associated with an increased risk of accidents, violence, criminal activity, poorer health and social outcomes. Among young people, early initiation of alcohol use has been shown to be linked to later binge drinking, heavy drinking and alcohol-related problems (Foxcroft & Tsertsvadze, 2012).

Development of effective preventive and early interventions for alcohol use in youths is important for a number of reasons, including the high clinical demand for such programmes, the possibility of influencing the typically negative course of early-onset drinking (Grant & Dawson, 1997; Hawkins et al., 1997), and the possibility of preventing the early onset of associated psychological problems such as depression (Newcomb & Bentler, 1989).

In order to obviate the consequences of juveniles' alcohol abuse, state and local authorities have adopted many kinds of prevention programmes, which vary considerably among countries (Anderson & Baumberg, 2006). In some European countries, preventive interventions have been broadly implemented for many years, and in some cases they have been thoroughly evaluated scientifically. In other countries, preventive interventions have been fewer, and efforts to evaluate them have been less scientific (Foxcroft et al., 2002).

A growing number of interventions have been found to be effective in preventing adolescent substance use and related health risk behaviours (Foxcroft et al., 2002¸ Foxcroft & Tsertsvadze, 2012), nevertheless many countries continue to invest in programmes or interventions with limited evidence of effectiveness.

In this phase of the European AAA-Prevent project we had to survey effective environmental strategies for the prevention of alcohol abuse among young people in Europe, with the objective of identifying and selecting programmes/interventions that have been evaluated and of which the effectiveness has been proved, with the intent of enabling politicians and policymakers to discern which interventions are effective or promising in the field of prevention. According to this aim, the selected effective programmes will also be published on the AAA-Prevent website (www.aaaprevent.eu/strategies).

21.2 Practices and interventions for prevention of alcohol use: an overview

Prevention science is based on the premise that empirically verifiable precursors (risk and protective factors) predict the likelihood of undesired health outcomes. Prevention science postulates that negative health outcomes like alcohol abuse and dependence can be prevented by reducing or eliminating risk factors and enhancing protective factors in individuals and their environments during the course of development (Coie et al., 1993).

Indeed, the focus of prevention programmes is principally on increasing the awareness of risks related to underage consumption and reducing the harmful consequences of alcohol use (Elliott, Morleo, & Cook, 2009). In general, the term "intervention" is an umbrella term which covers programmes, projects, training methods, forms of treatment and supervision. In this chapter a youth intervention is a goal-directed and systematic approach toward the prevention of alcohol carried out by various providers. In order to diminish the researcher's subjectivity, we referred to a modified Kahan and Goodstadt (2001) definition of best practices in health promotion, as follows: "*those sets of processes and actions that are consistent with health promotion values, theories, evidence and understanding of the environment, that are most likely to prevent alcohol use among juveniles*".

Ordinarily, prevention programmes can be classified as universal (for everyone in an eligible population), selective (for those who are members of population subgroups at higher risk) and indicated (for those with existing risk factors or conditions that identify them as being individually at risk) prevention interventions (Mrazek & Haggerty, 1994).

Focusing on the contexts and actors involved, we suggested organizing preventive interventions into five categories: individual, family, school, community and multi-component.

The individual level includes actions aimed at the creation and support of counselling, education and information services in schools and outreach programmes where young people can meet social and/or health professionals specialized in working with young people. Adolescents can explore whatever is going on in a young person's life in a safe, confidential and non-judgmental environment and in case they can be addressed to a proper specific service (e.g. addiction units). The individual interventions are also frequently applied in the field of selective and indicated prevention while if they are set up in the school context within a school counselling service they are part of the universal prevention approach (Botvin, 2000).

Family-based prevention programmes are designed for improving children's and parents' skills, such as enforcement of rules and limits, monitoring and controlling, communication in the family context, and social skills. In family-based prevention interventions, parents and those who are deputed to take care play a key role for the alcohol socialization of young people (Foxcroft & Tsertsvadze, 2011a).

Different prevention approaches have been used in universal prevention in the school context: from informative and education activities to active involvement of the final target. More recently, the scientific literature has shown that the most effective interventions are those aimed at increasing the awareness over the use of alcohol, social skills and skills to resist peer pressure. At the school level, prevention programmes can be provided as lessons included in the curriculum or as separate sections (UNICRI, 2003).

Community-based interventions include a variety of strategies and integrated and coordinated actions to promote changes at the environmental and individual level in different contexts in order to prevent risky behaviours and promote well-being among groups in a particular local community. It means to design and implement interventions that involve many actors in the community. Community-based interventions are aimed at modifying attitude and behaviour and changing norms, values and social beliefs on risks, health and wellness (Wandersman & Florin, 2003).

Multi-component prevention programmes are defined as those prevention efforts that are carried out simultaneously in multiple settings, for example in both school and family settings, typically combining school curricula with parenting interventions (Foxcroft & Tsertsvadze, 2011b).

21.3 Method

From a methodological point of view, partners from 25 European countries[1] were required to make an inventory of meso (school and community) and micro (family and individual) initiatives in the field of prevention of alcohol use among juveniles in their countries.

The inventory should be based both on the published scientific literature and on the "grey" literature (technical reports from government agencies or scientific research groups, working papers from research groups or committees, white papers, preprints, etc.).

The criteria of inclusion were: (i) the prevention programmes should explicitly include the prevention of underage drinking among their aims, even if other issues are targeted (e.g. drug use or abuse, etc.); and (ii) every programme/intervention should be developed in accordance with a manual, text or defined guidelines, in order to make its characteristics and implementation clearly understandable and to enable the programme/intervention to be replicated.

Each programme was briefly described and classified according to five domains (individual, family, school, community or multi-component). Because of the high heterogeneity among the reports (not all papers followed our template, particularly with regard to qualitative descriptions) and the lack of scientific evaluation of most programmes, there were some limitations for an in-depth analysis of these programmes.

So, we asked national experts to choose and propose two (or more, if available) "good" programmes or interventions in their country (one at the meso level and the other at the micro level) according to their competence and experience, as "best practice models". During the regional seminars (spring 2012) the findings were discussed, with particular attention to similarities and differences between the countries.

Modifying the ISRD-2 categorization, we decided to group the 25 countries into four clusters:

- The Central European cluster, comprising Germany, Belgium, Netherlands, Austria and Switzerland;
- The Nordic cluster, covering Ireland, Finland, Sweden, Norway, Denmark and Iceland;
- The Mediterranean cluster, grouping France, Spain, Italy, Portugal and Cyprus;
- The Eastern European countries, comprising the Czech Republic, Poland, Hungary, Estonia, Lithuania, Slovenia, Bosnia, Armenia and Russia.

This classification concerns the presence of different cultural and social attitudes towards drinking in the various countries considered. On the basis of the prevalent modality of alcohol consumption in the country, we can distinguish between "dry countries", where drinking tends to be of the "binge" type (infrequent but recurrently heavy drinking), as is the case in Northern, Central and Eastern European culture, and "wet countries", where drinking has a more "social" nature (frequent consumption of moderate amounts of alcohol, i.e. alcohol use integrated into everyday life), as is typical of Mediterranean countries (Felson et al., 2011).

To provide a unified evaluation of the programmes, we decided that three teams from the AAA-Prevent project (Italian, Estonian and Dutch teams) would evaluate the programmes selected by national experts according to the following inclusion criteria: the interventions' focus is primary and/or secondary level prevention; the interventions have been implemented and evaluated with positive outcomes and are described in published literature; the interventions show evidence of effectiveness in eliciting desired changes; the intervention addresses alcohol use prevention among children under the age of 18; the intervention addresses one or more of the following domains: individual, school, family, community, multi-component.

The three teams scored each prevention programme in three areas: theoretical background, implementation and outcome, according to the criteria presented in Table 21.1. As an example, in rating the programmes' effectiveness we used the Canadian Best Practices Portal.[2]

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1 Ireland, Sweden, Denmark, Iceland, Norway, Finland, Austria, Germany, The Netherlands, Switzerland, Belgium, France, Spain, Italy, Cyprus, Portugal, Bosnia-Herzegovina, Poland, Russia, Lithuania, Slovenia, Hungary, Armenia, Czech Republic, Estonia.

2 http://66.240.150.14/index-eng.html

Table 21.1 Evaluation criteria

Theoretical background	1 = meets the criteria	Intervention is based on strong theoretical background. References to the theory are mentioned in the programme's description
	0 = does not meet the criteria	Intervention is based on weak theoretical background. There are no references to the theory or theoretical background is not scientifically published
Implementation	1 = meets the criteria	It is evaluated how the programme has been implemented. The evaluation process is well described and published locally or in scientific journals or the evaluation is ongoing at the time or the programme has been evaluated in another country
	0 = does not meet the criteria	The programme's implementation is not being evaluated
Outcome	1 = meets the criteria	It is demonstrated how the programme's effectiveness has been evaluated. The evaluation process is well described and published locally or in scientific journals or the evaluation is ongoing at the time or the programme has been evaluated in another country
	0 = does not meet the criteria	The programme's effectiveness is not being evaluated

Each programme was scored according to these criteria on an overall progressive rating from 0 to 3.

(0) Does not meet the criteria = Weak theoretical background, implementation and outcome are not evaluated or published in local or international scientific journals; or the implementation and outcome are evaluated but reverse/no effects have been found.
(1) Minimally meets our criteria = Prevention is based on a strong theoretical background, implementation and outcome are not evaluated or published in local or international scientific journals; or the implementation and outcome are evaluated but reverse/no effects have been found; or theoretical background is weak, but implementation or outcomes are evaluated or published.
(2) Moderately meets our criteria = Prevention is based on a good theoretical background, only implementation is evaluated with the results in the positive direction and the results are published in national or international scientific journals or the implementation and outcome are evaluated in some other country or the implementation and outcome evaluation is in progress.
(3) Meets our criteria = Prevention is based on a good theoretical ground, implementation and outcome are both evaluated with the results in the positive direction and the results are published in national or international scientific journals.

The programmes scored with 2 and 3 were considered effective and will be published on the AAA-Prevent website.

21.4 Results and discussion

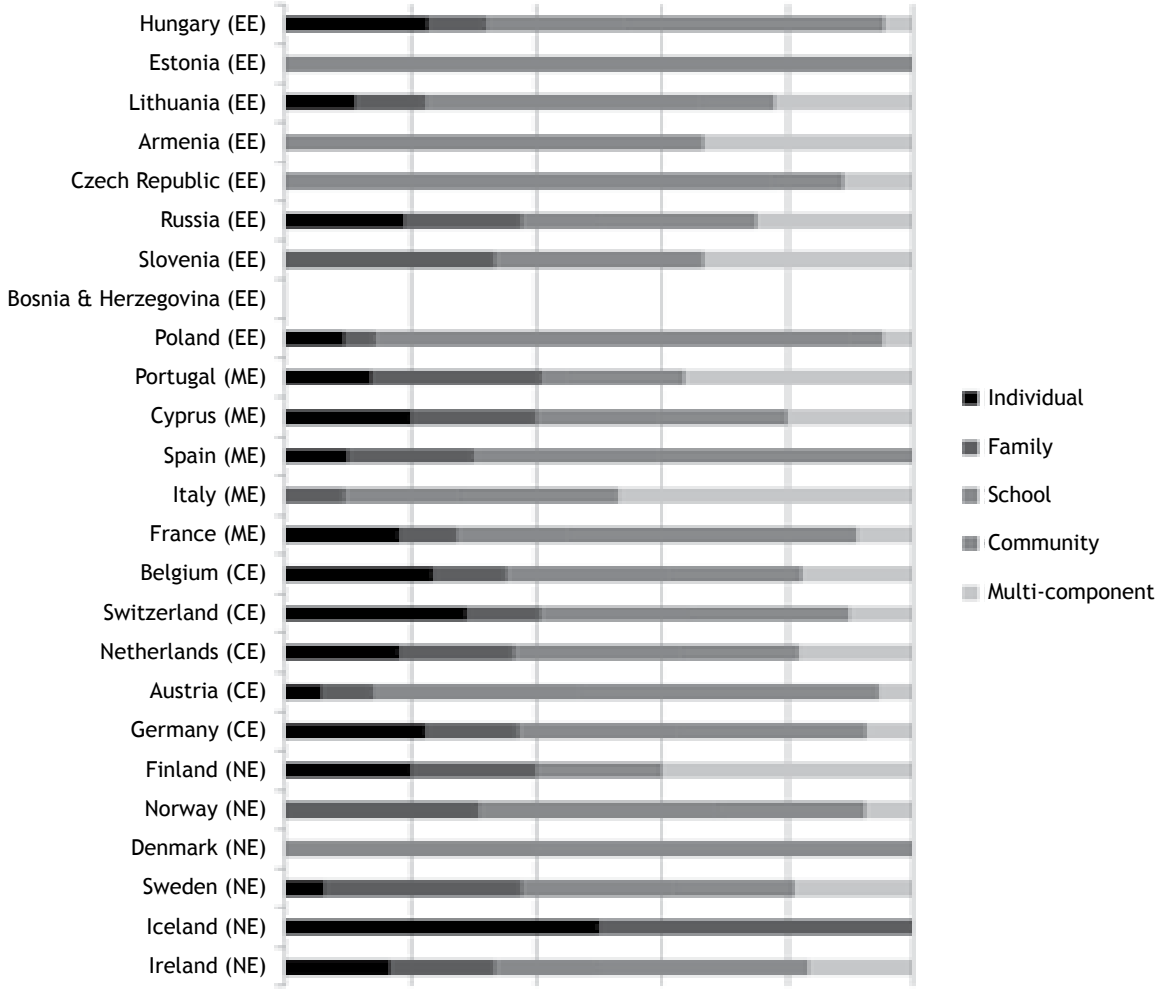
Overall, we recognized 391 programmes and interventions among 24 European countries (Bosnia was not available) (see Table 21.2 and Figure 21.1).

Table 21.2 Programs and interventions by country and level

Country/level	Individual	Family	School	Community	Multi-component
Ireland (NE)	1	1	1	2	1
Iceland (NE)	1	1	0	0	0
Sweden (NE)	1	5	4	3	3
Denmark (NE)	0	0	2	3	0
Norway (NE)	0	4	5	3	1
Finland (NE)	1	1	0	1	2

Country/level	Individual	Family	School	Community	Multi-component
Germany (CE)	6	4	7	8	2
Austria (CE)	2	3	12	17	2
Netherlands (CE)	2	2	3	2	2
Switzerland (CE)	17	7	14	15	6
Belgium (CE)	8	4	9	7	6
France (ME)	2	1	2	5	1
Italy (ME)	0	3	6	8	15
Spain (ME)	1	2	3	4	0
Cyprus (ME)	1	1	1	1	1
Portugal (ME)	3	6	1	4	8
Poland (EE)	2	1	16	1	1
Bosnia & Herzegovina (EE)	0	0	0	0	0
Slovenia (EE)	0	1	1	0	1
Russia (EE)	3	3	2	4	4
Czech Republic (EE)	0	0	14	2	2
Armenia (EE)	0	0	2	0	1
Lithuania (EE)	1	1	4	1	2
Estonia (EE)	0	0	4	0	0
Hungary (EE)	5	2	5	9	1
Total	57	53	118	100	62

Figure 21.1 Programs and interventions by country and level

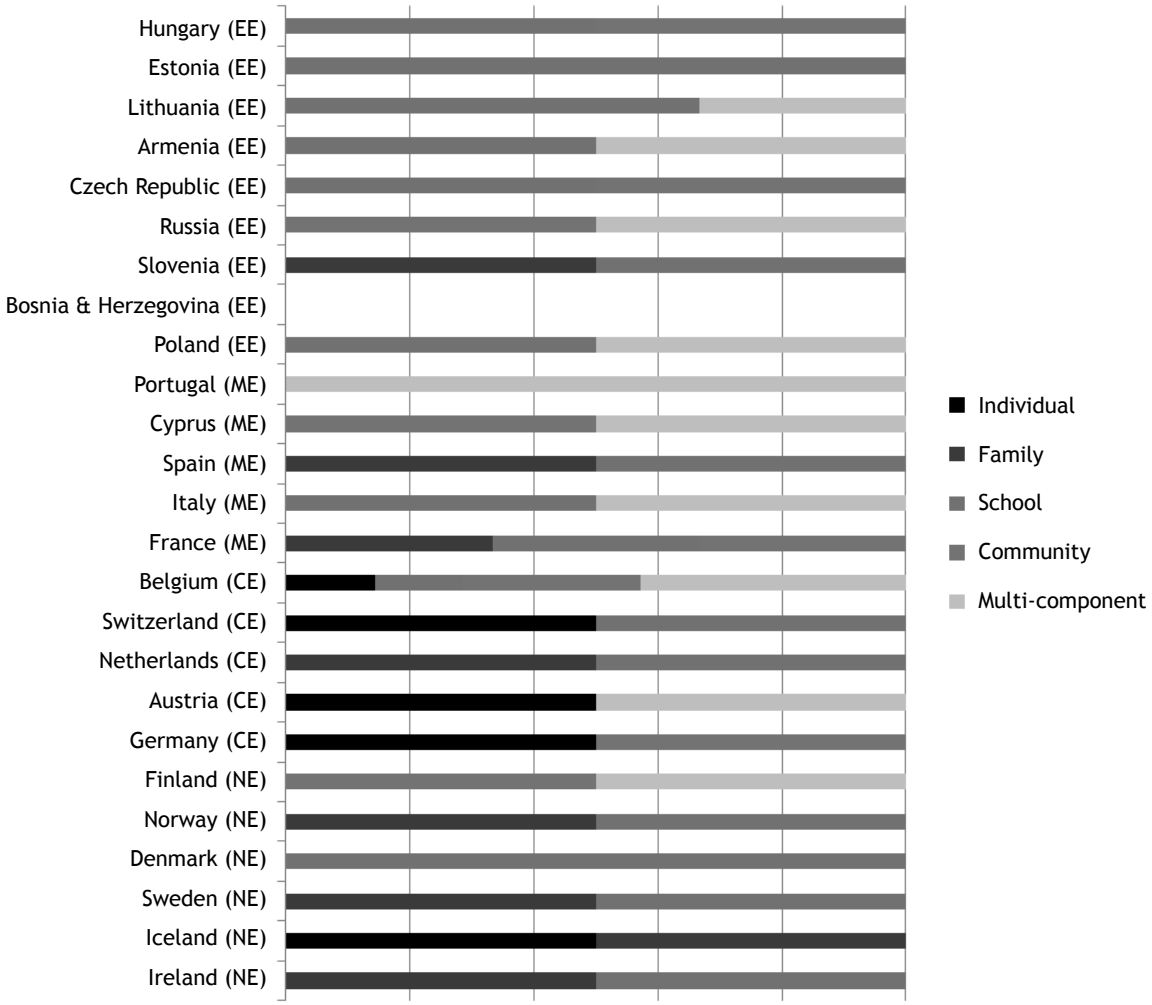


As we can see, the most widespread programmes are at school and community levels, while individual and family domains are less represented. The high number of multi-component interventions testifies that a holistic approach to prevention that targets several actors and dimensions simultaneously is becoming a further key factor in prevention strategies. Switzerland is the country with the highest number of programmes recognized (59), followed by Austria, Belgium and Italy. Armenia, Iceland and Slovenia have shown the lowest number of interventions. Most of the programmes are carried out in the Central European countries (Austria, Belgium, Germany, Netherlands, Switzerland) and in the Eastern European countries (Poland, Russia, Hungary, Czech Rep.), confirming a particular attention in these countries to alcohol prevention, probably due to their drinking culture. Interestingly, there are many more programmes described in the Mediterranean cluster (Cyprus, France, Italy, Portugal and Spain – N=80) than in the Nordic cluster (Ireland, Denmark, Finland, Iceland, Norway and Sweden – N=47). Individual interventions, as well as family and community programmes, are most developed in Central Europe. School interventions are common both in Eastern and Central Europe, while a multi-component approach is more frequent in Southern Europe. In the light of the limitations highlighted above, for evaluating aims we preferred to focus only on the programmes/interventions wished-for "best practice models" by national experts. We received 55 propositions from 24 countries (no programmes from Bosnia-Herzegovina) (see Table 21.3 and Figure 21.2).

Table 21.3 List of good practices proposed by local experts

Country/level	Individual	Family	School	Community	Multi-component
Ireland (NE)	0	1	1	0	0
Iceland (NE)	1	1	0	0	0
Sweden (NE)	0	1	1	0	0
Denmark (NE)	0	0	2	0	0
Norway (NE)	0	1	1	0	0
Finland (NE)	0	0	0	1	1
Germany (CE)	1	0	0	1	0
Austria (CE)	1	0	0	0	1
Netherlands (CE)	0	1	1	0	0
Switzerland (CE)	1	0	1	0	0
Belgium (CE)	1	0	1	2	3
France (ME)	0	1	1	1	0
Italy (ME)	0	0	1	0	1
Spain (ME)	0	1	1	0	0
Cyprus (ME)	0	0	0	1	1
Portugal (ME)	0	0	0	0	2
Poland (EE)	0	0	1	0	1
Bosnia & Herzegovina (EE)	0	0	0	0	0
Slovenia (EE)	0	1	1	0	0
Russia (EE)	0	0	0	1	1
Czech Republic (EE)	0	0	1	1	0
Armenia (EE)	0	0	1	0	1
Lithuania (EE)	0	0	2	0	1
Estonia (EE)	0	0	2	0	0
Hungary (EE)	0	0	1	1	0
Total	5	8	20	9	13

Figure 21.2 List of good practices proposed by local experts.



The majority of the programmes proposed are on school and multi-component levels (20 and 13, respectively), followed by family and community (8 and 9), while the individual domain is the least represented (5). An unexpected finding in the analysis is the substantial lack of an international scientific evaluation for the proposed programmes. Most attention is directed at the development of programmes, but little to no attention is given to their evaluation. Also, if evaluation is conducted, it concerns most often the implementation of the intervention (i.e. process evaluation). However, whether the programme had demonstrable effects was rarely investigated. As previously mentioned, to get over this limitation, we decided to perform a further evaluation of each programme. After the AAA-Prevent teams' evaluation of the proposed programmes, we selected 28 "good" interventions (see Table 21.4), according to the overall score (2 or 3). A brief description of these programmes is reported in the Appendix.

Table 4. Matrix of good practices suggested to publish in a AAA-Prevent website.

Domain	Program	Risk factor/s targeted*	Overall score	Country
Individual	Skoll (Self-control training)	Individual, peers	3	Germany
	Supra-f	Individual, peers	3	Swizerland
Family	Strengthening Families Program (SFP)	Individual, family, peers	2	Ireland
				Slovenia
	Triple P	family	3	The Netherlands
	Örebro preventionsprogram (ÖPP)	Family	3	Norway
				Sweden
	Dedalo	Family	2	Spain
School	Unplugged	Individual, family, peers	3	Belgium
				Italy
				Lithuania
				Slovenia
	To prevent is to live	Individual, peers, school	2	Spain
	Drug-Reason-Impact	Individual, peers, school	3	Czech R.
	Life Skills and Knowledge	Individual, school, peers	2	Hungary
	PDD-FM	Individual, peers, school, family	3	Poland
	Kurzintervention	Individual, peers	3	Swizerland
	I am OK when I say NO WAY	Individual, peers	3	Denmark
	PAS	Individual, family, school	3	The Netherlands
	Social Skills Training	Individual, family, peers	2	Estonia
Community	Prague 6 District	Individual, peers, school, family	3	Czech R.
	HaLT	Individual, family, peers, neighbourhood	3	Germany
	Don't start too early	Individual, family, peers	2	Belgium
	Local Alcohol Policy (PAKKA)	Peers, neighbourhood	3	Finland
	Responsible alcohol handling	Peers, neighbourhood	3	Norway
	STADs Responsible Beverage Service	Peers, neighbourhood	3	Sweden
Multi-component	PES´P Andar (Feet for Walking)	Individual, peers	2	Portugal
	Searching for Family Treasure	Individual, family	2	
	ODLOT	Individual, family, peers, neighbourhood	2	Poland
	Drug Policy at School	Individual, school, peers	3	Belgium
	A cool world	individual	2	
	ADSUME and EI	individual	2	Finland
	Snowball	Individual, peers	2	Lithuania

*Note: Individual: self-control and attitudes; family: family bonding, parents supervision, family affluence, life events; peers: lifestyle, friends and delinquency; school: disorganization, truancy, aspiration, school climate; neighbourhood: disorganization, bonding, integration.

On the whole, it seems that school is considered as the best domain for dealing with juveniles' alcohol prevention in real-life situations and this result substantially agrees with the literature. Foxcroft and Tsertsvadze (2012), in a recent review, found that the most commonly observed positive effects across programmes are for drunkenness and binge drinking and the evidence suggests that certain generic psychosocial and developmental prevention programmes can be effective and could be considered as policy and practice options (e.g. the Life Skills Training programme, the Unplugged programme and Good Behavior Game). If we consider the large number of multi-component interventions proposed, it seems that the multi-component approach has become of interest. This orientation comes from scientific literature that shows that the simultaneous involvement of different targets (e.g. students, parents, teachers) and settings (school, driving school, clubs, etc.) may offer a stronger potential than the involvement of only young people (Spoth et al., 2002; Foxcroft & Tsertsvadze, 2012).

Indeed, Foxcroft and Tsertsvadze (2012) reported that family-based prevention interventions also have consistent effects. Similarly, Carey et al. (2007) suggested that individual interventions may predict greater reductions in alcohol-related problems. However, we received a low number of micro-level propositions. A possible rationale may be that these domains are, by their inherent characteristics, more often governed at the local level than at the national level, with a consequent possibility of underexposure. For instance, domains such as individual and family are more often dealt with at the local level and, despite the existence of numerous programmes, few were included in the national reports because they did not fulfil some of the criteria for inclusion.

By analysing the risk factors targeted by the different programmes, we may notice that school-level interventions aim to improve students' individual aspects (self-control, attitudes and lifestyle) and school role (school as an educative alcohol-free environment). In the light of the evidence that the participation of families (parents) may be a more successful approach, it seems to be important to seek an interactive involvement between students and parents, particularly when the aim is to work on personal and social skills. An example of this approach is the widespread "Unplugged" (EU-DAP), an international prevention programme that is based on a Comprehensive Social Influence model, which integrates a life skills approach with normative education and the acquisition of knowledge concerning alcohol and substance (ab)use. This initiative has both a students' and a parents' programme, and it has been scientifically evaluated in numerous studies and in different countries. The Unplugged programme suggests the use of interactive methods of working in pairs or small groups. Specifically, the pupils exchange ideas and feelings and share and discuss their thoughts in groups; the role of the teacher is to encourage positive co-operation and interaction among the pupils (www.eudap.net).

At the community level, prevention programmes aim to limit the social and commercial availability of alcohol among youth, promoting responsible alcohol sales, changing drinking styles and influencing community attitudes and norms. An interesting approach has been developed by "HaLT", which connects behaviour-oriented prevention and condition-oriented prevention in order to recognize alcohol-related risks for young people at an early stage and to refer them to short intervention measures. Also, the organization of leisure activities can play an important role in alcohol prevention among youth, as demonstrated by an intervention programme used in the Czech Republic called "Prague 6 District" (see the Appendix).

It has been scientifically demonstrated that parents play a pivotal role when it comes to providing access to alcohol for early adolescents and in providing the attitudes towards alcohol consumption present among youths. In particular, when parents set restrictive rules about alcohol use, their offspring are more likely to postpone drinking. Therefore, at the family level, interventions aim to support the parents in their execution of the parental role (e.g. the Örebro Prevention programme). Indeed, it should be remembered that the list of programmes, compiled by national experts, reflects their attitudes and opinions, since each of them chose the programmes which he/she considered to be effective; so it is possible that other effective programmes are used in a certain country, but that they have not been selected. For this reason, the present report cannot be considered an ▫evidence-based review▫ of the best programmes/interventions for the prevention of alcohol use/abuse among juveniles in Europe, but is just an inventory of the best programmes/interventions according to the knowledge, competence, opinions and attitudes of the national experts participating in the research.

It is interesting to note that the national experts did not choose only evaluated, international programmes, but also local interventions without scientific evaluation but adapted specifically to each locality or culture; this attitude attests, as also emerged during the meeting in Ghent, to a clear ideological vision, which may be sharable. However, in our opinion, the need for evaluation cannot be abandoned. In the light of this, an important step forward could be moving from a "local" to a "global", or better a "glocal" approach, which could suggest an increase in the evaluation and implementation of evaluation processes, and help to develop evaluative strategies even for the most "local" initiatives.

21.5 Website of good practices

Concerning the dissemination of the information about the recommended best practices in alcohol prevention among youth, on the AAA-Prevent website a different subcategory was formed, namely

"Effective strategies" (www.aaaprevent.eu/strategies). On this website, prevention programmes, which were rated by a score of 2 or 3 according to our effectiveness ratings, are presented. When you click on this subsection, all the programmes that we found to be effective are displayed. The reader can click on a programme (s)he is interested in; there is also a chance to browse for specific programmes, limiting the list to a certain country, domain (individual, family, school, community, multi-component) or age (from 0 to 18). When you click on a specific programme, a description of the programme is displayed – namely, information about the goal, domain, age, target group, theoretical framework and method, also period of implementation, relevant literature and references to manuals of the programmes, overall effectiveness rating and sub-ratings (theoretical background, implementation and outcome measures), and finally information about evaluation processes.

In the sub-menu of "Effective strategies" (http://aaaprevent.eu/strategies/methodology), the methodology of the selection process of the programmes is displayed. Also, there is a link concerning alcohol policies in different countries (http://aaaprevent.eu/strategies/countries). When you click on a country, brief information about the alcohol policy in that country is displayed. The reader can download two files about the country: (i) country facts where information about the country in general is provided, and (ii) a longer alcohol policy description is provided (both deliverables from the first regional seminar reports). In addition, the list of recommended best-practice programmes is displayed below the short description of the alcohol policy.

21.6 Conclusions and recommendations

The main aims of the prevention programmes listed by the national experts are the delay of onset, consumption decrease and harm reduction. Prevention at school level is the domain of intervention considered to be most frequently effective compared to other domains. It is therefore important to define school as an educative alcohol-free environment. Interaction between families (parents) and youths seems to be a successful approach. It should be stressed that supporting the parental role by using different family-domain prevention methods is important in overall alcohol prevention. Community organization can also play an important role in alcohol prevention. Thus, it is recommended that local communities should be more actively integrated in alcohol prevention.

There is a substantial lack of evidence in evaluation, so there is a need to increase scientific research in the area of alcohol prevention methods. Many of the programmes used are only evaluated for implementation, and not for outcome. The outcome evaluation of the programmes should be encouraged and also supported. Evaluation in the long term should be improved, in particular by developing evaluative processes for local-based programmes. Effective projects need standards and a quality management for implementation purposes and in order to transfer these measures to other regions.

The limited funding for developing new alcohol prevention programmes should be pointed out. Prevention programmes should be seen as an investment for the future rather than just expenditure. This can lead to the increased use of international alcohol prevention programmes which may not be adapted according to the local context. It is recommended that more funding should be directed at the development and evaluation of new alcohol prevention programmes.

Finally, networking is also a very important issue concerning the application of alcohol prevention programmes. Both academics and practitioners should be provided with better opportunities to collaborate and exchange information concerning (i) the development of new alcohol prevention programmes, (ii) the evaluation of those programmes, and (iii) the implementation of the programmes into practice in different regions.

21.7 References

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22 *Policies, programmes and interventions: Results of focus groups with practitioners, policymakers and researchers*

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22.1 Introduction

In order to better understand the findings that came out of the AAA-Prevent study, and ultimately to formulate policy recommendations for further prevention actions on alcohol use, a seminar in Ghent was set up in the form of a series of focus groups. The purpose of this seminar was to encourage a discussion with policymakers, practitioners and researchers from different European countries on the results of the study. These findings were discussed in the form of a series of statements, and two sources of data were used as input for these statements: on the one hand, the findings that came out of the analyses on the ISRD-2 data set; on the other hand, findings from earlier focus groups in the regional seminars were used as well as the national reports that were provided as input for these seminars. The focus groups of the Ghent seminar were held on September 20-21, 2012. Thirty-four participants, representing 17 European countries, were present at the Ghent seminar (see Appendix I for a list of the participants). The represented countries were Belgium, the Netherlands, Germany, Switzerland, Ireland, Estonia, Finland, Lithuania, Italy, France, Spain, Cyprus, Czech Republic, Armenia, Russia, Hungary and Poland.

The focus group sessions were organized in four topics: two fixed ones and two variable ones. While the first of the two fixed focus groups handled the question of what levels prevention is supposed to work on, the second one addressed the question of how to handle the different alcohol cultures that exist in Europe. The other three focus group sessions tackled more specific topics. The first variable session was on involving parents and adolescents themselves as actors in prevention. The second variable session focused on how structural characteristics of the schools within countries can generate inequalities in drinking patterns. The table below gives an overview of the different focus group topics that took place in this two-day seminar. In what follows we give a synthesis of the findings and recommendations that came out of each of the four focus group topics.

22.2 Levels to work on prevention

The starting point for the first focus group topic was the observation that clear differences in alcohol use patterns are observed among adolescents in different European countries. One of the hypotheses for the quantitative analyses was that national policies would have an impact on youngsters' alcohol use. However, the analyses indicated that this was not the case. Differences in national policies could not explain the variation in alcohol consumption between the European countries. This raises the question of what this finding might mean for alcohol policy. What are the policy implications of this finding? What other factors might explain adolescent alcohol consumption? To streamline the discussion, some possible explanations and related statements were given.

22.2.1 Statements

An unexpected finding from the qualitative analysis is a substantial lack of evidence-based evaluation of prevention programmes. Most attention is directed at the development of programmes, but little to no attention goes to the evaluation of the programmes' effects. If evaluation is conducted, it is most often the implementation of the intervention (i.e. process evaluation) that is evaluated.

Statement 1:
It is hard to draw conclusions about what works, for whom and under what circumstances, since programmes are rarely evaluated. The European Union and its countries should invest more in impact or outcome evaluation.

It turned out that national policies (laws and regulations related to the sale and availability of alcohol, the legal age for purchasing alcohol, advertising, and harm reduction legislation such as drink-driving policy, etc.) explained little of the variation in alcohol use between the European countries. A possible explanation might be that these laws have already reached their maximum effect. This finding could be a plea for a shift from supply-reduction strategies to demand-reduction strategies (i.e. programmes aimed at drinking norms, beliefs and attitudes).

Statement 2:
More attention is needed for national policies targeting the demand side: drinking norms, beliefs and attitudes.

Overall, we registered 391 programmes and interventions in 24 European countries. The most widespread programmes are at the school and community level, with the individual and family domain receiving considerably less attention. The high number of multi-component interventions testifies that a holistic approach to prevention that targets several actors and dimensions simultaneously is a key factor in prevention strategies. This orientation is in line with scientific literature showing that a prevention policy targeting different domains (family, peers, schools, neighbourhoods, etc.) and sectors (in education, youth work, party sector, special youth care, etc.) simultaneously is the most promising way of working. Important herein is that not only youngsters themselves are the target of prevention but also all relevant intermediaries (teachers, parents, youth workers, etc). Specific attention should go to the local sector, because this is the domain where the various sectorial activities can be brought together and tailored to the needs of the local setting.

Statement 3:
An integrative programme of local government, schools and organizations (communities) is preferred to an accumulation of separate interventions.

One difficulty in quantifying national alcohol policy is that the existing alcohol policy measures at the national level do not fully represent the variance within the countries. This is because of the huge variation in alcohol policy and alcohol culture that exists at lower levels of government (communities, provinces, etc.). Therefore, the situation of adolescents (e.g. alcohol use pattern) specifically should be the starting point for prevention work.

Statement 4:
Policies and programmes should be tailored to the specific needs of different types of adolescents (e.g. moderate or heavy drinkers) in specific contexts (communities, areas, etc.). This also implies that research on the effects of alcohol policy and prevention should take the local governmental level into account.

22.2.2 Discussion with participants

Evidence-based prevention: Challenges and caveats
There is consensus that evidence-based prevention is necessary. The participants also recognize that few programmes have been evaluated, and that this holds in particular for country-specific programmes. Evidence-based prevention is, however, not without difficulties and caveats. First, the financial resources that are available for prevention are spent on the development instead of the evaluation of prevention. This choice is understandable given the fact that in most countries very little

money is available for prevention (this is especially true for less economically developed nations such as in Eastern Europe). On the other hand, it also holds that governments are not willing to spend money on prevention if its effects are not scientifically proven. The few evidence-based programmes that exist are often adapted versions of programmes that come from the United States or Australia. In Europe, on the other hand, hardly any prevention programme is evidence-based. Second, another difficulty in evidence-based prevention has to do with the complex nature and aetiology of alcohol use, the complicated methodological aspects linked to it, and the absence of a culture of evaluation. Also, it is much easier to identify the short-term effects of prevention programmes, but it remains unclear what the long-term effects are of these prevention programmes. Good evaluation research requires substantial personal, economic and financial investments and a know-how of how to conduct proper evaluation research. These resources are absent in most countries, making proper evaluation research a tedious task, if not impossible.

Community readiness

Attention should be paid to community readiness for prevention. For instance, introducing a new law on alcohol (e.g. raised age limits for buying or drinking alcohol) can set things into motion and make a certain public statement. Form a legal point of view, it then changes from being legally acceptable to non-acceptable. However, whether this stance will be *culturally* accepted depends on other factors as well. Sometimes, a prevention programme is proven to be effective but is not implemented because of emotional factors (i.e. the public is not ready for this). Experts see a tension between legal norms and social norms, because the latter are more group-specific in society whereas the former treat every individual the same way.

Because of these social and emotional factors, it is important to inform all intermediaries and stakeholders (politicians, teachers, parents, youth workers, bar and shop owners, etc.) about the problem at hand and the relevance of the suggested policy. The implementation of an evidence-based prevention programme needs to be accompanied by a social basis of public support (i.e. community readiness). However, it is clear that community awareness is more easily achieved with evidence-based prevention programmes than with prevention programmes that have not been scientifically evaluated. Putting something on the public agenda is thus almost as important as the prevention effort itself.

Task for European Union?

Given these difficulties and problems surrounding the evaluation of prevention, participants see here an important task for the European Union. Further development of new programmes should be rather discouraged, and more attention should go to the scientific evaluation of what is already present (both at the national and regional level). In doing so, we have more knowledge on the scientific validity of different kinds of programmes and practices. Different options are available. One could further continue implementing programmes from countries with a history of evidence-based prevention research. It is important, however, to adapt these programmes to the specific culture of the country at hand, but without losing the focus on the core aspects of the programme. Any adaptation needs to be done on a scientific basis. Some experts have stressed being cautious when implementing an internationally accepted programme and to prefer locally developed approaches instead.

Another option is to think about European research funding with specific attention to the scientific evaluation aspect. The European Union should also further develop a framework for alcohol prevention, because now there is no political will to spend money on scientific evaluation of programmes. The participants were also very positive about a European database of effective prevention programmes. Such a database would allow researchers to share knowledge concerning effective prevention programmes, to identify other relevant programmes, possibilities of implementation, etc. Such a database should be very intuitive and straightforward. The information cannot be too general, otherwise it is much more difficult to see the possibilities of the programme or the aspects that need adaptation. Within such a European network, meetings between local experts in prevention should be encouraged so that preventive efforts can more easily be diffused.

Targeting the demand side: A challenge

If the purpose is to change the alcohol culture (i.e. the demand side), then the question arises of how we can change not only the individual but also the society. Changing this latter aspect requires asking questions about why teenagers drink alcohol in the first place. What are the motives to drink alcohol? Sometimes drinking alcohol is not considered a problem in a society (e.g. in Southern European

countries), or there exists a general view that the state has no right to interfere with regard to drinking alcohol (e.g. in Anglo-Saxon countries).

It is stated that current prevention and harm-reduction methods often do not work with teenagers because teenagers simply like what they are doing; they want to explore their limits, meet people, have fun, and experimenting with alcohol is part of that process. Most often, teenagers are not really worried about the possible side effects of alcohol. Also, for most teenagers the total picture doesn't fit because of the mixed messages that are perceived: they see their parents drink alcohol, so why then would they not be allowed to drink alcohol? These differential standards are very confusing, and therefore some experts argue that the prevention goal of total abstinence for minors is not a realistic goal. Instead, we need to teach them how to drink in a responsible way, to understand what happens when drinking alcoholic beverages, to recognize the signals when they have to stop, etc.

Recommendations for changing the demand side

Changing the demand side is most effective when different kinds of mediums spread the same message. All voices in the same direction. It may be interesting to look at how other countries deal with this issue. Original and innovative methods can be found, for instance, in various countries. In other cultures, for instance, two countries with completely different cultural roots, alcohol prevention messages are also diffused through popular soap series.

If prevention targeting the demand side is undertaken, then one should always focus both on the adolescents themselves and their parents. In this process, a developmental perspective is required, adapted to the specific cultural context in that country. It is stressed that working with parents in prevention works best before teenagers start drinking alcohol. Focusing on adolescents means taking into account the huge influences of peers in this life stage, as well as recognizing that prevention should always be age-specific. However, when working on drinking norms, beliefs and attitudes, it is important to get the students involved in the process of doing prevention by working interactively and by integrating their daily life experiences. However, it is important not only to involve them in *doing* prevention but also in the *creation* of the prevention programmes themselves (to make them an active actor in this process). For instance, one could let them help decide what kind of programmes should be used for children, or discuss the programmes with them in exercises.

It is also argued that more attention should go in prevention to positive reinforcement of the "desired" behaviour. In health education at school, a good strategy is to give rewards for students abstaining from alcohol. In prevention, too much attention goes to the negative aspects of drinking alcohol. According to some, such "positive" messages (e.g. it can be cool and healthy to be a non-alcohol drinker) would even have stronger and longer-lasting effects than the latter (e.g. smoking can kill you). Such messages should not only focus on alcohol, but also on other dimensions of health (i.e. a healthy life style: non-smoking, exercise, reproductive health behaviour, etc.). Participants are much more positive about a health policy that not only invests in changing drinking behaviours, but also in other health behaviours. Finally, it is considered important to provide sufficient organized activities in which teenagers can meet each other in an alcohol-free environment or where teenagers can obtain alternative forms of statuses and integration in the peer group.

A general policy AND separate interventions

Most participants agree that a combination of separate distinctive interventions is most effective, but that these interventions should be anchored in an overall "general" alcohol policy. Ideally, each of these separate interventions should be scientifically evaluated (evidence-based), and then combined into a multifaceted alcohol policy. However, the experts recognize that no such thing as a "golden approach to prevention" exists. Prevention should also broaden its scope, and see whether things can be learned from other public health discourses (e.g. drink-driving policy, wearing seat belts, smoking policy, etc.). What has often been successful is a holistic approach to prevention incorporating several actors, domains and methods simultaneously.

The experts argue that national government should make the overarching goals of alcohol prevention more explicit, and that governments should provide the necessary resources so that programmes at different structural levels and domains can be set up. Rather than a policy in which different partners do their own thing, it is considered better to have a national alcohol policy in which all separate interventions are structurally embedded. Therefore, a framework is needed that makes the goals that are pursued explicit and that provides a clear argumentation of why these goals are so important. It is

considered of crucial importance that adolescents understand why this or that rule applies. However, in reality, setting up such an integrative policy is not easy to pursue for a variety of reasons that often differ from country to country. This observation raised some new questions in the focus groups. For instance, is it useful to introduce separate interventions if there is no general alcohol policy in that country? Or, if the overall alcohol policy is very permissive, is it worth putting money in separate programmes?

Universal prevention AND targeted prevention

Although universal prevention is the basis of every prevention strategy, prevention should take into account the social inequalities that exist in health behaviours such as drinking alcohol, but with special care not to stigmatize their target groups. Thus, we need a universal message with regard to alcohol prevention in adolescence (see *supra*), but the way this message is transferred needs to be tailored to the specific groups of teenagers we're dealing with (i.e. targeted prevention). Different kinds of youngsters need different types of messages (e.g. children from the more vulnerable social groups in society, sensation seekers, risky drivers, etc.). Vulnerable social groups, for instance (children from lower-educated families, poor households, etc.), are often not well reached by traditional prevention strategies. In such cases, other strategies are required, such as peer education. Again, what is important before implementing new strategies is to assess the specific needs and characteristics of our target social groups: why do they drink, in what social setting do they grow up, what are the characteristics of these groups, etc.? Participants stress the importance of hearing the voices of these particular social groups, to prevent top-down interventions causing unintended side effects (e.g. stigmatization). Ideally, any development of prevention programmes should be the result of an interaction between top-down and bottom-up processes in which policymakers, researchers and practitioners work together.

Local initiatives under the umbrella of a national funding scheme

Experts agree that there is a need for programmes that are tailored to the needs of the local setting. However, it is mentioned that the power of these local governments is very different in the European countries. In some countries local governments don't have much power (e.g. Ireland). In other countries (e.g. Spain) the municipalities are very autonomous. Another problem is that local communities have so many problems to solve, and prevention is often not a top priority, making them handle prevention more easily, e.g. with campaigns. Without the necessary local funding it is almost impossible to think about any good prevention strategy. It is here that lies, amongst others, one of the main tasks of national governments. They have to provide the framework, the necessary funding for local governments and NGOs, and the control mechanisms. But again, this relates back to a previous point, i.e. that governments are not eager to spend money on prevention if the programmes are not scientifically evaluated (see *supra*).

22.3 Handling alcohol cultures

The topic of this focus group is on alcohol cultures within different countries and it serves as a discussion point regarding global prevention methods in Europe. The starting point for the focus group was the observation that alcohol policies do not vary significantly between the various European countries. A second observation was that countries differed quite a lot in the prevalence of problematic drinkers (e.g. prevalence rates of problematic drinking behaviour are higher in Western European countries than in Mediterranean countries). However, these policies did not explain any of the large variation in alcohol consumption patterns. These two observations are used as an introduction to the question of how prevention should deal with the cultural differences in drinking behaviours on the one hand, and what factors are associated with them on the other. After this short introduction, a series of statements are presented to the focus group participants to get a discussion going on policy recommendations with regard to alcohol prevention.

22.3.1 Statements

Statement 1:

Prevention efforts should target different use patterns

- How should we define risky alcohol use among teenagers? Which alcohol use patterns can be considered risky and why?
- Given the quite high alcohol consumption among minors, what is it that we want to achieve in alcohol policy for this group of adolescents: zero tolerance or responsible drinking? Is responsible drinking not a more realistic goal? And if so, how should we promote this, e.g. by focusing on responsible drinking in the family?
- How can we delay the onset of drinking? How should we encourage minors to abstinence? How should we encourage minors to responsible drinking?
- Should prevention efforts target different use patterns and different groups of alcohol users in countries with different alcohol-drinking cultures in order to reach these goals?
-

Statement 2:

Integrating cultural norms – Traditional wine-drinking cultures (i.e. Mediterranean countries) show a lower proportion of users at risk whereas Central European countries show a greater proportion of excessive use habits.

- Can Mediterranean cultures serve as a kind of example for the whole of Europe? What do Mediterranean drinking habits exactly comprise?
- Is it possible to export cultural norms, given that these cultural aspects are so rigid, persistent and difficult to change? How could such a change be pursued?
- Should prevention efforts target different use patterns and different groups of alcohol users in countries with different alcohol-drinking cultures?

22.3.2 Discussion with participants

Cultural drinking

European countries vary quite a lot in the prevalence of particular alcohol consumption patterns. The way adolescents use alcohol is very much dependent upon the cultural background. For that reason, the definition of risky drinking or problematic consumption must be redefined within each cultural group. In some countries, problematic drinking starts with the consumption of alcohol before the legal drinking age. However, other cultures see adolescent drinking as a part of socialization and growing up. The alcohol culture in a country is grounded in, for example, traditions, i.e. the family life which again influences and contributes to the way youngsters feel about alcohol. Culture is considered to be an important criterion for the development of consumption patterns and should therefore not lose its importance. According to the experts, the first step is to understand drinking behaviour or to recognize the motives behind the consumption patterns of adolescents. These reasons can be: firstly, a way to have fun with peers; secondly, it functions as a coping mechanism for youngsters with problems, e.g. bullying; or there are also adolescents who drink because they learn it from home (e.g. parents with drinking problems). The first reason is considered to be the aspect with the highest influence from the cultural background. Alcohol is a way to have fun and this is expressed differently within each culture. For a lot of adolescents in Western European countries, the expected outcome of consuming alcohol is to get drunk. However, in Mediterranean countries, drunkenness is considered to be inappropriate and seen as shameful. In some countries, adolescents drink because there is a huge lack of alternative activities to spend their leisure time on. Prevention should focus on the drinking motives of youngsters and their cultural background, and should provide sufficient alternatives.

Zero tolerance versus responsible drinking

Countries differ only insignificantly regarding their alcohol policies. The minimum drinking age is 16 years in most countries for low-alcoholic drinks, e.g. beer, with a legal age limit of 18 years for liquors. There is a general tendency in Europe to have a zero tolerance policy on drinking up to the age of 16, combined with permissive attitudes towards drinking by those who are already 18. The age 16 to 18 is in a “grey zone”; the policy direction is unclear. Furthermore, cultures vary in the way they obey these rules, e.g. parents let their children drink alcohol at home. Furthermore, countries vary in the strength

of policy reinforcement by the government. We should differentiate between declared policies and enforcement of policies. While in some countries zero tolerance is hardly ever enforced (e.g. Italy), in other countries (e.g. Scandinavia) enforcement is efficient. According to the law, no-drinking behaviour is expected before the age of 16. But still youngsters find a way to consume alcohol and therefore other measures apart from policy regulation are needed to protect children from engaging in transgressive behaviour and show them how to act responsibly. Prohibition and reinforcement of rules and regulations are only the first step. But not only should sellers, shop owners and bartenders be involved but also parents should be obliged to know and care about their child's health. Further research and education should be promoted when alcohol consumption is of concern. A clear message would be that drinking alcohol is not acceptable below the legal drinking age, and when drinking becomes an issue (age 16), youngsters should be made aware of responsible drinking and the consequences of alcohol. And another important factor for defining risky alcohol use is to consider the consequences of use, such as risky sexual behaviour or driving a vehicle when drunk.

Family-oriented countries

Every culture has its own way to handle alcohol education for adolescents. In many countries, family is considered as very important; generations live together and influence each other. In Mediterranean countries in particular, adolescents are brought up with alcohol traditions they learn from their parents. For them, learning how to drink (i.e. responsible drinking) is part of their socialization and ought to be a parental task. Data show that this approach might contribute to the low number of problematic drinkers in those countries. However, even in such countries, risky drinking habits are becoming more prevalent according to the change of society. Problematic alcohol use happens outside the family context when youngsters start to go out with their peers.

There is a huge debate over whether responsible drinking is a learning process which needs to start very early in life or whether it is better if children are abstinent up to a certain age and start drinking once they are grown-ups. According to experts, some methods of drinking education work better in some countries while in other cultures a zero tolerance policy is more suitable. However, beyond that, alcohol education should be considered as a way to make children aware of the consequences alcohol can have, and also they should know what moderate drinking is supposed to mean, perhaps not in a practical but rather in an informative sense. We can conclude that zero tolerance can only be the last option towards prevention of underaged problematic drinking and one step further should be taken by introducing prevention programmes which work on the community, school and especially the family level to learn about alcohol before children start using it.

European level

The question is what works on the European level and what can further be done to influence the alcohol behaviour of adolescents from this array of countries. Can we learn from other countries how to lower the alcohol consumption of youngsters or to delay the age of onset? Figures have shown that Mediterranean countries in particular present a lower prevalence of problematic drinking behaviour than other countries. Experts do not think that a cultural mentality can be integrated into other countries with completely different traditional values in regard to alcohol. Countries are far too different within Europe to be able to find a general rule for preventing youngsters consuming in a dangerous manner. However, a global strategy can work regarding the opening hours of off-licences, advertisement restrictions (e.g. labels on alcoholic products), restrictions regarding sponsoring partners (e.g. alcohol drink sponsors for sport events), parental responsibility toward the health of their children and alcohol use in public (e.g. trains, buses). Despite that, it should be added that societies start to change in every country for different reasons, such as the rising number of immigrants, tourists and settled international companies, and more travelling possibilities. European countries start to become globalized and this indirectly affects drinking habits and attitudes. In Mediterranean countries, a change towards a more peer-oriented drinking pattern is more and more visible, diminishing parental control and therefore increasing the risk of problematic consumption behaviour.

Conclusion

Prevention should focus on the drinking motives of youngsters and their cultural background, and should introduce alternatives to drinking alcohol as a leisure time activity. Responsible drinking and the possible consequences of alcohol consumption should be a part of their general education, teaching children in an informative way what happens when alcohol is consumed and how someone should

react in emergencies. A general European prevention strategy might not be that successful considering those enormous cultural differences regarding alcohol traditions, however a global strategy could work regarding the opening hours of off-licences, advertisement restrictions, restrictions regarding sponsoring partners, parental responsibility toward the health of their children and alcohol use in public. Awareness should be raised towards the upcoming cultural changes as a consequence of globalization. Those changes affect the drinking cultures and the role of youngsters as consumers resp. as a target group for advertisements.

22.4 Involving parents and adolescents in prevention

From the analysis of the effects of family factors on adolescent alcohol use, it was found that family bonding and supervision act as protective factors for adolescents. In reports from the second regional seminars, and also discussions held in the seminars, it was pointed out that it is sometimes difficult to involve parents in prevention activities. It is important to discuss how to involve parents better in the prevention programmes. Based on this, the following statements were presented to the participants of the focus group.

22.4.1 Statements

Statement 1:
There are very few prevention methods mentioned in national reports which involve adolescents or young people themselves in prevention activities.

- Adolescents and young people can be more involved in alcohol prevention. How can we reach them better? What could motivate youth to participate in prevention work?
- How effective are prevention efforts involving adolescents themselves compared to those conducted by professionals?

Statement 2:
In the reports, several prevention methods involving parents were described. We are interested in how these methods are applied in practice in different countries.

- How do these programmes reach parents in practice? Are the parents eager to participate or are these countries encoutering difficulties with involving parents in prevention activities?
- How can we involve parents more effectively in alcohol prevention? What could motivate parents to participate in prevention programmes?
- Zero tolerance toward adolescent drinking or responsible drinking at home – what policy should families promote?

22.4.2 Discussion with participants

The effect of supervision
First, what works in educating families was discussed. It was suggested that supervision is an important factor in reducing alcohol use. It was pointed out from the research that family bonding has an effect on alcohol use but not on delinquency. One should consider that supervision can have a co-effect with how much parents drink alcohol themselves. If they do not drink or drink responsibly, and also they practise effective supervision over their children, then it can have a positive effect in decreasing adolescent alcohol use.

Effective prevention programmes and their targets
Of the effective programmes, the Örebro Prevention Program from Sweden and the Strengthening Families Program (which is not solely an alcohol prevention programme) from the US are mentioned as good examples. It has been pointed out that the application of these prevention programmes depends largely on the capacity of parents. Some of the programmes like SFP are really excessive and take a lot of time, while ÖPP is a brief intervention. From the Netherlands, Triple P is mentioned.

Another issue discussed was whether universal or targeted programmes should be used. It was mentioned that as well as alcohol it is important to focus on other risky behaviours; alcohol use is only a part of it. It is crucial to involve parents as well as adolescents in these programmes. Practitioners

note that those parents who most need to participate may not come to the school, for example, and therefore forwarding the message to them is difficult. Still, school is the easiest place for parents to come after their everyday work.

The "prevention paradox" was mentioned – the prevention message gets to more cases from the general population than from the target group. On the other hand, it was discussed that one aim is to influence the general norms of the society – and this can be done by reaching those parents who attend the intervention meetings (and may not be from the target group). Practitioners' cooperation with schools was stressed – it has to be good for the programme to work well.

Approaching and involving parents

Parents can be difficult to reach. One idea which seems to work well is that when an alcohol prevention programme is conducted, the same topic is discussed with parents in the same evening. By doing this, the involvement of parents will increase. Also, a good idea is the indirect approach – for example, children make up a theatre play regarding the topic of alcohol or drugs. They create the content and rehearse, and finally they present their play to the parents (after which a professionals-based discussion about the effects of alcohol can be introduced and myths broken). The youngsters' involvement is thereby guaranteed.

Still, the question remains of how to approach parents. Selective programmes may create ethical problems: for example, the risk of stigmatization at school. One solution could be a private approach (for example, if something has happened as a consequence of alcohol use). If the private approach is done systematically and teachers are attentive to certain problems at school, then it can have a strong effect on alcohol use.

It is important to use parents when implementing the programmes – what do they think of the programmes. This has been used in implementing the imported programmes into practice. When parents are involved, they will know what language and concepts we use when doing prevention and they can also use the same terms afterwards. It was discussed also that sometimes parents rely very heavily on school, like in matters of sex education or drugs – what is the situation regarding alcohol? Or do they think of alcohol at all? It needs to be studied who gives the adolescent advice concerning alcohol.

Age of the target group

Also, it was discussed at what age children should be spoken to by parents regarding information concerning alcohol? It was mentioned that this should be done at a young age. The effectiveness of alcohol prevention programmes is higher if they are started earlier. However, for younger children the overall message of being healthy can be more effective; alcohol prevention can be a part of the message.

Content of the prevention programmes

The message that should be targeted at parents is that they have an effect on the upbringing of their children. Parents should be responsible for their children. Parental control and supervision work and these strategies are effective. Parents should not rely only on school (or peers) but deal with these issues at once and directly. Problems should be dealt with when they arise. Children learn everything from the family, especially how their parents behave when problems occur.

The parents' role modelling and constant monitoring are crucial, establishing norms and rules in the family. The main aim is not to punish but to monitor. It was mentioned that there are parenting programmes for parents of very young children, but why are there no programmes for 10-to-15-year-old children's parents on various issues.

Among the participants, there was also a tension between alcohol abstinence and responsible drinking. Wine tasting in Mediterranean countries is one thing, but another is turning a blind eye when a minor comes home drunk. One approach in prevention could be a generalized "healthy class/healthy school" competition, when not only alcohol but other issues are stressed. In this the group could co-operate and not point at those who are wrong. Peer pressure can be more effective than the influence of adults or parents.

Cultural differences

Cultural differences should be acknowledged; there cannot be only one "European" message. The messages should be carefully targeted. Youth should be contacted and asked whether when they took a risk, for example, it was worth it and what they learned from it. Protective factors may not be universal either – for example, look at the differences in binge drinking.

Policy recommendations

For alcohol policy recommendations, the following issues can be pointed out. It is important to consider how the message of alcohol prevention is carried to the parents without stigmatization. There have to be different messages to different target groups. One way of safely forwarding the message could be overall health issues, among which the topic of alcohol is also touched upon because parents usually want their children to be healthy. This can be for prevention programmes for both youth and parents. Among youth, peer pressure can also be used for the whole class to stay healthy.

It is important to invite parents to school to let them know which programmes are carried out with their children. If only some parents turn up, it will still carry the message to the local community. When doing interventions with parents, it is important to explain to them that what they do at home when rearing their child is important. They have to take responsibility for rearing the child, to monitor what the child is doing and, when problems emerge, address these problems at once.

Cultural differences should be considered when implementing the programmes; there cannot be one unique method or message for the target group. One thought for where to begin would be changing attitudes: for example, it is not OK for adolescents to be drunk. For research, it needs to be studied who gives the adolescent advice concerning alcohol at home. Also, parenting programmes for teenagers (aged 10 to 15) are needed, especially on how to deal with issues such as alcohol, tobacco, drugs, sexuality, et cetera.

22.5 *Alcohol use and schools*

The topic of the fifth focus group was on schools as a structural context in which teenagers spend a lot of time together, in an environment that also shapes students' moods, well-being and ultimately their health behaviour including alcohol use. The starting point for the focus group was a set of observations that came out of the analyses of the ISRD data. More particularly, we focused on a small group of countries with a streamed educational system from the first year of secondary school onwards. Comparative analyses indicate that prevalence rates of problematic drinking behaviour (e.g. heavy episodic drinking) are higher in lower- than in higher-status education types, but that these differences are more pronounced in the countries with the strongest hierarchical streaming structure in Europe (i.e. Western European countries). A second observation is that the inflow into the different educational streams is strongly determined by the socioeconomic background of the students. Students from lower socioeconomic backgrounds tend to concentrate on the vocational streams, while students from higher socioeconomic backgrounds tend to group together into the more academic streams. However, according to the data, these selection effects are observed to a much lesser degree in the Eastern European countries. A third observation is the so-called "waterfall mechanism" that is especially prevalent in Western European countries. Students who don't get enough points in general education tend to "drop down" into the educational system and often end up in vocational education. These three observations are used as an introduction to the question of how prevention should deal with the school environment to offset or attenuate the differences in drinking behaviours on the one hand, and the school-related risk factors that are associated with it on the other. After this short introduction, a series of statements was presented to the focus group participants to get a discussion going on policy recommendations with regard to alcohol prevention.

22.5.1 Statements

Statement 1:
It is often said that the school is the domain of intervention considered to be most frequently effective, because you can easily reach a whole group of same-age peers at once. However, given the differences in drinking behaviour between students from different streams, the question arises of whether prevention is also effective for the more vulnerable adolescents, the socially excluded youth, the youngsters from lower socioeconomic groups?

- Is it not so that school-based prevention is less effective in reaching these groups of teenagers, given, for instance, the higher prevalence of an anti-school climate in vocational-oriented streams?
- Should a different approach to health prevention be pursued according to education type or should one focus on a universal prevention only?

Statement 2:
Would prevention not be better shifting from an approach targeting the individual to an approach targeting the structural context of, for instance, the school environment? Are these findings not a plea for changing the school system or school environment so that these forms of (health) inequalities are less pronounced?

- Is it desirable to have streaming systems so *early* in secondary school?
- Should one try to achieve a better appreciation of vocational-oriented streams*?*
- What other aspects of the school environment deserve more attention from a prevention perspective?

22.5.2 Discussion with participants

Is prevention effective for vulnerable adolescents?
Schools are considered a very easy domain to work on health promotion because it is one of the few settings in which you can reach all youngsters at once. But prevention programmes should be tailored to the special needs and characteristics of the student population within these schools. Some prevention programmes, such as "Unplugged" (a life skills approach), seem to be quite good at reaching various groups of adolescents by setting up different kinds of dialogue and interaction styles with these students. The way instructors relate with students for a programme such as Unplugged is different from the way they relate with students in a normal classroom situation. Working on health promotion in a school context is considered most effective when conducted in a dialogue-based way, with high participation and involvement of the students in this process. Little is known, however, about how schools deal with prevention in everyday reality. This is because, in the end, schools themselves make the final decision on whether they want to work on health prevention or not and how they plan to do that. Also, while in prevention terminology a distinction is often made between universal, selected and indicated prevention, it is not always clear to what extent this distinction is implied in reality.

Political support
It is argued that we need to be cautious about saying that schools are responsible for prevention in their schools, especially when it is not clear whether there is political support for working on prevention in schools. Teachers and school administrators are simply not equipped with the necessary knowledge, skills and means to work on health promotion with adolescents. Even doctors and other first-line carers have no training to work on health promotion in their daily practices, an alarming illustration that prevention receives little attention in the current public health discourse. Thus, more political support is necessary for health promotion in schools and other settings, so that teachers know how to handle such situations and have the necessary means and skills to do so. If political support is absent for health prevention, teachers might become frustrated, or feel incompetent, and this might eventually lead to adverse effects on working on health promotion. So, there are plenty of parameters we have to bear in mind before saying that schools have a responsibility in health promotion, *if* schools are responsible at all! In some countries, like France, people are very clear about this: schools cannot take responsibility for every aspect that relates to adolescents' development.

Systemic approach
Schools alone cannot bear full responsibility for adolescents' health promotion, and a more systemic approach is indispensable where different partners at the local level work together (i.e. shared respon-

sibility), and where some form of coordination and support exists at the regional and national levels. A related point in this discussion on doing prevention in a "systemic" way is the age group at which all current prevention is aimed. This target group seems to be *adolescents* exclusively, with little to no attention to young adults. Once students enter into higher education and university, all prevention comes to an end, because youngsters are considered "free will" adults and their drinking behaviour should no longer be the focus of attention. However, when students enter into higher education, a huge tradition of alcohol consumption emerges and it is in these years that certain kinds of alcohol consumption patterns are developed. Prevention should not come to an end once students become young adults.

Structural environment of school

Schools are often used as the main channel to work on health promotion, but the prevention strategy is often focused on changing *the individual* (for instance, working on the development and consolidation of life skills). The structural environment of the schools themselves is, however, seldom the focus of attention in prevention policy. More particularly, why is it that the more vulnerable youth, youth in the more vocational-oriented education types, etc., drink more problematically. What are the motivations behind their health behaviours? These questions relate to the risk and protective factors of alcohol use, factors that are connected to the school environment and that may differ for students of different backgrounds, for students in different types of schools, and even for students in different cultures. Teenagers may drink because they are feeling unhappy at school, because they perceive themselves as educational failures given the way secondary education is structured (i.e. the waterfall mechanism), especially in Western Europe. When children perceive themselves as low achievers, their level of self-esteem and study motivation goes down. They have different and often strained relationships with teachers and school staff. Drinking alcohol may then become a kind of coping mechanism to handle the strain emanating from these negative experiences. More attention should thus be paid to changing the school environments themselves in order to grasp the more distal risk and protective factors of alcohol use. It is imperative in this regard to bear in mind that motives for drinking alcohol may not only differ among students from different backgrounds, but also among students in different countries. However, it is argued that in countries with a stronger history in communism or where liberal-democratic regimes are a more recent phenomenon, students in vocational streams do not always feel educational failures with a eroded self-esteem, etc. In these countries, the working class has traditionally been seen more as a model class (being a labour worker was a good thing), and growing up in an intellectual, bourgeois family was often a reason for being despised.

Although the ISRD data indicate that clear differences exist according to education type, it is not clear whether differences in drinking behaviours exist according to the socioeconomic background of the parents. Research often indicates mixed findings in this regard. Nevertheless, when using education type as a proxy of a student's future socioeconomic position, clear differences are observed among students in different types of education. It is argued, however, that we should be very careful with the labels we use to categorize youth (i.e. students from lower versus higher socioeconomic background, students in academic-oriented versus vocational-oriented streams), especially in the light of the kind of reports we intend to write.

The findings regarding alcohol use differences between students from different streams are also in line with PISA studies in the sense that in countries where streaming starts early in secondary school, social differences in academic outcomes are more pronounced than in countries where no streaming exists or where this choice is postponed until later years. It is for this reason that the Organisation for Economic Co-operation and Development (OECD) has pushed its member states for many years to postpone the definitive choice for a particular stream until later years in secondary school. Delaying the choice for a particular stream until upper secondary school might be one of the many ways to cope with the observed inequalities in health behaviour. Another option might be the pursuit of a better appreciation of studies in vocational streams, and to decrease the segregation of students of different streams. Too often, following vocational education is not a personal choice, not a positive choice, but a consequence of the fact that you failed in general education. This is also linked with research indicating that teachers in lower streams often think of their students as "educational failures" and "unruly", and that teachers have lower expectations of and give fewer positive stimuli to these students. By streaming students together (e.g. having a strong school segregation among students of different

streams), a particular cultural climate starts to emerge, especially when this grouping is linked with the socioeconomic status of these students.

Prevention policy should also think about other structural measures that might create a better physical and psychosocial school environment for these students, especially in the more marginalized schools. Examples in this regard might be: a safe and well-maintained school, a suitable offering of sport and leisure time activities, student councils in order to involve student participation, but also empowering pupils by involving them in planning, creating and sustaining a school culture of safety and respect, a better involvement of the family and neighbourhood in school affairs, etc.

Conclusion

Health prevention, as we know it, is targeted too much at one particular group of people (i.e. adolescents) and is too focused on changing the individual. This while prevention is most promising when pursued in a more systemic way, both in time (prevention aimed at adolescents, young adults, adults) and place (prevention aimed at the individual, schools, neighbourhoods, families, media, etc.). The different partners (schools and, for instance, neighbourhoods) also need to work together in this regard in order to deal efficiently with the underlying risk and protective factors of alcohol use (see ‘Communities that Care’).

Part VI

The Bigger Picture

Part VI draws conclusions about the meaning and implications of all the results from the AAA-prevent project. Based on the analysis of existing environmental strategies of public and private actors at different governance levels, and the outcomes of our analysis of factors on different levels that influence the initiation of youth alcohol consumption, possible effective strategies for the prevention of alcohol abuse by adolescents in different European countries will be presented.

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23 *Afterthoughts*

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23.1 Introduction

Adolescent alcohol and other drug use is a problem of growing concern within Europe. Youths in Europe start to drink at a younger age and drink more frequently than youths in other countries (European Monitoring Centre for Drugs and Drug Addiction, 2003; Junger-Tas et al., 2010; National Research Council and Institute of Medicine [NRC-IOM], 2009; United Nations, 2005). Hazardous and harmful drinking patterns, such as drinking beyond the point of intoxication and heavy episodic or so-called binge drinking, seem to be on the rise among adolescents and young adults (WHO, 2007; McAllister, 2003; Lancet, 2008). Excessive alcohol use increases the risk of individual and social harms, such as addiction, injuries, diseases, crime, violence and abuse. It is often so that the higher the frequency and intensity of alcohol consumption, the more serious the harm (Anderson & Baumberg, 2006), and many of these cases also go hand in hand with high economic costs.

In the contemporary context of globalization, nations can no longer formulate their alcohol policies in an international vacuum. Several organizations have recognized the importance of addressing alcohol policy from a cross-national perspective, whereby the World Health Organization plays a leading role. Since 2001, the EU has also been active in this sphere of public health, and since 2006, the European Commission has played a significant role by communicating a vision and strategy which supports member states in reducing alcohol-related harms. The EU alcohol strategy explicitly aims to protect young people from alcohol misuse and its harmful consequences. The development and maintenance of a common evidence-based strategy at the EU level is one of its priorities. It is within this context that the current seventh framework programme 'AAA-Prevent' should be placed, that is, as a means to attain these goals for its member states based on the 'knowledge triangle' of research, education, and innovation.

The starting point of this study was the observation that adolescent alcohol consumption has risen over the past years, and that problematic drinking, especially, (i.e. underage drinking and heavy episodic drinking) was and still is an issue of growing importance. Due to the fact that drinking patterns start to develop during adolescence, and strongly determines future drinking habits, tackling these problems requires a focus on prevention.

Fortunately, prevention science has identified several malleable risk and protective factors that can be targeted with preventive interventions to reduce the rates of youth health and behavioral problems (Coie et al., 1993; NRC-IOM, 2009; Woolf, 2008). However, evidence that supports this relationship between risk and protective factors and adolescent health and behavioral problems is mostly based on U.S. samples. Much less is known about levels of risk and protective factors in other countries and how they are related to youth alcohol and drug use, from a comparative perspective (Oesterle et all, 2012). This study tested whether these risk and protective factors are indeed related to alcohol use of juveniles between the ages of twelve and sixteen, from twenty-five European countries[1]. The data was drawn from the ISRD2 study, which is a school-based survey, wherein primary sampling units were school classes, including a total of 57,771 students.

We also determined whether predicting factors and alcohol consumption patterns were similar between countries by investigating the variability of alcohol use on the country level, and whether

1 The countries involved in this study are Armenia, Austria, Belgium, Bosnia & Herzegovina, Cyprus, Czech republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Russia, Slovenia, Spain, Sweden, Switzerland.

there were differences in terms of the associations between predicting factors and (problematic) adolescent alcohol use.

Cross-national variations of cultural, normative, legal, and policy settings may affect levels of exposure to risk and protection and also how specific factors are associated with adolescent health and behavioral problems (Beyers, Toumbourou, Catalano, Arthur & Hawkins, 2004; Fagan, Van Horn, Hawkins, & Arthur, 2007; Simons-Morton, Pickett, Boyce, ter Bogt, & Vollebergh, 2010). Thus, we analysed whether national characteristics (e.g., affordability of alcohol, legal drinking age, advertising restrictions) may explain differences of juvenile alcohol use between countries.

Examining these relationships should form the basis of the implementation and adaptation of risk- and protection-focused preventive efforts internationally. This prevention strategy should target the underlying risk and protective factors of juvenile problem behaviors, such as risky alcohol use. However, given the unequal allocation of funds to the advantage of treatment and harm reduction programs in most European countries, it seems as though prevention programs are much less valued among politicians and policymakers. In this study, we investigated some of the potentials of alcohol prevention strategies by focusing on individual and structure-related antecedents of alcohol use, as well as an evaluation of guidelines and examples of good practices of prevention programs.

This final chapter wants to accomplish three main objectives. First, we will provide an overview of the main findings of our research: *what do we know* and what do we still need to know? This part of the study will summarize the results. The second question is: *what lessons* have we learned from this study? This part focuses on the main conclusions of this project. The third part focuses on *what can or must we do* with the knowledge obtained? This final section will provide several recommendations based on the results of this study, and the implications of this study for policymakers and practitioners who work with adolescents.

23.2 What do we know?

23.2.1 Alcohol use is quite common among adolescents in Europe

Based on our data we can conclude that alcohol use is quite common among European juveniles between the ages of twelve and sixteen, and that adolescent alcohol use is a major concern in all European countries. Generally, when juveniles drink alcohol they mostly consume low alcoholic beverages such as beer or wine, as opposed to hard liquor such whiskey or rum. On a European level, 60.4% of young people in the first three classes of secondary school have ever consumed beer, wine and breezers during their lifetime, 34.2% have consumed spirits, and 9.7% have used cannabis. The prevalence rates for last month substance use rates were nearly half; 28.1%, 13.5% and 3.7%, respectively. Furthermore, the number of adolescents who drink increases with age and school grade. Nonetheless, not all adolescents consume alcohol. More than one third of students (38.6%) were abstainers, meaning that they don't consume any alcohol or other substances at all. Abstinence is more prevalent among females compared to males. However, no differences were detected between girls and boys in regards to alcohol consumption, during last month or ever. Our study also indicated that cannabis use is more prevalent among boys than girls (measured as lifetime and last month use).

Regarding the prevalence rates for the 25 European countries separately, Estonia ranked the highest for ever and last month use (86.0%; 45.9%), while Iceland (21.4%; 9.7%) and Bosnia & Herzegovina (31.6%; 8.2%) ranked the lowest for low alcoholic beverages and spirits for lifetime as well as last month use.

When we took a close look at specific alcohol use patterns of youngsters we were able to uncover many differences. At the hand of a hierarchical cluster analysis, we were able to identify four different groups of alcohol consumption patterns: the majority of students were *mild users* (73.6%) who seldom drank and, when they did, consumed very few alcoholic beverages; the second group consisted of *moderate users* (19.9%) who drank relatively often and consumed a moderate amount of alcoholic beverages; the third group consisted of those who often drank moderately, but consumed a large amount of alcoholic beverages (*high amount use*, 2.7%); the last group comprised of those adolescents who drank frequently but consumed a moderate amount of alcoholic beverages (*frequent use*, 3.8%). Heavy episodic drinking (the consumption of more than five glasses of beer, wine or breezers) seems to be a very common consumption pattern in European countries such as Ireland, Finland, Denmark, the

Netherlands and Germany. Similarly, drinking more than 5 units of spirits during one occasion seems to be very popular in countries such as Estonia, Czech Republic, and Poland. The lowest proportions of adolescents who are involved in binge drinking or have ever been drunk are from South European and Balkan countries (Bosnia & Herzegovina and Armenia).

From our data, we can conclude that there are both differences and similarities between countries when it comes to alcohol consumption patterns. The **Nordic drinking style,** which is characterized by consuming large quantities of spirits was more common in Estonia and Lithuania. While, a drinking culture characterized by the consumption of mostly beer, wine and breezers along with high levels of episodic drinking was more common in **Central European** countries. The **Mediterranean style** of alcohol consumption, which implies drinking frequently but in moderation, was more prevalent in France, Portugal and Bosnia & Herzegovina.

Generally, more males were engaged in binge drinking compared to females. Prevalence rates rose with increasing age and school grade. Adolescents who were grade repeaters became drunk more often compared to non-repeaters, but this correlation might have been due to the fact that repeaters were generally older. No gender differences were found for drunkenness.

Notwithstanding the general picture, we are confronted with a differential picture of youth alcohol consumption in Europe. Our data illustrate that youth alcohol and drug consumption differ between the countries involved, also in terms of the different kinds of substance use. Besides the general picture, these differences should be taken into account when we take a closer look at European policies on underage drinking.

23.2.2 Adolescent alcohol use is strongly associated with risk factors in different domains

To better understand alcohol and drug use, we tested the importance of risk factors in the different domains in which youngsters grow up in such as: their families, schools, neighbourhoods and their friends. We looked at which risk and protective factors were related to juvenile alcohol use and whether similarities or differences could be detected between countries. In our study, we started with a factor on the individual level, namely 'low self-control'. We know that *self-control* is an important factor related to juvenile problem behaviour, and our study also indicated that a strong relationship exists between low self-control and juvenile alcohol use and other risky behaviours. The effect of self-control on alcohol use is relatively strong whereby the strongest effects were found for excessive drinking (binge drinking, drunkenness) and cannabis use. Although the distinctions in the self-control subscales (such as temper or risk taking) were observable and statistically significant, the general level of self-control varied less apparently, offering a solid base for the international comparison. The effects of low self-control on substance use have a relatively universal character. More importantly, we observed that low self-control is much more common among students living in disorganized schools and neighbourhoods, and among students living in disrupted families or families characterized by low bonding and parental supervision. Thus, from a prevention perspective it is interesting to know that low self-control is more prevalent in certain vulnerable social groups.

Based on this study, we may conclude that *family*-related factors have strong effects on adolescent alcohol and cannabis consumption, both in quantity and frequency. Furthermore, it can be said that protective and risk factors can also be related to a youths' family. For example, a two-parent family structure, high family social control and strong family bonding, reduce the quantity and frequency of alcohol and soft drugs for ever and last month use. We also found that drinking with the family act as a protective mechanism for problematic alcohol behaviour. However, family affluence and negative life events were considered risk factors within this domain. From our results, we may conclude that during adolescence, the role of parents is important when it comes to alcohol use. Having a good relationship with ones parents and strong parental control decrease the likelihood of alcohol consumption.

Within our theoretical model, *school* is one of the most important settings for influencing adolescent alcohol and drug use. The school can be considered a target arena for promoting health behaviours. In almost all European countries, students who spent a lot of time doing homework, enjoying school, and (although to a lesser degree), perceived their school climate to be positive, have lower prevalence rates on all alcohol and drug outcomes. It is, on the other hand, the disaffection from school, as expressed through truancy, which contributes strongly to alcohol use. The fact that truancy shows such strong associations with alcohol and drug outcomes is in itself not surprising because earlier studies have consistently showed that this form of school misconduct is strongly correlated with other risk behaviours (Jessor & Jessor, 1977; Petraitis et al., 1995). Other school-related variables, such as school attitude and school disorganization, had considerably lower effect sizes.

Our study also found that a youths' *neighbourhood* has an influence on their drinking behaviour. Especially living in a deprived neighbourhood, characterized by disorganization (abandoned buildings, high crime rates) increases the likelihood of drinking among juveniles, while a lack of social integration and bonding with the neighbourhood increases all kinds of substance use. Adolescents who experienced social cohesion or felt connected to their neighbourhood were less likely to drink alcohol (beer, spirits) and used soft and hard drugs less often. When youngsters described their neighbourhoods as disorganized, they showed higher levels of alcohol and drug use.

During adolescence youths spend more time with *friends* outside the house. The juveniles involved in this survey varied enormously in terms of their lifestyles and the way they spent their leisure time. We found that alcohol use is strongly associated with the social lives of youngsters (*peer*-related factors). When youngsters spent more time with their friends and frequently went out at night, they were more likely to drink alcohol. These peer risk factors were also related to other forms of substance use, such as cannabis and hard drugs. On the other hand, adolescents who spent more time engaging in individual activities at home (e.g., reading books, doing homework) were less likely to drink alcohol. Overall we can conclude, that youngsters who are more peer-oriented have a higher probability of drinking more alcohol than youngsters who are more family- or individual orientated. Having a large group of friends who regularly drink has a large impact on ones own excessive alcohol use. This study also found a strong relationship between, having friends who are delinquent or being a member of a group who commits illegal acts (gang membership), and the use of alcohol.

We know that substance use is generally linked to all kinds of juvenile problem behaviours, but with the IRSD-data we were able to examine one of these problem behaviours namely *delinquency and vicitimization,* more in depth. In agreement with the literature (Finkelhor et al. 2005; Shepherd et al., 2006), we observed that alcohol use was significantly correlated to victimisation. In particular, alcohol consumption proved to be closely associated with the experience of being a victim of a violent offence, a finding, which is in line with those of other studies (Morojele & Brook, 2006). These results were confirmed by our analyses of the individual countries, which revealed that the link between alcohol consumption and victimisation was particularly close in Scandinavian countries, while it was less evident in Southern European countries. Another interesting discovery was that all the alcohol consumption indexes were more strongly correlated with violent offences than with property offences. A possible explanation for this may be that violent offences are more likely to be committed impulsively than property offences. In addition, it is worth mentioning that alcohol use was strongly correlated with the variable "versatility", suggesting that the gravity of delinquent behaviour (represented in this case by committing several types of offence) is closely linked to alcohol consumption. The results also seem to suggest that the presence of socially well-integrated peers, as opposed to the absence of friends, is a protective factor against alcohol use. If, however, the peer group is of a delinquent nature, all forms of alcohol use increase significantly. Based on the results of these analyses, we can conclude that there is a strong association between delinquency and alcohol consumption in all of the individual countries. Moreover, in every country, alcohol use was more strongly correlated with "versatility" and violent offences, than with property offences.

Up until now we looked at the influence of these factors on each separate domain. We then proceeded to assess the relative influence of risk and protective factors of alcohol use in five domains in a multivariate model. The results of this full model confirmed our hypothesis: the ecology of adolescent alcohol use is multifactorial and the risk and protective factors from different domains are correlated. Within the full model, peers and self-control are highly predictive of alcohol use because they directly focus on the most immediate precursors of alcohol use. In concurrence with the literature, a more peer-oriented lifestyle showed the strongest relationship with alcohol use. Given that drinking is largely a social phenomenon, and given that adolescents often drink as a way of integrating themselves into groups and gaining status (Crosnoe, Muller, & Frank, 2004), it should not come as a surprise that a more peer-oriented lifestyle is so strongly associated with alcohol use. The strong peer effect makes sense because one of the items in the lifestyle scale measures the frequency of going out at night: a behaviour strongly correlated with alcohol consumption (Piko & Vazsonyi, 2004). Not surprisingly, the strongest predictor of alcohol use is the presence of deviant activities in one's peer group. Teenagers who engage in deviant activities with their friends more often or who have friends who do so, are more prone to use alcohol in a problematic way. Although the results regarding family, school and neighbourhood factors indicate a lower association in comparison to peers and low self-control, one

cannot conclude that these factors are much less important in the etiology of adolescent alcohol use, and thus deserve less attention in prevention strategies.

Finally, in regards to the cross-national aspect of the study, the relative importance of the different domains was more or less equal for each country cluster (Western, Nordic, Central-Eastern and Mediterranean). An important conclusion of this study is that the relative importance of the risk and protective factors within the different domains is more less equal between the countries. The impact is the same in all the countries. There are no large differences between the countries for the effects of theoretically relevant predictors. The only exception was for self-control, where we observed that the direct effects of this trait were much less strong (when compared to the other domains in the model) in Nordic countries than in Mediterranean, Western and especially Central-Eastern European countries.

23.2.3 The country where you live influences alcohol use

So far, we know that there are various risk and protective factors within the different domains that are of influence on juvenile alcohol use. We did not find any large differences in terms of predictors and juvenile alcohol use associations between the countries involved. Risk and protective factors are of similar influence in different countries such as, Iceland, Cyprus, Poland and the Netherlands.

Another finding of this study was that although it is quite common for juveniles to drink alcohol in all of the participating countries, the country of residence does exert influence on a youths' drinking pattern. In those countries with strict alcohol policies, such as the Nordic European countries, we found that more young people between the ages of 12 and 16 do not drink at all. However, the Nordic countries do exhibit complex drinking patterns. Danish youths rank the highest in most of the comparisons, especially concerning risky alcohol use, while Icelandic youths rank the lowest. Youths living in Finland, Norway and Sweden are often ranked somewhere in between. In the Balkan and Mediterranean countries, where youths are more likely to consume alcohol with their families at home, youths are more likely to drink moderately and have less risky drinking patterns. In these countries, the number of juveniles who drink excessively is much lower. Quite the opposite occurs in Western and Central European countries, which have a drinking culture geared toward intoxication, while the drinking culture of these countries is characterized by drinking more frequently but also more moderately (see also Järvinen & Room, 2007).

Our findings support the assumption that underage alcohol use is not only the result of individual choice. Drinking behaviours are strongly influenced by the social context in which you are born, grown up and live. We found that individual risk and protective factors are associated with youth alcohol use in different countries. Risk and protective factors within the different domains are quite universal and they predict problematic drinking behaviours of juveniles in a similar way. Nonetheless, we did find country differences in regards to juvenile alcohol patterns when we looked at problematic or risky alcohol use. By combining all of the different individual level variables (sociodemographic factors, risk factors and protective factors) we were able to analyze the variability of problematic or risky alcohol use and the influence of the social context more efficiently. Important was the question of whether country level indicators could explain partial variances of problematic or risky alcohol consumption.

As mentioned above, we found that when we combined all of the individual predictors into one model, strong effects for peer-related factors, such as delinquent friends and deviant group behaviour, and low self-control were apparent. However, there still remains a substantial unexplained variability of risky alcohol use on the country level. Due to the fact that we determined such a high level of variability of youth alcohol use between countries, we studied the country influence extensively. Systematically, we analyzed a broad range of country-level indicators, which (based on theory) may have an influence on risky alcohol use. In succession, we looked at the influence of alcohol policies on risky alcohol use: affordability, availability (beer, spirits), restrictions on juvenile drinking, sale restrictions, severity of alcohol policies, legal blood alcohol limit (whilst driving a vehicle), national policies (per capita consumption, proportion of alcohol disorders, importance of friends, percentage of youngsters drinking spirits alone, drinking culture), and socioeconomic conditions (Human Development Index (HDI), life expectancy, Gross Domestic Product (GDP), Education Index, Global Competitiveness Index, unemployment rate).

We used different, but similarly measured country variables and detected a strong relation between the individual variable, delinquent friends and the country level variable 'alcohol culture'. We found that in countries where risky alcohol use is likely be considered as problematic behaviour, the

association with having delinquent friends is stronger than in those countries where there is a more tolerant attitude toward juvenile alcohol use.

Although there was a strong variability of risky alcohol use between countries, other structural indicators could hardly explain these differences. Perhaps these indicators are too rough and don't take the variability within the countries into account. It is also possible that we did not find the right indicators to explain underage drinking. A third possibility may be that the similarities of the European countries on these indicators are too strong. A last possibility is that the number of participating countries (25) was too small for effectively analyzing this influence.

Due to the complexity of the model and relatively low number of countries used in this study, we also used Bayesian statistics to analyze whether some national policies had a stronger effect on the type of drinking pattern. Besides risky alcohol use, we also looked at abstinence. The assumption was that national policies may have more of an effect on delaying juvenile alcohol consumption rather than on alcohol-related problematic youth behaviours. We found that there are some indications that strict national policies do have an influence on lowering risky alcohol use and promoting abstinence amongst youths. Sale restrictions and strict policies do lower the probability of risky alcohol use among juveniles and increases the number of abstainers. Affordability and availability are considered to be factors which promote alcohol use. In our data, we saw that the affordability (which means that it is easier for youngsters to get alcohol) has no influence on risky alcohol use. However, we did see that the less affordable the alcohol, the more likely it is that juveniles do not drink at all. This is in line with our other results, which indicate that the more general environmental indicators (defined as Social Economic Condition) such as the Human Development Index, life expectancy, and the Education Index, are not associated with juvenile alcohol patterns. Only unemployment lowers the probability of risky drinking patterns, perhaps due to the fact that, in that case, juveniles would not have the money to drink alcohol frequently. However, all these effects disappear when we add risk and protective factors to the full model.

The main conclusion here is that the drinking culture of a country influences the use of alcohol among youngsters. In cultures where it is more common and accepted to drink alcohol, youths are less likely to abstain and more likely to consume alcohol in a problematic manner. The amount of alcohol consumed by adults and the number of youngsters who drink strong alcohol is also of influence on the risky alcohol use.

Thus, when it comes to juvenile alcohol use, it isn't only alcohol policies that matter, but it is especially the attitude and norms of adults which influence juvenile alcohol use.

23.2.4 Policies, programs and practice

The development of effective preventive and early interventions for youths who consume alcohol is important for several reasons. Besides the high clinical and social demand for such programs, effective strategies could possibly influence the typically negative course followed by early-onset drinking and prevent early onset associated psychological problems, such as depression and delinquency. Investing in youths is crucial because youths are often responsible for a high proportion of the burden of health and life course effects. For many years, multiple preventive policies, programs and practices have been broadly implemented in different European countries. Together, they show a very divergent picture of prevention in Europe.

In recent years, a number of critical questions have arisen: Are these preventive efforts really effective? Are they activated in the right place, at the right moment and as early as possible? On which theoretical knowledge and practical experiences are they based upon? There became a real interest with the promise and possibilities of *evidence-based programs* in science, policy, and practice worldwide. From that moment on, a growing number of interventions have been critically tested and found to be effective in preventing adolescent substance use and related health risk behaviours, as well as in tackling empirically verifiable precursors (risk and protective factors) which predict the likelihood of these undesired outcomes. As a result of those investments, a systematic way of thinking about effective programs and best practices in health prevention and promotion arose. This can be summarized as: "those sets of processes and actions that are consistent with health promotion values, theories, evidence and understanding of the environment, are most likely to prevent alcohol use among juveniles" (Kahan & Goodstadt, 2001). Classifications of prevention programs were made, pertaining to different groups of youngsters (universal, selective, indicated) as well as different categories of

contexts and involved actors (individual, family, school, community, as well as multi-component). Nonetheless, many countries still continued to invest in programs or interventions with limited evidence of effectiveness.

In this study we explored the use of policies, programs and practices in the 25 European countries. Experts from all of the countries made an overview and an inventory of preventive initiatives on the meso level (school, community) and micro level (family and individu). Based on scientific literature and 'grey' literature and inclusion criteria, we first determined what was on the status quo per country. Due to the high level of heterogeneity among reports and the lack of scientific evaluation of programs, we asked national experts to choose and propose two good interventions (on each level: meso and micro) as 'best national practice models' for the prevention of underage drinking according to their competence and experience. The proposals were discussed in four cluster seminars. Subsequently, three researchers from three countries (Estonia, Italy and the Netherlands) evaluated 391 programs and interventions from 24 European countries (none from Bosnia & Herzegovina could be collected). These programs were then scored on the basis of three evaluation criteria (theoretical background, implementation and outcome) and ranked in an overview. The AAA-Prevent team defined an inventory of 28 'good' interventions according to their overall score. These programs were then placed on the website, with information about the theory (goal, domain, age, target group, and theoretical framework), implementation (method, relevant literature and references to manuals of the programs) and outcome (effect research) as well as their scores (www.aaaprevent.eu). The website also offers an overview of these national programs that can be used in other European countries. School prevention programs, as well as individual, family, community and multi-component programs in Europe are also highlighted. Good programs within separate national states (for example Supra-f in Switzerland) as well as good programs, that have been implemented in different countries simultaneously (for example Unplugged), have also been made visible.

Based on our study, we also identified a substantial lack of evidence in evaluation and a strong need for scientific research in the area of underage alcohol prevention. Up until now, scientific work has mainly been dominated by process evaluations in Europe, while outcome evaluations remain quite rare in this field. Outcome evaluations should be encouraged and supported, and the quality of evaluations on long-term program effects should be improved. At our regional seminars, practitioners working in the field of prevention, have pointed out that they also require more knowledge about the transferability of these programs: Can programs be implemented in other local settings and to what extent can programs be adapted to the cultural environment without risking the loss of quality. Europe must take this field of effective youth programs more seriously during the next years. Prevention programs should be seen as a long-term investment, rather than just a short-term expenditure.

23.3 Lessons learned from prevention workers and practitioners

In order to get a better view of what works in prevention, a series of seminars and focus groups were organized with experts in the field of alcohol prevention. One of the topics discussed extensively was the role of culture in the development of country-specific alcohol consumption patterns. The analyses in this report indicated that clear differences in drinking cultures exist between the various European countries. To initiate change in drinking norms, beliefs and attitudes, it is crucial to understand the motives behind these consumption patterns. In Mediterranean countries, adolescents are raised with alcohol traditions through their parents. For these youths, responsible drinking is part of their socialization and learning how to drink is considered a parental task. Data shows that this approach might contribute to the low amount of problematic drinkers in these countries. However, even in these Southern European countries, problematic drinking has become an issue, due to weakening family ties and international influences. On the other hand, for some countries such as Sweden or Iceland, a strict policy towards underage drinking seems to be successful in delaying the age of onset of juveniles.

Due to these strong cultural roots, a simple general European prevention strategy is not recommended and this has also been made very clear by the European Commission: "Specific measures adopted by Member states to reduce alcohol-related harm with a view to protecting public health are based on their particular cultural contexts" (Commission of the European Communities, 2006).

However, awareness must be raised about the upcoming cultural changes as a consequence of globalization, whereby (problematic) alcohol consumption patterns have become more prevalent in the so called 'wet' cultures, where alcohol has been integrated into the daily conduct of social life and where excessive drinking was minimal up until now.

National governments often promote prevention strategies by raising awareness on the risks and dangers of using alcohol and drugs through campaigns and education. The experts in our study agreed that awareness is not only geared towards juveniles but also their parents, because they have a tendency to underestimate their children's' substance use (Trimbos, 2008). However, they could not agree on what that message should ideally be. Some experts argued that, because adolescence is a phase of experimentation, and that experimenting with drugs and alcohol is a part of that process for most teenagers, a prevention goal of total abstinence is unrealistic, and that responsible drinking should be the central focus of alcohol policy. The transmission of mixed messages should be avoided, for example: adults can drink alcohol, but adolescents cannot. Differential standards can be confusing, and it is very important that adolescents understand why certain rules only apply to them.

Therefore, a central task for the European Commission is to continue to develop a framework for alcohol prevention. This framework should clarify which goals should be pursued and why achieving them is so important. Due to the inherent differences of drinking cultures, it is probable that some methods of alcohol education (e.g. responsible drinking) will work better in some countries while in other cultures, a policy based on both responsible drinking and abstinence would be more suitable. In order to change drinking norms, beliefs and attitudes (this study makes clear how important this influence is) students themselves must be involved in prevention strategies by working interactively and by integrating their daily life experiences. Youngsters should understand why it is important not to drink (excessively). More attention should be paid to the positive reinforcement of 'desired' behaviours' (for instance by giving rewards to students who abstain from drinking alcohol). 'Positive' messages (e.g. it can be cool and healthy to be a non-alcohol drinker) could even have stronger and longer-lasting effects than negative messages (e.g. smoking can kill you).

The seminar experts and focus groups agreed that simply telling citizens how to behave often backfires. This is especially the case when it comes to lifestyle behaviours deeply rooted in cultural traditions (such as alcohol use). Therefore, governmental actions that are based on regulatory or legislative interventions have limited chances of success if these are not backed up by a social basis of public support (i.e. community readiness). To achieve this social basis of support, governments need to engage every player in the field, and cover all domains (family, peers, schools, neighbourhoods, etc.) and sectors (education, youth work, party sector, special youth care, civil society, consumer organizations and industry, politicians, etc.) simultaneously. It is important to inform all intermediaries and stakeholders about the problem at hand, and the relevance and expected results of the suggested policy. A holistic or integral approach to prevention is a key factor for success, and much attention should be paid to the local sector. This is the domain where the various sectorial activities can be brought together and tailored to the needs of the local setting. Most experts we spoke to during our study agreed that a combination of separate (evidence-based) interventions is most effective, but that these interventions should be structurally embedded in an overall 'integral' alcohol policy. This general alcohol policy is, however, not present in all European countries or the existing alcohol policy only focuses on a few issues (e.g. drinking and driving policy, alcohol advertisement, etc).

Prevention should also take into account the social inequalities that exist in health-related behaviours such as drinking alcohol. Although we need a universal message with regard to alcohol prevention in adolescence (i.e. the prevention of problematic and underage drinking), the way this message is transferred must be tailored to the needs of the specific groups of teenagers we are dealing with. Our study shows that young people exhibit different patterns of alcohol consumption. These variations cause youths to be more sensitive or less sensitive to certain measures or prevention strategies. Young people who have a pattern of high episodic drinking are less sensitive to measures such as increasing the legal age for buying alcohol, and the availability or affordability alcohol. Different kinds of youngsters require different types of messages, and in the current Communication of the European Commission on Alcohol Policy, attention is only paid to three types of vulnerable groups (young people,

pregnant women, and drivers). However, our study indicates that a group of risky drinkers exist, who are not being addressed in the Communication.
The data shows that these vulnerable groups with risky use patterns are teenagers from disadvantaged socioeconomic groups, students in vocational tracks, sensation seekers, and youths with low self-esteem. These vulnerable social groups are difficult to reach with traditional prevention strategies, thus alternative prevention strategies are required. Again, what is important before implementing new strategies is to assess the specific needs and characteristics of our target social groups: Why do they drink? In what social settings are they raised? What are the characteristics of these groups? Experts stress the importance of hearing the voices of these social groups, to prevent top-down interventions from causing unintended side effects (e.g. stigmatization). Ideally, the development of prevention programs should be the result of an interaction of top-down and bottom-up processes whereby policy-makers, researchers and practitioners work together, and data and knowledge play a central role.

23.4 What we need to know

Although the large scope of this study allowed to us study many important aspects, it was not possible to research absolutely everything. How young people develop- also in conjunction with alcohol consumption or other forms of risk behaviours- are complex interactions pertaining to personal and social interactions in various social contexts, and on multiple levels. In the understanding of biological processes, in which brain science, genetics, neurobiology and neuroscience play an enormous role, huge steps forward have taken place. These processes influence the development of cognitive abilities, emotions as well as behaviour, and this knowledge has been of great influence to the prevention sciences for children and youngsters (IOM, 2009). Our study focused on the influence of risk and protective factors on adolescent alcohol consumption in their environmental context. In the future this 'lower' level should also be taken into account. Another aspect partly overlooked was the co morbidity of problem behaviours (risk behaviours). Our study primary focused on alcohol and drug consumption, and delinquency, however, other problem behaviours (often strongly related to these) that may also have been significant to take into account were depression, anxieties and sex-related problem behaviours.

The risk and protective factors (social determinants) studied here were correlative and associative with alcohol use and other outcomes. However, the clear associations illustrated through our cross-sectional country analyses do not prove causation. Nonetheless, our selection of risk and protective factors are based on many experimental and longitudinal studies carried out over last decades in which these associations are consistently prominent. We have thus defined them as 'approximations of causes'. While risk factors increase the probability of negative outcomes, protective factors increase the probability of pro-social behaviour: acting as a buffer against the impact of risk factors. Both can be found in the domains in which youngsters grow up in: their families, schools, friends and communities (Loeber et al., 2008). These risk and protective factors contribute to prevalence rates and are the best determinants we have at the moment in preventive science and practice. Most of the work on risk factors, protective factors and prevalence rates of alcohol use and other problem behaviours has been carried out within countries. We need research that confirms the hypothesis that the associations between the outcomes and modifiable risk and protective factors are consistent across countries when controlled for other variables. Cross-national research between a restricted number of countries is forthcoming (Jonkman et al., 2012; Oesterle et al., 2012; Jessor et al., 2004). Nonetheless, we need cross-national studies that entail a substantial number of countries to be able to study the associations more in depth, such as this one.
In order to study causal paths of outcomes and social determinants they must be analyzed from a longitudinal perspective. This could help us to identify in which periods life, youths are most sensitive to the influence of risk and protective factors, and also when these factors typically emerge. Longitudinal studies contain observations of identical research units – of the individual or groups of individuals over a longer period of time. Longitudinal studies can provide answers to questions concerning changes that cross-sectional studies cannot. Longitudinal studies also provide better accuracy whilst observing these changes, and they can be applied to various other fields. Longitudinal studies will help us answer research questions about systematic changes over time in individual

behaviours, and about the occurrence and timing of life events, questions which we were not able to answer in this study. Moreover, the benefit of a longitudinal study is that researchers are able to detect developments or changes in the characteristics of the target population at both the group and the individual level and look at the influence of risk and protective factors over a longer period of time.

However, the existing state-of-the-art studies on causal paths of alcohol use in Europe are limited: most of the current knowledge is based on studies within the United States. Without a doubt, causes which drive individual and societal processes, developments, and changes in the educational and socioeconomic sector cannot be adequately studied without a valid and reliable database, based on results from carefully conducted longitudinal studies. Hence, it is necessary to develop a comparative longitudinal European study that includes information from administrative data sources, as well as self-reports of children from early childhood, school years, adolescence and adulthood, as well as changes in national policies through out their lives. Such a study can provide the basis for developing an enhanced and more integral understanding of the health and behaviours of people living in Europe.

In sum, there is substantial knowledge about the influence of risk and protective factors on behaviour of youths (proximal factors). However a better understanding of the relationship between risk factors on the individual level and structural (social) indicators on country level was needed – which we attempted in this innovative study. More studies must be formulated which examine these associations within a broader setting and take this upstream perspective into serious consideration.

A plethora of social and policy indicators measuring the problem behaviours and wellbeing of youngsters emerged from the '60s onwards. Since then, most of the indicators can be defined as external conditions, which have been mapped at different geographic levels (countries, regions, communities), mainly in the US and Western Europe. Many indicators have been collated in statistical series produced by national statistics agencies (*Social Trends* in the UK, *Kinderen in Tel* in the Netherlands, the UNDP *Human Development Reports* and WHO *Alcohol Indicators)*. In relation to children and adolescents, data has been compiled under the auspices of bodies such as UNICEF, whose annual *State of the World's Children* reports review basic indicators of child development (e.g. infant mortality, school enrolment, percentage immunisations).

Thus, social and policy indicators are studied, but the influence of social or structural indicators (e.g. poverty and socioeconomic status of the environments, policy factors and cultural factors) together with individual variables, are studied less systematically and internationally. Especially the influence of the broader social context on risk and protective factors has been paid too little of attention in prevention science up until now. The public health burden of adolescents worldwide also underlines the need to act on a structural level as well (Lancet, 2012). Surveys between and within countries as presented here in this study may contribute to this knowledge. However, this is just a small step in light of what still needs to be done.

Various international studies have illustrated that population-wide reductions of alcohol use and other problem behaviours is possible through evidence-based prevention programs and policies (Elliott, 1997; Axford, 2012). Such programs affect whole populations by targeting relevant risk and protective factors and reduce burdens on public health systems. International, national and local governments have to take this knowledge seriously. The interest in evidence-based programs as what should be delivered to whom, when, where and how, (Axford, 2012) has increased. Scientifically proven effective programs for children and youngsters are slowly growing in several countries in various areas of development (health, behaviour, education, well-being, relationships). Some of them were specifically developed for the prevention of substance abuse or showed positive results on reducing youngster prevalence rates. However, when we looked at operative effective programs in Europe, and the current situation in many countries, we were dissapointed. European researchers, politicians and practitioners must find a way to research programs and policies more systematically and utilize these programs on a broader scale. Societal improvement requires political will and research capacity to expand scientific evidence that can identify what works and what is counterproductive. Different parties must cooperate to increase evidence-based knowledge, which in turn must be communicated and utilized by other actors to reach relevant target populations. In order to increase efficacy, this work must also be carried out on different levels. However, the current situation in Europe does not lend to these aspirations.

Recently, different documents call on international, national and local leaders to promote the well-being and prevention of health problems among youths as a top priority in society. Furthermore, the importance of early childhood has recently been recognized as a key developmental period (Agrawal et al., 2010; Danese et al., 2007; Nomura et al., 2011; Turner et al., 2011; 1989). In regards to adolescence, recent reports have also underlined the importance of this life course phase as a foundation for subsequent development (Lancet, 2012). Child and youth development is a central phase of physical, mental, sexual and reproductive health in adulthood. Social investments in these domains promote to end the cycle of poverty, eliminate inequities and to secure a better future for children and young people (Unicef, 2011), also in terms of trans-generational processes. Investing in these domains is essentially an investment in country development (Worldbank, 2007). The European Union should expand the research agenda on this topic further in the years to come.

23.5 Policy recommendations

The conclusions and recommendations, drawn from the previous chapters in this report, have been formulated with the aim of supporting the European Commission by providing insights on: alcohol use patterns in Europe, the associated risk factors, and good practices in the field of alcohol prevention. Many steps can be taken by a wide range of actors in different domains to prevent young people from developing problematic alcohol use patterns, and in most European countries, substantial realizations have been made in this regard, supported by the European Alcohol Strategy (Commission of the European Communities, 2006). However, in order to realize the full potential of a preventive alcohol policy, the final recommendations in the following section of this report must be taken into account.

Recommendation 1:
Empower young people by means of a life skills approach

Adolescents need to acquire a variety of competences in order to handle their future personal and professional lives effectively. One of these required competences relates to a skill that enables youths to: manage emotiveness and interpersonal relationships, resist social pressures, and ultimately safeguards them from harmful or undesirable outcomes related to, for instance, having sex, drinking alcohol, or using drugs. Programmes that focus on empowering young people with these psychosocial skills is currently one of the most popular prevention programmes. This research has shown that juveniles are vulnerable to negative life events especially when they have a low self-control. Therefore programs that stimulate social skills is should be promoted.

An example of such a *person*-related prevention programme is the life skills programme, 'Unplugged', which is currently operating in several European countries. This program is also one of the few that has undergone a scientific evaluation. Programs that place an emphasis on these psychosocial skills (e.g. self-efficacy, coping strategies, assertiveness, handling peer pressure, etc) encourage young people to behave consciously, responsibly and in a well-mannered way.

In helping youths cope with peer pressures, providing accurate and up-to-date information on alcohol and drugs, as well as the manner in which adolescent peers use them, is crucial. This is because adolescents tend to systematically overestimate alcohol and substance use of their peers (Reid, Manske, & Leatherdale, 2008). Since the only precondition for social influence to occur is the availability of information about the behaviour of others (even when this information is based on false beliefs) adjusting these misperceptions through accurate information campaigns has the additional benefit of diminishing possible negative peer influences. However, European and national campaigns should also address the high levels of episodic or binge drinking among young people. Education should encourage teenagers and young adults to think about the choices they make about drinking, and particularly about the possible negative consequences of excessive alcohol consumption.

In any person-related prevention programme, it is important to involve the students themselves in their educational process by working interactively and by placing their particular social world in the foreground. By making students *actors* in prevention instead of passive recipients, and by focusing on *positive* messages (e.g. it can be cool and healthy to be a non-alcohol drinker) instead of negatives ones (e.g. drinking can kill you) investments in prevention programmes would have even stronger and longer-lasting effects.

The role of European, national and local governments:

- Governments should create conditions that increase the availability and accessibility of programs on a local level, that empower adolescents by training life skills.
- Governments should organize campaigns and invest in education about alcohol consumption that provides information for adolescents so that young people may take greater personal responsibility for their behaviour.
- Governments should guarantee that young people are included in alcohol policymaking.

Recommendation 2:
Person-related prevention should be complemented by structural prevention

Although empowering youths with psychosocial skills is defendable and even necessary from a prevention perspective, it does however have a disadvantage: it largely neglects the broader structural and cultural forces at play. In the AAA-Prevent project, we focused on risk factors that relate to the structural and cultural environment in which teenagers spent most of their time together (i.e. the family, the school, the neighbourhood). The analyses indicated that prevention can go one step further by also focusing on targeted forms of structural prevention. Moreover, while alcohol prevention strategies aimed at working on psycho-individual coping mechanisms are a valuable investment, we believe that the efficacy of these person-related preventions can be substantially increased if complimented with targeted forms of structural prevention. The latter would focus more on long-term measures that address the underlying causes of alcohol and substance use. Prevention should be focused on a broader spectrum of risk and protective factors that are of influence on juvenile alcohol use. As such, they have a much broader scope and have the potential to increase the durability of prevention considerably. Structural prevention, and prevention in general, is most effective at the local level because this is the level where the various sectorial activities can be brought together and tailored to the needs of the local setting.

While structural prevention has been widely adopted in the domain of regulation (e.g. drunk-driving policy, controlling the availability and taxation of alcoholic beverages, consumer information, et cetera), this is not the case for the different structural and cultural environments students grow up in. Our analyses indicated, for instance, that different risk and protective factors exist in the family domain. Parents should be more aware of adolescents' lifestyles, especially the lifestyles of their own children. Our data showed that parental supervision and positive bonding aspects between parents and their offspring are important in protecting adolescents from (problematic) alcohol use. Therefore, not only should the participation of adolescents themselves in prevention activities be stimulated, but also the participation of the students' parents. The purpose of a parents' programme should be to increase the awareness of parents regarding different family risk and protective factors related to alcohol use in early adolescence. An authoritative parenting-style should be encouraged, characterized by high control and the positive encouragement of the child's feelings and needs. Such an approach requires a comforting and protecting attitude of parents, together with acceptance and even encouragement of the child's own independent choices. In this way, prevention should also encompass an emancipative component (Goris, Burssens, Melis, & Vettenburg, 2007).

The analyses in this report also showed that sometimes changes are needed in the structural conditions of domains other than the family (e.g. schools, neighbourhoods). For instance, given that adolescents spend so much time in school, investment in structural aspects of these school environments is of crucial importance, especially given that these school experiences determine students' well-being. Our data showed that positive bonding, and a positive school climate has a positive effect on reducing alcohol consumption, while school disorganization has a negative effect. Thus it is important to create a better physical and psychosocial school environment for these students, by for example, developing and supporting a student council to increase student involvement and commitment, and by promoting positive contacts between students and school administration.

Other examples include: providing appropriate training and support for teachers in working proactively with these students, or better cooperation with other local agencies that work with youths. However, investments in structural characteristics of school environments are also crucial if these characteristics tend to (re)produce inequalities. For example, the analyses in this report showed that

an educational practice such as tracking (or streaming) leads to gradients in adolescents' alcohol and drug use, to the disadvantage of the more vulnerable social groups. Therefore, postponement of the definitive choice of a particular track until upper secondary school might be preferred, or more attention should be paid to the question of whether health education is sufficiently tailored to the needs and specific learning styles of students in the more vocational tracks. This is especially relevant given that people from more disadvantaged socioeconomic backgrounds are not well reached with traditional prevention strategies (Bernaert, 2008).

However, another important component is the school's drug policy, which serves to set normative values and expectations for student behaviour as well as to document procedures for dealing with alcohol or drug-related incidents. Studies in Australia and the US (Evans-Whipp, Bond, Toumbourou, Catalano, 2007; Beyers, Evans-Whipp, Mathers, Toumbourou, & Catalano, 2005) showed that schools' policies and enforcement procedures which reflected national policy approaches, when delivered effectively, were associated with reduced student alcohol and drug use at school.

We may conclude from this study that the influence of the neighborhood can play a crucial role in alcohol prevention strategies aimed at adolescents. Programs should especially focus on the decrease of neighborhood disorganization, by combating crime, drug dealing, fighting, graffiti and empty and abandoned buildings. In addition, programs could promote healthy development by targeting social attachment between neighbors, involvement in the neighborhood, and by focusing on the norms and values of the individual. Alcohol should not have exposure in any youth environments (education, sport, recreation, entertainment), warning labels should be used and marketing restrictions should apply when it comes to advertising to youths. The organization of Alcohol free parties should be more supported and stimulated by the government; especially school parties or activities must be alcohol free.

To conclude, in order to have longer-lasting effects, prevention needs to engage all actors in the field. This argument is also one of the principal motivations behind the EU Alcohol & Health Forum: to bring all relevant stakeholders together. Parents, schools and local communities are partners herein, but also civil society, consumer organizations, the alcohol industry, and the social and cultural sector. The message should be uniform: all voices in the same direction! However, a uniform message does not implicate that the way this message is delivered should be harmonized. As discussed earlier on, the success of a prevention program to a large degree depends on the way it is tailored to the needs of the setting at hand. Due to strong cultural influences, both at the national and local level, recommendations for preventive programmes and interventions are best negotiated at these corresponding levels.

The role of the European, national and local government:

- Goverments and organisations should create effective conditions for integrated prevention in relation to underage (problematic) drinking.
- Governments should advocate and ensure that all stakeholders within the different structural and cultural environments that juveniles grow up in (parents, teachers, youth workers) are involved with juvenile alcohol prevention strategies and programmes.
- Governments should create the right conditions that increases the availability and accessibility of programs on a local level, as well as educate parents about juvenile alcohol use and train their competencies in dealing with alcohol use by their own children.
- Alcohol prevention should be an integral part of the training and education of professionals who work with young people.

Recommendation 3:
Investment in evidence-based prevention programmes and policies and in the diffusion of implementation and knowledge on best practices

A final conclusion is that the full potential of preventive actions is hampered by a lack of scientific evidence indicating whether these preventive actions really work. In contrast to interventions in more clinical settings (i.e. treatment and harm reduction), few evidence-based interventions exist in prevention. If an evaluation is conducted, it is most often the implementation of the intervention itself (i.e. process evaluation) that is evaluated. Whether the programme also resulted in demonstrable effects on the target outcomes (i.e. outcome evaluation) often remains an open question. Although it is true

that the development of evidence-based interventions in prevention is challenged by more complicated methodological conditions (in conjunction with the complex etiology of alcohol use itself), researchers and policymakers should not be taken aback but should strive to tackle this complexity head on. Moreover, given that so little evidence-based prevention programmes exist in Europe, it should not come as a surprise that governments are not willing to invest in prevention. Perhaps, the European Commission can alleviate this problem by, for example, continuing to subsidize research projects focused on the development of evidence-based interventions. This particular project was a first step in this direction, and made an inventory of best practices in the different European countries that can serve as examples for other prevention workers. Ultimately, however, these programmes should undergo a rigorous test of whether the assumed effects can be scientifically validated. A final and concluding remark in this regard is that more investments need to be made in the construction of knowledge centers specialized in evidence-based prevention. To this day, an absence of a culture of evaluation exists in most European countries. Even in countries with a solid track record in other areas of scientific research, only a few institutions are specialized in evaluating prevention programmes.

Finally, knowledge related to best practices or evidence-based prevention programmes should be made available to a broader audience, and if possible, within an existing European framework. Prevention workers and practitioners were very positive about the idea of a European database of effective prevention programmes. Such a database allows researchers and policymakers to share knowledge concerning effective prevention programmes, to identify other relevant programmes, possibilities of implementation, and to have a better view on what works for which groups and under which conditions. This project partially fulfilled this aim by providing an overview, to this date, of best practices of alcohol prevention among youths. However, in order to reach its maximum effect, such databases need to be updated on a regular basis, so that further progress and development in the field of alcohol prevention are captured and disseminated between policymakers, prevention workers, practitioners and other stakeholders.

The role of the European, national and local government:

- There is a need for knowledge valorisation in the areas of juvenile alcohol patterns, alcohol consumption determinants, and the developmental process of juveniles.
- Due to a lack of evidence in terms of evaluating the effectiveness of programs, there is a need for increasing scientific research in the area of alcohol prevention methods.
- There is a need for a national coordinating databank on effective policies and programs founded on practice and evidence-based research.
- Governments should create the right conditions for the implementation of integrated programs and prevention that tackle risky alcohol use among juveniles.

It is clear that drinking among young people is a community wide problem that demands a community wide response. Although youth development is a complex process of interactions between biological, personal and social interactions, we found that (risky) alcohol use in early adolescence is strongly influenced by social contexts such as family, school, peer group and neighbourhood. Most alcohol prevention strategies aimed at working on psycho-individual coping mechanisms are a valuable investment, and we believe that individual prevention can only be efficient if complimented with long-term measures which address the underlying causes of risky alcohol and substance use in these different domains.
Integrated prevention, more generally, is most effective at the local level because this is the level where the various sectorial activities can be brought together and tailored to the needs of the local setting and culture. Due to strong cultural influences, both at the national and local level, recommendations for preventive programs and interventions are best negotiated at these corresponding levels. Proposing individual strategies which prevent alcohol-related harms in Europe's member states, is therefore not recommended and should be formulated by the countries themselves. The European Union correctly recognizes the different cultural habits related to alcohol consumption in the various member states making it rather dangerous to impose a harmonized legislation or prevention strategy. However, this does not mean that the European commission should not have an important role in formulating or influencing policies that prevent underage drinking. For example, the European commission could create the structural conditions to make these strategies possible (budget, research,

capacity building local policies). The European parliament can take on an advocacy role within Europe to ensure that risky alcohol use among juveniles is prioritized on the political agenda.
From the meetings with the experts from 25 European member states, it was clear that there is a large knowledge gap between the countries involved. Thus knowledge valorisation is perhaps an issue that the European commission can place and prioritize on their agenda. The results of this study, however, can be used, further inform and educate other member states on certain topics that require attention, preferably by further extending the Communication on the European Union's strategy to support Member States in reducing alcohol related harm (Commission of the European Communities, 2006). For instance, in the Communication, no attention is paid to the origins of these alcohol use patterns (both at the individual and country level), and our study also indicated that there are other (more specific) vulnerable groups (i.e. other than pregnant women, young people, and car drivers: the three main risk groups as defined in the Communication). Also, understanding the social and psycho-individual antecedents of alcohol use, and especially how both the prevalence rates of these antecedents as well as their relationships with alcohol use vary between the European countries, can be of high value for Europe and links back to one of the European Commission's priority themes, i.e. to develop and maintain a common evidence base at the EU level.

Adolescent alcohol and drug use are worrisome societal problems within Europe and the implementation and adaptation of risk- and protective focused preventive efforts on an international level, and the use of sound programmes is an effective way to address this. With this report, we were able to map out the status quo of the situation in several European countries, present the lessons we learned from this comparative study, and illustrate how to utilize the information we obtained by formulating operational recommendations. Hopefully this international study will have a positive impact on European, national and local policies, programs and practices.

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Part VII

Appendices

Verwey Jonker Instituut

Appendix A

A: Mean Age of Grade Repeaters and non-repeaters by country

	Non-repeaters			Grade Repeaters		
Country	**Mean AGE**	**95%CI Lower**	**95%CI Upper**	**Mean AGE**	**95%CI Lower**	**95%CI Upper**
Armenia	13.82	13.65	13.98	13.91	13.38	14.44
Austria	13.89	13.74	14.05	14.95	14.77	15.13
Belgium	13.52	13.36	13.69	14.74	14.58	14.89
Bosnia & Herzegovina	13.58	13.42	13.75	14.60	14.00	15.20
Cyprus	13.16	13.01	13.32	13.71	13.38	14.05
Czech Republic	13.66	13.47	13.85	14.06	13.78	14.34
Denmark	13.97	13.84	14.10	14.53	14.28	14.78
Estonia	14.35	14.15	14.56	14.98	14.65	15.31
Finland	14.32	14.16	14.49	15.32	15.06	15.58
France	13.12	12.92	13.33	14.07	13.87	14.27
Germany	13.79	13.65	13.93	14.80	14.64	14.96
Hungary	14.42	14.14	14.70	15.24	14.88	15.60
Iceland	13.38	13.33	13.43	13.00	13.00	13.00
Ireland	13.98	13.78	14.17	14.39	14.10	14.69
Italy	13.34	13.25	13.43	14.77	14.63	14.91
Lithuania	13.99	13.82	14.17	14.72	14.20	15.24
Netherlands	13.75	13.58	13.93	14.59	14.42	14.77
Norway	14.35	14.17	14.52	14.67	14.22	15.11
Poland	14.39	14.26	14.51	15.03	14.72	15.34
Portugal	13.10	12.88	13.31	14.59	14.32	14.86
Russia	14.02	13.90	14.15	14.34	14.05	14.64
Slovenia	13.31	13.05	13.58	13.61	13.02	14.20
Spain	13.25	12.98	13.51	14.46	14.20	14.73
Sweden	14.20	14.06	14.34	14.86	14.61	15.11
Switzerland	14.07	13.89	14.25	14.88	14.69	15.07
Total	**13.81**	**13.78**	**13.85**	**14.58**	**14.52**	**14.64**

B: Female and Male Grade Repeaters within countries (with 95% Confidence intervals)

Countries	Female	95%CI lower	95%CI upper	Male	95%CI lower	95%CI upper
Armenia	.7%	.3%	1.6%	1.0%	.4%	2.0%
Austria	10.7%	8.4%	13.5%	14.2%	11.8%	16.8%
Belgium	32.3%	26.7%	38.4%	32.0%	26.7%	37.8%
Bosnia and Herzegovina	1.2%	.3%	4.2%	.8%	.2%	2.8%
Cyprus	2.9%	2.0%	4.4%	6.9%	5.2%	9.1%
Czech Republic	3.4%	2.0%	5.7%	4.9%	3.4%	7.1%
Denmark	4.6%	3.2%	6.6%	8.4%	6.5%	10.8%
Estonia	1.7%	.9%	3.3%	7.2%	5.1%	10.0%
Finland	3.4%	2.3%	4.9%	3.1%	2.0%	4.9%
France	26.5%	23.7%	29.4%	37.7%	34.2%	41.3%
Germany	15.1%	12.4%	18.4%	21.5%	18.8%	24.4%
Hungary	5.6%	2.8%	10.8%	7.8%	4.4%	13.5%
Iceland	--a	--a	--a	.8%	.2%	2.9%
Ireland	7.3%	5.1%	10.3%	8.2%	5.9%	11.3%
Italy	8.0%	6.5%	9.7%	11.0%	9.3%	13.0%
Lithuania	1.1%	.5%	2.3%	2.6%	1.7%	4.0%
Netherlands	29.7%	25.5%	34.3%	31.1%	27.0%	35.4%
Norway	.7%	.3%	1.7%	2.2%	1.3%	3.7%
Poland	1.6%	.8%	3.2%	5.9%	3.8%	9.2%
Portugal	20.6%	14.9%	27.8%	26.3%	20.8%	32.7%
Russia	1.2%	.7%	2.3%	2.7%	1.7%	4.2%
Slovenia	1.4%	.5%	3.4%	3.6%	2.2%	5.8%
Spain	26.4%	18.7%	35.9%	41.9%	33.9%	50.3%
Sweden	4.5%	3.3%	6.2%	7.2%	5.4%	9.4%
Switzerland	15.3%	12.3%	18.9%	20.8%	16.8%	25.4%

a: No valid cases

C: Female and Male abstainers within countries (with 95% Confidence Intervals)

Country	Females	95%CI Lower	95%CI Upper	Males	95%CI Lower	95%CI Upper
Armenia	32.4%	28.6%	36.5%	23.0%	19.2%	27.3%
Austria	39.0%	33.9%	44.3%	37.0%	32.4%	41.7%
Belgium	37.8%	33.2%	42.6%	38.1%	33.5%	42.8%
Bosnia and Herzegovina	75.6%	68.2%	81.7%	59.9%	53.0%	66.5%
Cyprus	60.2%	55.6%	64.6%	44.2%	39.9%	48.7%
Czech Republic	16.4%	12.9%	20.6%	14.6%	11.5%	18.4%
Denmark	29.4%	25.3%	33.8%	24.4%	20.4%	28.8%
Estonia	13.9%	10.9%	17.6%	14.1%	10.9%	18.1%
Finland	28.2%	24.0%	32.8%	30.3%	26.1%	34.8%
France	68.6%	63.4%	73.4%	63.7%	58.3%	68.7%
Germany	35.0%	31.2%	38.9%	32.9%	29.7%	36.2%
Hungary	18.5%	11.5%	28.5%	12.1%	6.9%	20.4%
Iceland	80.9%	74.8%	85.8%	74.5%	68.6%	79.7%
Ireland	33.6%	27.0%	40.8%	32.6%	27.8%	37.8%
Italy	42.4%	39.5%	45.5%	35.7%	32.8%	38.6%
Lithuania	14.3%	11.4%	17.9%	20.7%	16.8%	25.2%
Netherlands	35.4%	30.4%	40.7%	33.3%	28.8%	38.1%
Norway	51.5%	45.7%	57.3%	50.4%	45.1%	55.8%
Poland	25.7%	21.1%	30.9%	32.8%	27.4%	38.8%
Portugal	60.0%	52.6%	67.1%	59.6%	53.9%	65.1%
Russia	29.5%	24.7%	34.8%	29.9%	25.6%	34.6%
Slovenia	40.8%	33.1%	48.9%	36.7%	29.6%	44.4%
Spain	52.5%	42.9%	62.0%	44.0%	36.4%	51.8%
Sweden	42.0%	37.9%	46.2%	49.1%	44.7%	53.5%
Switzerland	39.1%	34.0%	44.4%	33.6%	28.7%	38.8%

D: Life-time and Last Month Prevalence for Beer, Wine & Breezers

Country	Life-time	95% CI lower	95% CI Upper	Last Month	95% CI lower	95% CI Upper
Estonia	85.7%	83.2%	88.0%	44.6%	39.8%	49.4%
Hungary	84.7%	78.4%	89.5%	45.9%	39.1%	52.9%
Czech Republic	84.2%	81.0%	86.8%	39.1%	35.6%	42.8%
Lithuania	81.7%	78.5%	84.6%	34.4%	30.7%	38.2%
Armenia	71.3%	68.0%	74.4%	25.9%	23.0%	29.1%
Finland	70.5%	66.8%	73.9%	31.2%	27.6%	35.0%
Poland	70.4%	66.0%	74.4%	30.5%	26.8%	34.4%
Denmark	70.4%	66.7%	73.7%	39.8%	35.7%	44.1%
Russia	70.0%	65.7%	73.9%	24.9%	21.7%	28.5%
Germany	65.3%	62.3%	68.1%	37.3%	34.3%	40.4%
Ireland	64.8%	60.4%	69.0%	31.4%	27.4%	35.6%
Netherlands	63.5%	59.0%	67.9%	36.4%	32.0%	41.0%
Switzerland	62.7%	58.2%	66.9%	34.0%	30.1%	38.3%
Austria	60.5%	56.2%	64.7%	35.0%	31.4%	38.7%
Belgium	60.3%	56.6%	63.9%	33.8%	30.4%	37.3%
Slovenia	60.1%	53.1%	66.8%	24.6%	20.2%	29.6%
Italy	58.2%	55.7%	60.7%	29.2%	26.9%	31.6%
Sweden	53.1%	49.8%	56.4%	21.0%	18.3%	23.8%
Spain	49.1%	41.6%	56.6%	18.1%	13.5%	23.8%
Norway	47.9%	43.1%	52.6%	23.2%	19.6%	27.3%
Cyprus	45.4%	41.7%	49.1%	20.9%	18.3%	23.8%
Portugal	37.2%	32.2%	42.5%	12.5%	9.7%	16.1%
Bosnia and Herzegovina	30.9%	26.6%	35.6%	7.5%	5.5%	10.2%
France	30.9%	26.7%	35.4%	12.9%	10.7%	15.6%
Iceland	21.6%	17.6%	26.3%	9.3%	6.7%	12.9%

a: No valid cases

E: Life-time and Last Month Prevalence for Spirits

Country	Life-time	95% CI lower	95% CI Upper	Last Month	95% CI lower	95% CI Upper
Estonia	62.0%	57.5%	66.4%	26.8%	23.3%	30.6%
Hungary	60.3%	51.5%	68.5%	24.7%	19.7%	30.5%
Denmark	57.3%	53.5%	61.0%	28.5%	25.3%	32.0%
Czech Republic	49.7%	44.9%	54.4%	18.8%	15.9%	22.2%
Ireland	48.3%	43.5%	53.1%	20.7%	17.4%	24.5%
Lithuania	44.6%	40.2%	49.0%	12.4%	10.0%	15.2%
Finland	42.7%	38.6%	46.9%	16.0%	13.5%	18.8%
Germany	37.3%	34.3%	40.4%	15.2%	13.2%	17.4%
Austria	36.9%	33.4%	40.6%	17.0%	14.6%	19.7%
Poland	36.7%	32.4%	41.3%	14.9%	12.0%	18.3%
Switzerland	35.4%	31.1%	40.0%	16.8%	14.2%	19.7%
Sweden	33.7%	30.8%	36.8%	13.7%	11.8%	16.0%
Netherlands	33.5%	29.5%	37.8%	15.2%	12.6%	18.2%
Spain	32.6%	25.7%	40.3%	14.7%	11.0%	19.3%
Belgium	31.0%	27.5%	34.7%	11.6%	9.7%	13.7%
Slovenia	30.7%	24.7%	37.5%	9.0%	6.5%	12.2%
Russia	28.7%	25.2%	32.4%	8.0%	6.5%	9.7%
Norway	26.9%	23.2%	31.0%	10.6%	8.4%	13.2%
Italy	25.9%	23.7%	28.3%	10.6%	9.2%	12.3%
Portugal	23.9%	19.5%	28.8%	6.2%	4.6%	8.3%
Cyprus	21.4%	18.4%	24.7%	8.8%	7.0%	11.0%
Armenia	20.5%	17.6%	23.8%	6.2%	4.8%	8.0%
France	15.8%	13.1%	18.8%	6.4%	5.2%	7.8%
Bosnia and Herzegovina	11.5%	8.4%	15.4%	2.5%	1.4%	4.5%
Iceland	8.0%	5.9%	10.8%	3.0%	1.7%	5.1%

F: Life-time and Last Month Prevalence for Cannabis

Country	Life-time	95% CI lower	95% CI Upper	Last Month	95% CI lower	95% CI Upper
Estonia	22.0%	18.9%	25.6%	7.8%	5.9%	10.3%
Ireland	20.0%	16.9%	23.6%	7.5%	5.8%	9.6%
Switzerland	19.2%	16.3%	22.4%	7.9%	6.2%	10.0%
Spain	17.5%	12.9%	23.3%	8.5%	5.5%	13.0%
Netherlands	17.4%	14.2%	21.2%	8.4%	6.6%	10.6%
Czech Republic	15.7%	13.0%	18.9%	5.5%	4.0%	7.4%
Hungary	13.1%	9.7%	17.4%	4.1%	2.3%	7.1%
Denmark	11.8%	9.6%	14.4%	2.9%	2.0%	4.1%
Belgium	11.6%	9.4%	14.3%	6.0%	4.6%	7.7%
Lithuania	11.2%	9.2%	13.5%	3.2%	2.4%	4.4%
Austria	9.6%	7.9%	11.7%	3.3%	2.4%	4.5%
Germany	9.5%	8.1%	11.2%	3.4%	2.6%	4.4%
France	8.7%	7.2%	10.6%	3.9%	2.9%	5.1%
Slovenia	8.6%	5.9%	12.4%	2.4%	1.4%	4.0%
Italy	8.3%	7.2%	9.7%	3.9%	3.2%	4.9%
Russia	8.1%	6.2%	10.5%	2.2%	1.5%	3.2%
Poland	7.3%	5.6%	9.5%	2.5%	1.6%	3.9%
Sweden	4.6%	3.6%	6.0%	1.6%	1.1%	2.4%
Norway	4.5%	3.2%	6.2%	1.6%	1.0%	2.6%
Finland	4.4%	3.3%	5.8%	.7%	.3%	1.3%
Cyprus	3.2%	2.2%	4.7%	2.0%	1.2%	3.3%
Iceland	1.7%	.9%	3.5%	1.0%	.5%	2.2%
Armenia	1.6%	1.0%	2.5%	.7%	.3%	1.4%
Portugal	1.2%	.7%	2.3%	.5%	.2%	1.3%
Bosnia and Herzegovina	.8%	.3%	2.0%	.4%	.1%	1.5%

G: Life-time Prevalence for Females and Males by country (Beer, Wine & Breezers)

Country	Female	95%CI lower	95%CI upper	Male	95%CI lower	95%CI upper
Armenia	67.2%	63.2%	71.0%	76.2%	71.8%	80.0%
Austria	59.6%	54.3%	64.7%	61.3%	56.4%	66.0%
Belgium	61.2%	56.5%	65.8%	59.3%	54.6%	63.8%
Bosnia and Herzegovina	23.9%	17.7%	31.5%	37.8%	31.6%	44.4%
Cyprus	38.2%	33.8%	42.8%	53.4%	48.7%	58.0%
Czech Republic	83.3%	79.0%	86.9%	84.9%	81.0%	88.1%
Denmark	67.7%	63.2%	71.9%	73.3%	68.7%	77.4%
Estonia	85.5%	81.7%	88.6%	86.0%	82.1%	89.2%
Finland	71.4%	66.8%	75.6%	69.6%	65.1%	73.8%
France	29.2%	24.5%	34.4%	32.5%	27.6%	37.7%
Germany	64.4%	60.4%	68.1%	66.0%	62.6%	69.2%
Hungary	81.5%	71.5%	88.5%	87.3%	79.5%	92.5%
Iceland	19.4%	14.4%	25.7%	25.1%	19.9%	31.1%
Ireland	64.6%	57.4%	71.2%	65.1%	59.6%	70.1%
Italy	54.7%	51.8%	57.7%	62.0%	59.0%	65.0%
Lithuania	85.1%	81.6%	88.1%	77.9%	73.3%	81.9%
Netherlands	63.0%	57.5%	68.2%	64.2%	59.3%	68.9%
Norway	47.8%	42.0%	53.7%	48.3%	43.0%	53.5%
Poland	73.7%	68.1%	78.5%	66.2%	60.1%	71.8%
Portugal	36.2%	29.7%	43.3%	38.2%	32.9%	44.0%
Russia	70.5%	65.2%	75.3%	69.4%	64.8%	73.7%
Slovenia	58.0%	49.9%	65.6%	62.4%	54.6%	69.5%
Spain	44.7%	35.1%	54.7%	53.7%	45.5%	61.7%
Sweden	56.0%	51.8%	60.2%	50.1%	45.8%	54.5%
Switzerland	60.3%	55.0%	65.3%	65.2%	59.9%	70.2%

H: Life-time Prevalence for Females and Males by country (Spirits)

Country	Female	95%CI lower	95%CI upper	Male	95%CI lower	95%CI upper
Armenia	13.4%	10.7%	16.8%	29.0%	24.3%	34.2%
Austria	37.3%	32.6%	42.2%	36.7%	32.7%	40.8%
Belgium	29.7%	25.3%	34.5%	32.4%	27.9%	37.2%
Bosnia and Herzegovina	9.4%	5.7%	15.1%	13.6%	10.1%	18.0%
Cyprus	17.0%	13.4%	21.3%	26.3%	22.5%	30.5%
Czech Republic	49.5%	43.6%	55.4%	49.9%	43.8%	56.0%
Denmark	55.8%	50.9%	60.5%	58.9%	54.3%	63.4%
Estonia	61.7%	55.6%	67.5%	62.4%	56.8%	67.6%
Finland	41.5%	36.8%	46.3%	43.9%	38.9%	49.0%
France	14.5%	11.6%	18.0%	16.9%	13.6%	20.9%
Germany	36.6%	32.9%	40.5%	38.0%	34.4%	41.7%
Hungary	58.6%	45.9%	70.3%	61.7%	50.5%	71.7%
Iceland	7.3%	4.5%	11.6%	8.9%	6.0%	13.2%
Ireland	50.9%	43.5%	58.3%	46.4%	40.4%	52.5%
Italy	24.7%	22.0%	27.7%	27.2%	24.5%	30.2%
Lithuania	45.9%	40.7%	51.2%	43.1%	37.6%	48.7%
Netherlands	32.0%	27.5%	37.0%	35.1%	30.5%	40.0%
Norway	26.6%	21.9%	31.9%	27.6%	23.3%	32.3%
Poland	37.0%	31.4%	42.8%	36.5%	30.6%	42.8%
Portugal	26.7%	20.9%	33.5%	20.9%	16.6%	26.0%
Russia	26.0%	22.0%	30.6%	31.3%	26.8%	36.2%
Slovenia	29.3%	22.3%	37.6%	32.3%	25.7%	39.7%
Spain	34.4%	25.5%	44.6%	30.7%	23.4%	39.1%
Sweden	38.3%	34.3%	42.3%	29.0%	25.1%	33.2%
Switzerland	33.0%	28.0%	38.5%	38.0%	32.9%	43.3%

I: Life-time Prevalence for Females and Males by country (Cannabis)

Country	Female	95%CI lower	95%CI upper	Male	95%CI lower	95%CI upper
Armenia	.1%	.0%	.9%	3.4%	2.1%	5.3%
Austria	8.0%	6.2%	10.4%	11.3%	8.9%	14.4%
Belgium	11.5%	8.6%	15.2%	11.7%	9.0%	15.1%
Bosnia and Herzegovina	.8%	.2%	3.0%	.8%	.2%	3.0%
Cyprus	1.5%	.7%	3.0%	5.2%	3.5%	7.8%
Czech Republic	15.1%	11.5%	19.5%	16.3%	13.0%	20.1%
Denmark	11.7%	9.0%	14.9%	11.8%	9.0%	15.2%
Estonia	18.1%	14.4%	22.6%	26.1%	22.0%	30.8%
Finland	3.8%	2.5%	5.8%	4.9%	3.3%	7.3%
France	6.8%	4.9%	9.2%	10.7%	8.5%	13.3%
Germany	7.4%	5.7%	9.5%	11.5%	9.6%	13.7%
Hungary	13.0%	7.5%	21.5%	13.2%	9.5%	17.9%
Iceland	1.0%	.3%	2.8%	2.7%	1.1%	6.4%
Ireland	17.9%	13.7%	23.0%	21.8%	17.7%	26.6%
Italy	6.8%	5.4%	8.5%	10.1%	8.5%	11.9%
Lithuania	8.6%	6.5%	11.3%	14.1%	10.9%	18.0%
Netherlands	15.9%	12.3%	20.2%	19.0%	15.2%	23.5%
Norway	4.0%	2.7%	5.9%	5.1%	3.4%	7.5%
Poland	5.7%	3.9%	8.5%	9.4%	6.7%	13.0%
Portugal	.7%	.2%	2.2%	1.8%	.9%	3.5%
Russia	5.9%	4.0%	8.6%	10.3%	7.8%	13.5%
Slovenia	8.7%	5.8%	13.0%	8.5%	5.0%	14.0%
Spain	15.4%	10.6%	21.9%	19.7%	14.0%	26.8%
Sweden	4.4%	3.0%	6.4%	4.9%	3.5%	6.7%
Switzerland	14.8%	11.7%	18.6%	23.5%	19.7%	27.7%

J: Drunkenness for Grade repeaters and non-repeaters by country (Beer, Wine & Breezers)

Country	No repetition	95%CI Lower	95%CI Upper	Grade repetition	95%CI Lower	95%CI Upper
Armenia	14.7%	12.6%	17.2%	22.2%	5.6%	57.9%
Austria	21.1%	18.5%	24.1%	37.3%	30.9%	44.2%
Belgium	15.9%	13.2%	19.1%	24.4%	20.6%	28.8%
Bosnia and Herzegovina	8.9%	6.4%	12.2%	--a	--a	--a
Cyprus	9.1%	7.4%	11.1%	25.5%	15.1%	39.5%
Czech Republic	27.8%	24.2%	31.7%	30.4%	18.8%	45.3%
Denmark	35.0%	31.3%	38.9%	33.8%	23.4%	46.1%
Estonia	41.9%	37.6%	46.3%	56.7%	38.5%	73.2%
Finland	34.0%	30.0%	38.2%	47.4%	31.1%	64.2%
France	5.6%	4.4%	7.2%	11.2%	8.2%	15.0%
Germany	20.7%	18.3%	23.3%	34.9%	29.8%	40.3%
Hungary	28.9%	23.6%	34.8%	45.0%	25.8%	65.8%
Iceland	6.2%	4.3%	9.0%	--a	--a	--a
Ireland	28.6%	24.5%	33.1%	40.7%	28.6%	54.0%
Italy	12.9%	11.4%	14.5%	37.6%	32.3%	43.1%
Lithuania	23.2%	20.0%	26.7%	50.0%	24.2%	75.8%
Netherlands	17.6%	14.6%	21.0%	24.2%	19.6%	29.5%
Norway	17.9%	14.8%	21.4%	46.7%	24.0%	70.8%
Poland	21.9%	18.4%	25.9%	33.3%	17.8%	53.6%
Portugal	7.5%	5.1%	10.8%	15.4%	9.7%	23.5%
Russia	29.2%	25.7%	33.1%	29.6%	15.3%	49.6%
Slovenia	14.1%	10.4%	18.9%	25.0%	9.8%	50.4%
Spain	10.5%	6.6%	16.3%	26.8%	18.5%	37.2%
Sweden	17.4%	15.1%	19.9%	23.0%	15.4%	32.9%
Switzerland	20.4%	16.8%	24.5%	32.2%	25.2%	40.1%

a No valid cases

K: Drunkenness for grade repeaters and non-repeaters by country (Spirits)

Country	No repetition	95%CI Lower	95%CI Upper	Grade repetition		95%CI Upper
Armenia	5.7%	4.5%	7.3%	10.0%	1.4%	46.8%
Austria	15.0%	12.9%	17.4%	27.9%	22.0%	34.8%
Belgium	7.0%	5.2%	9.4%	17.6%	13.9%	21.9%
Bosnia and Herzegovina	2.6%	1.4%	4.8%	--a	--a	--a
Cyprus	5.4%	4.1%	7.1%	18.5%	10.4%	30.7%
Czech Republic	17.5%	14.5%	21.0%	13.6%	5.5%	30.0%
Estonia	37.8%	32.8%	43.0%	51.7%	33.1%	69.9%
Finland	25.1%	21.6%	28.9%	38.5%	24.2%	55.0%
France	3.3%	2.4%	4.6%	9.0%	6.5%	12.5%
Germany	14.5%	12.3%	17.0%	27.4%	23.2%	32.1%
Hungary	24.0%	17.9%	31.4%	35.0%	18.9%	55.4%
Iceland	2.8%	1.8%	4.5%	--a	--a	--a
Ireland	21.3%	18.1%	25.0%	41.9%	28.6%	56.6%
Italy	7.7%	6.6%	9.0%	27.7%	23.2%	32.8%
Lithuania	15.5%	12.6%	18.9%	17.6%	6.1%	41.5%
Netherlands	10.6%	8.3%	13.5%	16.6%	13.0%	20.8%
Norway	11.1%	8.8%	13.9%	40.0%	20.7%	63.0%
Poland	15.2%	12.5%	18.4%	25.0%	12.9%	42.9%
Portugal	5.7%	3.8%	8.3%	13.0%	7.5%	21.5%
Russia	15.1%	12.7%	18.0%	3.7%	.5%	22.3%
Slovenia	10.1%	7.3%	13.6%	--a	--a	--a
Spain	6.4%	3.6%	11.2%	20.9%	12.6%	32.5%
Sweden	13.5%	11.6%	15.6%	17.8%	11.1%	27.2%
Switzerland	15.2%	12.5%	18.4%	20.3%	14.8%	27.2%

a No valid cases

L: First time use of beer, breezers or wine

Country	Overall	female	male
Armenia	11.81	12.19	11.40
Austria	12.16	12.30	12.02
Belgium	12.27	12.51	11.95
Cyprus	11.29	11.90	10.75
Czech Republic	11.18	11.16	11.20
Denmark	12.74	12.72	12.76
Estonia	11.49	11.95	11.08
Finland	12.76	13.04	12.49
France	12.20	12.43	11.95
Germany	12.67	12.77	12.57
Hungary	11.57	11.56	11.58
Ireland	13.01	13.22	12.84
Italy	11.80	12.06	11.46
Lithuania	11.58	11.77	11.35
Netherlands	12.25	12.42	12.07
Norway	12.99	13.23	12.71
Poland	12.40	12.57	12.11
Portugal	12.13	12.18	12.08
Russia	12.10	11.96	12.24
Slovenia	10.78	11.30	10.13
Spain	12.82	12.89	12.76
Sweden	12.93	13.27	12.54
Switzerland	12.55	12.73	12.35
Total	**12.12**	**12.33**	**11.90**

M: First time use of strong spirits

Country	Overall	female	male
Armenia	12.68	13.30	12.35
Austria	13.33	13.21	13.45
Belgium	13.35	13.48	13.22
Cyprus	12.24	12.91	11.57
Czech Republic	12.70	12.74	12.66
Denmark	13.19	13.00	13.36
Estonia	12.85	13.26	12.46
Finland	13.86	13.96	13.76
France	13.12	13.08	13.17
Germany	13.73	13.75	13.71
Hungary	13.19	13.00	13.28
Ireland	13.54	13.61	13.48
Italy	13.21	13.32	13.06
Lithuania	12.92	13.27	12.50
Netherlands	13.46	13.35	13.56
Norway	13.88	14.08	13.65
Poland	13.02	13.20	12.77
Portugal	13.25	13.37	13.07
Russia	13.26	13.21	13.28
Slovenia	12.07	12.08	12.06
Spain	13.10	13.21	12.98
Sweden	13.51	13.59	13.40
Switzerland	13.75	13.69	13.81
Total	**13.19**	**13.27**	**13.12**

O: First time use of weed, marijuana or hash

Country	Overall	female	male
Armenia	14.00	--a	14.00
Austria	13.64	13.59	13.69
Belgium	13.26	13.65	12.87
Cyprus	11.63	10.60	12.00
Czech Republic	13.57	13.65	13.49
Denmark	13.90	14.07	13.65
Estonia	14.27	14.33	14.22
Finland	14.38	14.44	14.34
France	13.51	13.64	13.54
Germany	13.83	14.00	13.68
Hungary	14.11	14.27	14.00
Ireland	13.89	14.15	13.75
Italy	13.66	13.68	13.64
Lithuania	14.11	14.15	14.10
Netherlands	13.88	13.87	13.88
Norway	14.05	14.17	13.90
Poland	13.61	13.62	13.60
Portugal	13.25	-- a	13.25
Russia	14.03	14.16	13.97
Slovenia	13.25	13.46	13.00
Spain	12.96	13.12	12.84
Sweden	14.18	14.04	14.40
Switzerland	13.65	13.69	13.61
Total	**13.63**	**13.71**	**13.56**

a no valid cases

P: Binge drinking by gender within countries (Beer, Wine & Breezers)

Country	Females	95%CI Lower	95%CI Upper	Males	95%CI Lower	95%CI Upper
Armenia	1.0%	.5%	2.2%	5.1%	3.6%	7.2%
Austria	14.0%	11.2%	17.4%	18.2%	15.1%	21.7%
Belgium	15.6%	12.9%	18.8%	14.8%	11.6%	18.8%
Bosnia and Herzegovina	2.7%	1.3%	5.7%	7.2%	4.2%	12.0%
Cyprus	2.6%	1.4%	4.6%	11.0%	8.3%	14.4%
Czech Republic	11.2%	8.5%	14.5%	15.4%	12.2%	19.2%
Denmark	19.2%	15.9%	23.0%	25.4%	21.0%	30.4%
Estonia	9.0%	6.5%	12.4%	13.6%	10.7%	17.2%
Finland	23.0%	19.4%	27.1%	28.0%	23.7%	32.7%
France	2.8%	1.7%	4.5%	5.0%	3.6%	6.9%
Germany	15.0%	12.4%	18.1%	18.2%	15.5%	21.3%
Hungary	5.0%	2.3%	10.5%	11.3%	6.8%	18.3%
Iceland	4.7%	2.4%	8.8%	4.3%	2.4%	7.9%
Ireland	22.3%	17.5%	28.0%	29.3%	24.2%	35.1%
Italy	5.4%	4.3%	6.8%	10.1%	8.4%	11.9%
Lithuania	9.1%	7.1%	11.6%	16.5%	13.4%	20.0%
Netherlands	17.8%	13.9%	22.4%	20.5%	16.6%	25.1%
Norway	12.8%	9.8%	16.4%	16.0%	12.8%	19.8%
Poland	12.4%	9.3%	16.2%	18.2%	13.9%	23.5%
Portugal	5.0%	3.2%	7.7%	7.5%	4.7%	11.5%
Russia	5.6%	3.8%	8.0%	9.5%	7.2%	12.5%
Slovenia	5.3%	3.1%	9.0%	9.3%	5.9%	14.1%
Spain	9.3%	6.4%	13.4%	17.3%	12.4%	23.4%
Sweden	9.8%	7.6%	12.4%	12.5%	9.8%	15.7%
Switzerland	13.0%	10.1%	16.5%	15.1%	11.9%	18.9%

P: Binge drinking by gender within countries (Spirits)

Country	Female	95%CI Lower	95%CI Upper	Male	95%CI Lower	95%CI Upper
Armenia	.1%	.0%	1.0%	3.2%	2.0%	5.1%
Austria	6.8%	5.2%	8.9%	8.3%	6.2%	11.0%
Belgium	3.9%	2.8%	5.5%	5.5%	3.9%	7.7%
Bosnia and Herzegovina	1.2%	.4%	3.4%	2.0%	.9%	4.3%
Cyprus	1.9%	1.0%	3.8%	5.1%	3.4%	7.5%
Czech Republic	7.1%	5.0%	9.9%	6.2%	4.3%	9.0%
Denmark	15.3%	12.2%	19.0%	15.1%	12.0%	18.9%
Estonia	17.8%	13.8%	22.7%	22.0%	17.3%	27.6%
Finland	9.9%	7.4%	13.1%	10.6%	8.2%	13.6%
France	1.7%	1.0%	2.9%	2.8%	1.7%	4.6%
Germany	6.7%	5.0%	8.9%	9.6%	7.6%	11.9%
Hungary	5.5%	2.8%	10.6%	8.0%	4.7%	13.2%
Iceland	2.0%	.7%	5.3%	1.2%	.4%	3.5%
Ireland	15.8%	12.0%	20.5%	17.3%	13.5%	22.0%
Italy	3.3%	2.6%	4.3%	4.7%	3.6%	6.0%
Lithuania	9.9%	7.5%	13.0%	13.1%	9.9%	17.2%
Netherlands	6.2%	4.3%	8.9%	6.3%	4.7%	8.5%
Norway	3.3%	2.1%	5.0%	4.6%	2.9%	7.1%
Poland	10.1%	7.3%	13.9%	14.1%	10.3%	19.0%
Portugal	1.7%	.7%	4.2%	3.3%	1.9%	5.7%
Russia	2.8%	1.7%	4.6%	5.5%	3.7%	8.3%
Slovenia	4.0%	2.2%	7.2%	4.9%	2.7%	8.6%
Spain	4.2%	2.3%	7.6%	11.6%	8.1%	16.5%
Sweden	7.3%	5.7%	9.4%	6.3%	4.7%	8.4%
Switzerland	5.0%	3.4%	7.4%	8.0%	5.8%	11.0%

Q: Drinking alone by gender within countries (Beer, Wine & Breezers)

Country	Female	95%CI Lower	95%CI Upper	Male	95%CI Lower	95%CI Upper
Armenia	7.6%	5.3%	10.6%	13.1%	10.1%	16.9%
Austria	2.8%	1.7%	4.6%	4.4%	3.1%	6.1%
Belgium	2.3%	1.3%	4.3%	7.6%	5.4%	10.6%
Bosnia and Herzegovina	9.8%	4.4%	20.6%	11.2%	5.6%	21.1%
Cyprus	6.8%	4.3%	10.6%	15.9%	12.3%	20.4%
Czech Republic	6.1%	4.3%	8.7%	9.6%	7.3%	12.6%
Denmark	1.9%	1.0%	3.8%	2.3%	1.3%	4.2%
Estonia	4.3%	2.8%	6.6%	4.7%	3.0%	7.2%
Finland	4.1%	2.7%	6.3%	8.4%	6.2%	11.2%
France	3.6%	2.0%	6.6%	7.1%	4.7%	10.6%
Germany	2.1%	1.2%	3.5%	4.5%	3.2%	6.2%
Hungary	7.0%	3.4%	13.9%	9.2%	5.8%	14.4%
Iceland	5.4%	1.9%	14.0%	9.7%	4.2%	20.8%
Ireland	2.9%	1.5%	5.5%	3.2%	1.8%	5.6%
Italy	5.0%	3.8%	6.5%	6.4%	5.1%	7.9%
Lithuania	3.9%	2.6%	5.8%	8.6%	6.3%	11.6%
Netherlands	4.9%	3.2%	7.4%	6.1%	4.1%	8.9%
Norway	6.3%	4.0%	9.7%	6.2%	3.6%	10.6%
Poland	8.4%	5.9%	11.8%	10.3%	7.0%	15.0%
Portugal	10.9%	5.7%	19.9%	13.2%	8.4%	20.0%
Russia	2.9%	1.8%	4.8%	8.6%	6.4%	11.3%
Slovenia	4.7%	2.6%	8.4%	9.0%	6.0%	13.3%
Spain	2.8%	.9%	7.9%	6.3%	3.0%	12.6%
Sweden	3.3%	1.9%	5.6%	6.7%	4.7%	9.5%
Switzerland	3.8%	2.2%	6.5%	6.0%	4.1%	8.8%

R: Drinking alone by gender within countries Beer (Spirits)

Country	Female	95%CI Lower	95%CI Upper	Male	95%CI Lower	95%CI Upper
Armenia	11.2%	6.0%	20.0%	15.6%	10.6%	22.4%
Austria	2.3%	1.1%	4.5%	6.5%	4.3%	9.7%
Belgium	3.7%	1.8%	7.3%	10.4%	7.0%	15.3%
Bosnia and Herzegovina	13.0%	5.3%	28.6%	18.2%	9.4%	32.2%
Cyprus	10.7%	5.9%	18.8%	17.6%	12.4%	24.5%
Czech Republic	6.5%	4.1%	10.1%	13.6%	10.4%	17.7%
Denmark	1.6%	.7%	3.7%	3.4%	2.0%	5.9%
Estonia	3.6%	2.0%	6.2%	4.0%	2.3%	6.7%
Finland	4.2%	2.4%	7.5%	9.9%	7.1%	13.5%
France	5.2%	2.5%	10.7%	10.8%	6.6%	17.3%
Germany	2.7%	1.4%	5.0%	3.3%	1.9%	5.5%
Hungary	5.4%	2.5%	11.1%	6.8%	3.6%	12.4%
Ireland	1.4%	.5%	4.0%	5.0%	3.0%	8.3%
Italy	4.2%	2.7%	6.3%	8.3%	6.0%	11.3%
Lithuania	3.4%	2.0%	5.8%	9.5%	5.7%	15.4%
Netherlands	6.0%	3.6%	9.9%	7.2%	4.5%	11.3%
Norway	5.1%	2.4%	10.6%	3.9%	1.8%	8.4%
Poland	10.9%	6.9%	16.7%	13.6%	9.0%	20.0%
Portugal	6.5%	3.3%	12.3%	6.0%	2.5%	13.6%
Russia	2.8%	1.2%	6.4%	8.7%	5.7%	13.2%
Slovenia	8.4%	4.7%	14.6%	15.2%	9.6%	23.2%
Spain	1.2%	.2%	8.0%	5.5%	2.2%	13.0%
Sweden	5.8%	3.7%	8.9%	8.4%	5.6%	12.5%
Switzerland	4.8%	2.6%	9.0%	8.6%	5.6%	13.0%

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Appendix B

Synthesis report first regional conferences about policies toward alcohol use of juveniles

Authors: Drs. Zuzana Podaná and Dr. Jiří Buriánek

Is this report a short summary is presented of the results of the 23 national papers written by the national experts of participating countries for the first regional conferences. These included: Armenia, Austria, Belgium (divided into Flanders and Wallonia), Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Russia, Slovenia, Spain, and Switzerland.

Restrictions on juvenile drinking and substance use

The experts from each country were asked about four aspects of their substance use policy targeting juveniles: what is the minimal age for purchase and if possession, consumption, and purchase by juveniles are regarded as a criminal offence. Substance use was further divided into alcohol, soft drug and hard drug use. The age limits for purchase of alcohol use were already discussed in section 3.1. Interestingly, juvenile drinking is not considered as a criminal act in majority of countries – except for, for instance, Baltic countries. On the other hand, almost all countries are highly restrictive with regards to juvenile drug use.

Alcohol – minimum age to purchase (missing: AM)	40% - 18 years
Alcohol – possession a criminal offence (missing: AM)	no (83%)
Alcohol – consumption a criminal offence (missing: AM)	no (74%)
Alcohol – purchase a criminal offence (missing: AM, PL)	no (60%)

Soft drug – minimum age to purchase (missing: CY, ES, FR)	AR (95%)
Soft drug – possession a criminal offence (missing: AR)	yes (79%)*
Soft drug – consumption a criminal offence (missing: AR)	yes (67%)
Soft drug – purchase a criminal offence (missing: AR, CY)	yes (92%)

Note: AR = absolute restriction

Hard drug – minimum age to purchase (missing: CY, ES, FR)	AR (100%)
Hard drug – possession a criminal offence	yes (92%)
Hard drug – consumption a criminal offence	yes (71%)
Hard drug – purchase a criminal offence	yes (96%)

* Netherlands and Belgium-Flanders (not Wallonia) have a special status for cannabis use. Absolute restriction is valid for underage juveniles (18 age limit) and liberal approach is applied for adults.

Note: AR = absolute restriction

Based on the first table above, countries can be categorized according to the approach of their policy towards juvenile alcohol use ranging from very tolerant ones (Spain and Italy), to very restrictive (Finland). Generally, Western and Southern European countries are more inclined to a tolerant attitude, Northern Europe, Baltic countries and Russia are restrictive and Central European countries lie in between them. If we compare these results with the clustering from section 3.1, we can summarize that restrictive countries have strict regulations for both adults and juveniles; on the other hand, there

are, for instance, some Central European countries (Austria, Germany, and Czech Republic) which have liberal alcohol policy regarding adults, but stricter regulations with respect to juveniles.

Very Tolerant	Tolerant	Neither tolerant nor restrictive	Restrictive	Very restrictive
Spain	Denmark	Austria	Estonia	Finland
Italy	Belgium	Cyprus	Iceland	
(Armenia)	Netherlands	Czech Republic	Lithuania	
	Portugal	Germany	Norway	
		France	Russia	
		Hungary	Slovenia	
		Switzerland		
		(Poland)		

Note: Armenia and Poland could not be categorized due to missing values on some indicators. Their position was therefore only estimated.

Untargeted policy indicators

This section briefly summarizes other policy indicators which are usually not directly linked with juvenile drinking but rather apply to the whole population. First, our experts evaluated the approach of their country policy to alcohol and soft drugs (for the typology, see section 2). A great majority of countries do not have zero tolerance to alcohol use (except for 3 Northern European countries) and almost all of them claim to focus on harm, supply and demand reduction (not e.g. Armenia). The same aims are stated for soft drugs; however, in this case, most countries apply also zero tolerance approach.

Policy to alcohol – zero tolerance	No (88%)
Policy to alcohol – harm reduction (missing: CY)	Yes (100%)
Policy to alcohol – supply reduction (missing: CY)	Yes (88%)
Policy to alcohol – demand reduction (missing: CY)	Yes (96%)

Policy to soft drugs – zero tolerance	Yes (63%)
Policy to soft drugs – harm reduction (missing: CY)	Yes (96%)
Policy to soft drugs – supply reduction (missing: CY)	Yes (100%)
Policy to soft drugs – demand reduction (missing: CY)	Yes (100%)

Availability of alcohol can be reduced by various means (see also section 3.1) and we also asked our experts on several of them. State monopoly for selling alcohol in shops is not usual in Europe and its partial version can be found only in Russian, Finland, and Norway. Restriction on density of shops is also rather infrequent, on the other hand, many countries do not allow sale of alcohol on certain days or hours. Finally, community programs for raising awareness are a common place in Europe.

State monopoly for selling alcohol beverages in retail stores (missing: FR, IS)	None (86%)
Restrictions on density of shops with alcohol (missing: IS)	None (83%)
Restrictions on business hours and days for sale (missing: CY, IS)	None (41%) Hours or day (59%)
Community programs for raising awareness (missing: CY, FR, IS)	Yes (91%)

The last table presents results on various indicators concerning mainly advertising and drinking and driving. Almost all countries set regulations on advertising of alcohol beverages, but only some have mandatory consumer warnings or information on labels of beverages. Restrictions on BAC limits are still surprisingly variable in Europe (see also section 3.1) and many countries have already introduced lower limits for young drivers (e.g. Austria, Germany, Spain). More than half of these countries also attempt to regulate drinking during practising selected sports (e.g. cycling or skiing).

Advertising restrictions for printed media (missing: IS)	Yes (91%)
Advertising restrictions in broadcast (missing: IS)	Yes (96%)
Advertising restrictions on billboards (missing: IS)	Yes (87%)
Legal blood alcohol limit – adults (mg/dl)	0 – 0.02 (25%) 0.03 – 0.07 (71%)
Legal blood alcohol limit – young drivers	0 – 0.01 (42%) 0.02 – 0.03 (25%) More than 0.04 (33%)
Mandatory penalty for exceeding legal limit (missing: CY, FR, IS, SI)	Fine + License-suspension (80%)
Restrictions on alcohol use during cycling, skiing, snowboarding, etc. (missing: AR, CY, FR, IS)	Yes (60%)
Restrictions on commercial communication (promotion) targeting young people (missing: CY, IS, FR)	Yes (100%)
Consumers information or warning labels on alcohol beverages (missing: CY, FR IS, PL)	No (80%)

Colofon

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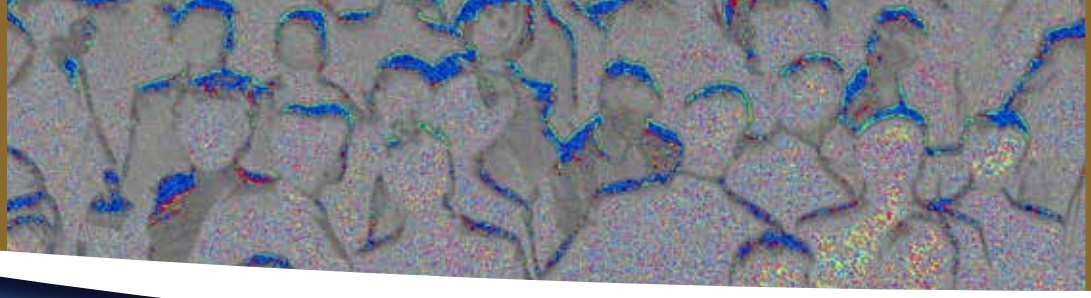

In the past several years, adolescent alcohol consumption has become a growing problem in a number of European countries. Problematic drinking behaviours, such as binge drinking and the early age at which youths start consuming alcohol and other drugs, have not only raised health concerns, but may also have implications for society as a whole. Against this backdrop, the AAA-Prevent project (Alcohol use Among Adolescents in Europe, Environmental Research and Preventive Actions) conducted a three-year study that examined the extent of adolescent alcohol and drug consumption in 25 European countries from a multilevel perspective.

Many alcohol-related studies stipulate that alcohol consumption merely manifests as the result of individual choice. This report however, recognizes the complexity of the issue at hand, and takes a closer look at the push and pull effects of a variety of risk and protective factors in different social domains and structural levels in 25 European countries. The scope of this study also allowed for an extensive comparison of the influence of the various domains and risk factors on youth substance use, between European regions and countries. At the same time taking into consideration the diversity of national alcohol policies and cultural and socioeconomic indicators. It is in essence the different contexts which played a central role in the analyses.

In addition to this report, with a glimpse towards the future, the AAA-Prevent project also documented and elaborated on the different effective adolescent substance use prevention programs and interventions in Europe. These are presented on the project website: www.aaaprevent.eu. The aim of this database is to provide policymakers and practitioners with a pragmatic overview of effective youth alcohol prevention strategies in Europe.