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Adolescents Substance Use:
Identifying Factors Influencing Alcohol Consumption among High School Students in the Czech Republic

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Declaration of Authorship

I hereby declare that I compiled this thesis independently, using only the listed resources and literature.

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Signature

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I would like to thank to my consultant, Filip Pertold, for his time and a great and very helpful tutoring.

Abstract

This bachelor thesis focuses on indicating the factors, which influence the participation in adolescent substance use. Possibly important factors are identified based on the previous researches dealing with the same topic. The effect of these factors is then tested with the empirical model. This thesis deals with a dataset from the European School Survey Project on Alcohol and Other Drugs done at the Czech high schools among freshmen and juniors. Since the results in dependence on sex and class year are expected to be different, the regression is run separately. The most significant factors are for all cases: the smoking experience, the age of the first intoxication, and the share of friends who already consume alcohol.

Keywords: Adolescents, Substance Use

Abstrakt

Cílem této bakalářské práce je identifikovat faktory, které přispívají k užívání alkoholu mezi mladistvými. Z předešlých výzkumů na toto téma jsou vybrány faktory, které by mohly pravděpodobnost konzumace alkoholu nejvíce ovlivňovat. Jejich vliv je testován pomocí empirického modelu. Použitá data pocházejí z Evropské školní studie o alkoholu a jiných drogách, která proběhla v roce 2003 ve vybraných prvních a třetích ročnících českých středních škol. Vzhledem k tomu, že se dají předpokládat různé výsledky v závislosti na pohlaví a ročníku, regrese byla provedena odděleně pro jednotlivé případy. Jako nejvíce signifikantní vycházejí pro všechny případy: zkušenost s kouřením, stáří v době prvního opití a vysoký podíl přátel konzumujících alkohol.

Klíčová slova: Adolescents, Substance Use

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List of Abbreviations

EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
ESPAD	European School Survey Project on Alcohol and Other Drugs
CSO/CSU	Czech statistical Office
LPM	Linear Probability Model
NHMRC	National Health and Medical Research Council
NIAAA	National Institute on Alcohol Abuse and Alcoholism
OLS	Ordinary Least Square
UIV	Institute for Information on Education
WHO	World Health Organization

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1 Introduction

1.1 Alcohol and Related Problems

Alcohol is the most used drug in the world. It is mainly because alcohol is legal and socially acceptable in most countries (Keller and Vaillant, 2010)[1]. Majority of people drink alcohol, generally for enjoyment, relaxation and sociability. Most people belongs to group of moderate drinkers and at this level, alcohol causes only a few adverse effects (NHMRC, 2009). Actually, sensible drinking can even be beneficial for the health of adult (White, 1999)[2]. Unlike the moderate drinking, experiencing of severe or frequent intoxication negatively affect short-term as well as long-term health condition. Often alcohol abuse and alcoholism does not affect just health of the drinker, but also harms drinker's family and friends, employer and the broader community. Even though, there is just a small proportion of people who consume alcohol at higher levels, the impact of this group on society is significant.

The society suffers from heavy drinkers mentally as well as economically[3]. It is not just the treatment of alcohol related to illnesses problems such as cirrhosis of the liver, or cancer of the oesophagus or stomach, which is costly. Drinkers are frequently predisposed to common injuries. All this health related trouble together with often physical and mental incompetence caused by intoxication rise to decrease in productivity and to higher absence from work. Among others, alcohol abuse increases crime-related costs as well as vehicle crash costs. Moreover, heavy drinkers and alcoholics are more likely to die prematurely (Harwood et al, 1998). Unfortunately, the burden of alcohol problems does not fall just on the abusers. It is primarily the rest of society, who bears these costs[4].

The relationship to alcohol starts to develop during childhood. From the drinking habits in childhood is possible to predict some conclusion about the drinking level and about the health status in adulthood. Early initiation to drinking is associated with increase in the risk of alcohol dependency in adulthood. Persons who begin to drink at the age of fourteen or

[1] Encyclopædia Britannica

[2] Drinking during pregnancy is an exception from this rule. Even one standard drink a week can negatively affect the health of fetus (Keller and Vaillant; 2010).

[3] The economic costs of alcohol problems in United States are in billions of dollars per year (Harwood et al; 1998)

[4] Non-users have direct material and mental loss when they are victims of alcohol-related crime or car crash. Non-abusing public also pay the costs of health problems of drinkers through public health insurance. Moreover, the expenditures of government on criminal justice system or highway safety as well as lower tax revenues caused by lost productivity are often covered from social insurance. (Harwood et al; 1998)

younger have almost 40% probability they become abusers or alcoholics later in the age, whereas individuals who starts drinking at ages 20 and older have the probability just 10% (Grant and Dawson, 1997). Besides, continuous alcohol consumption starting in early adolescence has significantly negative effect on health later in the age (Aarons et al., 1999). It is impossible to protect the young people from the possible future dependency on alcohol without working antidrug policy. However, successful policy cannot be created without continuous observation of youth risk behaviour and its involvement in time. It is not an aim of this thesis to invent such policy, but to indicate factors, which influence young people's decision to drink. I believe that knowing those factors is essential for inventing good alcohol abuse policy.

1.1.1 Alcohol in the Czech Republic

The drinking prevalence in the Czech Republic is very high and the Czech society is very tolerable not just to regular alcohol use but also to extensive drinking (Sovinová and Csémy, 2003). This attitude not just negatively influences the risk behaviour of adolescents but also significantly decreases successful implementation of a functional prevention programs. The main problem ground in the disesteem of the health risks related to alcohol use, especially to extensive drinking. This unknowingness is not only problem of the Czech society, but also of the Czech government. It seems that the government only enjoys the income from alcohol to the treasury, but do not see the expenditures on the treatment of health-related problems.

The problem of alcohol and the health of society are very relevant in the Czech Republic, because of the high alcohol consumption per head. It was 10.4 litters of pure ethanol in 2008 (CSO, 2009). The economic and social costs of alcohol are not known yet. However, the study of Social costs of alcohol, tobacco and illegal drugs in the Czech Republic in 2007 (Center for Addictology, 2010) is in process now. The results should be released in year 2011 and are expected to provide an economic lead for further intervention in this field.

1.2 Youth Drinking

Statistics from the last European School Survey Project on Alcohol and Other Drugs (ESPAD) report (Hibell et al, 2009) show repeatedly that early intoxication and binge drinking of adolescents is a common problem in many European countries. Indeed, it is not

problem just in Europe, but also in the United State or Austria. Moreover, the risky attitude to alcohol is spreading to teenagers in developing countries (WHO, 2001).

According to The 2007 ESPAD Report, the average from the surveyed countries[5] is around 90% of high school students who have tried alcohol at least once in their lifetime, 82% during the past year and 61% in the last month. This statistics does not vary much from the year 1995 when the ESPAD started. Especially the figures for lifetime and past year drinking remain almost unchanged. The share of drinking boys in the last 30 days even decreased in comparison to year 2003. Unlike the quantity of alcohol consumed which increased in 2007. A trend of growth in heavy episodic drinking is observable particularly among girls. Boys have always consumed alcohol at higher level than girls have, but generally, the difference between boys and girls drinking behaviour is decreasing.

The growing tendency of young people to binge drinking is not very positive, especially when concerning the health status of youth. As mentioned in the Introduction the alcohol usage in adolescence has many potential health risks. Being more specific, alcohol, when consumed in childhood can for instance affect normal brain development, or cause hormones' misbalance in young organism (NIAAA, 2006). In addition, alcohol consumption elevates the risk of psychiatric co morbidities, especially depression, anxiety or attention-deficit disorder (Turner and Gil, 2002). Negative effect on liver can also occur (Clark, 2001). Although it takes a long time to develop the alcohol related diseases such as cirrhosis, heart disease or cancer, at some adolescent heavy drinkers can appear a beginning of liver damage in early age (Newbury-Birch et al., 2009).

In any case, most health risks of drinking adolescents are connected with short-term acute effects of alcohol usage. Primarily, acute intoxication causes unpleasant health problems such as vomiting but in some cases, there is a risk of rapid development to coma with possible consequence of death (Lamminpaa, 1995). Generally, drinking leads to a higher risk of accidents and injuries and plays a significant role in many injury hospitalizations (Johnson and Richter, 2002). In a large extent, alcohol contributes to unintentional injuries, homicide and suicide, which are the leading causes of death among youth (Miller et al, 2007). Adolescents who consume alcohol are more likely to engage in a dangerous behaviour such as having a high-risk sex (Läuchli et al, 1996), driving impaired or committing a crime (Zhang et al;2002). Among others, drinking is associated with poorer performance at school, which can lead to academic failure (Bergen et al; 2005).

[5] In year 2007 participated 35 European countries in ESPAD

1.2.1 Czech Youth Drinking

The Czech Republic belongs to the countries with the highest rate of lifetime alcohol prevalence by youth. The statistics about drinking prevalence of the Czech high school students do not change much from 90's. In the Graph1 is shown the comparison of the Czech students ESPAD score on alcohol, cigarette and other drug use with the average from other European countries. In the Czech Republic there are about 93% of high school students who drank alcohol in last 12month. It is more than 10% above the average of European countries included in ESPAD. Czech teens also consume alcohol beverages more frequently and in higher quantity than is the average among European youth. Share of adolescents with heavy drinking episodes differs across regions in the Czech Republic, but in most of them it is much higher than the average of other European countries (Hibell et al, 2007).

Alcohol-related problems are not rare among Czech young drinkers. Almost 16% of those who consumed alcohol during last year were in physical fight because of their own alcohol use. In consequences of drinking, 23% of drinkers had serious problems with their parents and about the same percentage had trouble with friends. About 17% had an accident or injury and 1.5% had to be hospitalized as a result of alcohol consumption. Alcohol usage end up in trouble with police for 7% of drinkers and 3% were victimized by robbery or theft. Alcohol was the reason why 12% of teen drinkers engaged in sexual intercourse without a condom and why 14% of them had sexual experience that they regretted afterwards. Above 18% of Czech young drinkers performed poorly at school or work because of liquor usage. More than 50% of the students who have ever tried alcohol in their life, have experienced at least one of the mentioned problems (Csémy et al, 2008).

From this statistics is clear that the drinking of Czech adolescent is an indispensable problem. Indeed, alcohol is a problem not just among youth, but also in the whole Czech society. However, changing the risk behaviour of adults is much harder than influencing the opinion on alcohol and drinking behaviour of adolescents. To be able to do that successfully, it is important to detect the factors influencing participation and intensity of substance use of adolescents.

2 Determinants of Youth Drinking: Literature Review

Research on adolescent substance use has identified number of factors that influence the alcohol consumption of youth.

The adolescence is an important period in life, when the young people have to deal not just with many changes that happen in their organism (hormonal alterations, brain development) but also with the new environment after transfer from elementary to secondary school. The effort to 'fit in' and to be socially accepted by the fellows can have very negative influence on decision making concerning drinking behaviour and drug use in general. There has been found a significant correlation between adolescent alcohol usage and the drinking behaviour of friends (Ali and Dwyer, 2009; Harmon, 2007). From the age of 14, 15 years, the influence of parents decreases as the young people start to spend more time with their friends and accordingly increases the influence of peers. Therefore, peer effect has a great influence on alcohol consumption of adolescents.

Likewise, the role of regular drinking parents and siblings in adolescent substance use is not negligible. It has been found that the influence of drinking mother and drinking father on youth regular alcohol consumption is the same, but the relative risk of drinking parents is the lowest in comparison with influence of siblings and peers (Scholte et al, 2008). Generally, the role of parents lays more in the monitoring of adolescent and the shown approval or disapproval of alcohol use (Nash et al, 2005). The effect of regular drinking siblings is higher than of drinking parents, but depends on the age and sex of the sibling. Drinking habits of younger sibling does not seem to have any influence on youth alcohol usage (Vorst, 2007). Highest influence has the same-sex twin, but having the regularly drinking same-sex older sibling also significantly increases the probability of regular adolescent substance use (Scholte et al, 2008).

Engels et al. (2006) is concerned about the personality characteristics as an explaining factor for adolescent substance use. According to this study, young people with certain characteristics are more likely to engage in risk behaviour such as drinking and smoking. Teens, who were evaluated from their classmates as sociable and self-confident and those who were considered as aggressive and emotionally insecure usually smoke and drink more than their classmates with different characteristics. Poor sociability, on the other hand is associated with lower level of alcohol use or abstinence (Leifman et al, 2000). Important

behaviour predictor of regular heavy drinking is the tendency to deviancy and rebelliousness. Young people who are evaluated as radical and who show lower commitment to conventional values are more likely to consume alcohol in higher quantity and frequency (*Newbury-Birch et al, 2009)[6].

Drinking behaviour of adolescents is also influenced by their expectancies about substance use. Intuitively, if the view of alcohol is mainly positive and the risk perception is low, then the adolescent is more likely to be a heavy drinker (Smith and Goldman, 1995). There is a reciprocal relationship between expected social facilitation of alcohol and drinking level – the higher the expectancy the higher the amount of alcohol consumed and vice versa. Usually in the adolescence, the social advantages of alcohol consumption are higher than the potential health problems caused by substance use. The underestimation of the risks is caused by the long-term development of the alcohol-related problems (*Harmon, 2007)[7].

Among others, the age of beginning of substance use can be a good predictor of future drinking behaviour of young people. Generally, the earlier the individual starts to drink the higher is the risk of development of alcohol use disorders (Zeigler et al.; 2005). On the contrary, research done on the sample of US college students (*Newbury-Birch et al, 2009)[8] showed that the later the individual had tried the first alcohol drink the lower its alcohol consumption is as a college student. Grant and Dawson (2002) reported that the probability of lifetime alcohol dependence is 40% among adolescents who first tried alcohol as fourteen year old or younger, whereas individual who began drinking at the age of twenty or later has just 10% prevalence rate to become alcoholic.

The cigarette smoking might also affect the drinking prevalence. There is an evidence of co-occurrence of alcohol and cigarette use among adolescents (Hoffman, 2001). Hanna et al (2001) reports that early-onset regular smokers who began at the age of 16 or younger are more likely to use alcohol than non-smokers are. According to Taylor and Conrad (2004), the risk for smoking or using alcohol increases with higher share of smoking friends in adolescent's environment. Chen and Unger (2002) tested on the sample of 11 239 subjects the hypothesis that cigarette smoking has a gateway effect on alcohol use. The results showed that adolescents who tried the cigarette at least once in their lifetime have higher

[6] from Brennan, Walfish (1986)
[7] from Slovic (1987)
[8] from Saltz and Elandt (1986)

risk ratio of last 30-day alcohol use. However, it is not impossible for two drugs to be gateway for each other. Even though the evidence of cigarettes as gateway drug for alcohol is high the causal relationship is ambiguous.

3 Construction of Model

The main aim of this thesis is to determine which factors influence the alcohol consumption among the high schools students. As many of the studies focus just on one determinant and its causal effect on the adolescent drinking (e.g. Ali and Dwayer, 2010 - social network effects; Engels et al, 2006 - peer group reputation), I have decided to provide a descriptive evidence of youth alcohol consumption[9]. I try to show which factors are the most significant in the context of all possibly important determinants of adolescent substance use. Since the significance can vary a lot for variable $class\ year$ and $gender$, I want to compare the results across four different groups (freshmen boys/girls and junior boys/girls).

3.1 Methodology

Since this thesis focuses on the participation indicator of drinking, the dependent variable of interest is binary variable – respondent drank alcohol during last month or did not. The independent variables are categorical and ordinal variables. To deal with the dichotomous explanatory variable, the linear probability model (LPM) is used for the construction. This model (LPM) has its positives as well as its negatives. The main limitation of this model is the natural violation (William, 2009) of ordinary least square (OLS) assumptions, namely the assumption of homoskedasticity, normality and linearity.

Firstly, the violation of the condition of homoskedasticity in the LPM is obvious. As the dependent variable is dummy variable, the residual versus fitted plot looks like two lines, where lay the values of all dependent data. The heteroskedasticity can be eliminated by using heteroskedasticity-robust or cluster-robust estimators for standard errors[10](Nichols and Schaffer, 2007). Secondly, errors in the LPM are not normally distributed. However, according to Mittelhammer et al. (2000) for large samples the linear probability converges to normal. Thirdly, it is possible that the values of estimates are higher than 1 or below 0, which advert on the violation of linearity. It is possible to deal with this problem by setting a range (from 0% to 100%) and all the values outside the range are considered to be the

[9] The inspiration for this model was the Irish College Study on Behaviour Economics and Drinking Behaviour (Harmon; 2007). Compare to the IZA Paper, the dataset used in this thesis contains different information about individuals and more importantly, the aim of the study is different. While the explanatory variable in Irish College Study are the expenditures on alcohol among college students, my model focus on the probability of high school students to drink alcohol beverages in a short-term period.

[10] By using those estimators, just the standard errors term increases but the point estimates stay unchanged.

minimum, respectively maximum. On the other hand, the LPM is very intuitive for the construction, where the value of the explanatory variable is a linear combination of the independent variables plus disturbances. It is also easy to interpret.

I could have used the logistic regression for this analysis, which is often used in the social studies (Peng and So, 2002). However, according to Pohlmann and Leitner (2003) and Newman et al. (2004) both methods give very similar results. Even though, logistic regression provides more accurate estimates, there was found a high correlation between estimated effects predicted by OLS and by logistic regression. Therefore, both modelling methods can be used to test model with dichotomous dependent variable. As the aim of this thesis is to distinguish the factors that affect probability of adolescent substance use and the accuracy of estimates is not too important, the linear probability model serves well for my objectives.

3.2 Empirical Model

My model is in its simplified form following:

$$D_{ist} = \alpha + \beta DF_{ist} + \gamma BP_{ist} + \delta PSE_{ist} + \varepsilon_{ist}$$

where D_{ist} is $\Pr(drank_{ist})$ that means the probability that the respondent *i* at school *s* drank alcohol beverages during the time *t*. In this case, t is the period of past 30 days. Each variable in this equation contains related dummy variables[11]. DF_{ist} is the vector for demographic factors, which covers certain parent characteristics, socio-demographic factors and school specification. BP_{ist} is the vector of behavioural parameters such as certain risk behaviour of the individual, its risk perception and personality. PSE_{ist} is a vector which examines the effect of peers and older siblings. Parameter α represents a constant in the model, while parameters β, γ, δ are vectors of the constituent influence of related dummy variables.

Available dataset[12] does not allow me to use all variables I would like. For instance, the information about parental drinking is missing. However I am still able to control for a number of parent characteristics such as parent education, subjective wealth of the family and whether the respondent lived with both his/her biological parents till the age of fifteen in the same household. The socio-demographic factors are gender and grade. School

[11] All used dummy variables described in the section 4.2 Sample
[12] ESPAD 2003 the Czech Republic

specification covers the type of the high school and the region where the school is. Along with the theory, I considered gender and grade (age) to have a great influence and therefore I divided the data to four different groups: freshmen boys, freshmen girls, junior boys, junior girls and run the regression separately for those cases.

Generally, I expect the intercept for boys and juniors to be higher than for girls and freshmen (Curtin et al., 2004; Ali and Dwyer, 2010; Harmon, 2007). From the other control variables, I suggest the type of school to have an influence, especially on the girls drinking. According to Curtin et al.(2004), girls from mixed-schools (schools with similar share of boys and girls) are more likely to try the cigarettes or alcohol. Therefore I suggest the academic type of school to have negative influence on girls, but probably not very important. Higher alcohol prevalence can be also in the apprenticeship schools, where adolescents with deviant behaviour and other negative characteristics are usually concentrated (Engels et al., 2006). As in most studies demographical factors serve solely as a control variable and are not alone of a great interest I do not expect them to have a great effect on the dependent variable in any group.

Unlike for demographic factors, I expect the variables from the group of behaviour parameters to be of a great significance. I observe the lifetime smoking prevalence and the age of first intoxication. Going along with the theory, it is supposable that the early initiation with higher level of substance use will markedly increase the risk ratio of substance use of the individual at high school (Zeigler et al., 2005). When estimating the influence of smoking behaviour, based on the study made by Chen and Unger (2002) I predict that the individual who smoked or smokes, no matter what gender and class year, will have a significantly higher probability of alcohol consumption than never-smoker.

The expectations about risk perception are quite clear. The riskier a certain behaviour according to the respondent, the lower the risk of alcohol use is, while the lower is the estimate of possible harm caused by this behaviour the higher the probability of $drank$. (Smith, Goldman, 1995). Risk perception of girls should be generally higher than those of boys (Sjöberg, 1998). The influence of risk perceptions on weekend drinking and regular marihuana use is examined. I use the risk perception on marihuana because I want to distinguish how important the view of risks of soft illicit drug is on the explained variable. Mills (1984) found out that drug use has a stable, sequential and cumulative hierarchy. In this hierarchy marihuana follows cigarette smoking and alcohol use. Therefore, individuals who use marihuana and thus evaluate its risks as slight, are more likely to consume alcohol

(Windle, 2002). I assume the risk perception on weekend drinking to be generally lower and with greater effect on the possibility to drink than risk perception of regular marihuana use. Universally, I think that personal risk perception affects more behaviour of girls than of boys.

Personality is in my model characterised by self-estimated confidence and by respect for rules. Following the results from other studies (Leifman et al., 2000), (Brennan and Walfish, 1986) I expect both factors to be significant and to noticeably influence the substance use of an individual. I assume the influence of confidence to be negative, hence to increase the possibility of alcohol consumption among self-confident respondents. Reversely, I expect the students with low self-confidence to be less likely engaged in substance use. I suggest this rule to hold for all my groups. The abidance by rules is surmised to decrease the adolescent alcohol consumption, while lower respect to rules should be related to higher probability of drinking. I suggest that the rebelliousness is more significant among freshmen, because alcohol consumption is illegal until the age of 18 (in the Czech Republic and majority of other European countries) and thus the ban on drinking alcohol for underage may be one of the rules that can be break.

Finally, I estimate the peer effect and the influence of siblings on the adolescent drinking. Respectively, I examine the effect of the share of drinking and smoking friends in the individual's environment and the influence of older sibling who drinks or/ and smokes regularly. My hypothesis is that the higher the share of respondents friends with risky behaviour the higher the probability of his/her substance use (Pertold, 2009; Ali and Dwyer, 2009). Since girls as well as boys have usually friends of both sexes I suggest the effect is the same for both groups. I also expect the risk behaviour of older sibling to have a significant negative influence on adolescent's alcohol consumption on both genders no matter what class year (Scholte et al., 2008). However, I expect the influence of sibling not to be as big as the influence of drinking friends.

3.3 Limitations of the Model

This model has some limitations that should be presented before running the regression and presenting the results.

Firstly, used data are dependent on adolescent self-report measures. Unfortunately, there is no other accurate method of collecting the data of drug use. O'malley et al. (1983)

and Brener et al. (2003) show a high reliability and stability of self-reports of drug use. Moreover, Adlaf (2005) concludes that even though the collected data from school survey on substance use underrate the true usage, the estimates based on those surveys are sufficiently valid and reliable. However, the results should still be seen with the circumspection.

Secondly, the estimates are biased due to self-selection mechanism. There is no doubt that the error term in this model contains many unobservables, which affect the chosen variables. Therefore, I can conclude that the results of the regression are biased, I just cannot be sure that all are biased in the same way. I would need to know whether the omitted variables influence the chosen groups identically, and thus the results for those groups are comparable, or whether the influence is different and the estimates cannot be compared. However, the problem with the selection is very complex and is not in the extent of this bachelor thesis to solve it. Consequently, for this thesis I suggest the self-selection process for girls and boys and for different class years to be the same.

Thirdly, as mentioned previously, the ESPAD Survey 2003 does not contain all information I wished to use. These pieces of information are either fully missing or not complete. One example of incomplete information is about the friends drinking where the only accessible data are about the share of drinking friends. However, as the study by Alexander et al. (2001) shows, the closest friends have much higher influence on individuals risk behaviour than the rest of peer network. Unfortunately, I miss the data about the structure of peers consuming alcohol and thus the results are very general and can be little misleading.

It is important to remember all above mentioned limitations and take them into account when assessing the results.

4 Data description

4.1 Data Source

Data source for this empirical analysis is the European School Survey Project on Alcohol and Other Drugs (ESPAD). This survey is run every fourth year in several European countries since 1995. The participating countries are for example all Scandinavian countries, France, United Kingdom, Germany, all Baltic countries, Russia, Croatia, Turkey and many others. 35 European states were conducted in last two waves in years 2003 and 2007. ESPAD is the largest national cross-section research focusing on youth substance use.

The target group is 16years old high school students, and each country has the possibility to add another age group (usually 18years old students). The survey is run during April/May i.e. almost at the end of the school year. Main aim is to collect representative data sample about the quantity and frequency of cigarette and alcohol consumption such as the other drugs use among European adolescents based on anonymous questionnaire (ESPAD webpage, 2010). Results from ESPAD are used by European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and are utilized in the creation of the national antidrug policy[13].

There is not any approved method of sampling for participating countries. Each country is supposed to find the method of sampling itself, which is optimal in given conditions and brings the objective results. The ESPAD national researchers have only two clear conditions. First, more than 2400 students from one state should participate in the study. This requirement should provide representative data sample and eliminate possible deviation e.g. in genders share in some schools. Second, students who are not able to fill out the questionnaire themselves by any reason (e.g. mentally challanged), must be excluded from the study. Such students do not belong to the target group.

4.2 Sample

Dataset uses for the analysis comes from the Czech Republic (CR) and was collected in the third wave of ESPAD study, it is in year 2003. Surveys were performed in 35 European countries that year.

[13] ESPAD ČR 2007 – rámcový plán projektu

In the Czech Republic in year 2003, the survey was conducted in 178 randomly chosen high schools and focused on the first and third grade students in year 2003. All types of high school and all regions from the Czech Republic were represented. This sample had to represent the real share of different type of schools in the Czech secondary education system. Multiple-stage stratification selection was used for the construction of the sample. The Czech researchers used information from CSO (Czech Statistical Office) about demographical structure of CR and information from UIV (Institute for Information on Education) about students and apprentices.

The questionnaire consisted of 52 questions in total, where most of the questions comprised three or more sub-questions.[14] In majority of questions participants had to simply check off the answer, that was the most suitable for them. Data were collected at schools by research worker. All students were assured that the questionnaire is anonymous and voluntary.

In total 9293 students filled out the questionnaire from which 4262 were girls (46%) and 5031 boys (54%). The share of the first year students (freshmen) was 51% (4766) against 48% (4527) of the third year class students (juniors).

4.3 Measures

4.3.1 Variable Specification

All the variables used in this analysis are derived from the answers to the questions in the ESPAD Survey. Not all questions asked in the questionnaire are relevant for our analysis, thus I concentrate on the questions relating to demographic factors, behaviour parameters and friends and siblings influence in the first step. From this data selection I choose the questions I suggest to be most suitable for the model in the second step. All of these questions are interval questions, mainly likert scale questions (Trochim, 2006) (5-point scale ranged from “strongly agree” to” strongly disagree”). I create and use following dichotomous variable in my model.

[14] Questions used for the model are listed in Appendix II: Used Questions

Explanatory Variable

Drank last month (Q8). It is a dummy variable. *Drank* is equal zero in case the student had alcohol beverages once or twice or did not drank alcohol at all during last 30 days (*Abstinent last month*). This explanatory variable is equal to one if the student drank more than twice in 30 days. The quantity or kind of alcohol beverage is not important.

Demographic Factors

To the key demographic factors belong: the school characteristics such as type of the school and region or class year of the student. Those questions were filled up by the research workers. Students had to answer questions about their gender, parent's education, household structure and family wealth. Dichotomous or nominal questions were used to collect this information. From given answers I made following dummy variables:

Classyear*: first grade, third grade*

Gender (Q1)*: boys, girls*

School type: *academic (gymnasium), vocational (SOS), apprenticeship (SOU)*

Parents education (Q40, Q41): *parent higher education* , *parent secondary education* , *parent low education* , *parent education unknown.* Te dummy variables here measure the higher education of both parents. For example, if respondent's mother has college degree and father completed secondary school it means *higher* education of parents. Higher education here means only completed college or university. *Secondary* education is both whether the more educated parent completed secondary school or started but not finished some college or university. *Low* education means not finished secondary education, completed elementary school or less. Dummy *uknown* is equal one just for adolescents who do not know education of any of their biological parents.

Structure of upbringing (Q44b): *Parents together, parents separated*

Family wealth (Q42): *rich, average, poor.* Where *rich* is the sum of answers "Very much better off", "Much better off" and "Better off". *Average* is the equivalent for "About the same" whereas dummy for *poor* is equal one if the answer was "Less well off", "Much less well off" or "Very much less well off".

Regions: *Prague, Central Bohemian, South Bohemian, Plzeň, Karlovy Vary, Ústí, Liberec, Hradec Králové, Pardubice, Vysočina, South Moravian, Olomouc, Zlín, Moravian-Silesian*

Behavioural Parameters

Smoking behaviour (Q6): *Smoker, Nonsmoker.* As non-smoker, are marked adolescents who did not smoke more than five times during their lifetime. This label does not concern the current attitude of the student. If the student was current smoker but smoked often in the past, he or she is considered as smoker.

Drinking behaviour (Q29*): First intoxication (14 years old or less), First intoxication (15 years old or less)*

Risk perception (Q34): *marihuana smoking – slight risk/ moderate risk/ great risk/ don't know the risk; weekend drinking- slight risk/ moderate risk/ great risk/ don't know the risk.* This question concentrates on the opinion about specific risk behaviour. I focus on the risk perception of regular cannabis or hashish use and of the regular weekend heavier drinking. Both the answers "no risk" and "slight risk" are labelled as *slight risk.*

Self-confidence (Q48): *proud of himself/herself, not proud of himself/herself.* I create two dummy variables according to the opinion about the statement "I feel I do not have much to be proud of". Dummy *proud of himself/herself* is equal one for respondents who disagreed or strongly disagreed with the statement. Whereas dummy *not proud of himself/herself* is equal one for those who ticked off "Agree" or "Strongly agree". I use the pride as a proxy for self-confidence, for the model from two reasons. Firstly, I suggest the self-confidence of an individual and its pride to be highly correlated. Secondly, there is a significant sample of students in both groups (proud of himself/herself and not proud).

Respect rules (Q50): *breaking rules, abidance by rules, breaking rules - not sure about.* The students who totally agreed or agreed with the statement "You can break most rules if they don't seem to apply" belong to group *breaking rules.* Whereas those who checked "Disagree" or "Totally disagree" showed certain *abidance by rules.*

Influence of Others

This section covers the influence of friends – so called peer effect- and influence of older sibling. Questions in ESPAD are just about the risk behaviour of older siblings.

Peer effect (Q36): *friends smoking –few friends/ some friends/ most friends; friends drinking- few friends/ some friends/ most friends. Few* in this context means none or few friends smoking, respectively drinking. *Most* includes both "most" and "All" friends smoking, respectively drinking.

Siblings influence (Q39): *sibling smoker, sibling non-smoker, no sibling; sibling drinking, sibling abstinent.* As mentioned before, just influence of older sibling is taken into account. Therefore, those students who do not have any older siblings or those who do not know anything about their older sibling substance use are placed into group no sibling. As s*ibling smoker/ sibling drinking* is marked older sibling who smokes/drinks "Sometimes" or "Often". *Sibling non-smoker/ Sibling abstinent* is the one who smokes/drinks "Rarely" or "Never".

4.4 Descriptive Statistics

Going deeper in the analysis, I run the regression for four different cases – boys in 1.year, girls in 1.year, boys in 3.year and girls in 3.year of high school. The descriptive statistic for these four cases is shown in Table 2.

Explained variable as well as all explanatory variables are dummy variables, therefore their minimum and maximum is 0 and 1. The variable Age is not in the final model, but I include it into descriptive statistics to show the average age and the whole age interval for each individual case. It is continuous variable with values between 15years 4months to 20years 3month.

The statistics show high drinking prevalence. More than half of all respondents (54%) consumed alcohol beverage more than three times during last 30days. Not surprisingly, higher alcohol consumption can be observed between juniors (60%) than between freshmen (47%). Generally, boys drink more than girls. During the last month the share of guys who drank is 61% whereas it is just 47% of girls. The highest share of alcohol drinkers is among third year boys -70%, the lowest is among the first year girls – 43%. It also seems that more boys than girls start drinking between the first year and third year of their studies.

Table 3 describes drinking behaviour in different types of school. It shows visible variation of the share of drinkers across types of school of both sexes in the first year. However, this variation disappears in the third year of high school, when the share of drinkers varies from 2% among 3.year male students to 4% among 3.year female students. In general, the share of boys drinking is higher in both class years in all different types of school than those of girls drinking. The highest difference in the proportion of drinkers between observed years is in the group of boys studying at academic type of school, it

counts for 25%. I can observe high variation between the first and third year also among female drinkers from gymnasiums.

Concerning the age of the first intoxication, boys reported the first experience of getting drunk before 15years age in more cases (37%) than girls (28%). Interestingly, the first year students reported more often their first intoxication at the age of 14years and earlier (37%) than third year students (27%). Universally, the share of respondents from gymnasiums who got firstly drunk before their enrolment to higher education is significantly lower than of respondents who study now at apprenticeship school. For both genders, the difference is about 14%. The share of "experienced" students from vocational schools is exactly in between – 35% of boys and 27% of girls.

The description statistics show a low variation among genders between the estimations of shares of friends drinking. 79% of boys and 78% of girl reported that most or all of their friends drink alcohol beverages. However, the variation between class years is high. While 73% of the first year students estimated that majority of their friends drink, in the third year it was 83% of respondents with the same estimation.

The statistics also shows a high smoking prevalence. Only 40% of respondents belong to group of never smokers. The difference between the share of boys and girls, who smoked cigarettes, more than five times in their life, is very small. It is not more than 5%. Logically, more first year students than third year students belong to non-smoker group. It stems from our definition of non-smoker and smoker. As I do not focus on current smokers, but on lifetime experience with smoking, third year students had more time to try cigarettes.

However, 57% of respondents reported that most or all of their friends smoke cigarettes, in the time stated. There is a low variance between high share of smoking friends of first and third year students. The proportion of boys and girls who reported majority of smoking friends is almost the same. Still, female students estimated the high share of smoking friends a little bit more often (59%) than male students (54%).

Generally, risk perception is higher among girls than among boys, no matter which class year or kind of risk behaviour. Regular smoking of marihuana was universally evaluated as more dangerous than regular weekend drinking. More than 56% of all students think that marihuana use is highly risky. This opinion decreases with higher age and among

males. More than 63% of first year girls consider regular marihuana or hashish use as highly risky, whereas slightly fewer than 50% of third-year boys do.

The risk of having five or more alcohol beverages each weekend is considered as moderate by most of the students (42%). The statistic shows similar patterns as in the risk perception of marihuana and hashish use. Boys qualify regular drinking at weekends as lower risky than girls and this risk perception gets even lower with age. Yet, most of the third year boys think that this behaviour cause no or slight risk. Contrary, the risk perception among first and third year girls remains almost the same. About 45% of girls consider the regular weekend alcohol consumption as moderately risky.

Concerning the distribution in personality parameters, older students are generally more self-confident and show more respect for rules. According to the descriptive statistic, there is a relatively low variance between reported self-confidence in different groups. Highest share of respondents, who reported that they do not have much to be proud of, is among first year girls (34%). Whereas, in the group of third year girls is this share the lowest (27%).

Higher respect for rules is reported by girls (51%) than boys (41%) and by third year students (49%) than first year students (44%). Highest share of respondents who think that "you can break rules if they don't seem to reply" is among boys in first class-year (35%), whereas only 25% of girls in the same class year think so. Most respectful to rules is a group of third year female students, where just 20% of respondents think that they can break rules when needed. Numerous group is created by respondents who are not sure if they can break rules. Share of those people in the sample is around 26% and does not vary much across our four cases.

5 Results

As mentioned before, the sample is split up into four cases in two steps. First division is according to class year of the students. Second division is by gender. At the end the model is run for these groups: freshmen boys, freshmen girls, junior boys, and junior girls. Results for full sample and results for divided samples are presented in Table 3 and Table 4. For the purpose of completeness, I provide the estimates for all control variables and discuss their effect on the dependant variable.

Both multivariate analyses are conducted with the linear OLS regression procedure in Statistical package STATA 10 [15] . Results were controlled using Statistical package GRETL[16]. All standard errors are clustered at the class level. Those linear regressions are determining the individual probability of drinking more than two alcohol beverages during past 30days.

Constant in this model tells us what the probability is that a student from the certain group, with specific characteristic, drank during last 30days. This respondent is a student of vocational school in Prague with at least one secondary educated parent. His/her parents live together and the family is about average wealth. This student is a smoker, but his first intoxication was after the age of 15 years or never. He/she has a moderate risk perception on marihuana smoking as well as weekend drinking. This person is proud of himself/herself and does not break rules. Several of his/her friends are current smokers and drinkers. That individual does not have any older siblings or does not know anything about their smoking and drinking behaviour.

The intercept is significant in all groups. The value is highest in the group of third year boys, where the boy with mentioned specification has the probability of 57% to drink. The freshmen girls have the lowest probability (28%). The first year boys and the third year girls filling those criteria have identical probability around 41%.

In summary, the results reveal a substantial effect of most of the behaviour parameters and also of the peer group and older sibling drinking. Unlike the geographic variables which seem to have just a little influence on the explanatory variable. Indeed, types of school do not show a big effect on current drinking in most cases. Parental variables in general are

[15] StataCorp LP, Stata/SE 10.0 for Windows. College station, TX, 2007
[16] GNL Rergression, Econometric and Time-series Library, Gretl 1.8.7

poor explanatory variables in our model. Parental education and family wealth do not cause significant changes in most cases. There is no general relationship between regions and probability of drinking. The influence of different regions has a high variance across groups.

Behaviour parameters explain the explanatory variable much better. Universally, the highest effect on the probability of drinking has lifetime experience with smoking. If the student is non-smoker, it decreases probability of alcohol consumption at least about 20%. In contrary, first intoxication before 15years age increases the probability from 9 to 13% across groups. Risk perception in general has a great influence. The opinion on marihuana smoking may not be as important as view of weekend drinking, but is still important. Generally, low risk perception predicts higher probability of drinking whereas high risk perception lowers this likelihood. Uncertainty about the risk has also important effect on the persons drinking behaviour. However, this effect differs a lot across groups and is both negative and positive in different cases.

In terms of personality variables, low self-confidence decreases the probability to drink. However, the significance of this variable decreases with the class-year of the respondent. The relationship between respect for rules and drinking during past month is strong. Generally, a student with higher respect for rules is less likely to drink. Abidance by rules decreases the probability up to 11%. The effect of uncertainty about breaking rules is both positive and negative, but in most cases decreases the possibility to drink.

Finally, I find a very strong evidence of peer effect and the influence of siblings. In general, low share of friends smoking or drinking decrease the probability to drink, while most drinking fellows increase it. Although the share of friends smoking has just a slight impact on the likelihood to drink, the relationship between share of drinking friends and possibility to drink is very strong. High share of drinking friends have a great “positive” effect on the individual. In the group of third year boys, this increase in probability to drink even overcomes the decrease in case on non-smoker. Concerning the influence of older siblings, person with older sibling who smokes is less likely to drink. However, this effect is significant and much higher among boys than girls. In contrast, older sibling who drinks significantly increases the probability of student alcohol usage in all groups.

Coefficient of determination is higher for groups of first year students (around 24%). My model therefore explains the explanatory variable better for first year-class. The influence of variables mentioned before applies for all groups, indeed with various size of

coefficients for different groups. Besides, there are important some variables[17] in each group that in other groups might have no discernible relationship with explanatory variable. For instance, poor financial situation decreases the possibility to drink about 5% in the group of first year boys.

The group of girls in first year is the only group where are geographical factors are more significant and matters. If the girl is a student of apprenticeship school then she is more likely to drink (6%). The probability is apart from others related to the family wealth. Above-average financial situation has "positive" effect on first year girls drinking (+6%). In addition, low education of parents negatively affects first as well as third year girls alcohol usage (-4%). Unlike for third year boys where is more important parental higher education which increases the probability of alcohol consumption (+4%). there is a significant positive relationship (+5%) between the school type, academic school respectively, and the likelihood to drink among girls from third year.

5.1 Discussion of Results

Most of the results go along with the previous studies and my expectations. However, there occur results that are surprising or whose effect should be considered cautiously. I try to find a reasonable explanation for some of those results.

The great influence of smoking experiences was expected. According to the results, students who smoke or smoked are at least about 20% more likely to be drinkers than those who do not have any or just little experience with smoking, no matter what gender and class year. The causality between smoking and drinking is not clear, though. As mentioned previously[18], cigarette smoking has a gateway effect on alcohol use (Chen and Unger, 2002), however it can be also the other way round. Therefore, it is important to take this influence with caution.

The importance of the share of drinking friends also supports the findings of other studies (Ali and Dwyer, 2009; Harmon, 2007). However, it is interesting, that the positive effect (decreasing one's participation in substance use) of low share of drinking friends is almost unnoticeable and cannot be compared with the great negative effect of having most

[17] Some factors seem to affect the probability of drinking a lot e.g. the variable unknown parental education, but the sample of respondents who do not know their parent education is so small that I cannot generalize this result. Therefore, I do not quote here the significant coefficient if the sample counts for less than 10% of the respondents from specific group (see descriptive statistics).

[18] Chapter 2 Determinants of drinking

friends drinkers. The high share of drinking friends is crucial especially for junior boys, where the possibility of alcohol usage increases about 22%. It seems that drinking friends have in general higher influence than non-drinking friends. This interpretation can be of course a little bit tricky, because as mentioned in the limitations, the structure of friends is not known. Thus, for instance, when the best friends of the respondent are among the few drinking friends, the rest of the non-drinking peer network is less likely to positively influence the adolescent. Surprisingly, the share of smoking friends seems to have no effect on adolescent substance use. I expect that these dummies have low significance probably because the referent person is a smoker. When considering this, those variables for friends smoking do not have any value added and could be excluded from the model.

Along with the theory (Grant and Dawson, 2002), also the early start with drinking, the age of first intoxication respectively, shows a high significance. It seems that individuals who started young with the alcohol consumption are likely to continue in drinking. The time of initiation with drinking is a little bit less important for the group of the third year boys. It could be explained by the general high share of drinking junior boys and by the significant peer effect. Simply said, drinking prevalence of full age boys is high and this prevalence can decrease the influence of certain characteristics.

According to my expectations (based on Scholte et al. (2008)) the sibling effect is not as high as the influence of friends. As the results show, boys are more likely to be affected by the risk behaviour of older sibling. I think that the monitoring of parents has a big role in this case (Nash et al, 2005). Usually, the parents monitoring of daughters and the effort to protect them is very strong, while sons are not controlled so carefully. Parents are usually more benevolent to boys, because they often let allow them to join their older sibling in the evenings.

Behavioural characteristics estimates are also of the expected importance. However, there are still some interesting findings. Junior boys with tendency to rebelliousness are not affected by this characteristic as much as the other respondents with similar behaviour. As mentioned previously, it seems that the drinking prevalence among older boys is so common that it decreases the effect of personal quality. The estimate of influence of self-confidence (non self-confidence respectively) supports the literature (Engels et al, 2006) too. Self-confidence is an important predictor of participation in drinking. Junior girls are the only exception. It could mean that not self-confident older girls can be more susceptible to the

influence of their drinking peers and many of them try to get confidence by behaving the same as others.

6 Conclusion

6.1 Summary

In this thesis, I estimated the model of adolescent substance use to identify the factors, which influence the participation in drinking of high school students the most. As the determinants can vary for different gender and class year I provide the descriptive evidence of alcohol consumption for four different groups – freshmen boys/girls and junior boys/girls. This separation should help to identify the important factors more accurately. I use a linear probability model to estimate the effect of various demographic factors, behavioural characteristics and peer and sibling influence. The dataset used for the analysis comes from the ESPAD Survey that was run in the Czech high schools in year 2003.

The findings are mostly in accordance with the accessible literature[19]. However, it is important to stay aware of the certain limitations of this analysis. Firstly, at the beginning I take the assumption about identical influence of self-selection process on all groups. If this assumption does not hold true, the estimates would be biased differently among groups and thus it would be impossible to make comparisons between them. If this supposition is correct, all the estimates are biased the same and I can compare the results across groups without any difficulties. Secondly, there can be problem of causality between dependent and independent variables. Namely, the experience of smoking can be both the gateway to drinking or the drinking can be gateway to smoking. Those are the two main limitations that should be taken into account when assessing the results.

The main results suggest that the greatest influence on participation in drinking among all groups have: the experience with smoking, high share of drinking friends and age of first intoxication. Significant effect also has the drinking of older sibling, risk perception on weekend drinking and the low respect for rules. Those variables influence the participation in substance use among all groups, but not equally. When the adolescent is a boy, he is more affected by the drinking older sibling. The increase in the probability of substance use among boys with older sibling that often drink is noticeably higher than among girls. Girls, on the other hand, are more influenced by the behavioural characteristics. For instance, the tendency to break rules affects girls negatively more than boys. Junior girls, in comparison to other groups, are also more likely to drink when having a low risk perception on regular

[19] Chapter 2 Determinants of Youth Drinking: Literature Review

heavy weekend drinking and less likely to consume alcohol when considering the regular heavy weekend drinking as very risky.

In conclusion, the most important determinants influencing participation in drinking are the same for all groups; however, the effect of other factors varies across genders and class years. Finding of this thesis show that the working prevention program creation cannot be universal for all adolescents, but that the variation among different groups should be taken into account when making the alcohol abuse policy.

6.2 Implementation

As mentioned previously, the alcohol and related problems are very relevant in the Czech Republic[20]especially among young people[21]. This thesis determines the important factors influencing the participation in drinking of youth. I hope that these findings help to the better understanding of the problematic of adolescent substance use and might contribute to the creating of a working prevention program. I believe that after releasing[22] the results of the study on Social costs of alcohol, tobacco and illicit drug use in the Czech Republic in 2007, the concerns about drinking problematic will increase. Then, more studies based on the Czech data (such as this thesis) will be needed to create a successful alcohol abuse policy. For the further works would be also interesting to make this research repeatedly so that the changing trends in importance of different factors can be observed.

[20] 1.1.1 Alcohol in the Czech Republic
[21] 1.2.1 Czech youth drinking
[22] In year 2011

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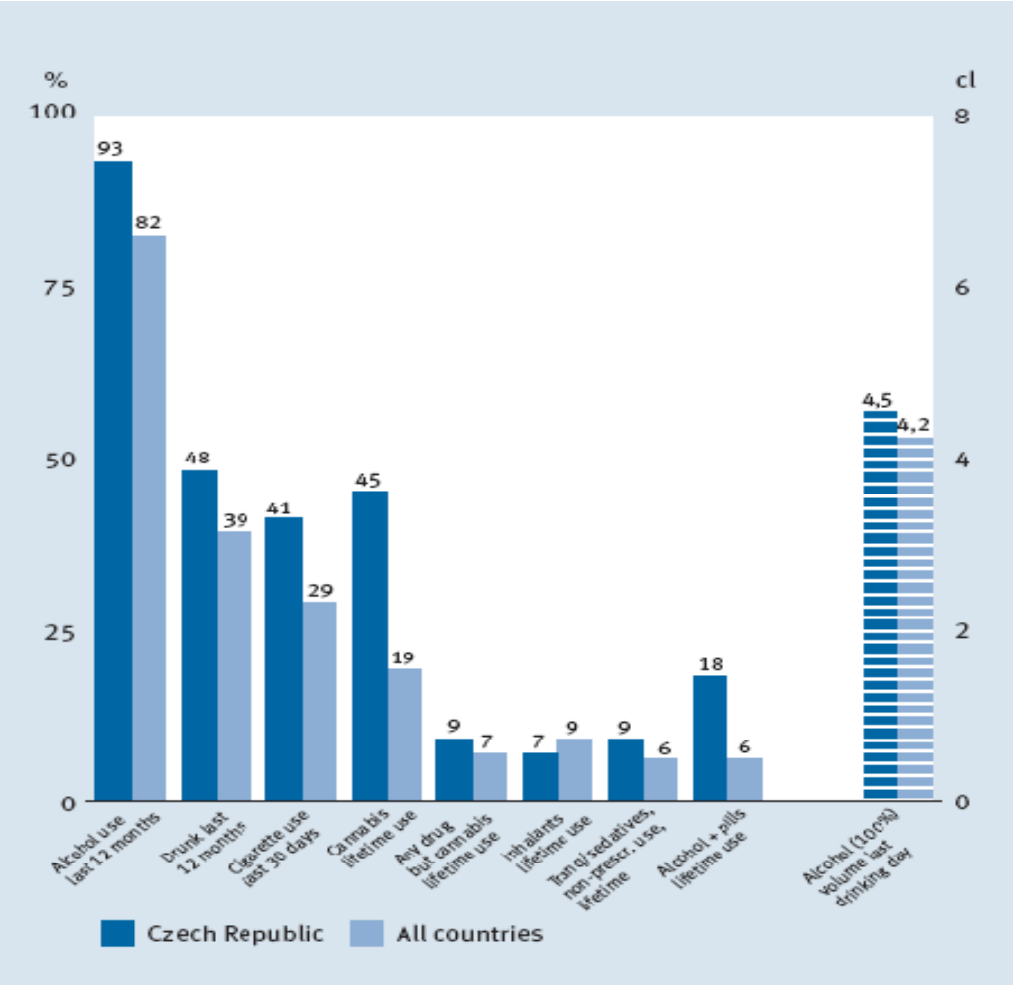
Appendix

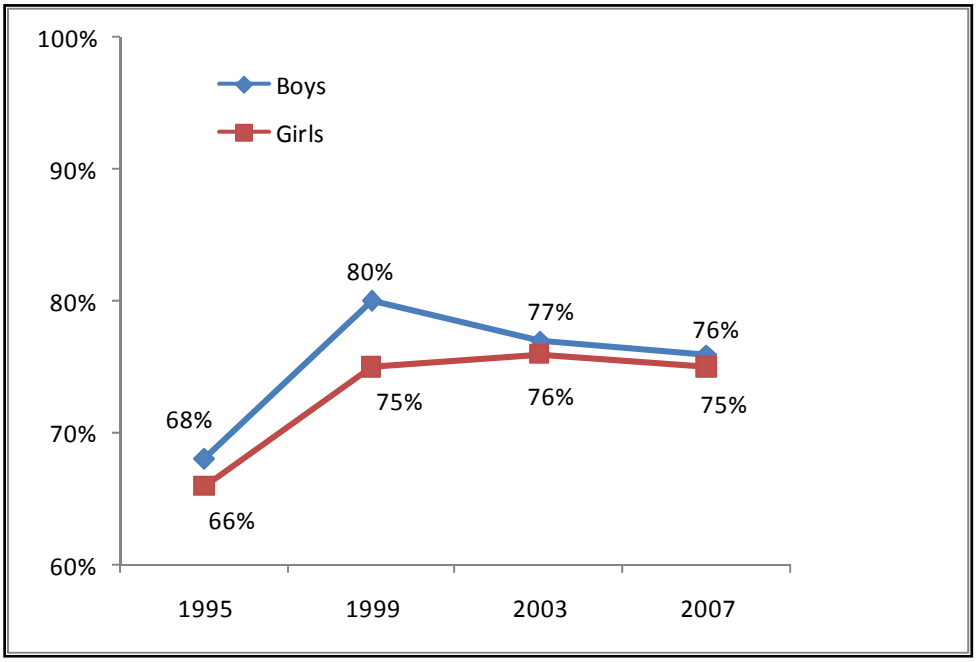
Appendix I: GRAPHS

Graph 1: Adolescent substance use – comparison CR with the average of all countries participated in ESPAD 2007



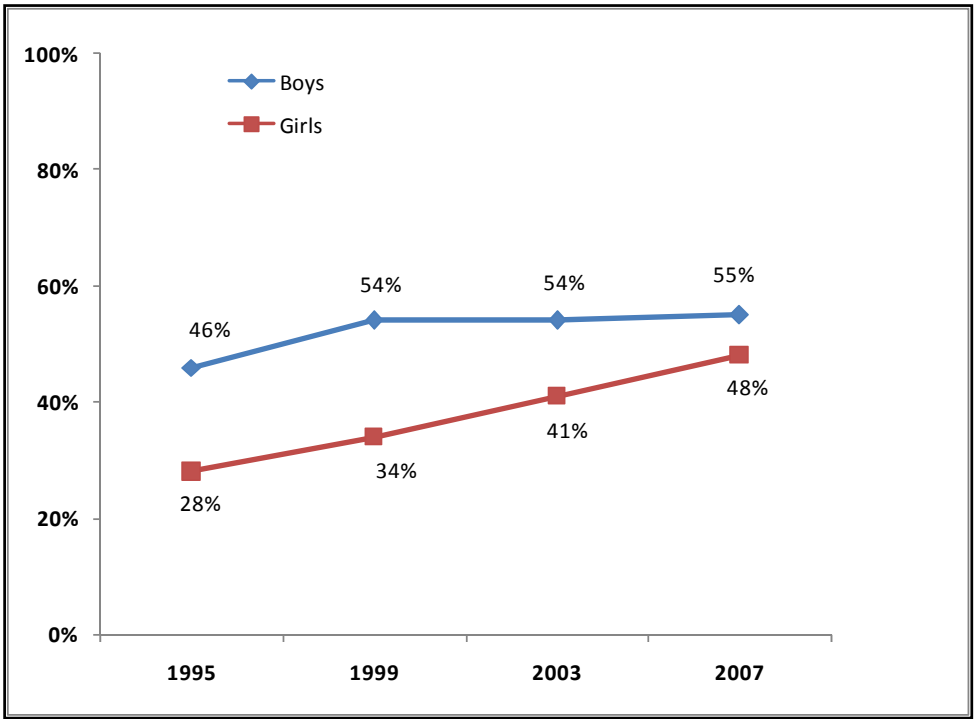
Source: ESPAD Report 2007

Graph 2: Czech youth alcohol use (past 30days) according to gender



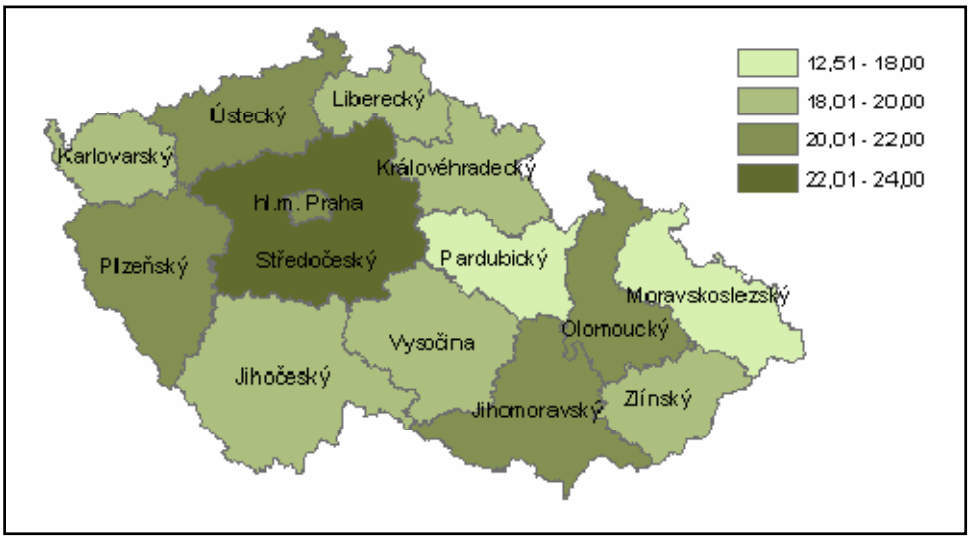
Source: The ESPAD Report 2007

Graph 3: Heavy episodic drinking (past 30days) of youth in CR



Source: The ESPAD Report 2007

Graph 4: Heavy drinking episods (5 or more alcohol beverages, more than twice in last 30days), in %, CR



Source: ESPAD 07 Přehled hlavních výsledků

Appendix II: USED QUESTIONS

1. What is your sex:

1 ☐ Male
2 ☐ Female

6. On how many occasions (if any) during your lifetime have you smoked cigarettes?

0	1-2	3-5	6-9	10-19	20-39	40 or more
☐	☐	☐	☐	☐	☐	☐
1	2	3	4	5	6	7

8. On how many occasions (if any) have you had any alcohol beverage to drink?

Mark one box for each line

	Number of occasions						
	0	1-2	3-5	6-9	10-19	20-39	40or more
a) In your lifetime	☐	☐	☐	☐	☐	☐	☐
b) During the last 12 month	☐	☐	☐	☐	☐	☐	☐
c) During the last 30 days	☐	☐	☐	☐	☐	☐	☐
	1	2	3	4	5	6	7

29. When (if ever) did you FIRST do each of the following things?

Mark one box for each line

	First at the age of:						
	Never	11 or earlier	12	13	14	15	16 or later
a) Drink beer (at least one glass)….....	☐	☐	☐	☐	☐	☐	☐
b) Drink wine (at least one glass)..	☐	☐	☐	☐	☐	☐	☐
c) Drink spirits (at least one glass)……	☐	☐	☐	☐	☐	☐	☐
d) Get drunk on alcohol..	☐	☐	☐	☐	☐	☐	☐
e) Smoke your first cigarette….....	☐	☐	☐	☐	☐	☐	☐
f) Smoke cigarettes on a daily basis.....	☐	☐	☐	☐	☐	☐	☐
	1	2	3	4	5	6	7

34. How much do you think PEOPLE RISK harming themselves (physically or in other ways), if they…

Mark one box for each line

	No risk	Slight risk	Moderate risk	Great risk	Don't know
a) Smoke cigarettes occasionally.....	☐	☐	☐	☐	☐
b) Smoke one or more packs of cigarettes per day.....	☐	☐	☐	☐	☐
c) Have one or two drinks nearly every day	☐	☐	☐	☐	☐
d) Have four or five drinks nearly every day	☐	☐	☐	☐	☐
e) Have five or more drinks once or twice every weekend...	☐	☐	☐	☐	☐
f) Try marijuana or hashish once or twice……	☐	☐	☐	☐	☐
g) Smoke marijuana or hashish occasionally….....	☐	☐	☐	☐	☐
h) Smoke marijuana or hashish regularly.....	☐	☐	☐	☐	☐
	1	2	3	4	5

36. How many of your friends would you estimate...

Mark one box for each line

	None	A few	Some	Most	All
a) Smoke cigarettes	☐	☐	☐	☐	☐
b) Drink alcoholic beverages (beer, wine, spirits)	☐	☐	☐	☐	☐
c) Get drunk at least once a week	☐	☐	☐	☐	☐
d) Smoke marijuana (pot, grass) or hashish.....	☐	☐	☐	☐	☐
	1	*2*	*3*	*4*	*5*

39. Does any of your older siblings.....?

Mark one box for each line

	Never	Rarely	Some-times	Several times	Don't know	No older sibling
a) Smoke cigarettes.....	☐	☐	☐	☐	☐	☐
b) Drink alcohol beverages (beer, wine, spirits).	☐	☐	☐	☐	☐	☐
c) Get drunk	☐	☐	☐	☐	☐	☐
d) Smoke marijuana or hashish	☐	☐	☐	☐	☐	☐
	1	*2*	*3*	*4*	*5*	*6*

40. What is the highest schooling your father completed?

1 ☐ Elementary school
2 ☐ some secondary school (apprenticeship)
3 ☐ completed secondary school
4 ☐ some college or university
5 ☐ completed college or university
6 ☐ Don't know

41. What is the highest schooling your mother completed?

1 ☐ Elementary school
2 ☐ some secondary school (apprenticeship)
3 ☐ completed secondary school
4 ☐ some college or university
5 ☐ completed college or university
6 ☐ Don't know

42. How well off is your family compared to other families in your country?

1 ☐ Very much better off
2 ☐ Much better off
3 ☐ Better off
4 ☐ About the same
5 ☐ Less well off
6 ☐ Much less well off
7 ☐ Very much less well off

44B. Have you been bringing up by both your biological parents till the age of 15years?

1 ☐ Yes
2 ☐ No

48. Below is a list of statements dealing with your general feelings about yourself.

Mark one box each line to indicate if you agree or disagree

	Strongly agree	Agree	Disagree	Strongly disagree
a) On the whole, I am satisfied with myself……..	☐	☐	☐	☐
b) At times I think I am no good at all……..	☐	☐	☐	☐
c) I feel that I have a number of good qualities……	☐	☐	☐	☐
d) I am able to do things as well as most other people	☐	☐	☐	☐
e) I feel I do not have much to be proud of…….	☐	☐	☐	☐
f) I certainly feel useless at times……..	☐	☐	☐	☐
g) I'm a person of worth on equal plane with others	☐	☐	☐	☐
h) I wish I could have more respect for myself……	☐	☐	☐	☐
i) All in all, I am inclined to feel that I am a failure..	☐	☐	☐	☐
j) I take a positive attitude toward myself……..	☐	☐	☐	☐
	1	*2*	*3*	*4*

50. How much do you agree or disagree with the following statements?

Mark one box for each line

	Totally agree	Rather agree	Don't know	Rather disagree	Totally disagree
a) You can break most rules if they don't seem to apply……..	☐	☐	☐	☐	☐
b) I follow whatever rules I want to follow……	☐	☐	☐	☐	☐
c) In fact there are very few rules absolute in life….	☐	☐	☐	☐	☐
d) It is difficult to trust anything, because everything changes……	☐	☐	☐	☐	☐
e) In fact nobody knows what is expected of him/her in life……..	☐	☐	☐	☐	☐
f) You can never be certain of anything in life……..	☐	☐	☐	☐	☐
	1	*2*	*3*	*4*	*5*

Appendix III: DESCRIPTIVE STATISTICS

Table 1: Descriptive Statistics – full sample (Mean (Std. Dev.))

Variable	full sample
drank last month	0,538 (0,499)
abstinent last month	0,462 (0,499)
age	17,106 (1,024)
(min; max)	(15,34; 20,26)
1.year	0,513 (0,500)
3.year	0,487 (0,500)
boys	0,459 (0,498)
girls	0,541 (0,498)
boys 1.year	0,243 (0,429)
girls 1.year	0,270 (0,444)
boys 3.year	0,215 (0,411)
girls 3.year	0,272 (0,445)
academic (gymnasium)	0,258 (0,437)
vocational (sos)	0,394 (0,489)
apprenticeship (sou)	0,348 (0,476)
parent higher education	0,255 (0,436)
parent secondary education	0,441 (0,497)
parent low education	0,272 (0,445)
parent education unknown	0,009 (0,094)
family wealth (rich)	0,187 (0,390)
family wealth (average)	0,677 (0,468)
family wealth (poor)	0,136 (0,343)
parents separated	0,222 (0,416)
parents together	0,761 (0,427)
Prague	0,101 (0,301)
Central Bohemia Region	0,101 (0,302)
South Bohemian Region	0,063 (0,244)
Plzeň Region	0,051 (0,220)
Karlovy Vary Region	0,032 (0,176)
The Ustí Region	0,084 (0,278)
Liberec Region	0,046 (0,210)
Hradec Králové Region	0,052 (0,222)
The Pardubice Region	0,049 (0,215)
The Vysočina Region	0,050 (0,219)
South Moravian Region	0,109 (0,312)
The Olomouc Region	0,060 (0,238)
Zlín Region	0,063 (0,243)
Moravian-Silesian Region	0,137 (0,344)
non-smoker	0,404 (0,491)
smoker	0,596 (0,491)
first intoxication (14year old or less)	0,319 (0,466)
first intoxication (never /15year or older)	0,684 (0,465)
marihuana smoking- slight risk	0,120 (0,325)
marihuana smoking- moderate risk	0,270 (0,444)
marihuana smoking- great risk	0,564 (0,496)
marihuana smoking- don't know	0,032 (0,176)
weekend drinking- slight risk	0,290 (0,454)
weekend drinking- moderate risk	0,421 (0,494)
weekend drinking- great risk	0,240 (0,427)
weekend drinking - don't know	0,035 (0,183)
not proud of himself/herself	0,301 (0,459)
proud of himself/herself	0,699 (0,459)
breaking rules	0,277 (0,448)
breaking rules -not sure about	0,259 (0,438)
abidance by rules	0,464 (0,499)
friends smoking (few)	0,077 (0,267)
friends smoking (some)	0,352 (0,478)
friends smoking (most)	0,571 (0,495)
friends drinking (few)	0,038 (0,191)
friends drinking (some)	0,178 (0,383)
friends drinking (most)	0,784 (0,411)
sibling smoker	0,258 (0,438)
sibling non-smoker	0,369 (0,483)
no older sibling/unknown smok.habits	0,373 (0,484)
sibling drinking	0,382 (0,486)
sibling abstinent	0,255 (0,436)
no older sibling/unknown drink.habits	0,363 (0,481)
total number of observations	9293

Table 2: Descriptive Statistics – different groups (Mean (Std. Dev.))

	1.year		3.year	
Variable	boys	girls	boys	girls
drank last month	0,532 (0,499)	0,426 (0,495)	0,700 (0,459)	0,525 (0,499)
abstinent last month	0,468 (0,499)	0,574 (0,495)	0,300 (0,459)	0,475 (0,499)
age	16,20 (0,420)	16,17 (0,409)	18,08 (0,397)	18,07 (0,354)
(min; max)	(15,34; 18,29)	(15,34; 19,09)	(16,34; 20,26)	(16,34; 19,59)
academic (gymnasium)	0,212 (0,409)	0,300 (0,458)	0,206 (0,404)	0,297 (0,457)
vocational (sos)	0,345 (0,475)	0,445 (0,497)	0,344 (0,475)	0,427 (0,495)
apprenticeship (sou)	0,443 (0,497)	0,255 (0,436)	0,450 (0,498)	0,276 (0,447)
parent higher education	0,288 (0,453)	0,239 (0,427)	0,266 (0,442)	0,233 (0,423)
parent secondary education	0,438 (0,496)	0,450 (0,498)	0,433 (0,496)	0,441 (0,497)
parent low education	0,237 (0,425)	0,283 (0,450)	0,260 (0,439)	0,302 (0,459)
parent education unknown	0,015 (0,122)	0,009 (0,093)	0,009 (0,094)	0,003 (0,056)
family wealth (rich)	0,235 (0,424)	0,158 (0,365)	0,211 (0,408)	0,153 (0,360)
family wealth (average)	0,656 (0,475)	0,701 (0,458)	0,651 (0,477)	0,693 (0,461)
family wealth (poor)	0,109 (0,312)	0,141 (0,348)	0,137 (0,344)	0,154 (0,361)
parents separated	0,207 (0,405)	0,253 (0,435)	0,204 (0,403)	0,220 (0,414)
parents together	0,769 (0,421)	0,734 (0,442)	0,774 (0,418)	0,768 (0,422)
Prague	0,081 (0,273)	0,115 (0,319)	0,091 (0,288)	0,112 (0,315)
Central Bohemia Region	0,094 (0,292)	0,107 (0,309)	0,118 (0,323)	0,089 (0,284)
South Bohemian Region	0,057 (0,233)	0,072 (0,258)	0,058 (0,234)	0,065 (0,246)
Plzeň Region	0,056 (0,230)	0,048 (0,213)	0,045 (0,208)	0,055 (0,228)
Karlovy Vary Region	0,029 (0,168)	0,036 (0,187)	0,034 (0,183)	0,029 (0,166)
The Ustí Region	0,078 (0,268)	0,089 (0,284)	0,075 (0,263)	0,093 (0,291)
Liberec Region	0,054 (0,225)	0,046 (0,208)	0,045 (0,207)	0,041 (0,198)
Hradec Králové Region	0,052 (0,222)	0,053 (0,225)	0,040 (0,197)	0,060 (0,238)
The Pardubice Region	0,059 (0,236)	0,037 (0,189)	0,048 (0,214)	0,051 (0,221)
The Vysočina Region	0,049 (0,215)	0,049 (0,216)	0,064 (0,245)	0,042 (0,201)
South Moravian Region	0,132 (0,339)	0,088 (0,284)	0,121 (0,327)	0,099 (0,299)
The Olomouc Region	0,061 (0,240)	0,063 (0,242)	0,051 (0,221)	0,064 (0,245)
Zlín Region	0,057 (0,231)	0,069 (0,254)	0,059 (0,237)	0,066 (0,248)
Moravian-Silesian Region	0,140 (0,347)	0,129 (0,335)	0,148 (0,356)	0,134 (0,341)
non-smoker	0,425 (0,495)	0,448 (0,497)	0,357 (0,479)	0,379 (0,485)
smoker	0,575 (0,495)	0,552 (0,497)	0,643 (0,479)	0,621 (0,485)
first intoxication (14year old or less)	0,404 (0,491)	0,340 (0,474)	0,328 (0,470)	0,217 (0,412)
first intoxication (never /15year or older)	0,580 (0,494)	0,642 (0,480)	0,657 (0,475)	0,769 (0,422)
marihuana smoking- slight risk	0,132 (0,339)	0,090 (0,286)	0,171 (0,377)	0,099 (0,298)
marihuana smoking- moderate risk	0,266 (0,442)	0,232 (0,422)	0,283 (0,451)	0,303 (0,460)
marihuana smoking- great risk	0,548 (0,498)	0,633 (0,482)	0,495 (0,500)	0,566 (0,496)
marihuana smoking- don't know	0,042 (0,200)	0,030 (0,170)	0,038 (0,192)	0,020 (0,141)
weekend drinking- slight risk	0,326 (0,469)	0,236 (0,424)	0,380 (0,485)	0,241 (0,428)
weekend drinking- moderate risk	0,387 (0,487)	0,455 (0,498)	0,375 (0,484)	0,454 (0,498)
weekend drinking- great risk	0,236 (0,425)	0,253 (0,435)	0,197 (0,398)	0,266 (0,442)
weekend drinking - don't know	0,037 (0,188)	0,043 (0,203)	0,032 (0,176)	0,027 (0,162)
not proud of himself/herself	0,308 (0,462)	0,340 (0,474)	0,282 (0,450)	0,272 (0,445)
proud of himself/herself	0,692 (0,462)	0,660 (0,474)	0,718 (0,450)	0,728 (0,445)
breaking rules	0,348 (0,476)	0,249 (0,433)	0,319 (0,466)	0,208 (0,406)
breaking rules -not sure about	0,266 (0,442)	0,270 (0,444)	0,243 (0,429)	0,255 (0,436)
abidance by rules	0,386 (0,487)	0,481 (0,500)	0,437 (0,496)	0,537 (0,499)
friends smoking (few)	0,079 (0,269)	0,091 (0,288)	0,067 (0,251)	0,070 (0,256)
friends smoking (some)	0,374 (0,484)	0,311 (0,463)	0,394 (0,489)	0,339 (0,474)
friends smoking (most)	0,548 (0,498)	0,598 (0,490)	0,539 (0,499)	0,590 (0,492)
friends drinking (few)	0,054 (0,225)	0,052 (0,223)	0,020 (0,142)	0,023 (0,150)
friends drinking (some)	0,212 (0,409)	0,217 (0,412)	0,129 (0,336)	0,147 (0,354)
friends drinking (most)	0,734 (0,442)	0,731 (0,444)	0,850 (0,357)	0,830 (0,376)
sibling smoker	0,238 (0,426)	0,269 (0,444)	0,230 (0,421)	0,288 (0,453)
sibling non-smoker	0,394 (0,489)	0,356 (0,479)	0,392 (0,488)	0,342 (0,474)
no older sibling/unknown smok.habits	0,368 (0,482)	0,375 (0,484)	0,378 (0,485)	0,371 (0,483)
sibling drinking	0,352 (0,478)	0,377 (0,485)	0,373 (0,484)	0,422 (0,494)
sibling abstinent	0,290 (0,454)	0,260 (0,439)	0,262 (0,440)	0,214 (0,410)
no older sibling/unknown drink.habits	0,358 (0,480)	0,363 (0,481)	0,365 (0,482)	0,364 (0,481)
total number of observations	2261	2505	2001	2526

Appendix IV: RESULTS

Table 3: Estimation of drank last month – full sample (Coef., Robust Std.Err.))

Variable	full sample		
1.year	-0,097	***	(0,011)
boys	0,095	***	(0,012)
academic (gymnasium)	0,036	***	(0,014)
apprenticeship (sou)	0,022	*	(0,013)
parent higher education	0,012		(0,012)
parent low education	-0,023	**	(0,011)
parent education unknown	-0,089		(0,057)
family wealth (rich)	0,019		(0,012)
family wealth (poor)	-0,020		(0,013)
parents separated	-0,021	*	(0,011)
Central Bohemia Region	-0,018		(0,023)
South Bohemian Region	0,060	***	(0,023)
Plzeň Region	0,047	*	(0,027)
Karlovy Vary Region	-0,026		(0,030)
The Ustí Region	-0,033		(0,025)
Liberec Region	0,010		(0,027)
Hradec Králové Region	0,001		(0,022)
The Pardubice Region	-0,002		(0,027)
The Vysočina Region	0,047		(0,029)
South Moravian Region	-0,003		(0,022)
The Olomouc Region	-0,073	***	(0,025)
Zlín Region	-0,023		(0,026)
Moravian-Silesian Region	-0,039	*	(0,021)
never smoked	-0,222	***	(0,012)
first intoxication(14year old or less)	0,110	***	(0,011)
marihuana smoking- slight risk	0,038	***	(0,015)
marihuana smoking- great risk	-0,043	***	(0,011)
marihuana smoking- don't know	-0,057		(0,035)
weekend drinking- slight risk	0,077	***	(0,012)
weekend drinking- great risk	-0,077	***	(0,012)
weekend drinking- don't know	0,074	**	(0,030)
not proud of himself/herself	-0,031	***	(0,010)
breaking rules	0,070	***	(0,012)
breaking rules (not sure about)	0,025	**	(0,012)
friends smoking (few)	-0,022		(0,020)
friends smoking (most)	0,015		(0,012)
friends drinking (few)	-0,030		(0,022)
friends drinking (most)	0,195	***	(0,013)
older sibling smoking	-0,048	***	(0,013)
older sibling drinking	0,078	***	(0,012)
constant	0,419	***	(0,026)
Observations	9288		
R-sq	(0,23)		
(Std. Err adjusted for …… clusters in kod_trid)	for 360		

*** p < 0,01; ** p< 0,05; * p< 0,1

Table 4: Estimation of drank last month – different groups (Coef., Robust Std.Err.))

	1.year				3. year			
Variable	boys		girls		boys		girls	
academic (gymnasium)	0,023	(0,034)	0,037	(0,024)	0,023	(0,029)	0,051 *	(0,026)
apprenticeship (sou)	0,035	(0,029)	0,063 ***	(0,024)	-0,002	(0,024)	-0,009	(0,024)
parent higher education	0,028	(0,024)	0,002	(0,023)	0,039 *	(0,023)	-0,018	(0,027)
parent low education	-0,002	(0,025)	-0,037 *	(0,021)	-0,013	(0,024)	-0,036 *	(0,020)
parent education unknown	-0,002	(0,083)	-0,102	(0,070)	-0,233 **	(0,107)	-0,010	(0,211)
family wealth (rich)	0,031	(0,023)	0,056 **	(0,027)	0,005	(0,021)	-0,011	(0,024)
family wealth (poor)	-0,051 *	(0,029)	-0,029	(0,025)	0,005	(0,028)	-0,009	(0,024)
parents separated	-0,006	(0,023)	-0,029	(0,020)	-0,013	(0,023)	-0,031	(0,025)
Central Bohemia Region	-0,045	(0,041)	-0,014	(0,034)	-0,016	(0,040)	-0,025	(0,061)
South Bohemian Region	0,109 **	(0,048)	0,028	(0,035)	0,045	(0,030)	0,070	(0,047)
Plzeň Region	0,069	(0,065)	0,122 ***	(0,038)	-0,050	(0,037)	0,037	(0,050)
Karlovy Vary Region	-0,030	(0,086)	-0,035	(0,043)	-0,088	(0,058)	0,006	(0,045)
The Ustí Region	-0,022	(0,043)	-0,003	(0,038)	-0,093 ***	(0,036)	-0,036	(0,060)
Liberec Region	0,008	(0,057)	0,082	(0,055)	-0,032	(0,053)	-0,029	(0,060)
Hradec Králové Region	0,069	(0,043)	0,002	(0,056)	-0,063 *	(0,037)	-0,018	(0,044)
The Pardubice Region	0,000	(0,060)	0,020	(0,045)	-0,067	(0,042)	0,045	(0,049)
The Vysočina Region	0,075	(0,073)	0,043	(0,054)	0,033	(0,047)	0,020	(0,044)
South Moravian Region	-0,006	(0,040)	0,082 **	(0,038)	-0,025	(0,046)	-0,059	(0,047)
The Olomouc Region	-0,067 *	(0,036)	-0,091 ***	(0,034)	-0,104 *	(0,056)	-0,041	(0,062)
Zlín Region	0,010	(0,051)	-0,028	(0,039)	-0,051	(0,059)	-0,008	(0,046)
Moravian-Silesian Region	-0,062	(0,045)	-0,039	(0,029)	-0,043	(0,036)	-0,013	(0,041)
never smoked	-0,250 ***	(0,023)	-0,203 ***	(0,026)	-0,212 ***	(0,025)	-0,216 ***	(0,024)
first intoxication(14year old or less)	0,133 ***	(0,024)	0,104 ***	(0,022)	0,087 ***	(0,022)	0,102 ***	(0,022)
marihuana smoking- slight risk	0,012	(0,029)	0,081 ***	(0,031)	0,040 *	(0,023)	0,026	(0,036)
marihuana smoking- great risk	-0,032	(0,023)	-0,033	(0,023)	-0,049 **	(0,020)	-0,052 **	(0,022)
marihuana smoking- don't know	-0,054	(0,068)	-0,109 *	(0,062)	-0,073	(0,069)	0,070	(0,078)
weekend drinking- slight risk	0,091 ***	(0,025)	0,063 ***	(0,023)	0,045 *	(0,023)	0,103 ***	(0,023)
weekend drinking- great risk	-0,067 ***	(0,027)	-0,063 ***	(0,021)	-0,079 ***	(0,027)	-0,093 ***	(0,023)
weekend drinking- don't know	0,092	(0,064)	0,093 *	(0,052)	-0,005	(0,077)	0,106 *	(0,056)
not proud of himself/herself	-0,043 **	(0,022)	-0,039 **	(0,020)	-0,041 *	(0,022)	-0,010	(0,020)
breaking rules	0,061 ***	(0,023)	0,108 ***	(0,025)	0,035	(0,022)	0,075 ***	(0,023)
breaking rules (not sure about)	-0,034	(0,025)	0,031	(0,023)	0,049 *	(0,026)	0,058 ***	(0,023)
friends smoking (few)	-0,009	(0,038)	-0,024	(0,033)	-0,060	(0,049)	0,002	(0,040)
friends smoking (most)	0,009	(0,025)	0,031	(0,024)	0,006	(0,022)	0,022	(0,022)
friends drinking (few)	-0,058	(0,041)	-0,010	(0,031)	-0,019	(0,070)	-0,040	(0,055)
friends drinking (most)	0,172 ***	(0,025)	0,197 ***	(0,025)	0,223 ***	(0,035)	0,186 ***	(0,027)
older sibling smoking	-0,070 **	(0,029)	-0,038	(0,024)	-0,051 **	(0,026)	-0,036	(0,024)
older sibling drinking	0,108 ***	(0,024)	0,060 ***	(0,022)	0,082 ***	(0,023)	0,072 ***	(0,023)
constant	0,412 ***	(0,044)	0,282 ***	(0,044)	0,573 ***	(0,047)	0,414 ***	(0,054)
							0,663	
Observations	2258		2504		2001		2525	
R-sq	(0,24)		(0,24)		(0,19)		(0,19)	
(Std. Err adjusted for ….. clusters in kod_trid)	for 169		for 153		for 169		for 153	

Appendix V: BACHELOR THESIS PROPOSAL

UNIVERSITAS CAROLINA
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Academic Year 2009/2010

TEZE BAKALÁŘSKÉ PRÁCE

Student:	Martina Mandelíková
Obor:	IES
Konzultant:	Ing. Filip Pertold

Garant studijního programu Vám dle zákona č. 111/1998 Sb. o vysokých školách a Studijního a zkušebního řádu UK v Praze určuje následující bakalářskou práci

Předpokládaný název BP:

Smoking and Drinking Behaviour of (Czech) Youth

Charakteristika tématu, současný stav poznání, případné zvláštní metody zpracování tématu:

Czech teenagers are known for high cigarette and alcohol consumption. What are the determinants for cigarette and alcohol use of first and third year students of high schools? Using Data based on ESPAD (The European School Survey Project on Alcohol and Other Drugs) I will try to answer this question. This research was done among high school students in years 1999 and 2003 in many European countries, which presents a significant sample of adolescents.

Struktura BP:

Abstract:

A general assumption is that there are students with different level of risk behaviour at different types of high schools. This thesis tries to determine what influences the smoking and drinking behaviour of youth and if this behaviour has impact on the selection of high school. Or more precisely, whether the teenagers with similar behaviour concentrate at the same kind of school or whether it does not matter.

Osnova:

I. *Introduction*
II. *Literature Review and Basic Methodological Issues*
III. *Institutional Setting and Identification Strategy*
IV. *Data Description and Overview of Risky Behaviour*
V. *Results*
VI. *Conclusion*

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