Risk Factors for Marijuana Use among Russian and Canadian Adolescents: a Comparative Analysis

by

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A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Arts
in
Sociology

Waterloo, Ontario, Canada, 2007

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Abstract

The increasing use of toxic substances is one of the most serious problems in today's society. Recent tendencies such as widening of the variety of drugs available, intensity of drug circulation, and the decrease in age for first time users indicates that drug abuse is becoming one of the most alarming problems globally. Marijuana use remains the most widely used drug among the world population, and the number of cannabis users is increasing every year. The major focus of this research is on the young adolescents' social environment and the risk factors for marijuana use that it produces. The influence of such elements of social environment as family, school, and peers is examined in this study.

Evaluating the applicability of some theories, such as social control theory (Hirschi, 1969) and peer cluster theory (Oetting and Beauvais, 1986), to marijuana use of Russian and Canadian samples of adolescents between the ages of 14-16, this research employs the risk-focused approach. This approach requires the identification of risk factors for marijuana use for its prevention. The study involves making a comparative analysis of risk factors for marijuana use produced by social environment of the Canadian and Russian adolescents.

The analysis is based on the data obtained within a World Health Organization Cross-National Study "Health Behaviour in School-Aged Children" in 2001/02. The method of logistic regression modeling is applied in order to examine which aspects of social environment of adolescents produce greater risks for marijuana use. The results shows that in spite of the differences between countries, peers have the strongest influence on adolescent marijuana use, which supports peer cluster theory. In addition, the study shows that young people's own use of licit drugs, such as alcohol and tobacco, significantly increase risks of getting involved in marijuana use, which supports the major gateway hypothesis. Although these variables are not in the major research interest, they have strong predictive power, which can be discussed and examined in detail in future research.

Acknowledgements

I would like to express my sincere gratitude to the members of my thesis committee – Professor Weizhen Dong, my supervisor; Professor Keith Warriner, and Professor Robert Hiscott. I greatly appreciate your advice, support, and guidance. I have gained new knowledge due to your involvement in my project and responsiveness to my inquires.

I would like to thank Ilona Kosa for her help and support in solving many questions and problems I was having while doing my work and going through the program. I am also thankful for the advice and guidance of Prof. Augie Fleras who always encourages me and inspires me with new energy.

I would also like to acknowledge the assistance and help in obtaining access to the data that are essential for this analysis Ms. Ingrid Leversen (Norway), Ms. Ivar Andreas Lima (Norway), Dr. William Pickett (Canada), and Dr. Alexander Komkov (Russia).

I would like to thank my family for their unconditional love, support, and patience and my friends for their encouragement.

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1. Introduction

"…Marijuana does the most social harm of any illegal drug.
Marijuana is currently the leading cause of treatment need:
nearly two-thirds of those who meet the psychiatric criteria
for needing substance-abuse treatment do so because of marijuana use.
For youth, the harmful effects of marijuana use
now exceed those of all other drugs combined".
- John P. Walters

The problem of drug addiction among the general population and youth in particular, has become a global problem. It affects individuals, their families, the development of population, and all aspects of society. Until very recently, drug use has been limited to relatively small groups of the population. However, there has been a radical increase in the use of all types of drugs among the population and more importantly, an inconceivable rise in drug use among youth (Oetting and Beauvais, 1986; Shcherbakova, 2005; Canadian Addiction Survey, 2004; World Drug Report, 2006). The above quote by John P. Walters, Director of the White House Office of National Drug Control Policy of the United States, demonstrates the harmful influence of one drug - marijuana, which is in the major focus of this research. Marijuana became one of the most frequently used drugs in the world (World Drug Report, 2006), and its use is widespread among the Russian and Canadian population. In Canada, the use of illicit drugs is generally limited to cannabis only. The current research is focused on the risk factors associated with marijuana use in both a Canadian and Russian context.

My primary research interest has been in understanding and analyzing problems of youth drug use. In my own social environment, I have witnessed the tragic decline into drugs and lethal overdosing of some of my acquaintances. This has deeply affected and

influenced my decision to focus my past research on issues related to drug use among youth in Russia. Based on the analysis of the risks factors for drug use among Russian adolescents, the study indicated that the most influential factors in determining one's exposure to and use of drugs is the youth's association with drug using peers and accessibility of drugs (Gvozdeva et al, 2004).

A few years after completing this study, I relocated to a mid-sized city in Canada. I have since become interested in expanding the research that has been started in Russia. I started to question if the risk factors associated with drug use, specifically marijuana use, were the same globally, or if they were culturally specific. Making a comparative analysis of circumstances of marijuana use in two countries is beneficial for both Russia and Canada. First, it is useful for the determination of the most influential major risk factors and differences in patterns of adolescent marijuana use, because it provides opportunity to account for differences affected by cultural, political, and economic circumstances. Second, it may contribute to the Russian section of the analysis due to the opportunity of applying theories developed by North American researchers, such as Hirschi's control theory, peer cluster theory, and others, which are not broadly applied in Russia. Finally, it is of great value in a broader sense due to the opportunity to realize and use the experience of others in our quest to eradicate this problem from society.

The major findings obtained throughout research work in Russia give reasons to conclude that peer cluster theory, which was proposed by American researchers in the late 1980s, can partly explain drug addiction among youth (Oetting and Beauvais, 1986). The theory proposes that peer drug association has the strongest and direct influence on adolescent drug use, whereas other elements of social environment affect it only

indirectly. Alternatively, Hirschi's (1969) control theory hypothesizes that there are three major elements of social environment that mediate the development of deviant behaviours, including marijuana use: family, school, and peers. Both theories discuss the main elements of social environment and were frequently applied to the analyses of different types of substance abuse behaviour in North America; however, they have not been applied in Russian studies. Thus, it is beneficial to apply these theories in the different contexts and samples, to evaluate their applicability, and to determine major risk factors for youth's marijuana use in different countries. As a result, it is my hope that the findings will reflect the broader context for adolescent drug abuse, by the example of marijuana use, breaking down the cross-national and territorial borders.

2. Contextualizing the research: Reviewing the Literature

2.1. Problem Area: Drug Use in Canada and Russia

According to the United Nations Organization World Drug Report (UNOWDR, 2006), some 200 million people or five percent of the world's population aged between 15 and 64 years have used drugs at least once in the previous 12 months. It proposes the increases in some drug categories, such as cannabis and ecstasy, and an observed tendency towards poly-drug abuse. The United Nations Office on Drugs and Crime global prevalence estimates suggest that overall drug use has been rising over the last few years. Over the last twelve years, the strongest increases in drug use were perceived for cannabis and amphetamine type stimulants. Increases in opiates and cocaine were less pronounced. The Human Development Report (1999: 41) states that "the illegal drug trade in 1995 was estimated at $400 billion, about 8 percent of world trade, more than the share of iron and steel or of motor vehicles, and roughly the same as textiles (7.5 %) and gas and oil (8.6 %)".

Among the world's population of drug users, the number of Russian and Canadian citizens continually increases. The proportion of Canadians reporting any illicit drug use in their lifetime increased from 28.5 percent in 1994 to 45.0 in 2004, and in the past 12 month from 7.6 to 14.4 percent (Canadian Addiction Survey, 2004).

The Russian population of drug users reached 6 million people in 2005, which is about 4.1 percent of the total population with more than 200,000 people involved in narcobusiness (Federal Drug Circulation Control Service of Russian Federation, 2005). However, people who are registered as patients in treatment and prevention institutions

represent just a small portion of those who abuse drugs and other psychoactive substances (Shcherbakova, 2005). In accordance with some expert judgments, the real number of drug users in the country is ten times as much compared to the reported rate. In Russia, the extremely rapid increase in the number of drug users occurred in the 1990s. Over a ten-year period the number rose from 50-80 thousands people to 6 millions, and majority of them are young people.

2.2. Marijuana Use in Russia and Canada: Prevalence and Risks

Self-reported marijuana use to represent illicit drug behaviour by Canadian and Russian adolescents is considered in the analysis for several reasons. First, marijuana is one of the early known drugs, which appeared in times of ancient Greeks and was mentioned in Homer's Odyssey (Anslinger and Cooper, 1995). Marijuana is a weed of the Indian hemp family that has been considered as one of humanity's oldest medicines; however, today, it is classified as "a substance with a high potential for abuse and limited medical use" (Grinspoon and Bakalar, 1995). Among all illicit drugs, cannabis remains the most widely used. The number of cannabis users in the world is now estimated at some 162 million people, or 4 percent of the world's population in the 15-64 age group (World Drug Report, 2006). Use of marijuana still is widely spread both in Russia and in Canada. The use of illicit drugs in Canada is generally limited to cannabis only. About 28.7 percent of Canadian population (63.4 percent of lifetime users) report using only cannabis during their lifetime, and 11.5 percent (79.1 percent of past-year users) used only cannabis during the past year (Canadian Addiction Survey, 2004). Compared to Canada, where cannabis is considered the most common drug, cannabis consumption, while being the most frequently used drug among the Russian population, is accompanied

by the use of opiates. According to UNOWDR (2006), the following types of drugs are frequently used in Canada and Russia:

Table 1. Annual prevalence of drug abuse
Annual prevalence of abuse as percentage of the population aged 15-64 (unless otherwise indicated), %

Type of drug	Canada	Russian Federation
opiates	0.4 ((Ontario,18+), 2000)	2.0 (2004)
cocaine	2.3 (2004)	0.1 (2003)
cannabis	16.8 ((15-64), 2004)	3.9 (2003)
amphetamines	0.8 (2004)	0.2 (2003)
ecstasy	1.1 (2004)	0.1 (1999)

Second, marijuana is recognized as a gateway drug and, thus, leads to the use of other more harmful drugs. According to some research, "cannabis users, after experiencing and getting used to the mild high of cannabis, begin to crave a more intense high and thus move on to other drugs" (Evidence to the Home Affairs Committee Inquiry into drug policy, 2001). Research has also shown that regular users of cannabis are more likely to progress to more harmful drugs than occasional users. According to John Ingersol, director of the Bureau of Narcotics and Dangerous Drugs in the seventies, "the overwhelming majority of those who use heroin or LSD …have had prior experience with either marijuana or hashish. Thus it seems reasonable to assume that if many individuals did not get involved with marijuana they would never get around to using the more potent dangerous drug" (Goode, 1973: 45). A single experiment of using marijuana does not mean a person will become a regular drug user, but it may remove some of the barriers against trying drugs again. In some cases, people who regularly use one drug are more likely to use other drugs (Health Canada, 2000). In addition, the use of marijuana is itself highly correlated with having other friends who use marijuana and other drugs.

Lastly, marijuana use can be considered as one of the patterns of adolescents' deviant behaviour. Analysis of the determinants of marijuana use may be relevant for explaining the main factors that influence the initiation of any kind of deviant behaviour in general. Marijuana use is one of the examples of behaviours that entail the violation of social norms and the law and demonstrate the mechanism and causes of the involvement in the activities that are socially disapproved.

2.3. Prevalence of Drug Use among Young Population in Russia and Canada

The focus of this study is on young people between the ages of 14-16. This period is very important because it may involve pervasive changes in social roles and contexts, actual transitional experiences, decision-making processes, and greater amounts of experimentation often related to use of illicit drugs that result in negative consequences in their lives and development. Adolescent years are times when youth are making decisions concerning alcohol and other drugs that can influence the rest of their lives.

The literature shows that "initiation of substance use (alcohol, marijuana, and tobacco) generally occurs for most individuals at some point during adolescence or early adulthood" (Oxford et al., 2000: 600). National Canadian studies show that the average age when a child first tries alcohol is 11, and for marijuana, it is 12. Many kids start becoming curious about these substances even sooner. According to some Russian studies, initiation of drug use for the majority occurs before the age of 15, and only for 37 percent, it happens later in their lives. Young people who have tried drugs before the age

of 10 compose 19 percent, people between the ages 10-12 represent 26 percent, and the ages between 13 and 14 comprise 18 percent (Bikov, 2000).

Youth's involvement in drug use is widespread nowadays. According to the survey "Horizons Three: Young Canadians - Alcohol and Other Drug Use: Increasing Our Understanding" conducted in 1995, over one-third of young people aged 15-24 have used toxic substances sometime in their lives. About 5 percent of the 15-24 age group have used other drugs such as LSD, cocaine, crack, speed or heroin (Health Canada, 1995). For example, in Ontario, the consumption of 11 different types of drugs including hallucinogens, LSD, and heroin among the students of grades 7 to 12 significantly increased since 2003 (Adlaf and Paglia-Boak, 2005). According to data from the Ministry of Health of the Russian Federation, the level of drug use among Russian adolescents increased 17 fold in 2001 compared to 1991 (Aref'ev, 2003), and it rose by 10.5 percent in 2000 compared to 1999 (Materials for the Government Committee meeting, 2001). The number of young people who were under medical observation as users of toxic substances peaked in 2000, and formed 123.9 for every 100,000 people between the ages of 15 and 17 (Shcherbakova, 2005).

According to the study conducted in Moscow in 2003, only 27 percent of Moscow schoolchildren have never tried drugs in their lives. Furthermore, 35 percent reported that they had used drugs once or twice in a lifetime, and 15 percent indicated high level of drug use (8 percent use drugs several times per month, 5 percent – several times per week, and 2 percent use drugs every day) (Pishulin and Pishulin, 2003).

The importance of research on this group of the population is also conditioned by the need for the development and realization of preventive works and programs against

substance abuse. Determination of the major risk factors for drug use among adolescents is necessary for the formulation and implementation of accurate policies and programs, the goal of which is to increase the age at which young people begin experimenting with drugs and to decrease the number of young people involved in drug use. Those who start experimenting with drugs early in adolescence are more likely to develop drug problems in later life (Health Canada, 2000). Thus, it is important to put forth the maximum effort to prevent the first try of drugs in order to keep younger generations from using it in their lives. To prevent the first try means to prevent the subsequent drug use and drug dependence, and it is much easier to do the former rather than struggle with the latter.

2.4. The Human Development Conception: Consequences of Drug Use

The problem of drug use may be considered within the frame of the human development conception. This framework suggests that the basic capabilities for human development are to live long and healthy lives, to be knowledgeable, to have access to the resources needed for the decent standard of living, and to be able to participate in the life of the community (Human Development Report, 2005). Without these, many choices are simply not available, and many opportunities in life remain inaccessible.

Although marijuana use may have less harmful consequences compared with other drugs, it is a first step towards the use of more harmful drugs, which affects three major determinants of human development: health and life expectancy, education level, including literacy rate, and standard of living. The consequences of drug use in society result in broken families, illness, shortened lives, high rate of deaths, violent crimes, loss of good minds to industry and professions, as well as other social problems. First, drug

use has a harmful affect on people's health. Substance users are at an increased risk for AIDS, HIV, hepatitis and other infections (Health Canada, 2000). These infections are transmitted by sharing needles, syringes, and other paraphernalia for injecting drugs. Forty one percent of people who inject drugs have shared needles to inject drugs. Injection drug use is estimated to be associated with at least 70 percent of all new hepatitis C cases (Health Canada, 2000). The immune system of drug addicts quickly deteriorates and becoming less strong over the time of drug use. The risk of premature death for males that use drugs is five times greater compared to the male population in general, whereas for female drug users it is eleven times greater (Social Encyclopedia, 2000). Second, people who use drugs lose interest in self-development, hard work, and education. Education is no longer considered as the way of self-actualization once one is involved in the consumption of toxic substances (Malikova, 2000). Third, economic position and standard of living of those who are involved in frequent drug use may decline through spending considerable amounts of money on drugs and borrowing them from other people. According to Canadian Addiction Survey, 6.5 percent of the population (age 15+) reported decreased economic stability due to their own drug use, and 3.5 percent indicated difficulty learning.

Reviewing the major human development indicators, it may be concluded that the overall level of human development of the two countries significantly differs. Canada shows high level of human development over period of 10 years, while Russia remains at the medium level as is shown in the table 2 (Human Development Reports, 1996, 2000, 2001, 2002, 2003, 2004, 2005). With the exception of 2001, Canada is one of the countries that are in the top quintuple since 1996. Russia, however, remains far behind. In

spite of the substantial gap in human development level between these countries, they demonstrate the same dynamics by losing positions in the world human development rating.

Table 2. Human Development Indicators – Human Development Index Rank and Human Development Index Value

Year	Canada		Russian Federation	
	HDI Rank*	HDI Value**	HDI Rank*	HDI Value**
1993	1	0.951	57	0.804
1997	1	0.932	71	0.747
1998	1	0.935	62	0.771
1999	3	0936	55	0.775
2000	3	0.940	60	0.781
2001	8	0.937	63	0.779
2002	4	0.943	57	0.795
2003	5	0.949	62	0.795

*Human Development Index Rank
** Human Development Index Value (The human development index (HDI) is a composite index that measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate and the combined gross enrolment ratio for primary, secondary and tertiary schools; and a decent standard of living, as measured by GDP per capita in purchasing power parity (PPP) US dollars. The index is constructed from indicators that are currently available globally using a methodology that is simple and transparent).

2.5. Grounds for Choosing Russia and Canada for a Comparative Analysis

The current analysis of drug issues considers two countries – Russia and Canada. The overall level of human development among these countries differs greatly as has been shown in table 2. Moreover, these two countries have very different economic, social, and cultural circumstances. Since the beginning of the 1990's, Russia has been through a lot of changes and transitions in the economic, political, and social spheres. The transition of the society from planned to market economy resulted in the collapse of moral foundations and the loss of vitally important values and ideals. Consequently, there

has been a drastic rise in number and extent of social issues, including youth problems, such as drug use, crime, child neglect, and prostitution. The social-economic transition of the whole society and moral degradation and weakening of such social institutions as school and family have affected youth's drug use behaviours dramatically (Selivanova, 2001). For instance, the rate of child neglect greatly increased in the 1990's affected the rate of youth' involvement in drug use. Seventy-five percent of stray teenagers, people who are out of parents' and school's control, got involved into drug use (Pishulin and Pishulin, 2003). Since the early 1990's, less and less attention has been devoted to young people's problems by the state and society. Thus, "the State Committee for Young Affairs that develops and coordinates the implementation of youth policy on a nationwide scale, has been abolished, and the financing of programs oriented toward young people has been cut back" (Aref'ev, 2003: 23).

To the contrary, in Canada youth are a key target population prioritized under Canada's Drug Strategy, which is the federal government's response in addressing the harmful use of substances. This strategy proposes that it is essential to monitor youth drugs rates and patterns of use, associated consequences, and other related dimensions in order to carry out prevention works and make relevant policy decisions. According to Health Canada's official web site, many studies have been recently conducted by Statistics Canada and sponsored by Health Canada. Most provinces and territories in Canada conduct school-based student drug use surveys. Expenditures on health are one of the priorities in public spending in Canada, and the value of this indicator is almost two times greater compared to Russia. Thus, in 2002 public expenditures on health in Canada

were 6.7 percent of the Gross Domestic Product, while in Russia they constituted 3.5 percent (Human Development Report, 2005).

Moreover, the two countries differ in the economic status of their populations. Thus, in 2003 the Gross Domestic Product per capita in purchasing power parity US dollars (GDP per capita PPP US dollars) was 20.7 for Canada, whereas for Russia it was only 9.2 (Human Development Report, 2005). The low economic stability of the Russian population contributes to the spread of many social diseases, including drug use.

After the collapse of the USSR in 1991, the Russian national borders, especially on the south, have been exposed to the illegal importation of drugs from former Soviet neighbouring republics, such as Kazakhstan. The bulk of different drugs for the illicit traffic to Russia come from such countries as Tadjikistan and Afghanistan through Kazakhstan. Afghanistan is considered as one of the major drug suppliers in the world. Opium production in Afghanistan (4,100 tons) accounted for 89 per cent of global opium production in 2005 (World Drug Report, 2006). Thus, the large-scale trafficking of drugs mostly originated in Afghanistan to Russia generates the main threat for national security of the country. Canada is not exposed to such a large-scale and uncontrolled entry of drugs from the world's largest drug producers, because it does not lay along the main trafficking routes of drugs.

In addition, attitudes of the public and governments towards marijuana are quite different in Russia and Canada. The Canadians are increasingly permissive towards marijuana use. The increasing acceptance of marijuana can be explained by theories of "transnational movements of cultural values", which argue that Canadians have been exposed to different values of marijuana use due to the immigrants move from varieties

of countries. Therefore, immigrants bring "their cultural practices, which may go through 'transnational transformations' as they are adapted to the national culture" (Spicer, 2002). In Canada, compared with Russia, the immigration rate is considerably higher. Thus, in 2006, 186,380 immigrants landed in Russia (Federal State Statistics Service, 2007), while in Canada the number of immigrants was 254,359 (Statistics Canada, 2006). In addition to the lower rate of immigration in Russia, immigrants are primarily ethnic Russians moving out from former republics of the Soviet Union (Rosenberg, 2006). Therefore, due to the "transnational movement of cultural practices" and some other factors such as hippie movement in the 1960's, "Canadians have gained exposure to other cultural values of marijuana use which has resulted in the emergence of new Canadian attitudes towards marijuana, threatening the traditional moral hegemony" (Spicer, 2002).

The acceptance of the regulations allowing access to marijuana for medical use in July 2001 in Canada contributed to the reinforcement of Canadians' permissive mentality for marijuana use. Thus, some study supports the tendency of the growing permissive attitude and shows that "47 percent of Canadians favour the legalization of marijuana, which is up from 31 percent in 1995 and 26 percent in 1975" (Spicer, 2002). While in Canada more and more people support legalization or at least decriminalization of marijuana, in Russia the government supports the maintenance of prohibitions against drugs. In Russia, any attempts to demand the legislation of marijuana have been suppressed by authorities and government officials and rejected for further consideration.

Summarizing, Canada and Russia are considered as examples of countries with very different levels of overall human development, economic status of the population, political and cultural circumstances, and the degree to which they experience illegal drug

trafficking and accept marijuana use. All these factors may strongly influence the marijuana use in a country, patterns of marijuana use among young population, and their attitudes towards its consumption. In addition, the functioning of the main institutions of socialization, such as family and school, may be affected by these determinants.

3. Theoretical Framework

3.1. The Population Health Perspective

The problem of youth's involvement in marijuana use can be considered within the broader framework of the *population health perspective* that has become significant in academic and policy making discourse. For preventing diseases and promoting population health, not only the impacts that marijuana use has on youth's health should be considered but also the factors that determine and provoke marijuana use. Hayes and Dunn (1998) argue, "population health focuses on the interrelated conditions and factors that influence the health of populations over the life course, identifies systematic variations in their patterns of occurrence, and applies the resulting knowledge to develop and implement policies and actions to improve the health and wellbeing of those populations" (as cited in Eyles et al., 2001:1612).

Population health theorists consider "the entire range of factors that determine health [and address issues other than medical care, such as social environment], rather than focusing on …clinical factors related to particular diseases" (Young, 2005: 5). The perspective suggests that the fundamental casual pathways do not depend on risk factors for specific life-threatening conditions, such as marijuana addiction; however, the diversity of life conditions can influence the human biology and vitality that can be directly affected by social environment (Hertzman and Wiens, 1996). Therefore, the analysis of the factors that are embedded in the social environment of young people leading to marijuana use, which, in turn, determine the overall health of adolescents, can

be effective for improving adolescent health, preventing the spread of drug use, and developing appropriate policies. Although the population health perspective mostly focuses on the macro level and developing policies and programs directed towards the improvement of the health of wider groups, it is useful to employ it in this analysis as a broad framework that allows considering more factors determining adolescent marijuana use and affecting their health.

3.2. Risk-Focused Approach

In order to determine the spectrum of factors that can influence drug use behaviours, such as marijuana use, the risk factors for drug use produced by social environment should be identified. Some researchers argue that the most promising route to effective strategies for the prevention of the adolescent drug use problem is through a *risk-focused approach* (Hawkins et al., 1992). The risk-focused explanation of drug use, which is based on patterns of vulnerability and risk, states that cannabis takes its place among a range of antisocial behaviour patterns that make the individual more likely to become more heavily involved in cannabis and other illicit drugs (Evidence to the Home Affairs Committee Inquiry into drug policy, 2001). This approach proposes an idea that there are a number of risk factors and life pathways which predispose some young people to use cannabis and others to use other illicit drugs.

The risk-focused approach requires the identification of risk factors for drug use and its prevention by eliminating, reducing, or mitigating its precursors. Thus, the

number of recommendations for drug use prevention addressing the revealed risk factors can be formulated. Risk factors that have been broadly discussed in scientific literature show that there is a high level of stability over time in spite of changing norms. Some findings demonstrate the "risk factors' stability as predictors and [thus] their viability as targets for preventive work" (Hawkins et al., 1992: 85). Moreover, the knowledge of risk factors is important due to the fact that "the more risk factors present, the greater the risk of drug abuse" (Hawkins et al., 1992: 85). It is likely that a greater length of exposure to the environmental risk factors intensifies risk as well. Therefore, the determination of some of the essential risk factors for adolescent marijuana use may provide us with the indicators of the degree to which social environment affects young people's lives.

According to the literature, there are two main categories of risk factors: contextual factors, which are based on societal and cultural norms and expectations for behaviour and external circumstances that may intensify risks, and individualistic, which lie within individuals and their social environment, the main elements of which are family, school, and peer groupings (Hawkins et al., 1992). The latter group of risk factors includes physiological and psychological factors that indicate predisposition to drug use and factors that lie within social environments. In this study, only those factors that are produced by the social environment of adolescents are in the focus of the analysis. These risk factors regard such characteristics of social environments as alcohol and drug behaviours in family and attitudes towards its use, atmosphere within family and level of family conflicts, low level of attachment to family, academic failure or low school performance, low degree of commitment to school, peer rejection, association with drug-using peers, availability of drug use in friends circles, and other qualities. The risk factors

that are relevant to the purpose of this study will be discussed in the section 3.5. in greater detail.

3.3. Sociological Theories of Drug Use

A number of theories of drug use exist in the literature; however, only a few have found general recognition as "foremost candidates for explaining adolescent deviant behaviour" (Benda, 1994: 375). Benda (1994) argues these are social control and social learning theories. In addition, peer cluster theory, which grew out of drug use theories developed in the 1970's and 1980's has been widely used in studies on adolescent deviant behaviour (Oetting & Beauvais, 1986; Oetting & Beauvais, 1987a; Hays & Revetto, 1990; Swaim et al., 1995; Gerevich & Bacskai, 1996; Rose, 1999; Nagasawa et al., 2000). In this work, only theories that are relevant to the goals of the study have been considered. Some elements of the theories considered in this analysis provide the basis for developing the theoretical framework, distinguishing the most influential elements of young people's social environment that could affect adolescent drug use, formulating hypotheses, justifying the selection of the components of the analysis, and the way of structuring it. The theoretical grounds of this study are mostly based on Hirschi's (1969) social control theory and peer cluster theory (Oetting and Beauvais, 1986), as they are the best fit for the determination of the most influential elements of youth's social environment, description and explanation of its effects on adolescent drug use in accordance with the conception of the proposed research. The former theory focuses on the social bonds that young people have with family, school, and peers that help to

protect young people from deviant and delinquent behaviours. The latter theory explains how peer clusters, which considered the most influential element of youth's social environment, directly affect adolescent drug use and create most risks of getting involved in drug use or other deviant behaviour. In addition, some elements of gateway theories, social learning theories, and Becker's (1953) theory of becoming a marijuana user will be discussed due to their ability to explain some aspects of the mechanism for becoming a drug user.

3.3.1. Hirschi's Social Control Theory

One of the earliest theories of adolescent drug use is Hirschi's social control theory (1969). This theory has been broadly applied and tested in many studies on youth's involvement in the use of licit drugs or illicit drugs (Thompson et al., 1984; Akers & Cochran, 1985; Cochran & Akers, 1992; Benda, 1994; Gerevich & Bacskai, 1996; Akers & Lee, 1999). The "licit" drugs are legal drugs, such as alcohol and tobacco, while "illicit" drugs are illegal, such as marijuana, cocaine, and other hard drugs (Hanson et al., 2001).

According to Hirschi's (1969) model, deviant or delinquent behaviour arises if the individual's link to society is weak or broken. The most influential elements in the link to 'conventional' society are attachment to parents, attachment to school, and attachment to peers (Hirschi, 1969). This theory is basically a theory of conformity with society's norms and rules explaining "why some youths do not violate society's rules in spite of the lures of drugs, alcohol, petty theft, and other temptations" (Nagasawa et al, 2000:

584). Thus, this theory is capable of explaining the high drug use among young people when their attachment to main elements of social environment is weak and the low drug use when these ties are strong and stable. All the main elements of social environment influence youth's behaviours and attitudes directly through the mechanisms of "attachment, commitment, involvement, and beliefs" and are considered to be equally important (Benda, 1994: 378). When "attachment to others, commitment to conventional lines of activity, involvement in conventional activities, and belief in general conventional norms" are strong, individuals have a high degree of integration to society and conformity to society's norms and values (Akers & Cochran, 1985: 324). Society's norms and values are internalized through a strong attachment to family that involves adoption of parental beliefs. Young people who are committed to these values and beliefs are more likely to be involved in school life and activities, thus also having a stronger attachment to school. These bonds serve as protective factors and help dissuade youth from drug use. However, if parental discipline in the first decade of a child's life is poor, it "prevents that child from developing high self-control, which serves as a buffer against all forms of substance use" (Rebellon & Gundy, 2006: 517).

Moreover, the strong attachment to friends may lead to intensifying of drug use and increasing the risks of first try if young people's friends are delinquents or deviants. Therefore, as Coleman (1961) argues, "attachment to peers may weaken ties to parents" (as cited in Hirschi, 1969: 139). If the bonds with parents, school and other "conventional" institutions is "weakened or fails to develop, the individual is not constrained from deviance (the motivation to commit deviance is assumed)" (Akers & Cochran, 1985: 324). The role of youth's attachment to parents, school, and peers, which

in this study considered the main elements of social environment of young people that protect from or provoke drug use, in greater detail will be discussed in the section 3.5.

3.3.2. Peer Cluster Theory

Peer cluster theory (Oetting and Beauvais, 1986) hypothesizes that peer clusters have the most important and the only direct effect on adolescent drug use (Hays and Revetto, 1990). Peer clusters are considered as small subsets or tight, cohesive groups including couples and best friends. This theory proposes that the most powerful and direct socialization characteristics are in peers. The founders of the theory state:

> When drugs are actually used, it is almost always in a peer context. Peers initiate the youth into drugs. Peers help provide drugs. Peers talk with each other about drugs and model drug using behaviors for each other and in doing so shape attitudes about drugs and drug-using behaviors. A peer cluster consensus is reached about where drugs are to be used, about how much to use drugs, and even about how drugs affect you emotionally and how you behave when you take particular drugs (Oetting & Beauvais, 1987a: 137) .

Oetting and Beauvais (1986: 20) argue, "when considering all socialization characteristics, 95% of the predictable variance in drug use can be accounted for by the influence of peers". Based on the results of qualitative and quantitative analysis, the authors came to the conclusion that although some psychological characteristics can create the potential for drug use, the major mediating factor in adolescent drug use are still peer clusters and their influence. However, it should be mentioned that the influence of peer cluster could also be positive in cases where young people's friends reject drug consumption.

Although this approach emphasizes the critical role played by peer clusters, it does not negate the importance of such factors as connections between young people and the major elements of social environment (family, school, and others), which affect adolescent drug use indirectly (Oetting and Beauvais, 1986). Therefore, the negative influence of peer clusters on the youth's involvement in drug use can be reduced by the strong attachment to family and commitment to its values.

The applicability of peer cluster theory in the frame of the current study lies in the fact that this theory "has proven to have cross-cultural explanatory merit" in a number of studies such as Oetting and Beauvais's research on socialization characteristics and adolescent drug use (1987b), the study on Indian and Anglo adolescent alcohol use by Oetting et al. (1989), and analysis of drug use among American Indian adolescents by Swaim et al. (1993) (Swaim et.al., 1995: 49). Thus, the application of this theory in the frame of the current comparative cross-cultural study directed on examining and explaining adolescent marijuana use is of great value for formulating the main research hypotheses, evaluating the major elements of youth's social environment, and selecting the key elements of statistical models.

3.3.3. Social Learning Theory

In contrast to Hirschi's control theory but similar to the peer cluster theory, the social learning theory explains mechanisms that "operate to motivate and to control deviant behaviour" (Benda, 1994). This theory has been developed by integrating "differential association theory" with "behavioral reinforcement theory" into a theory of deviant behavior that has been called "social learning theory" (Akers, 1985). Social

learning theory suggests that deviant behaviour is initiated and developed through the "differential association with groups that model and differentially reinforce normative definitions (motives, attitudes, rationalizations) that favour norm violation" (Akers, 1994 as cited in Benda, 1994: 376). The process by which behaviour is shaped involves the application of reinforcements and punishments. Differential associations serve as sources of both reinforcements and punishments. The reward or reinforcement increases the behaviour and may involve a satisfying feeling, acceptance by a peer group, or receiving something valued, which is positive reinforcement, if you follow a certain type of behaviour. Actions can also function as a negative reinforcement when "they lead to "escape-avoidance behaviors" such as doing something to avoid the rejection of significant others or engaging in an action to forestall some unpleasant event" (Winfree & Griffiths, 1983: 221). The punishment is "a decrease in behavior brought on by a sanction subsequent to the behavior" that can be positive in case of "the imposition of an action-solicited sanction" followed the behaviour or negative in case of "the loss or removal of a reward" (Winfree & Griffiths, 1983: 222). The individual tends to associate with groups or individuals who reward his/her behavior.

This theory has been tested in Akers's own research on alcohol and marijuana use (Akers et al., 1979). As the result, he proposed an argument that:

> the probability of substance use would increase where there is greater exposure to using rather than to abstinent models, imitation, when there is more association with using than with abstinent peers and adults and their norms, differential association, when use is differentially reinforced (greater balance of rewards and costs) over abstinence, differential reinforcement, and where there are more positive or neutralizing than negative definitions of use (Akers & Cochran, 1985: 324).

Thus, hypothesizing in accordance to this theory, differential associations with peers who reinforce normative definitions in favour of the consumption of marijuana or other drugs will be positively related to young people's involvement in drug use behaviours. In other words, those who associate with drug users are themselves prone to be involved in drug use, while those who do not associate with drug users are unlikely to get involved in drug use. There is a lot of support for the model in the literature explaining young people's drug use (Akers et al., 1979; Winfree & Griffiths, 1983; Akers & Cochran, 1985; Winfree et al., 1993; Benda, 1994; Winfree & Bernat, 1998, and other). Thus, some research shows that social learning theory is able to account for 34 to 52 percent of the variance in the level of marijuana use (Winfree & Griffiths, 1983).

Social learning theory assumes that young people acquire their beliefs about drug use and other deviant behaviours from their role models, friends, parents, and other representatives of reference groups that are important for adolescents. Therefore, from this perspective, it is important that social environment of young people provides youth with positive role models and teaches them refusal skills and the belief that they can resist drugs. As Sellers and Winfree (1990) argue that behaviours, decisions, and actions of young people depend on behaviours and values of "the learning environment", which adolescents associate themselves with. This theory supports the theoretical grounds of this research and the arguments about the influential and important role of social environment in the process of mediating youth's drug involvement.

3.3.4. Gateway Theories

The general gateway hypothesis contains two different assertions regarding the nature of drug use. A first assertion suggests that drug use begins with such drugs as alcohol and tobacco (licit drugs) or marijuana (illicit soft drugs). A second assertion proposes that "using drugs like marijuana independently causes an increase in one's susceptibility to use harder drugs like cocaine" (Rebellon & Gundy, 2006). Hence, alcohol and tobacco have been consistently identified as the first 'gate' through which almost all illicit drug users pass. Users of any licit drugs, such as alcohol and cigarettes, are more likely to use any other drug, including illicit drugs, such as marijuana, heroin, and others. There is evidence that smoking tobacco is highly correlated with cannabis use (Health Canada, 2000). Goode (1973: 22) argues that "young people who drink alcohol – whether underage or legally – and who smoke cigarettes are precisely those who stand a high likelihood of turning on to the use of illegal drugs – whether heroin, LSD or marijuana". Use of licit drugs may be considered as the first step in the path to the use of hard drugs.

The second step following the use of licit drugs is the use of marijuana that is considered a soft drug. Marijuana is a gateway drug for many people. Marijuana-users have a higher likelihood of trying and using drugs that are more dangerous. According to John Ingersol, former director of the U.S. Bureau of Narcotics and Dangerous Drugs, "the overwhelming majority of those who use heroin or LSD …have had prior experience with either marijuana or hashish. Thus it seems reasonable to assume that if many individuals did not get involved with marijuana they would never get around to using the more potent dangerous drug" (Goode, 1973: 45). Moreover, Kandel's (2002) research

suggests that adolescents rarely use hard drugs without first using marijuana. However, a single experiment does not mean a person will become a regular drug user, but it may remove some of the barriers against trying drugs again. In some cases, people who regularly use one drug are more likely to use other drugs as well (Health Canada, 2000). In addition, the use of marijuana is itself highly correlated with having other friends who use marijuana as well as other drugs.

Kandel (1975) argues, "adolescent substance use tends to progress in four stages: abstinence, use of alcohol and cigarettes, use of marijuana, and use of other illicit substances" (as cited in Rebellon & Gundy, 2006: 516). Some studies have shown that the similar progression is apparent among adolescents cross-nationally; however, marijuana use may not be a necessary stage of drug use progression, while alcohol and cigarettes were implicated as important gateway drugs among adolescents (Blaze-Temple & Lo, 1992). Therefore, explaining risks for drug use that the social environment of young people may produce it is important to consider such factors as adolescents' consumption of alcohol and tobacco as it strongly affects the involvement in marijuana use. It should be mentioned that young people's involvement in the use of licit drugs could be the result of interactions with the agents of social environment and adoption of some behavioral patterns, such as parents' smoking, friends' consumption of tobacco and alcohol, and other negative influences.

3.3.5. Becker's Theory of Becoming a Marijuana User

Becker's analysis of fifty interviews with marijuana users in 1953 provided the author with some grounds to question theories that explain drug use by antecedent

predispositions and to propose another explanation based on the fact that involvement in the use of marijuana is ascribed to the emergence and change of "motives and dispositions" that people have in the course of experience. In his work, Becker attempts to make the theoretical explanations for deviant behaviour not from psychological point of view but sociological standpoint.

Becker's (1953: 235) study seeks to describe and explain "the sequence of changes in attitude and experience which lead to the use of marijuana for pleasure". If the user experiences nothing or has unpleasant or frightening experience, the conception of the drug as a source of pleasure will not develop and subsequent use of marijuana will less likely to occur. However, the user may rethink his/her conception of the drug and his/her attitude towards it and redefine the sensations as pleasurable during the learning process. Changes in the drug use behaviour greatly depend on the corresponding changes in the conception of the drug. An individual will be able to become a marijuana user only when he/she "(1) learns to smoke it in a right way that will produce real effects; (2) learns to recognize the effect and connect them with drug use; (3) learns to enjoy the sensations he[/she] perceives" (Becker, 1953: 235). The change of the conception of the drug that predispose an individual to the continuation of drug use is "a result of the individual's participation in groups in which marijuana is used" and observation of more experienced users who do get high. Throughout the process of learning, which may occur in direct way (i.e. receiving the instructions on how to use drug properly in order to get high from experienced users) or indirect way (i.e. watching other people using drugs, listening to their remarks about feelings and symptoms that refer to the term "high" and applying to own experience), the novice acquires the right smoking technique, starts having

pleasurable sensations, and thus changes his/her conception of the drug. Therefore, "the taste for such experience is a socially acquired one" (Becker, 1953: 239). The individuals' close environment takes the main role in the process of redefining of the conception of the drug:

> This redefinition occurs, typically in interaction with more experienced users who, in a number of ways, teach the novice to find pleasure in this experience which is at first so frightening (Becker, 1953: 240).

Hence, Becker points out that social context or setting is an important determinant in the process of becoming a marijuana user. He argues that some interviewees indicated that only through the interaction with their friends they were able "to find pleasure in the effects of the drug" and, as the result, became a regular user. Thus, in the series of communications and interactions, the transformation of meanings, conceptions, and attitudes occur, and, therefore, the change in the behaviour of individuals happens. The author points out:

> …the presence of a given kind of behavior (the presence or absence of marijuana use) is the result of sequence of social experiences during which the person acquires a conception of the meaning of the behavior, and perceptions and judgments of objects and situations, all of which may the activity possible and desirable. Thus, the motivation and or disposition to engage in the activity is built up in the course of learning to engage in it and does not antedate this learning process (Becker, 1953: 235).

Becker's view of social learning to become a marijuana user has some similarities with social learning theory and peer cluster theory, both of which point out the importance of social settings in mediating adolescent drug involvement and the strong influence of drug use of youth's friends on their attitudes towards consumption of toxic substances.

3.4. The Application of the Theories in the Analysis

The theories discussed above are of great value for formation of the theoretical grounds of this study and delimitation of the main elements of adolescents' social environment in mediating drug use. Hirschi's social control theory (1969), which was a started point in this study, discusses the three main elements of social environment and proposes the idea that the degree to which youth are attached to parents, school, and peers may greatly affect the appearance of deviant behaviours, including marijuana use. According to this model, the three main blocks of variables that characterize the attachment to the major elements of social environment were selected for the analysis. Thus, statistical models for both Russia and Canada reflect some characteristics of family, school, and peer environments and their agents that may affect initiation of marijuana use or protect from getting involved in the use of it.

Peer cluster theory points out the significance of peer groupings that take an important role in the expansion of drug use among youth. The factors such as whether friends use drugs (legal or illegal), the amount of time spent with friends, the high degree of attachment to peers, and other factors are very important in the process of changing attitudes of adolescents towards drugs. The consideration of peer cluster model in addition to social control theory is useful for understanding the real power of peer clusters in the formation of drug use oriented minds. A peer grouping appears to be a very authoritative and influential element in producing risks for drug use due to its power as a reference group in transforming values, attitudes, and behavioural patterns of

adolescents. Therefore, the peer cluster theory has been used as a rationale of some hypotheses and a tool for justification and explanation of obtained results.

Social learning theory has been applied in this study as a supplement to peer cluster model for better understanding of the mechanism of developing drug use behaviours through the attachment to "differential associations" and system of the "reinforcement and punishment". Becker's (1953) theory provides more evidence of the importance of social settings in the process of becoming a drug user and gives a deep insight on this process based on marijuana users' reports. According to these theories, friends' drug use is among the most influential factors in the process of adolescents' involving in drug use. While peer cluster theory mostly focuses on the role that peer associations take in the process of drug initiation and peer groupings' direct influence on young people's attitudes towards drugs, social learning theory and Becker's theory explain the mechanism of drug initiation and outline the major factors that intensify youth' drug use. These theories are also useful in justifying hypotheses, selecting elements for the statistical analysis, creating indexes, and explaining findings.

Gateway theory has been used for the determination of some additional factors that do not lie in the social environment but could contribute to the initiation of adolescent drug use. One of these factors is the consumption of legal drugs, such as alcohol and tobacco, which is the first step in the path to the use of marijuana according to the gateway theory. Since adolescents' involvement in the use of alcohol or tobacco may be considered as the result of interacting with social environment and adopting some patterns of socially disapproved behaviours, these factors may have strong explanatory

power. Therefore, the additional factors representing the use of alcohol and tobacco have been included in the analyses in order to receive the complete explanation of risk factors' influence.

3.5. Major Elements of Youth's Social Environment and Its Role in Mediating Drug Use

3.5.1. Attachment to Family

Families potentially affect children's drug use behaviours in a number of ways. The direction in which families may affect children's drug use depends on whether parents are "conventional" or "unconventional" (Hirschi, 1969). It is hypothesized that a strong attachment to "conventional" parents works as a protective factor and keeps children away from drug use. In control theory, the major focus of attention has been on the link between the attachment and adequacy of socialization and internalization of norms. Some studies prove that the strong parent-child attachment results in the child's internalization of traditional norms, values, and socially desirable behaviours, which in turn leads an adolescent to associate with non-drug-using peers and the rejection of drugs (Brook et al, 1990). Hirschi states (1969: 85) "the fact that delinquents [or deviants] are less likely than nondelinquents to be closely tied to their parents is one of the best documented findings of delinquency research". There is some evidence suggesting that "the families of young drug users tend to be less close emotionally than those of young people who do not use illegal drugs" (Goode, 1973: 23). In this case, when the child is unattached to his/her parents, he/she is simply more likely to be exposed to "criminogenic

influences" (Hirschi, 1969). To the contrary, "[t]he child attached to his parents may be less likely to get into situations in which delinquent acts are possible, simply because he spends more of his time in their presence" (Hirschi, 1969: 88).

In the case of attachment to the "unconventional" parents, the risk of drug use may increase. Brook et al. (1990) argue that "poor parenting practices, high level of conflict in the family, [divorce, parents' abuse,] and a low degree of bonding between children and parents appear to increase risk for adolescent problem behaviours generally, including the abuse of alcohol and other drugs" (as cited in Hawkins et al., 1992: 82). The reduction of the pathogenic parental influences can contribute substantially to the prevention of drug use problems (Gerevich and Bacskai, 1996). More particularly, it regards parents' use of cigarettes, alcohol, and prescription drugs, when they become "unwitting conspirators in the movement towards the recreational use of drugs by the young" (Goode, 1973: 23).

3.5.2. Attachment to School

School is another "conventional" institution that is able to command adolescents' attachment, involvement, and commitment, and is able to move them from childhood to adulthood with minimum of deviant [or delinquent] acts (Hirschi, 1969). Several theoretical perspectives within the delinquency literature view low educational success as a precursor to or risk factor for delinquent acts including substance use.

In Hirschi's social control theory, educational success represents commitment to, and involvement in a conventional way of life that serves to deter substance use and other delinquent acts. In frustration (or strain) theories, "the lack of educational success reflects

a lack of current or perceived future opportunities, and substance use emerge as a coping response to the frustration of poor school performance" (Schulenberg et al., 1994: 46). In peer subculture (or cultural deviance) theories, poor school performance contributes to the involvement with deviant peers and acceptance of the norms of the deviant subculture (Schulenberg et al., 1994).

Thus, educational commitment and success in school are negatively related to substance use. Hirschi (1969: 115) states, "the academically competent [student] is more likely to do well in school and more likely as a result to like school. The [student] who likes school is less likely to be delinquent [or deviant]". Factors such as the level of liking school, time spent on homework, and perception of the relevance of course work are all related to levels of drug use, indicating a negative relationship between commitment to education and frequent drug use.

However, some surveys found that "higher scores on reading readiness and IQ tests [may predict] earlier and more frequent use of alcohol in adolescence" (Fleming, Kellam & Brown, 1982 as cited in Hawkins et al., 1992: 84). This can be explained by the higher level of social activity and higher degree of maturity of these people. Nevertheless, failure in school has been identified as a predictor of adolescent drug use in previous studies. Thus, in this work the low degree of attachment to school and teachers is considered a risk for drug use.

3.5.3. Attachment to Peers

The adolescent's immediate peer group, as a special normative reference group, influences the development of drug use. According to the social control theory, having

deviant friends is usually associated with the higher risks of becoming deviant. Hirschi (1969: 135) contends, "[m]ost delinquent acts are committed with companions, and most of the delinquents have delinquent friends". Matza (1969:102) consider deviation as a disease and states that if human subjects "properly placed and sufficiently exposed, they must [or may] "catch" a deviation" assuming that subjects are "appropriately vulnerable to the infection". Some studies indicate that peer drug use has been considered as the strongest predictor of substance use among youth (Kandel, 1978; Elliott, Huizinga & Ageton, 1985; Barnes & Welte, 1986; Kandel & Andrews, 1987; Brook et al., 1990). According to peer cluster theory, peer clusters determine where, when, and how drugs are used. These clusters shape attitudes and beliefs about drugs, provide social contexts for drug use, and help form the rationales that young people use to explain and justify drug use (Oetting & Beauvais, 1986).

The argument then is that if one's friends use drugs, drugs become easy to access, and the availability of drugs increases. One of the reasons for drug use is drug availability. Some studies shows that drug availability significantly relates to the use of cigarettes, alcohol, marijuana, and other illegal drugs (Maddahian et al. 1988 as cited in Hawkins et al., 1991: 81).

However, in order for an individual to be influenced by a peer group, he or she must readily accept and respect its values. Using for the first time is almost exclusively a group process. Young people turn to drugs specifically because they have friends and because they value the opinion of their friends. Using illegal drugs means to some degree being absorbed into a subculture and becoming subject to the values and the behaviour of those who use.

On the other hand, peer rejection may be considered as a predictor of drug use. Little research has been done on the direct relationship between peer rejection and drug use, instead the link between substance use and traits of the children associated with peer rejection, such as aggressiveness, shyness, withdrawal, social inhabitation, have been analyzed. However, some researchers prove that low acceptance by peers may put the young person at risk for school problems, social isolation and criminality, which are also risk factors for substance abuse (Hawkins et al., 1992).

Another factor that should be considered as the precursor of frequent drug use is the number of young person's friends. There is evidence that young people who try and use illegal drugs have more friends than their non using peers have; they are more active socially and value the opinions of their friends over those of the parental generation.

3.6. Scientific Contribution of the Study

The significance of the current study lies in the comparative nature of the analysis of circumstances of marijuana use in two countries: Russia and Canada. A lot of research on drug use among youth has been done both in Russia (Lisovskii & Yadov, 1975; Pozdnyakova, 1999; Juravleva, 2000; Bikov, 2000; Malikova, 2000, and others) and Canada (Oetting & Beauvais, 1986; Hays & Revetto, 1990; Swaim, 1991; Schulenberg et al., 1994; Oxford et al., 2000; Adlaf & Paglia-Boak, 2005, and others). However, there are no studies that involve a comparative analysis of risk factors for adolescent marijuana use generated by youth' social environment in the contexts of conflicting economic, social, political, and cultural circumstances and different overall drug situation of two countries, such as Russia and Canada. This study will question if the risk factors

associated with marijuana use are the same globally, or if they are culturally specific. Thus, this research will look at the risk factors associated with adolescent marijuana use in both a Canadian and Russian context, which is beneficial for better understanding and explaining drug use as a global problem.

In addition, this study will contribute to the Russian part of the analysis because it is based on the theoretical grounds that arise from the theories developed by North American researchers, specifically the social control theory (Hirschi, 1969) and the peer cluster theory (Oetting and Beauvais, 1986), which are not broadly applied in Russia. Finally, this study is of great value in a broader sense due to the opportunity to realize and use the experience of other countries in order to develop and apply effective policies aimed at protection of young people against drug use.

3.7. Research Questions

1) Is the prevalence of marijuana use in Russia and Canada the same or different within the groups of adolescents by major social-demographic characteristics, such as gender, economic status of young people's families, and family structure?
2) What social-demographic and behavioral characteristics distinguish adolescents who use marijuana from non-users among the Russian and Canadian adolescent population and what differences in these characteristics the groups of the Canadian and Russian marijuana users have?
3) What are the major factors that determine adolescent marijuana use in Russia and Canada and what are the differences in the influence of these factors on marijuana use?

4) What predictors of adolescent marijuana use are the most influential in terms of preventing marijuana use or provoking it in the Russian and Canadian samples?
5) What are the most influential elements of adolescents' social environment in mediating marijuana use?
6) Is there a difference in risk factors and the nature of its influence cross-culturally?

3.8. Hypotheses

- The lesser degree of bonding to the family and parents, the higher risk of turning to the use of marijuana. The degree of bonding to the family of Russian adolescents is weaker compared to the one of Canadian counterparts due to the degradation and weakening of the institution of family in Russia during the transitional period.
- The better a student does in school and the better the relationship with the teachers s/he has and the more s/he likes school, the less likely s/he is to be involved in marijuana use. In Russia, school has less influence in terms of protecting youth from marijuana use compared to Canada due to the social-economic transition of the Russian society and weakening such social institutions as school and family.
- Canadian and Russian young people have a higher probability of marijuana use if they have friends who are involved in the use of toxic substances, including illicit drugs.
- Young people with strong attachment to peers experience a higher level of absorption into a subculture that may be deviant and, thus, have greater risks of

getting involved in marijuana use. Russian adolescents are being exposed to more negative peer influences compared to their Canadian counterparts due to the weakening of school and family as social institutions.

- Adolescents' association with drug-using peers has the strongest influence on individual marijuana use in Russia and Canada. Peer cluster theory is better suited to explain marijuana use among the Russian adolescents due to the stronger influence of peers and lower influence of school and family in Russia compared with Canada. In Canada, the major social institutions (family, school) have greater strength and stability, thus their influence in mediating adolescent marijuana use can be more pronounced.
- Consumption of alcohol or/and cigarettes provokes marijuana use by Canadian and Russian adolescents.

4. Methodology

4.1. Data

The data sets used in the analysis were obtained from the monitoring of the Health Behaviour in School-Aged Children in Canada and Russia in 2001/02. The Health Behaviour in School-Aged Children (HBSC) Study involves the collaboration of researchers from 35 countries in 2001/02, under the guidance of the World Health Organization Regional Office for Europe (WHO) and under the teams from Canada and the United States. The research project was aimed at gaining new knowledge and increasing understanding of health behaviour, lifestyles, and attitudes of young people. The study was also directed to influence health promotion programs and health education policies aimed at school-aged children at the national and international levels (Currie, 2004). The HBSC study is unique and valuable because it monitors the health and health behaviours of adolescents across countries, and also encompasses the wider context of health, that "includes investigating family, school and peer settings, and the socioeconomic environment in which young people grow up, to understand what factors shape and influence their health and health behaviour" (Currie, 2004). The consideration of the influence of the social environment on and health determinants of young people's lives make the HBSC study the best fit for the goals of the proposed study.

The HBSC surveys are carried out at four-year intervals in a growing number of countries and are used to investigate health issues within and across participating countries (Currie et al., 2000). Canada entered the group of countries-participants in 1989/90, while Russia has been a participant since 1993/94 (Currie et al., 2004). The data

have been collected in the countries through school-based surveys, using the international research protocol. The survey instrument is a standard questionnaire developed by the international research network. The Russian questionnaire is a translation and adaptation of the standard international English version. The requirement of this study was that the translations allow comparability as far as possible. This allows researchers making direct comparisons of some social and demographic characteristics and examining associations between the broad spectrum of variables across countries. Administration of the questionnaires took place in the school classroom and guaranteed the confidentiality of received information and young people's anonymity throughout the data collection process. In this study, a clustered sampling design has been used to select the respondents. Therefore, either the school or school class has been chosen as the basic sampling unit. (Currie, 2004). It should be mentioned that the cluster sampling employed in this study produced additional standard errors since students' responses cannot be assumed to be independent as students within the same class tend to have similar characteristics and thus similar answers.

The Canadian study was coordinated by William Boyce and Matt King Social, Program Evaluation Group, Queens University, Kingston; Wendy Craig, Department of Psychology, Queens University, Kingston; Lesley Doering, Health Canada, Ottawa; John Freeman, Faculty of Education, Queens University, Kingston; Health Canada, Ottawa; Ian Janssen, Department of Community Health and Epidemiology, Queens University, Kingston; Health Canada, Ottawa; William Pickett, Department of Community Health and Epidemiology, Queens University, Kingston. The Russian study was conducted under the supervision of Alexander Komkov, Ludmila Lubysheva, and Alexander

Malinin, Research Institute of Physical Culture, St. Petersburg (Currie, 2004). The Russian study was conducted in one region of the Russian Federation, which is the area of St. Petersburg. According to the design of the HBSC study, it was acceptable to conduct a study in only one region of a country as long as it is understood that generalizations could not be made for the entire country.

The reasons why HBSC study has been used for the proposed study are:

- the cross-national nature of HBSC study provides the opportunity to account for differences affected by macroeconomic, cultural, and political circumstances
- the HBSC study relies on young people as reporters
- the HBSC study focuses on social as opposed to a purely biomedical research perspective, thus includes social and environmental influences or determinants of adolescent health, such as family, school and peer settings.

4.2. Measures

As mentioned above, the two data sets have been used in the analysis. The majority of the variables were mandatory for both Russia and Canada, which allows making a comparative analysis. Thus, most of the indexes and new variables for Russia and Canada were constructed in a similar manner. However, some of the variables used in the Canadian study were optional in the Russian one and were not collected. Therefore, all the differences in creating variables and indexes have been specified in this part of the chapter.

The independent variables representing students' attachment to family, school, and peers describe not only the relationship between young people and agents of their

social environment but also some relevant characteristics of the environment or its agents as far as the data allow. The complex indexes created for the purposes of the analysis have been checked for the consistency of items in the scale through the reliability analysis of the scale. The value of Cronbach's alpha, that measures "the extent to which item responses obtained at the same time correlate highly with each other", has been considering for the examination of the scales integrity and justification of the method of its creation (Statnotes: Topics in Multivariate Analysis). In addition, the analysis of means has been run for the justification of the way in which dummy variables were coded.

Since in the Canadian study more questions were included, the constructed indexes for Canada cover a greater spectrum of the relevant aspects of the students' relationships with their social environment. In spite of this, indexes created for Russia and Canada are still comparable because they include some indicators measured identically in both countries. The analysis of the Canadian adolescents' marijuana use, which includes a greater number of relevant variables, may help to reveal the interplay of some determinants of adolescent's marijuana use that have not been considered in the Russian study.

4.2.1. Dependent variable

The dependent variable represents the *use of cannabis in a lifetime*. It has been reclassified as a dichotomous variable, which indicates whether young people ever used cannabis or not. Therefore, the adolescents who have never used cannabis in their lives were coded "0", and those who have taken cannabis once or several times (up to 40 times

or more) represent the risk group and were coded "1". By transforming the variable that represents cannabis use to a dummy variable, the focus has been made on whether or not young people have ever used cannabis but not on the frequency of cannabis use. Considering the frequency of marijuana use, the problem of highly skewed distribution caused by the fact that the majority of young people do not use marijuana may aggravate the analysis. Thus, the distribution of cases between two categories in the Russian and Canadian data sets demonstrates that 81.2% of Russian adolescents and 52.8% of their Canadian counterparts have never used cannabis.

4.2.2. Independent variables

4.2.2.1. Background variables

Several background characteristics, which are not the focus of the major analysis, have been included because they may influence the outcome and thus should be considered. These are gender, economic status of the family, and family structure.

Gender. In this study, the gender variable, which is a dummy variable, represents females that were coded "2" and males that were coded "1".

Economic Status. This variable indicates how well off respondents think their families are, which has been measured with the 5-point scale, the high value representing that the family is very well off.

Family Structure. This variable is dummy-coded and represents two family types: 1) a one-parent family that was coded as "1", and 2) a two-parent family that was coded as "0". In the analysis, living with parents as well as with stepparents was considered.

4.2.2.2. Variables that represent attachment to family

Trust to parents. The degree of attachment to family in the Russian case was measured with an index that combined four variables describing how easy it was for respondents to talk about things that bother them with the members of their family, including mother, father, or stepparents. The reliability analysis of scales shows that the internal consistency of scale for Russia is .328 (a Cronbach's alpha), which is caused by the inadequate number of variables that were available for the analysis. The low value of Cronbach's alpha of the scale means that the created index constitutes an error more than it constitutes a true score. Therefore, this index has been entered in the analysis only for the comparative purposes. Thus, no reliable conclusions about this index could be made and all the interpretations of the results should be made carefully considering the limitations of the Russian data.

In Canadian data set, besides four variables used for Russia, this index also includes six additional variables that describe youth's attitudes to their lives at home and their relationship with the parents (the level of understanding and trust, the value of parents' opinion, the desire to spend time at home, and other indicators). The internal consistency of the scale of the index created for Canada, as measured by Cronbach's alpha, was .812. High values of the scale represent the higher degree of understanding and trust to parents, thus, higher degree of attachment to the family.

Parents' involvement in children's school life. This index combines five variables that represent the degree to which parents are being involved in their child's school life (parents' readiness to help with problems or homework, willingness to meet with teachers, and other indicators). This index is used only for the Canadian analysis due to

its availability. The Cronbach's alpha for this scale was .878, which indicates that scale is highly reliable.

Parents' smoking. This dichotomous variable indicates if either a mother or a father smokes (sometimes or daily), which was coded as "1", or none of the family members smokes, which was coded as "0". The variable represents an important characteristic of youth's immediate social environment that could affect their decision about smoking and lead to marijuana use later. Those students whose parents smoke are at higher risk of getting involved in marijuana use. The variable has been used only in Canadian part of the analysis due to its availability.

4.2.2.3. Variables that represent attachment to school

School performance. School performance index was measured with one dummy-coded variable describing what teachers think about the respondent's school performance in the respondent's opinion. The students who have very good or good school performance were coded as "0", while those who have average or below average school performance were coded as "1". The chosen way of combining groups has been justified by theoretical assumptions only since the analysis of means did not show significant difference in means between the four original groups of students with different level of school performance. The analysis of means shows that there is an increase in means corresponded to the decrease in the level of school performance; however, none of the groups stands out. Thus, average or below average performance at school will be considered as the factor that may increase the risk of becoming a marijuana user due to

the low level of attachment to school and interest in studies. Additionally, this way of dummy coding allows avoiding significant skewness of the index.

Liking school. This index is based on students' statements about how much they like or dislike the school they go to. The index created for Russia was dummy-coded. The group of those who do not like school a lot were coded as "1", while those who do not like it very much, like it a bit or a lot were coded as "0". The way of selecting groups has been justified by the results of the means analysis, which showed that the groups of those who do not like school a lot has significantly higher mean value measuring marijuana use compared with other groups. The index constructed for Canada is continuous and includes seven variables describing how students feel about school and school activities. The scale of the Canadian index has a Cronbach's alpha of .818. High values of the scale indicate that students like school a lot, enjoy schoolwork and activities, like being at school, do not find school work difficult and tiring, and other feelings.

School pressure. This indicator is based on one variable that represents how pressured students feel by the schoolwork they have to do that has been dummy-coded. The lack of any pressure, or some or a little pressure that students experience was coded as "0", while a lot of pressure was coded "1". The analysis of means explains the way of combining the groups of students experiencing different level of pressure at school. The group of students experiencing a lot of pressure significantly stands out in the mean level of marijuana use both in the Russian and Canadian samples. It is significant to consider this variable in the analysis because the high degree of pressure by schoolwork could be considered as a risk factor for drug use and reason why young people turn to marijuana

use in order to cope with stresses, frustration, and other feelings caused by school pressure.

Attachment to teachers. This index has been created only for Canada since only the data for this country provide measures to examine some characteristics of the relationship between students and their teachers. This indicator combines five variables (a Cronbach's alpha is .831) that represent how friendly, fair, supportive, and helpful students' teachers are in their opinion. The indicator is a continuous variable, and its high values indicate better students' evaluations of their relations with the teachers.

4.2.2.4. Variables that represent attachment to peers

Attachment to friends. The degree to which students are attached to their friends has been measured both for Russia and Canada with one index that combines two variables describing how much time young people spend with their friends. The young people who spend time with their friends right after school more than four times a week and spend more than four evenings a week with their friends away from home were coded as "1". Those students who do not spend that much time with their friends both right after school and at night away from home were coded as "0". The analysis of means proved the way of distinguishing the two groups with different level of attachment to friends for the analysis both in the Canadian and Russian samples. Adolescents who have high level of attachment to their friends and spend much time with them away from home lack the parental control and are more likely to get involved into deviant behaviours, such as marijuana use, that can be valued in friend groupings.

Trust to friends. Trust to friends was measured with three questions combined in one dichotomous variable that represent how easy for respondents to share things that bother them with their best friend or friends of the same or opposite sex. The students who answered that it is easy for them to talk with their friends were coded as "1", and those students who find this difficult or do not have people to talk with were coded as "0". The way of coding justified by the theoretical assumptions since the analysis of means did not show any significant peculiarity of a certain group. High degree of trust to friends may result in accepting their values and norms, which may include drug use, and thus lead to the involvement in drug use behaviours.

Number of friends. Number of friends may be considered as a predictor of drug use since people who use drugs tend to have more friends than their non-using peers have. In addition, having more friends leads to the attachment to multiple peer grouping, which may increase risks for marijuana use. Therefore, respondents who have one or two friends were coded as "0" whereas those who have three friends or more coded as "1". The analysis of means justified the way of composing groups in the Russian sample, while in the Canadian one, the difference in means between groups was not that evident. In the Russian sample, the group of those who have three or more friends significantly stands out compared with the adolescents who have one or two friends. The dummy coding of the variable in the Canadian sample has been implemented by analogy with the Russian sample.

Friends' smoking. Friends' smoking is a very important characteristic of peer environment that could affect adolescent marijuana use. Having friends who smoke increases the availability of drugs (licit and illicit) and can influence adolescents'

decisions about smoking and later about using marijuana. However, this question has been asked only in Canadian study. The indicator has been represented by dichotomous variable that describes if any of young people's friends smoke cigarettes. The respondents that do not have any friends who smoke cigarettes were coded as "0". Those respondents whose friends smoke cigarettes were coded as "1". The way of coding has been justified by the analysis of means that indicated the peculiarity of the group of those who do not have any friends who smoke.

Friends' alcohol and drug use. This index was created only for Canada due to the availability of additional variables that describe the consumption of alcoholic drinks or/and drugs of respondents' friends. The reliability analysis of scales show that the scale is reliable and has a Cronbach's alpha of .754. High values of the index represent that all or most of respondents' friends have been drunk and use drugs to get stoned.

Peer rejection. This indicator for both Canada and Russia is based on one question that measures how often students have been bullied at school. The variable has been dummy-coded and "0" represents those students that have not been bullied for the last couple of months while "1" represents the group of students with whom it has happened once or several times a week in the past couple of months. Since the analysis of means did not reveal that some group is significantly different compared with the rest, the way of coding has been based on the theoretical assumption that any experience of being bullied may increase the level of social isolation of the young person, the feelings of depression, offence, or even anger that can result in turning to drugs, including marijuana use.

4.2.2.5. Additional variables associated with marijuana use

Respondents' use of cigarettes. This dichotomous variable indicates whether or not a respondent smokes. Those students who do not smoke were coded as "0" and those who smoke were coded as "1".

Respondents' use of alcohol. This indicator combines three questions measuring the frequency of the consumption of three types of alcohol, beer, wine and liqour. The students that do not use any of these types of alcoholic drinks were coded as "0". Those young people who use at least one of these types of alcoholic drinks were coded as "1".

4.3. Sample

The original samples of the HBSC study were composed of young people attending school aged 11 and older. Children were selected using "a clustered sampling design, where the initial sampling unit was either the school class or the school" (Currie, 2004). Samples may differ in terms of variables such as age, socioeconomic status, school system, and geographical coverage. School attendance may vary, which has the potential to introduce bias into the data presented. The original sample sizes of the Russian and Canadian students were 8,037 and 4,361 respectively.

The target population of the proposed study comprises the students in grade 9 and 10, which are between the ages of 14-16. The sizes of the samples that have been used in this study are 2,584 and 1,228 of the Russian and Canadian students respectively. These groups have been selected for two reasons. First, these age groups represent "the onset of adolescence, the time when young people face the challenges of physical and emotional change; and the middle years, when important life and career decisions are beginning to

be made" (Currie et al., 2004). This period is also important because it involves transformation of major social roles, the process of making serious decisions, and greater level of social activity that entails new experimentations often related to the use of drugs. Adolescence is also the period when the first initiation of drug use, such as tobacco, alcohol, and marijuana use, occurs (Oxford et al., 2000). Second, the questions of sensitive nature, such as drug use, sexual experiences, and other questions, have been asked only students in grades 9 and 10. In order to avoid the problem of the high number of missing values, only students in these grades were considered in the analysis.

4.4. Methods

4.4.1. Research Methodology

The quantitative research model has been chosen for the examination of the problems being investigated in the proposed study and realization of its goals. As the basis for the analysis, the data obtained from the Health Behaviour in School-Aged Children for Russia and Canada in 2001/02 have been used. The data have been obtained from self-administered interviews.

Surveys as the quantitative method may be considered as the best method for receiving information about socially sensitive issues, such as marijuana use, as it can be held in different ways, some of which guarantee a fair degree of anonymity. In addition, it is the best way to receive subjective information about people's intentions, opinions, attitudes, and values (Yadov, 1995). Moreover, surveys allow receiving statistically reliable data and making generalizations.

Ontological and epistemological assumptions of a quantitative approach provide arguments in defense of the use of the quantitative method for measuring the involvement in sensitive behaviours. Quantitative methods serve as the fundamental way of gathering research information within the positivistic paradigm. The ontology of positivism is based on the assumption that only one objective reality exists and "human activity is understood as observable behavior taking place in observable, material circumstances" (Blaikie, 1991: 120). As Guba and Lincoln (1994: 109) argue, "[k]nowledge of the 'ways things are' is conventionally summarized in the form of time- and context-free generalizations" and "research can converge on the 'true' state of affairs". The quantitative analysis allows obtaining reliable information based on the representative sampling, which in turn allows making generalizations about wider population groups.

The epistemology of positivism refers to the question regarding the relationship between "knower and what can be known". In the positivistic approach, "the investigator and the investigated "object" are assumed to be independent entities, and the investigator to be capable of studying the object without influencing it or being influenced by it" (Guba and Lincoln, 1994: 110). This means the researcher has external position to the environment of the respondent. Using the quantitative method, the objectivity of investigation is guaranteed and the low risk of making subjective conclusions is ensured by the external position of the researcher towards the subject. Due to the external position of the researcher, the chance to influence respondents' answers is eliminated.

Therefore, the ontology and epistemology of the quantitative approach suggest that the quantitative method is the best way of receiving reliable, valid, and objective information about general laws of actual phenomena and social processes. However, even

reliable and valid research methods can generate biases. It depends on the type of the methodology that has been applied and on whether the questionnaire includes items regarding sensitive issues or not.

Surveys as the best way of receiving quantitative information could be held in different ways. The most used types of survey are telephone survey, mail survey, personal interview, and self-administered interview. Although personal interview is considered as the preferable way for respondents to give information to the interviewer (Fox and Tracy, 1986), it does not guarantee the high level of anonymity that is critical for respondents answering sensitive questions. Mail and telephone surveys involve high rate of non-response itself. Therefore, a questionnaire for self-completion, which has been used in the NBSC study, may be the best way of getting sensitive information as it guarantees anonymous way of receiving results and the secrecy of findings. Moreover, it is relatively inexpensive and is in common practice among researchers to receive sensitive information from respondents (Jo, 2000; Brener et al., 2002; Helweg-Larsen et al., 2003).

Nevertheless, it should be mentioned that the method of self-administered interview has its shortcomings especially when it is applied to surveys on sensitive issues among youth. Inclusion of the questions about socially sensitive behaviours in youth surveys might entail the problem of increase of the non-sampling error such as non-response bias (refusal to respond) and response bias (lying) (Fox and Tracy, 1986). These biases may affect validity and reliability of data. Young people often are not honest and open answering sensitive questions because of their fear that answers might be exposed to inattentive disclosure to other people that can results in stigmatizing and punitive

consequences. Thus, this may entail the problem of underreporting of the prevalence of drug use among young people.

4.4.2. Statistical Methods

A variety of statistical procedures are used in the analysis. The preliminary analysis includes univariate descriptive and correlation analyses that are employed in order to describe each variable separately and examine the relationships between all possible combinations of independent variables and the dependent variable. In addition, a chi-square analysis is performed on the data and the adjusted residuals for the contingency tables calculated in order to evaluate the strength of association between variables and determine significant differences between the groups. The independent sample t-test is used to compare the values of the means from the groups of marijuana users and non-users and to test whether they have significant distinctions between each other in a number of characteristics.

The statistical method of logistic regression, which is a major technique in the analysis, is applied in the study. Logistic regression allows predicting a binary dependent variable from a set of variables that may be continuous, discrete, dichotomous, or a mix. Logistic regression is considered as the technique that is more flexible compared with the logit form of multiway frequency analysis, discriminant function analysis, or multiple regression analysis. In logistic regression, there are no assumptions about the predictors have to be normally distributed, linearly related, discrete, or of equal variance within each group (Tabachnick & Fidel, 2001). As well, "logistic regression does not assume a linear relationship between the dependents and independents" and normal distribution of the

dependent variable (Statnotes: Topics in Multivariate Analysis). There is no homogeneity of variance assumption, which means that the dependent variable does not to be homoscedastic for each level of independence. In addition, "normally distributed error terms are not assumed" (Statnotes: Topics in Multivariate Analysis).

However, some of the assumptions, such as independence of error terms (independent sampling), linearity between the predictors and log odds (logit) of the dependent, the lack of multicollinearity and outliers, and other assumptions, still apply, and violation of them can have serious effects (Statnotes: Topics in Multivariate Analysis).

Therefore, the popularity of logistic regression has been growing and it has been widely used in health sciences and applied in many health related studies (Novins & Mitchell, 1998; Du, 2002; Carlini-Marlatt, 2003; Ompad et al., 2005; Rebellon & Gundy, 2006; Kang et al., 2006; Yang et al., 2006, and other).

The following statistics and indexes are considered in the analysis for estimation the quality and reliability of logistic regression models:

- *Chi-square test*. The chi-square statistics and its level of significance are used to determine if the overall model is statistically significant. The level of significance represents the probability of obtaining the chi-square statistic given that the null hypothesis (there is no effect of the independent variables on the dependent variable) is true. The overall model is statistically significant when the p-value is less than a critical value (.05 or .01).
- *Nagelkerke R Square*. Due to the dichotomous nature of the dependent variable, there is no widely-accepted direct analog to Multiple Regression R Square.

Nagelkerke R Square is "an attempt to imitate the interpretation of multiple R-square based on the likelihood" (Statnotes: Topics in Multivariate Analysis). It is a further modification of some other coefficients imitating R Square that varies from 0 to 1 and could be considered for approximate estimation of variance explained, but it does not represent an actual percent of this value. It could be used for summarizing the strength of association; however, interpretation of these statistics should be done with great caution (UCLA Academic Technology Services, 2007).

- *Classification table of observed and predicted values*. The ratio of values observed in the dependent variable and values predicted in the dependent variable based on the full logistic regression model shows how many cases are correctly predicted and how many cases are not correctly predicted (UCLA Academic Technology Services, 2007). The overall percentage of cases that are correctly predicted by the regression model varies from 0 to 100 and the higher value represents the better fit of the model.
- *B-coefficients*. The values of coefficients are measured in log-odds units and represent the amount of increase (or decrease in case of negative value of a coefficient) in the predicted log odds of the dependent variable equals 1 "that would be predicted by a 1 unit increase (or decrease) in the predictor, holding all other predictors constant" (UCLA Academic Technology Services, 2007).
- *Wald Statistic Test*. "The Wald statistic is a …test which is …used to test the significance of individual logistic regression coefficients for each independent variable" (Statnotes: Topics in Multivariate Analysis). The level of significance

for the Wald statistic allows to test the hypothesis that the coefficient (parameter) equals 0. The value of a coefficient is statistically significant when the p-value is less than a critical value (.05 or .01).

- *Exp (B)*. These are the exponentiation of the coefficients and the odds ratios of the predictors. A logit could be converted to odds ration using the exponential function for an easier and better way of its interpretation. The one-unit-increase in the independent variable entails the increase (or decrease in case of negative relationship between the dependent and an independent variable) in the odds that dependent variable equals 1 by a factor of the corresponding odds ratio (the exponential function, e^b) that appears as "Exp(B)" in the "Variables and Equation" table (Statnotes: Topics in Multivariate Analysis).

All the procedures were performed with the use of SPSS for Windows version 14.0.

5. Data Analysis

5.1. Analytical Strategy

First, the main descriptive characteristics of the Canadian and Russian sample and the main characteristics of the variables and their distributions are examined. The comparison includes univariate analysis exploring each variable separately and looks at the range of values and their central tendency. The prevalence of marijuana use is examined in the groups of adolescents by gender, the economic status of the family, and family structure. The students who reported marijuana use (also called "risk group" in this study) are compared with those who reject use of marijuana (also called "control group") for each country using the analysis of crosstabulations. Crosstabs analysis is used to determine if there is a significant relation between two variables by looking at the values of adjusted residual and its standard deviation from the critical value of the confidence interval.

Secondly, all possible combinations of the independent variables and their relations with the outcome variable are examined in a Pearson zero-order correlation analysis in order to describe the type of relationship (positive or negative) that the variables have and determine the strength of these relationships. The correlation analysis also helps to get better understanding of the affects of multicollinearity, if any.

The main analysis consists of several stages that correspond to the major blocks of variables composed and entered in the analysis. Each block of variables for each country is examined individually using the logistic regression analysis. The creation of the blocks of variables was guided by the theoretical considerations mostly based on the

assumptions of Hirschi's control, peer cluster, and gateway theories. It should be mentioned that the analysis for Canada includes greater number of independent variables due to their availability.

The five blocks of independent variables represent the following. The first three blocks include variables that describe the relationship of adolescents with the three main elements of social environment defined in accordance with Hirschi's (1969) control theory and also describe some relevant characteristics of the agents of social environment that can affect adolescent marijuana use.

The next block includes background variables, such as gender, the economic status of the family, and family structure. These variables are not in the major research focus, but, capable of explaining some of the variance in the predicted log odds of the dependent variable. Therefore, these variables are included in the analysis as exogenous (outside or external) to the model with the purpose of controlling for them.

The last block of independent variables consists of two additional variables that affect young people's own consumption of alcohol and tobacco. These variables are considered in the analysis as some additional variables associated with marijuana use but not as main predictors. The inclusion of these variables can be justified by the assumptions of the gateway theory that points out the significant role that licit drugs, such as alcohol and tobacco, take in the progression of substance use.

In compliance with the blocks of independent variables composed for the analysis, a number of logistic regression models have been run. First, simple models for each block of variables individually are considered in order to examine and evaluate the power of predictors and describe significant affects provided the interplay with the

variables from other blocks has been eliminated. These models are examined both for Russia and Canada, which allows making not only a point-by-point comparison of the major relationships, significant factors, and the values of main statistics of the models, but also helps to determine significant variables for further analysis. Second, the integrated model for each country has been constructed by throwing those predictors of marijuana use that are significant in the preceding analysis. This reveals the strongest predictors of adolescent marijuana use that could mediate, provoke, or lessen young people's drug use eliminating additional errors and noise that not significant variables may create.

Additional integrated models that include all significant predictors except adolescents' consumption of alcohol and tobacco have been examined as well. Since young people's consumption of licit drugs greatly correlates with marijuana use and can also be considered as the result of series of interactions with the agents of close environment and the adoption of some patterns of behavior, it is important to examine the influence of the main predictors eliminating the influence of additional ones. Additional independent variables (the use of alcohol and tobacco) may have strong predicting power, and thus, the variance shared by these predictors with the others may be attributed to former ones in the regression analysis. Therefore, the additional models that exclude the influence of youth's own alcohol and tobacco consumption has been considered in the analysis with the purpose of getting better understanding what elements of social environment (family, school, or peer groupings) are the most influential in mediating marijuana use.

Sequential logistic regression has not been employed in the analysis due to the fact that some blocks of variables (in case of Russia, in particular) are not sufficiently represented by the variables essential for the analysis. Therefore, the change in pseudo R-Square, if any, will not contribute to the explanation of the variance in the predicted log odds of the outcome variable. The conclusions about the effects that social environment may have on adolescent marijuana use, the most influential elements in mediating marijuana use, and the differences that can be observed between two countries are based on the description of the detailed simple regression models run by blocks and the analysis of the integrated regression models. The interpretation of the influence of significant predictors has been made considering the fact that the main social institutions become most authoritative in the certain time precedence during the process of socialization. Thus, the family and parents come first, then school becomes an influential agent of socialization, and then peers can exert influence over the attitudes, values, and behaviors of their friends in later stages. Therefore, some independent variables may share the variance that in the end can be attributed only to one of the predictors in the course of statistical analysis. Thus, interpreting the effect of one predictor on the outcome variable, the potential interplay with other independent variables that appear to be not significant should be taken into account.

5.2. Description of Variables

The descriptive characteristics of the variables and indexes used in the analysis are presented in the Table 3 for both Russia and Canada. The univariate analysis includes the major characteristics of each variable, which are the central tendency measured by the mean and the dispersion measured by the standard deviation and range. Some indicators

were created only for Canada since equivalent information was not available in the Russian data. Moreover, some indexes composed of several variables are more detailed and include a greater number of indicators for Canada compared to Russia. Therefore, the range of the similar indexes created for Russia and Canada differs.

Table 3. Descriptive Statistics for the Independent and Dependent Variables

Indicators	Russia			Canada		
	Range	Mean	Std. Dev.	Range	Mean	Std. Dev.
Dependent Variable						
Use of Marijuana	0-1	.136	.343	0-1	.439	.497
Independent Variables						
Block 1. Background Variables						
Gender	1-2	1.56	.497	1-2	1.562	.496
Economic Status	1-5	3.495	.705	1-5	3.598	.924
Family Structure	0-1	.177	.382	0-1	0.166	.372
Block 2. Attachment to Family						
Trust to Parents	0-8	1.801	1.217	0-29	17.220	5.571
Parents' Involvement in Children's School Life	-	-	-	0-20	15.487	3.790
Parents' Smoking	-	-	-	0-1	.428	.495
Block 3. Attachment to School						
School Performance	0-1	.545	.498	0-1	.378	.485
Liking School	0-1	.082	.275	0-31	15.005	5.707
School Pressure	0-1	.026	.159	0-1	.171	.376
Attachment to Teachers	-	-	-	0-20	13.024	3.651
Block 4. Attachment to Peers						
Attachment to Friends	0-1	.412	.492	0-1	.293	.455
Trust to Friends	0-1	.644	.479	0-1	.597	.491
Number of Friends	0-1	.690	.463	0-1	.884	.321
Peer Rejection	0-1	.234	.423	0-1	.304	.460
Friends' Smoking	-	-	-	0-1	.808	.394
Friends' Alcohol and Drug Use	-	-	-	0-8	3.584	2.236
Block 5. Additional Variables Associated with Marijuana Use						
Use of Alcohol	0-1	.265	.442	0-1	.361	.480
Use of Tobacco	0-1	.289	.453	0-1	.214	.410

5.3. The Prevalence of Marijuana Use among Russian and Canadian Adolescents

The present study consists of 2,584 Russian students and 1,228 Canadian counterparts. The gender composition of the Canadian sample is 43.8 percent of males and 56.2 percent of females, whereas the Russian sample consists of 44.1 and 55.9 percent respectively.

In the Canadian sub-sample, 43.9 percent compose the "risk" group (those who report marijuana use) and 56.1 percent constitute "control" group (those who reject marijuana use), while these groups are represented by 13.6 and 86.4 percent respectively in the Russian sub-sample. Thus, it is evident that the level of marijuana use is significantly higher among Canadian adolescents compared with Russian ones.

The following discussion answers the question whether marijuana use is the same or different within groups of adolescents by several social-demographic characteristics considered in this study, such as gender, the economic status of young people's families, and family structure. Chi-square tests and values of adjusted residuals (standardized deviation of z-statistics) were used for evaluating the strength of the association between variables. Adjusted residuals are "useful in helping to interpret chi-square tables by providing information about which cells contribute to a significant chi-square" (SPSS Base 9.0 User's Guide). The values of z-statistics that exceed the critical values of the confidence interval ($-1.96 < z < 1.96$, where ± 1.96 is the critical value of the confidence interval at the level .05) indicate that a cell can be considered a major contributor to the overall chi-square value.

In Canada, 47.8 percent of males and 41.1 percent of females ($p < .05$) use marijuana, while in Russia these groups are composed by 19 and 9.3 percent ($p < .001$)

respectively (See Table 4). Evidently, marijuana use is more common among the Canadian population. In addition, current marijuana users are predominantly men in the Russian sample, while in Canada, use by males also exceeds use by females, although not to the same extent as in Russia.

Table 4. The Prevalence of Marijuana Use among Gender Groups [a]

	Canada		Russia	
	Males (n = 494)	Females (n = 662)	Males (n = 1,071)	Females (n = 1,358)
Do not Use Marijuana	52.2	58.9	81.0	90.7
Use Marijuana	47.8	41.1	19.0	9.3

[a] The number of missing cases for Canada was 72 (5.9 %) and for Russia was 155 (6.0 %)

The economic status of the families of marijuana users in Russia and Canada slightly differs. The analysis indicates that in Canada all the groups by economic status of the family have equal odds to become a marijuana user. The percentages of those who use marijuana are not significantly different within the groups by economic status ($p = .215$). This does not contradict the findings of the previous studies that have shown that drug use does not correlate with the economic status of the family (Malikova, 2000). However, the Russian students whose families are 'not at all well off' are more likely to use marijuana compared with the ones with higher economic status of the family (40 percent of those who have the low economic status of the family use marijuana, Adjusted Res. = $2.4 > 1.96$, $p = .034$). This could be explained by the difference in the standard of living of the two countries. The low economic status of the family in Russia usually is associated with parents' overtime work in order to support the family, or parents' alcohol

abuse, or other factors that usually lead to parents' neglecting children and thus the higher risk of children's involvement in deviant behaviors.

The structure of the family of adolescents affects the risk of marijuana use as well. Thus, the Russian students who live with one parent are more likely to use marijuana compared with those who live with two parents (18.5 and 12.5 percent respectively, p = .001) (See Table 5). The same pattern characterizes the Canadian adolescent population, although the difference is not that apparent. Marijuana use is more likely to happen to the Canadian adolescents who live with one parent as opposed to those who live with two parents (51.1 and 41.9 percent, p = .022).

Table 5. The Prevalence of Marijuana Use among Groups of Adolescents with Different Type of Family [a]

	Canada		Russia	
	Two Parents (n = 946)	One Parent (n = 180)	Two Parents (n = 1,970)	One Parent (n = 422)
Do not Use Marijuana	58.1	48.9	87.5	81.5
Use Marijuana	41.9	51.1	12.5	18.5

[a] The number of missing cases for Canada was 102 (8.3 %) and for Russia was 192 (7.4 %)

5.4. Differences in Demographic and Behavioral Characteristics among the Marijuana Users and Non-Users

While previous section of the analysis focuses on the distinguishing the group of those who use marijuana among the Canadian and Russian population and shows how prevalent marijuana use in the groups by major social-demographic characteristics, this section demonstrates the characteristics that differ group of those who use marijuana from those who reject it. The analysis of this section has been done with the purpose of

showing what characteristics distinguish people who use marijuana, which is important for better description of the group that is in the focus of the study. The independent sample t-test analyses suggest that the "risk" group has statistically significant distinctions in some characteristics compared with the "control" group (on the assumption of normalcy of distribution). Thus, in the Canadian sample, these groups significantly differ by a number of characteristics, such as the level of trust to parents and their involvement in children's school life, attachment to teachers, the degree to which they like school (at the .001 level). In the Russian sample, the t-test analysis showed that the distinctions in these characteristics are not that apparent also due to the less number of variables available for the analysis.

Table 6 describes some additional characteristics of marijuana users when compared with the adolescents who reject the use of marijuana based on the interpretation of crosstabs tables, the values of chi-square that shows the significance of differences observed among the groups, and the values of adjusted residual. Those cells that have absolute adjusted residuals with a positive value greater than 1.96 (typed in bold in Table 6) indicate over-representation by individuals in a distance category and show that the variables have a positive significant relationship.

Table 6. Characteristics of Marijuana Users ("Risk" Group) when Compared with the Adolescents who Reject the use of Marijuana ("Control" Group)

	Russia			Canada		
	"Control" Group (n = 2,099) n (%)	"Risk" Group (n = 330) n (%)	χ^2	"Control" Group (n = 648) n (%)	"Risk" Group (n = 508) n (%)	χ^2
Gender						
Male	867 (41.3)	**204 (61.8)**	< .001	258 (39.8)	**236 (46.5)**	< .05
Female	**1,232 (58.7)**	126 (38.2)		**390 (60.2)**	272 (53.5)	
Economic Status of the Family						
Not at all well off	6 (.3)	**4 (1.2)**	< .05	13 (2)	12 (2.4)	> .05
Not very well off	159 (7.6)	21 (6.4)		40 (6.2)	28 (5.5)	
Average	812 (38.7)	119 (36.2)		237 (36.9)	219 (43.4)	
Quite well off	1,050 (50)	167 (50.8)		227 (35.4)	165 (32.7)	
Very well off	71 (3.4)	18 (5.5)		125 (19.5)	81 (16)	
Family Structure						
Two parents	**1,724 (83.4)**	246 (75.9)	< .001	**550 (86.2)**	396 (81.1)	< .05
One parent	344 (16.6)	**78 (24.1)**		88 (13.8)	**92 (18.9)**	
School Performance						
Below average	1,106 (52.8)	**216 (65.7)**	< .001	192 (29.8)	**239 (47.5)**	< .001
Very good	**990 (47.2)**	113 (34.3)		**453 (70.2)**	264 (52.5)	
Liking School						
Do not like it at all	157 (7.5)	**43 (13)**	0.002	[a]		< .001
Like it	**1,940 (92.5)**	287 (87.0)				
School Pressure						
A lot of pressure	49 (2.3)	13 (4.0)	> .05	93 (14.6)	**103 (20.4)**	< .05
Not too much pressure	2,049 (97.7)	316 (96.0)		**545 (85.4)**	401 (79.6)	
Attachment to friends						
Low level of attachment	**1,099 (61.1)**	129 (41.6)	< .001	**512 (79.6)**	306 (61.4)	< .001
High level of attachment	701 (38.9)	**181 (58.4)**		131 (20.4)	**192 (38.6)**	
Trust to friends						
Low level of trust	**770 (36.9)**	87 (26.5)	< .001	**282 (43.9)**	184 (36.4)	< .05
High level of trust	1,319 (63.1)	**241 (73.5)**		361 (56.1)	**321 (63.6)**	
Number of Friends						
None/one or two	664 (31.7)	88 (26.7)	> .05	**88 (13.6)**	49 (9.7)	< .05
Three or more	1,429 (68.3)	241 (73.3)		557 (86.4)	**455 (90.3)**	
Use of alcohol						
Do not use	**1,629 (77.8)**	150 (45.5)	< .001	**497 (77.3)**	232 (46)	< .001
Use	464 (22.2)	**180 (54.5)**		146 (22.7)	**272 (54)**	
Use of tobacco						
Do not smoke	**1,634 (77.9)**	93 (28.2)	< .001	**611 (94.9)**	292 (57.8)	< .001
Smoke	464 (22.1)	**237 (71.8)**		33 (5.1)	**213 (42.2)**	
Parents' smoking						
Do not smoke				**401 (67.1)**	216 (46.2)	< .001
Smoke				197 (32.9)	**252 (53.8)**	

[a] The scale of the index varies from 1 to 31. The results of T-Test are in the text below.

Therefore, it can be seen that marijuana users tend to be males, while non-users tend to be females for both Canada and Russia, which support the pattern that characterizes the whole sample and that has been discussed previously. However, among the Canadian adolescents who constitute "risk" group the difference in a ratio of males and females is not that indicative (46.5 percent of males versus 53.5 percent of females) as among Russian adolescents who use marijuana it is more apparent (61.8 and 38.2 percent respectively). Although the number of females is greater than males in the group of Canadian marijuana users, the deviation of z-statistics (adjusted residual) shows that those who use marijuana are more likely to be men.

The economic statuses of the families of adolescents who use marijuana and reject it do not significantly differ. The majority of both "risk" and "control" groups fall in the category of those whose families have average or quite well off economic status for both countries. However, the Russian marijuana users are more likely to have a family that is "not at all well off" compared with those Russians who do not use marijuana (1.2 and .3 percent respectively, $p < .05$).

It is evident for both Russia and Canada that students that compose the "risk" group are more likely to live with one parent, whereas the adolescents who reject marijuana use in most part live with two parents.

It can be seen that those who use marijuana are more likely to have low school performance (for both Russia and Canada) and tend to have low level of liking school. In the Canadian case, the scale of the index "liking school" varies from 1 to 31; therefore, the t-test analysis has been performed to compare means of the level of liking school in the group of marijuana users and those who reject it. The differences between the groups

of marijuana users and non-users in Canada are also evident and support the same tendency that has been observed for Russia. Thus, the students who use marijuana tend to like school less than those who reject marijuana use and vice versa (the mean of the index 'liking school' equals 13.44 in the "risk" group and 16.26 in the "control" group , $p < .001$). In addition, the crosstabs analysis for the Canadian sample indicates that marijuana users are more likely to experience a lot of pressure in school ($p < .05$), while in the Russian sample the differences in the level of pressure by schoolwork among those who use marijuana and who reject it are not statistically significant.

For both countries, it has been shown that the adolescents of the "risk" group have higher level of attachment and trust to peers. However, among Russian population the percentage of those who use marijuana and have high degree of attachment and trust to friends is higher than among the Canadian adolescent population (58.4 percent for Russia versus 38.6 percent for Canada in case of attachment to friends, and 73.5 versus 63.6 percent respectively in case of trust to friends). It can be assumed that peers in Russia have greater influence on adolescents' attitudes, behaviours, and decisions about marijuana use than in Canada. Number of friends is not significantly different for young people who use marijuana and who do not in Russia. However, in case of Canada, the hypothesis that drug users are more socially active and have greater number of friends compared with those who do not use drugs can be accepted (90.3 percent of marijuana users as opposed to 86.4 percent of non-users have three or more friends, $p < .05$).

The most vivid differences between the "risk" and "control" groups in both countries are in the use of alcohol and tobacco. Thus, marijuana users are more likely to use alcohol compared to those who reject marijuana use: 54.5 percent the "risk" group

versus 22.2 percent of the "control" group in Russia and 54 versus 22.7 percent in Canada use alcohol. The differences in the use of tobacco even brighter: 71.8 percent of the "risk" group versus 22.1 percent of the "control" group in Russia and 42.2 versus 5.1 percent in Canada smoke. It is evident that tobacco smoking is more prevalent among the Russian adolescents in both groups compared with the Canadian ones. As measured only for Canada, in the group of marijuana users there are more students whose parents smoke (53.8 percent) compared with those who do not use marijuana (32.9 percent).

The differences in the level of trust to parents among marijuana users and non-users were analyzed as well. With regard to the Russian sample, no meaningful interpretations of the results have been done due to the low reliability of the index "trust to parents". However, in the Canadian sample, it has been revealed that those who use marijuana tend to have low level of trust to parents, while those who reject marijuana use have high level of trust (adjusted residuals > 1.96, $p < .001$). The results has not been included in the integrated table since the index has 29-item scale, which is difficult to represent.

5.5. Analysis of Correlations

5.5.1. Description of the Relationship between Marijuana Use and the Major Predictor Variables

In this section of the analysis, the strength of association between the variables that were discussed previously is examined. While crosstabs analysis allows revealing the main relationships and influential cells, the analysis of correlations shows how strong these relationships are. In addition, correlation analysis allows examining the

relationships between the main predictors. The examination of the Pearson zero order correlations between adolescent marijuana use in Canada and Russia and its major predictors shows the following. In the Canadian sample, the marijuana use (dependent variable) is negatively correlated with gender (-.067*)[b], the level of trust to parents (-.257**)[c], parents' involvement in children's school life (-.133*), liking school (-.245**), and attachment to teachers (-.215**). Thus, it could be stated that males, and those students who have low level of trust to parents, whose parents are less involved in their school life, who do not like school, and less attached to teachers are more likely to use marijuana.

The analysis of correlations applied to the Russian sample reveals the negative relationship between young people's involvement in marijuana use (dependent variable) with gender (-.142**). Marijuana use is also positively correlated to the level of liking school (.069**), which corresponds with the results of correlation analysis for Canada: those students who use marijuana are more likely to dislike school. The limited number of variables available in the Russian data aggravates the interpretation of the obtained results; however, it is evident that overall attachment to school measured by school performance, liking school, and attachment to teachers (only in the Canadian case) take an important role in mediating adolescent marijuana use both in Russia and Canada. As it is shown, the correlations between marijuana use and school related variables are weaker for Russia compared with Canada. This could be partly explained by the overall rapid degradation of social institutions of socialization in Russia during the post-soviet period and lessening of their influence on young population, which can affect level of liking

[b] * Correlation is significant at the 0.05 level (2-tailed)
[c] ** Correlation is significant at the 0.01 level (2-tailed)

school. Thus, the social institution of school may be less influential in the Russian society compared with the Canadian one. The level of trust to parents is not significant in the Russian case. This could be partly explained by the weakness of this social institution in Russia as was mentioned above; however, this assumption is not reliable enough due to the low consistency of the scale of the index. Therefore, its interpretation should be made with caution. Gender has comparatively stronger relationship with marijuana use among Russian population than among Canadian one, which does not contradict previous results saying that Russian adolescent marijuana users are predominantly men, while among Canadian marijuana users the gender groups do not greatly differ in the level of marijuana use.

In the Canadian sample, marijuana use is positively related to family structure (.068*), school performance (.182**), school pressure (.077**), the level of attachment (.200*) and trust (.075*) to friends, number of friends (.06*), friends' and parents' smoking (.280** and .210** respectively), friends' use of alcohol and drugs (.52**), and young people's own consumption of alcohol (.322**) and tobacco (.448**). In Russian case, marijuana use has positive relationship with the family structure (.067**), school performance (.089**), attachment (.140**) and trust (.074**) to friends, and adolescents' own use of alcohol (.251**) and tobacco (.376**).

It is evident that the strongest correlation is between marijuana use and respondents' consumption of alcohol and tobacco in both countries, which supports the major gateway hypothesis. Thus, if the adolescent uses marijuana, he or she is more likely to have used cigarettes and alcohol. The strong correlation of these predictors with the independent variable should be taken into account interpreting the results of the

multivariate regression analysis since these variables are not of the main research interest but may have strong predicting power and may pull most of the variance explained.

In the Canadian case, friends' and parents' consumption of the toxic substances and high degree, to which young people are attached to their friends, have strong correlation with adolescent marijuana use. This indicates that adolescent marijuana use is more likely to happen if the main agents of social environment are involved in the use of licit or illicit drugs. Unfortunately, comparisons of the values of these indicators between two countries are not possible due to limitations of the Russian data.

The evidence of the strong correlation of marijuana use with the level of attachment and trust to peers for both Russia and Canada supports the assumption of the peer cluster theory. Both in the Russian and Canadian sample marijuana use is strongly correlated with school performance, which indicates that those who have poor school performance are more likely to use marijuana. Moreover, the analysis shows that adolescent marijuana use in Canada corresponds to the high level of being pressured by schoolwork, whereas in the Russian case there is no significant correlation between these indicators. In addition, the analysis shows that Russian and Canadian adolescents who live with one parent are more likely to use marijuana compared with those who live with two parents.

5.5.2. The Interplay between the Predictors of Marijuana Use

Correlations between the main predictors have been analyzed as well and the most important relationships are discussed in this section. Analysis shows that both in Canada and Russia high level of trust to parents corresponds to high level of liking school and

good school performance (See Appendix 2. In addition, Canadian adolescents who are strongly attached to their parents also have high level of attachment to teachers. Thus, a young person who is attached to his/her parents is more likely to do well at school, enjoy studies and like school, and have a good relationship with teachers.

The analysis of correlations also suggests that the high degree of attachment to peers corresponds to the low school performance and low level of liking school. It is evident that, both in Russia and Canada, spending much time with friends affects students' school performance, and thus may affect their interest in studies and weaken the influence of this social institution in the process of youth's socialization. In addition, the high degree of attachment to friends negatively affects other aspects of adolescents' lives. Thus, those who have high level of attachment to friends are more likely to use alcohol and tobacco. The increase in the level of attachment to friends corresponds to the strengthening of the relationship of trust between adolescents and their friends. Therefore, it is evident that trusting to and spending much time with friends reinforce youth's sense of belonging to the peer grouping and the adoption of group values and behavior patterns, such as use of alcohol and tobacco. Conversely, if adolescents have high level of attachment to parents (measured by the level of trust to parents), they are less likely to smoke cigarettes or use alcohol.

The assumption that young people who face the low acceptance by peers and have been bullied hold the high probability to have problems at school, be socially isolated, and turn to the use of toxic substances has been partly rejected. The analysis of correlations shows that being bullied does not correlate with the school performance for both Canada and Russia. However, those who have been bullied tend to dislike school.

Since the low school performance at school corresponds to the low level of liking school, it could be assumed that people who have been bullied eventually may have some problems in their education. The level of attachment to peers does not significantly correlate with being bullied at school for both Canada and Russia. Therefore, it could not be stated that being bullied at school leads to the social isolation. The assumption that students who have been bullied at school are more likely to use toxic substances has been partly supported; however, some differences in coping mechanisms that young people in Canada and Russia may use in stressful situations, such as being bullied, were revealed. Thus, Russian students who have been bullied are more likely to smoke cigarettes, while Canadian counterparts are more likely to use alcohol.

The two variables that are available only in the Canadian data (parents' smoking and friends' use of alcohol and drugs) have been examined as well, which is of great value for the purpose of this study. Thus, parents' smoking has strong positive correlation with their children's using tobacco. Parents' smoking causes the lessening of the trust to parents and negatively affects children's school performance, the level of liking school, and the attachment to teachers. Moreover, those young people whose parents smoke are more likely to be more attached to their friends. The relationships between these variables may not be causal; however, it is apparent that parents' involvement in socially disapproved behaviors, such as smoking, affects children's attitudes and the level of their loyalty towards these behaviors. Evidently, social environment of young people may greatly influence their attitudes, values, and decisions by giving negative examples of the behaviors that could be taken as appropriate, and thus may increase the risk of adolescents getting involved in deviant behaviors, such as marijuana use.

5.6. Multivariate Regression Analysis

5.6.1. The Models Describing the Relationship between Adolescent Marijuana Use and Attachment to Family

First, the regression models that explain what influence the variables describing the overall degree of attachment to family and parents were created for both Canada and Russia. Due to the low level of the scale consistency that the index measuring trust to parents created for Russia has, the interpretation of it has to be done with a great caution. This index has been entered in the analysis only for illustrative purposes. The logistic regression analysis describing the influence of the level of attachment to family on adolescent marijuana use includes one index ("trust to parents") for Russia and three indicators ("trust to parents", "parents' involvement in children's school life", and "parents' smoking") for Canada.

The model created for Russia did not show any significant results (chi-square = .492, p = .483) due to the fact that the only one variable, which does not have the high level of scale consistency, was used for measuring attachment to parents and entered in the regression model. However, the overall model created for Canada is statistically significant (chi-square = 99.875, $p < .001$). The predictors explain 12.6 percent of the variance (Nagelkerke R-square), and the overall percentage of cases that are correctly predicted by the regression model is 62.9 (the percent of cases that are correctly predicted to be 1 ('use marijuana') is 47.6). Having parents who smoke is associated with 2.3-fold increase in the odds of marijuana use and can be considered the strongest predictor of marijuana use in this model (See Table 7). Students who have low level of trust to their parents are more likely to use marijuana (B = -.095). Therefore, it could be assumed that

adolescents' families can influence and provoke young people's marijuana use by giving negative examples of socially disapproved behaviors and not establishing good and trusting relationships with their children.

Table 7. Predictors of Canadian Adolescents' Marijuana Use Measuring Attachment to Family

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Trust to Parents	-.095	.014	43.050	1	.000	.910
Parents' Involvement in Children's School Life	.017	.021	.673	1	.412	1.017
Parents' Smoking	.811	.136	35.512	1	.000	2.249
Constant	.756	.309	5.976	1	.015	2.131

5.6.2. The Models Describing the Relationship between Adolescent Marijuana Use and Attachment to School

The next models include the variables that measure some characteristics of adolescents' school environment and its agents. Analyzing how school environment could influence young people's marijuana use, it was revealed that the overall models for Russia and Canada were statistically significant (Chi-square = 27.455, $p < .001$ for Russia and Chi-square = 93.051, $p < .001$ for Canada). The fit of the regressions models is satisfactory: the overall percentage of correctly predicted cases is 86.5 percent for Russia and 62.3 percent for Canada. However, the percent of cases that are correctly predicted to be 1 is 40.6 for Canada and 0 for Russia due to the skewness of the dependent variable; therefore, the conclusions should be made with caution. The Nagelkerke R Square account 2.1 percent for Russia and 11.1 percent for Canada. The higher value of the explained variance in case of Canada may have been caused by the

greater number of independent variables entered in the analysis compared with the Russian case. The Tables 8 and 9 demonstrate what contribution each of the predictors measuring some characteristics of adolescents' school environment make to explaining the variance of the odds of the outcome variable.

Table 8. Predictors of Russian Adolescents' Marijuana Use Measuring Attachment to Parents

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
School Performance	.483	.126	14.774	1	.000	1.621
Liking School	.506	.186	7.359	1	.007	1.658
School Pressure	.347	.322	1.158	1	.282	1.415
Constant	-2.203	.100	483.315	1	.000	.111

Table 9. Predictors of Canadian Adolescents' Marijuana Use Measuring Attachment to Parents

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
School Performance	.466	.139	11.315	1	.001	1.594
Liking School	-.056	.014	17.259	1	.000	.945
School Pressure	-.031	.177	.031	1	.860	.969
Attachment to Teachers	-.079	.021	14.075	1	.000	.924
Constant	1.432	.312	21.070	1	.000	4.189

As shown above, the common predictor of marijuana use for both countries is the level of students' school performance. The relationship between this predictor and the independent variable is positive, which means the students with low school performance, both Canadian and Russian, are more likely to use marijuana. Another predictor, which is level of liking school, explains some variance of the dependant variable in both samples. Thus, both Canadian and Russian adolescents with high level of liking school are less

likely to use marijuana. In the Russian sample, this predictor is slightly stronger compared with the Canadian one: the low level of liking school in Russia increases the odds of using marijuana by 1.658, while in Canada the high level of liking school decrease the odds of becoming a marijuana user (Exp (B) = .945).

In the Canadian sample, one more predictors contribute to the explaining of the variance, which is attachment to teachers. Thus, for students who have high level of attachment to teachers the odds of becoming a marijuana user are about 8 percent less than for those with low level of attachment to teachers.

5.6.3. The Models Describing the Relationship between Adolescent Marijuana Use and Attachment to Peers

The models that include variables that measure the relationship between adolescents and their peer environment and some relevant characteristics of young people's friends are statistically significant (Chi-square = 49.679, $p < .001$ for Russia and Chi-square = 370.761, $p < .001$ for Canada). The predictors describing young people's peer environment explain 4.1 percent of the variance in the Russian model and 38.5 percent in the Canadian model (measured by Nagelkerke R Square). The overall percentage of correctly predicted cases is 85.3 percent in the Russian sample and 73.7 percent in the Canadian one, while the percent of cases that are correctly predicted to be 1 is 66.4 for Canada and 0 for Russia due to the skewness of the dependent variable, which indicates the better fit of the Canadian model.

As can been seen, being greatly attached to peers, that is spending considerable amount of time with them just right after school and during the week, is the strongest

predictor of marijuana use among both Russian and Canadian adolescents. Having high degree of attachment to peers is associated with 2.07-fold increase in the odds of marijuana use in the Russian case and 2.19-fold increase in the Canadian one (See Tables 10 and 11).

Trust to friends appears to be a significant predictor of marijuana use among Russian adolescents as opposed to Canadian counterparts. This can be explained by the fact that marijuana use is less common among the Russian adolescents compared with the Canadian ones, and decision-making process about whether to use marijuana or not may require more closeness and greater trust to friends in order to come under their influence and make the first step.

Table 10. Predictors of Russian Adolescents' Marijuana Use Measuring Attachment to Peers

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Attachment to Peers	.726	.127	32.710	1	.000	2.067
Trust to Friends	.384	.146	6.960	1	.008	1.468
Number of Friends	.070	.142	.239	1	.625	1.072
Peer Rejection	.257	.144	3.198	1	.074	1.293
Constant	-2.497	.169	217.838	1	.000	.082

Table 11. Predictors of Canadian Adolescents' Marijuana Use Measuring Attachment to Peers

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Attachment to Peers	.785	.165	22.746	1	.000	2.192
Trust to Friends	.073	.154	.223	1	.637	1.075
Number of Friends	.199	.238	.700	1	.403	1.220
Friends' smoking	.730	.251	8.450	1	.004	2.074
Friends' Use of Alcohol and Drugs	.542	.041	175.544	1	.000	1.719
Peer Rejection	.170	.162	1.102	1	.294	1.185
Constant	-3.403	.334	103.890	1	.000	.033

In the Canadian sample, it can also be seen that two additional variables measuring friends' consumption of tobacco, alcohol, and drugs, that were not included in the Russian analysis due to the limitations of the data, explain some variance and can be considered influential predictors of marijuana use. Thus, having friends who smoke increases the risk to become a marijuana user by 2.07 times. In addition, the more friends who use alcohol or drugs the adolescent has, the greater the odds of using marijuana (Exp (B) equals 1.7). It could be assumed that if the similar variables were available in the Russian data, the same pattern would be observed for Russia since close people's consumption of toxic substances can significantly increase the probability of children's adopting the same behaviour as was discussed previously.

5.6.4. The Models Describing the Influence of Exogenous Factors on Adolescent Marijuana Use

The exogenous variables considered in this analysis are gender, the economic status of the family, and family structure. These characteristics of adolescents and some aspects of their environment are not of the major research interest; however, the analysis should be controlled for them since they may partly predict adolescent marijuana use. Thus, the analysis shows that both Russian and Canadian regression models are statistically significant (Chi-square = 60.828, $p < .001$ for Russia and Chi-square = 11.961, $p < .01$ for Canada). The Nagelkerke R Square accounts for 4.6 percent in case of Russia and 1.4 percent in case of Canada. The percentage of the overall cases that are correctly predicted is a bit low in the Canadian model (56.5 percent), whereas in the Russian one it is sufficiently great (86.5 percent). However, the percent of cases that are correctly predicted to be 1 is 11.3 for Canada and 0 for Russia. The high percent of overall correctly predicted cases representing the fit of the model in the Russian case can be partly explained by the higher skewness of the distribution of the dependent variable compared with the Canadian one, thus the interpretation of this result should be made with caution.

The strongest predictor of marijuana use among the variables considered in these models is the family structure (See Tables 12 and 13). Since the relationship between this predictor and the outcome variable is positive for both Russia and Canada, it could be stated that living with one parent increases the risk of marijuana use (Exp (B) equals 1.6 in the Russian model and equals 1.4 in the Canadian one). The economic status of the

family does not predict adolescent marijuana use in both samples, which does not contradict the findings of previously conducted research.

Table 12. Predictors of Russian Adolescents' Marijuana Use Measuring Gender, the Economic Status of the Family, and the Family Structure

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Gender	-.851	.123	47.434	1	.000	.427
Economic Status of the Family	.102	.087	1.365	1	.243	1.107
Family Structure	.495	.146	11.499	1	.001	1.640
Constant	-1.053	.364	8.369	1	.004	.349

Table 13. Predictors of Canadian Adolescents' Marijuana Use Measuring Gender, the Economic Status of the Family, and the Family Structure

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Gender	-.259	.123	4.476	1	.034	.772
Economic Status of the Family	-.087	.068	1.666	1	.197	.916
Family Structure	.344	.168	4.212	1	.040	1.411
Constant	.401	.323	1.545	1	.214	1.493

As it is demonstrated in the tables above (See Tables 12 and 13), both in Russia and Canada, males are at higher risk to become marijuana users, which is indicated by the negative values of the B-coefficients. Thus, the odds of using marijuana are 57 percent less for Russian females than for Russian males, while for Canadian females the odds are 23 percent less compared with Canadian males. The risk of using marijuana is about twice as high for Canadian females than Russian ones compared with males.

5.6.5. The Models Describing the Influence of Adolescents' Alcohol and Tobacco Use on Marijuana Use

The two factors that measure the use of alcohol and tobacco were examined as well. These variables are not considered as main predictors of marijuana use in the current study. The use of licit drugs, such as alcohol and tobacco, is associated and may have a high correlation with marijuana use, however, may not have causal relationship. According to the gateway theory, the use of alcohol or tobacco may be the first step towards the use of illegal drugs. The theory does not accent that one causes another, however, according to this theory, those who use marijuana are more likely to have consumed alcohol and tobacco. These two variables have strong correlation with the dependent variable, which is marijuana use, thus the models created for two countries are highly significant compared with previously discussed models. Therefore, the Russian model is significant with chi-square = 345.342 ($p < .001$) and the Canadian one with chi-square = 330.284 ($p < .001$). These two variables explain 24.2 percent of the variance in case of Russia and 33.6 percent in case of Canada (measured by Nagelkerke R Square). The overall percent of cases predicted correctly is sufficiently high (86.4 percent for Russia and 72.9 percent for Canada); however, the percent of cases that are correctly predicted to be 1 is 71.4 for Canada and 0 for Russia due to the skewness of the dependent variable. Therefore, the conclusions should be made with caution..

As it can be seen in the Tables 14 and 15 presented below, both variables entered in the analysis emerged as significant predictors of marijuana use for both Russia and Canada. Those adolescents who smoke cigarettes are 6.9 times for Russia and 13 times for Canada as likely to progress to marijuana use. This is extremely high values of Exp

(B), which indicates the strong predicting power of these variables. The significant difference in the values of Exp (B) for Russia and Canada gives grounds to assume that the process of progressing from tobacco to marijuana use is much easier and faster in Canada than in Russia. To make a decision whether to use marijuana or not may involve less doubts for Canadian adolescents who have already used tobacco compared with the Russian counterparts who smoke cigarettes. Therefore, the risk of using marijuana for smokers in Canada almost two times as high compared with ones in Russia. The use of alcohol is also significantly associated with marijuana use and increases the odds of marijuana use by 2.3 in case of Russia and 3.5 in case of Canada.

Table 14. Predictors of Russian Adolescents' Marijuana Use Measuring the Use of Alcohol and Tobacco

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Use of Alcohol	.824	.135	37.295	1	.000	2.280
Use of Tobacco	1.934	.140	191.431	1	.000	6.918
Constant	-3.050	.114	715.583	1	.000	.047

Table 15. Predictors of Canadian Adolescents' Marijuana Use Measuring the Use of Alcohol and Tobacco

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Use of Alcohol	1.250	.143	76.142	1	.000	3.492
Use of Tobacco	2.565	.210	149.178	1	.000	12.995
Constant	-1.185	.093	163.321	1	.000	.306

5.6.6. The Integrated Regression Models

The Table 16 describes the major parameters of the integrated regression models created for Russia and Canada. These models include only those variables that were significant predictors of adolescent marijuana use in the models run separately for groups of variables measuring different aspects of social environment of young people. Therefore, the Canadian model includes 12 variables, whereas the Russian one examines 8 variables that may affect marijuana use. It is should be mentioned that the analysis that includes all the predictors of marijuana use, significant and not significant in the primary regression analysis, has been run as well in order to see if not significant variables have some predictive power interacting with the rest of independent variables. However, the values of the major statistics, such as chi-square and pseudo R^2, have not changed significantly. Therefore, it is assumed that those predictors that became insignificant in the early stages of logistic regression analysis do not contribute to the explanation of the variance of the outcome variable, and thus have not been included in the further analysis.

The analysis shows that both models are statistically significant with sufficiently high values of Chi-Square statistics (415.287** for Canada and 348.726** for Russia). The model created for Canada explains 48.7 percent of the variance, while the Russian model explains 27.5 percent. The overall percentages of correctly predicted scores are 77.9 and 85.9 for Canada and Russia respectively, while the percent of cases that are correctly predicted to be 1 is 68.6 for Canada and 19.1 for Russia.

The models that describe the relationship between adolescent marijuana use in Russia and Canada and its predictors have some similarities. Thus, the strongest predictor of marijuana use in both countries is adolescent's own use of tobacco. The results

demonstrate that those students who smoke cigarettes are 5.9 times (in case of Canada) and 5.7 times (in case of Russia) as likely to progress to marijuana use than those who do not smoke. The second strongest predictor of adolescent marijuana use in both countries appeared to be the use of alcohol. Thus, the risk to get involved in marijuana use is 2.2 times higher for those Canadian and Russian students who use alcohol. Remarkably enough, the values of Exp (B) for the two predictors that measure alcohol and tobacco consumption in the Canadian and Russian models are very similar. It is evident that using alcohol and cigarettes creates the same risks of involvement in marijuana use across countries.

Table 16. The Integrated Model of the Predictors of Marijuana Use among Canadian and Russian Adolescents

	Canada			Russia		
	B	Sig.	Exp(B)	B	Sig.	Exp(B)
Gender	-.323	.075	.724	**-.704**	**.000**	**.495**
Family Structure	.343	.152	1.410	**.345**	**.038**	**1.412**
Trust to Parents	-.030	.099	.971	-	-	-
Parents' Smoking	.302	.091	1.353	-	-	-
School Performance	-.030	.875	.970	.054	.716	1.055
Liking School	-.021	.274	.980	.150	.499	1.162
Attachment to Teachers	-.024	.398	.976	-	-	-
Attachment to Peers	**.634**	**.001**	**1.885**	**.375**	**.008**	**1.455**
Trust to Friends	**-**	**-**	**-**	.263	.097	1.301
Friends' Smoking	.499	.079	1.646	-	-	-
Friends' Use of Alcohol and Drugs	**.426**	**.000**	**1.531**	-	-	-
Use of Alcohol	**.792**	**.000**	**2.208**	**.803**	**.000**	**2.232**
Use of Tobacco	**1.772**	**.000**	**5.880**	**1.741**	**.000**	**5.701**
Constant	-1.604	.008	.201	-2.346	.000	.096
Model χ^2		415.287**			348.726**	
Nagelkerke R Square		.487			.275	
Overall Percentage of Correctly Predicted Scores		77.9			85.9	

The level of attachment to peers, which is one of the variables that are of the main research interest, emerged as the third strongest predictor of adolescent marijuana use in

both countries. Hence, spending much time with friends increases the odds of marijuana use by 1.9 in Canada and 1.5 in Russia. The fact that the three strongest predictors are the same and have similar predicting power gives some grounds to assume that the differences in factors that can provoke marijuana use are not substantial cross-culturally. In addition, it is apparent that the peer cluster and the gateway theories have the strongest explanatory power when discussing the factors that can contribute to the expansion of adolescent marijuana use.

In spite of the fact that the models have some major similarities, there are some differences. In the Canadian case, another variable, which is friends' consumption of alcohol and drugs, contributes to the explanation of the variance of the outcome variable and increases the odds of marijuana use by 1.5. Due to the fact that some of the predictors significant for Canada are not available in the Russian data, it is recklessly to claim that they would not have any predicting power in the Russian case if they were available and included in the analysis. However, some other predictors turned to be significant in the Russian model as opposed to the Canadian one: the structure of the family and gender. Both factors are external to the analysis. Thus, living with one parent increases the risk of marijuana use by 1.4 times. Having only one parent may involve the deficit of parental control and, thus, the higher risks of children's involvement in deviant behaviours, such as marijuana use. Another factor that predicts marijuana use is gender. Hence, females are less likely than males to use marijuana (Exp (B) = .495). This tendency has been discussed previously and do not contradict the preliminary results.

Summarizing, the one variable describing the attachment to peers that is in the major focus of this study emerged as a significant predictor of adolescent marijuana use

in Russia and Canada. This finding supports the peer cluster theory suggesting that peer groupings may be very influential in mediating marijuana use. The strongest predictors of marijuana use, however, appeared to be adolescents' own consumption of alcohol and tobacco, which support the major gateway hypothesis. Since the predictors that measure alcohol and tobacco use, which are not of the main research interest, emerged as the strongest predictors of adolescent marijuana use and may have pulled some variance shared with other predictors, the models that exclude these two predictors are considered in the following section of the analysis. The models excluding the two predictors are examined with the purpose of getting better understanding of what dimensions of adolescents' social environment are most influential in mediating marijuana use eliminating the factors that can be the result of the interaction with this environment.

5.6.7. The Integrated Regression Models that Exclude the Predictors Measuring Adolescents' Alcohol and Tobacco Use

The additional models that include all the predictors considered in the previously discussed models except adolescents' own consumption of alcohol and tobacco are examined in this section. Adolescents' consumption of alcohol and tobacco can be the result of the interactions with the people of their close environment who are involved in the consumption of licit drugs. Since the focus of this research is mostly on the influences that social environment has on the expansion of adolescent marijuana use, it may be useful to eliminate such strong predictors as adolescents' own use of alcohol and tobacco. This will allow determining the factors lying in the social environment itself that may provoke adolescent marijuana use.

The Table 17 below describes the influence of the predictors of adolescent marijuana use excluding those measuring adolescents' alcohol and tobacco consumption. As it is shown, both models are statistically significant: the model Chi-square for Canada = 336.182 and for Russia = 118.642. Comparing with the parameters of the models that include all the variables (see Table 16), it is evident that the model Chi-square dropped substantially in both models ($\Delta \chi^2$ = 79.105 in the Canadian case and 230.084 in the Russian case), which indicate the significant contribution of the two predictors measuring alcohol and tobacco use to the overall Chi-square. The Nagelkerke R Square has decreased as well: the Canadian model explains 41 percent of the variance (ΔR^2 = .077) and the Russian model explains 9.9 percent of the variance, which is considerably lower compared with the model that includes predictors measuring alcohol and tobacco use (ΔR^2 = .176). It proves that the two predictors that have been eliminated in this analysis have very strong explanatory power. The overall percent of cases that are correctly predicted by the models are 73.9 for Canada and 85.5 for Russia; however, the percent of cases that are correctly predicted to be 1 is 73.9 for Canada and only 1.3 for Russia due to the skewness of the dependent variable, which should be taken into account making conclusions.

Table 17. The Integrated Model of the Predictors of Marijuana Use among Canadian and Russian Adolescents Excluding Predictors Measuring Adolescents' Alcohol and Tobacco Use

	Canada			Russia		
	B	Sig.	Exp(B)	B	Sig.	Exp(B)
Gender	-.316	.065	.729	**-.825**	**.000**	**.438**
Family Structure	.279	.215	1.322	**.557**	**.000**	**1.745**
Trust to Parents	**-.037**	**.029**	**.964**	-	-	-
Parents' Smoking	**.349**	**.038**	**1.418**	-	-	-
School Performance	.175	.328	1.191	**.395**	**.003**	**1.484**
Liking School	-.034	.052	.966	**.462**	**.023**	**1.588**
Attachment to Teachers	-.033	.223	.968	-	-	-
Attachment to Peers	**.639**	**.001**	**1.894**	**.644**	**.000**	**1.904**
Trust to Friends	-	-	-	**.390**	**.008**	**1.477**
Friends' Smoking	**.661**	**.016**	**1.936**	-	-	-
Friends' Use of Alcohol and Drugs	**.511**	**.000**	**1.668**	-	-	-
Constant	-1.112	.049	.329	-1.524	.000	.218
Model χ^2		336.182**			118.642**	
Nagelkerke R Square		.410			.099	
Overall Percentage of Correctly Predicted Scores		73.9			85.5	

The elimination of two factors from the regression analysis slightly changed the distribution of the predicting power among the independent variables. Thus, attachment to peers came to the place of the most influential predictor in the Russian model and the second strongest predictor in the Canadian one. In Russia, the influence of this predictor is slightly more pronounced and has greater power. The first strongest predictor of marijuana use among the Canadian adolescent population is friends' smoking, which is also one of the variables that characterize peer environment. It is unlikely that if the latter variable was available in the Russian data, the results would be different considering the fact that the major predictors have similar influence on marijuana use and similar explanatory power in the two samples. Thus, in the Canadian model, having the high degree of attachment to friends increases the odds of marijuana use by 1.89, and in case of friends' smoking the risk to become a marijuana user increases by 1.94 (see Table 17).

The interesting fact is that by eliminating the influence of the variable that measures the adolescents' own smoking, the variable "friends' smoking" becomes significant. Although the data are not longitudinal and do not allow making conclusions about the time order of events, it can be assumed that once the adolescent has adopted friends' pattern of smoking behaviour and became a smoker too, the predictor "friends' smoking" loses its explanatory power. In addition, those Canadian adolescents who have friends who use alcohol and drugs are more likely to use marijuana (Exp (B) = 1.668), which is the third strongest predictor.

In the Russian model, the distribution of explanatory power among the predictors of adolescent marijuana use is somewhat different. Since the Russian data have some limitations and do not include measures of some characteristics of peer groupings that the Russian adolescents belong to, only two variables that measure the level of attachment and trust to friends emerged as significant predictors of marijuana use. Thus, those Russian adolescents who are strongly attached to friends are 1.9 times as likely to use marijuana and those who have a high degree of trust to friends are 1.5 times as likely to become a marijuana user. It is should be mentioned that the variable measuring the level of trust to friends is the fourth strongest predictor in the Russian model, however it is one of the variables that are in the main research focus.

In addition, in the Russian model, the elimination of the two influential predictors that measure adolescents' own alcohol and tobacco use, brings such factor as school performance into play. Thus, having low school performance increases the log odds of using marijuana by 1.5. This fact provides some grounds in support of Hirschi's control theory: the low attachment to school measured by low school performance can provoke

deviant behaviours, such as marijuana use. It can be assumed that for those Russian students who have used alcohol or tobacco, school performance is no longer a predictor of marijuana use since it did not emerge as a significant independent variable in the integrated model with all the predictors included. In addition, the background variables describing gender and family structure remained to be significant predictors of marijuana use and support previous results.

In the Canadian model, the two variables, which did not explain any variance of the outcome variable in the previous model that included all the predictors, became significant after exclusion of the variables measuring adolescents' own alcohol and cigarette consumption. These variables are in the main research interest and measure trust to parents and parents' smoking. Thus, adolescents who have high level of trust to parents are less likely to use marijuana (Exp (B) = .964), and parents' use of cigarettes increases the odds of marijuana use by 1.418. It is evident that family and parents' behaviours can influence children's involvement in deviant behaviours, such as marijuana use, and adoption of socially disapproved behaviours. This provides some evidence in support of Hirschi's control theory, which proposes that the broken ties with parents may provoke deviant behaviours.

6. Conclusion

6.1. Summary of Findings

The purpose of this study was to describe the prevalence of marijuana use in Russia and Canada, find out the characteristics that distinguish marijuana users from non-users, and determine the most influential elements of adolescents' social environment in mediating marijuana use and differences that the two countries have.

The analysis of the prevalence of marijuana use among the Russian and Canadian adolescents revealed that the level of marijuana use is significantly higher among the Canadian adolescents compared to the Russian ones: 43.9 percent of adolescents in Canada versus 13.6 percent in Russia use marijuana. In addition, in Russia, the current marijuana users are predominantly men, while in Canada marijuana use is common for both males and females. The level of marijuana use is significantly higher among those who live with one parent, both in Russia and Canada, as opposed to those who live with two parents. The economic status of the family has not emerged as the factor that greatly affects marijuana use in Canada; however, in Russia, those adolescents whose families have very low economic status are more likely to use marijuana.

Comparing adolescents who use marijuana with those who do not has shown a number of similarities in Russia and Canada. Thus, marijuana users are more likely to have lower school performances and tend to have less liking for school in both Russia and Canada. In addition, the Russian and Canadian adolescents of the "risk" group have higher degrees of attachment and trust to peers. Marijuana users in Russia and Canada are more likely to use alcohol and tobacco compared to those who reject marijuana use.

Some additional characteristics of marijuana users in Canada have been examined due to their availability. Thus, in the Canadian sample, it is indicative that those who use marijuana tend to have low level of trust for parents compared with those who reject marijuana use. In addition, in the group of the Canadian marijuana users there are more students whose parents smoke compared with those who do not use marijuana.

The analysis of correlations in the Russian and Canadian samples has shown some interesting relationships between adolescent marijuana use and its predictors. In both countries, it is evident that the adolescent marijuana use and young people's consumption of alcohol and tobacco are strongly and positively correlated. These two predictors have the strongest relationship with marijuana use in both Canada and Russia.

The analysis of the relationship between marijuana use and its predictors that measure some characteristics of social environment revealed some similarities between the countries. Thus, adolescent marijuana use corresponds to the strong attachment to peer groupings in both Russia and Canada. It has been also found, both in Russia and Canada, that some variables that measure attachment to school, such as school performance and the level of liking school, have an important role in mediating adolescent marijuana use. Thus, the students who have poor school performance and do not like school are more likely to use marijuana in both countries. The relationship between marijuana use and school related variables is weaker for Russia compared to Canada. The less influential role of school in Russia can be to some extent explained by the overall rapid degradation of social institutions of socialization in the country during the post-soviet period and decreasing of their influence on young population.

In addition, the Canadian data revealed that the low level of trust to parents corresponds to adolescents' marijuana use. Also, in the Canadian sample, it has been shown that friends' and parents' consumption of the toxic substances have significant association with adolescent marijuana use. This indicates that adolescent marijuana use is more likely to happen when the main agents of close environment use any types of drugs.

The correlation analysis also shows that in the two countries males are more likely to use marijuana. Among other factors that are external to the analysis, living with one parent emerged as a factor that correlates with adolescent marijuana use in both countries, which supports previously obtained results.

The first part of the multivariate regression analysis that includes the regression models run by major blocks of variables separately helped revealing the significant predictors of adolescent marijuana use for further analysis. Thus, it has been revealed that in Canada there are 13 variables that explain the variance of the dependent variable in the separate logistic regression models, which are trust to parents, parents' smoking, school performance, level of liking school, attachment to teachers, attachment to peers, friends' smoking, friends' use of alcohol and drugs, respondents' own consumption of alcohol and cigarettes, gender, and family structure. In Russia, 8 variables contribute to the explanation of the variance of the outcome variable: school performance, level of liking school, attachment to peers, trust to friends, respondents' own use of alcohol and cigarettes, gender, and family structure. The integrated logistic regression models show that the most influential predictors of adolescent marijuana use in both countries are those measuring respondents' own use of alcohol and cigarettes. This finding supports the assumptions of gateway theory. The degree to which young people are attached to their

friends is the third strongest predictor of marijuana use in both Russia and Canada, which supports peer cluster theory that argues that peer influence on the development of deviant behaviours is the strongest among all the elements of social environment.

Since the variables measuring young people's own consumption of alcohol and cigarettes are not in the main research interest yet very influential predictors of marijuana use, the regression models that exclude the influence of these variables have been examined as well. The Canadian model shows that the most influential predictors of marijuana use are those that measure some characteristics of peer environment. Thus, the high level of attachment to peers, friends' use of cigarettes, alcohol, and drugs are the strongest predictors of adolescent marijuana use in Canada. The second strongest group of variables that influence adolescent marijuana use in Canada includes variables measuring family influence. Therefore, parents smoking and low degree of children's attachment to their parents can provoke marijuana use. These results to some extent support both peer cluster theory and Hirshi's social control theory. In Russia, the strongest predictor of adolescent marijuana use is the level of attachment to peers, which supports peer cluster theory. In addition, the level of trust to friends contributes to the explanation of the dependent variable's variance. Another two factors, such as school performance and family structure appeared to be significant predictors of adolescent marijuana use in Russia, which partly supports Hirschi's social control theory suggesting that the low degree of attachment to school can influence the development of deviant behaviours.

6.2. Discussion

This section of the chapter summarizes the most important results of the study and their implications, discusses the theories that have been considered in the analysis and their contribution to the explanation of marijuana use in Canada and Russia, and reviews the main research hypotheses and some circumstances of marijuana use in the two countries.

In this study, several major theories that provided the theoretical framework for the analysis have been discussed and to some extent have found support by the findings. This study demonstrates that the strongest predictor of adolescent marijuana use in both countries is young people's use of alcohol and cigarettes. This finding supports gateway theory, which identifies the use of alcohol and tobacco as the first gate to the use of marijuana and then harder drugs. Although the causal relationship between the use of legal drugs and marijuana has not been proved, it is likely that marijuana users have had experience of using alcohol and tobacco. Therefore, both the Russian and Canadian adolescents who have used alcohol and cigarettes have higher likelihood of getting involved in marijuana use, which supports one of the hypotheses of the current study suggesting that consumption of licit drugs provokes marijuana use among the Russian and Canadian adolescents. The influence of these predictors of marijuana use is similar in both countries, which indicates that gateway theory can find some support despite of cultural differences between countries.

Since the variables describing adolescents' social environment and its influence on the expansion of marijuana use are in the major research focus of this study, the additional analysis eliminating the influence of the two predictors measuring adolescents'

alcohol and cigarette use have been conducted in order to estimate the role of the major predictors. The findings of this analysis yield some interesting results and partly support some research hypotheses. The Canadian and Russian models show that the most influential element of adolescents' social environment in mediating marijuana use is peers and attachment to them, which supports peer cluster theory. The high level of attachment to friends and their involvement in the use of any types of drugs, such as cigarettes, alcohol, or illicit drugs, distort adolescents' conception of what is socially accepted and what is not and provoke deviant behaviours. Having friends to whom the adolescent is highly attached increases the odds of getting involved in the similar behaviours that have been practiced by their friends in order to be accepted by the group, strengthen the sense of belonging to friend circles, look "cool", or some other reasons. Thus, the adoption of these patterns of socially disapproved behaviours happens faster and involves less doubts and barriers when supported by close friends. The results demonstrate that the Russian adolescents' attachment to friends has slightly stronger influence on the development of marijuana use among adolescents compared with the one that the Canadian youth have. In addition, high level of trust to friends is significant predictor of adolescent marijuana use in Russia, while in Canada this factor did not appear as an influential predictor. Therefore, it gives some grounds to assume that the Russian adolescents are being exposed to greater peer influence in the process of the development of marijuana use behaviours compared with the Canadian counterparts, which supports one of the research hypotheses. It can be partly explained by the weakening of the major social institutions in Russia, such as family and school, due to the transitional period and low social stability that the country has been exposed to over last

decades. In Canada, it has been also found that friends' involvement in the use of cigarette, alcohol, and drugs increase risks to get involved in marijuana use. Friends' consumption of licit and illicit drugs increases the availability of drugs and makes easier to make a first try. This finding supports one of the research hypotheses stating that adolescents are more likely to use marijuana if they have friends who use any drugs, including licit drugs. Since the variables measuring friends' consumption of licit and illicit drugs were not available in the Russian data, this relationships have not been examined. However, it could be hypothesized that if they were available for the analysis, they would be influential predictors of marijuana use as well, since peers have similar influence in both countries and the degree to which young people are attached to their friends is a strong predictor of adolescent marijuana use in both Russia and Canada.

Furthermore, findings indicate that in Canada family plays some role in mediating adolescent marijuana use, even though its influence is significantly lower compared with one that peers have. The level of trust to parents may indicate the degree of children's closeness to their parents and degree to which parents are considered authoritative and influential in mediating the process of making serious decisions. In Canada, parents have some power in protecting their children from marijuana use in case of the high degree to which children are attached to them, which support the major hypothesis of social control theory and assumption of this study. It is evident that the high level of trust to parents can appear as a protective factor against marijuana use and the lack of trust to parents may increase the odds of getting involved in the use of toxic substances. In Russia, the variable measuring some characteristics of family environment of adolescents was not a significant predictor of adolescent marijuana use in the primary regression analysis,

therefore, has not been included in the analysis in later stages. It could be explained by either low reliability of this index in the Russian data or insignificant role of this institution in mediating marijuana use in Russia, which support previously discussed assumptions. One of the research hypotheses argues that the degree of attachment to family among the Russian adolescents is weaker compared with the Canadian ones due to the overall degradation of social institutions and weakening of the influence of the family during the transitional period. Moreover, the Russian findings show that living with only one parent is one of the strongest predictors of adolescent marijuana use, while in Canada this indicator is not significant. In Russia, having only one parent increases risks for children to be neglected and experience the lack of parental care and control since the parent has to support the family financially and often work long hours. It could be assumed that in Canada, single parents have more opportunities to spend time with their children due to having an advanced social support and benefits from the government, which maintains the institution of family and makes it stronger despite the number of parents that the family includes. It partly supports the assumption that the institution of family in Russia is noticeably weaker compared with the Canadian one due to the low support from the government, economic changes in society, and other factors.

The hypothesis suggesting that the low level of students' attachment to school and low school performance correspond to higher risks of getting involved in marijuana use has been partly supported by the Russian findings. Therefore, low school performance appears as a significant predictor of adolescent marijuana use in Russia. These results to some extent support Hirschi's social control theory arguing that low bonding to school may provoke deviant behaviours. Low school performance or failure in studies may lead

to the loss of the sense of belonging to school environment and weakening of the level of attachment to teachers and schoolmates, thus provoke the strengthening of the relationship with close friends and increase risks of using drugs, including marijuana. It was hypothesized that in Canada the institution of family has strong influence in mediating adolescent marijuana use and protecting from its initiation, however, this hypothesis did not find any support. It can be assumed that it is caused by different reasons of drug use that the Canadian and Russian students have. Therefore, since marijuana use is more common in Canada than in Russia, and since it is considered as usual practice among youth due to permissive attitudes toward its use in society, the reasons of using marijuana can be primarily entertaining and are not related to failures in life. To the contrary, in Russia, marijuana use may be considered as a mean to cope with stresses, failures, and social isolation, therefore, failure in studies can provoke marijuana use among young people.

In short, this study shows that the most influential predictor of adolescent marijuana use among those that describe the dimensions of social environment is the strong attachment to peers in both Russia and Canada. Peer groupings, level of attachment and trust to them, and some behavioural characteristics of peers take a critical role in mediating adolescent marijuana use, which supports the main hypothesis of the peer cluster theory and the assumptions of the current analysis. Social control theory has also found some support by the findings, which demonstrate that the family has some influence on the expansion of adolescent marijuana use in Canada, while in Russia school can partly affect young people's involvement in the use of marijuana.

6.3. The Research Limitations

The current study has a number of limitations that may have created some biases in the course of the analysis. This section addresses the most important limitations. First, the research includes a number of questions of sensitive nature, which may have affected the truthfulness of respondents' answers and response rate. The questions about whether respondents have ever tried marijuana, how often they use alcohol and cigarettes, and other questions of this nature can generate fears about being exposed to inattentive disclosure to other people that can results in stigmatizing and punitive consequences. Although the anonymity of participation in the survey and confidentiality of obtained information was guaranteed, some biases could have appeared considering that the respondents were people of young age and questions they have been asked regarded underage drinking, consumption of illegal drugs, and other questions. Moreover, the level of truthfulness in responses and disclosure of sensitive information about marijuana use can be different for the Russian and Canadian adolescents. As was previously shown, marijuana use is more common among the Canadian adolescents than among their Russian counterparts, which to some extent can make questions about marijuana use less sensitive for the Canadian youth. In addition, Canada can be considered as having more permissive culture in terms of marijuana use compared with Russia. Therefore, the level of openness that youth have answering sensitive questions and truthfulness of their responses can be higher in Canada compared with Russia since marijuana use is considered a common activity for the Canadian youth.

Second, young people, who are in the focus of this research, were reporters of the information, and the study did not rely on answers of other persons. On one hand, it can

be considered as a benefit of the study since the responses about behaviours and activities were received from the people who actually participated in and practiced these behaviours and activities. On the other hand, this research does not allow verifying young people's answers and comparing them with the answers of their parents or teachers who can have provided more exact and reliable information about some aspects of adolescents' lives, such as how much time they spend away from home, how well they perform at school, and other aspects.

Some biases can also relate to the research techniques and methods that have been used in the HBSC study. Hence, the way of sampling, which is a cluster sampling, could have produced some additional errors since the data were collected within the same class and students' answers tend to have similar characteristics. In addition, the Russian survey instrument is a translation of the international English version of the questionnaire; therefore, it could have distorted the meaning of questions that were originally created and affected the validity of obtained information in Russia.

The Russian data set that has been used in the analysis has a few limitations. First, the fact that some variables used in Canadian survey were optional in Russia does not allow making a comparative analysis with the same number of variables for both countries. Therefore, in the Russian data, there were not enough variables measuring the relationships between adolescents and their parents and some additional characteristics of parents and peers that may affect adolescent marijuana use. Thus, due to the limitations of the Russian data some conclusions, such as about the family's role in mediating marijuana use, are mostly based on the results for Canada. Another limitation that the Russian data has is the sample that is limited to the area of St. Petersburg. The St.

Petersburg area is not representative of the eastern part of Russia due to the differences in economic status of the population, people's life styles, and some social-demographic characteristics. The St. Petersburg area accumulates more resources than many cities in the eastern part of Russia, which makes the standard of living and economic status of people living in St. Petersburg significantly higher. In addition, this area does not lie along the main drug trafficking routs compared with Southeastern part of the country, which creates fewer risks for drug use. Therefore, generalizations cannot be made for the entire country and the interpretations of results should be made with caution.

6.4. Future Research

The findings of this study entail some need and ideas for future research. First, the research can be expanded to additional types of drugs, such as opiates, which have higher prevalence in Russia when compared to Canada. Considering wider spectrum of drugs that adolescents consume will allow making a comparative analysis between risk factors that provoke use of different types of drugs and determining peculiarities of drug use in different countries. Moreover, considering a greater variety of drugs will allow describing not only frequency of drug use but also intensity, which is how many different drugs adolescents use and have tried. In addition, consumption of licit drugs, such as alcohol and tobacco, can be considered in detail in the further analysis since these predictors have strong predictive power in both countries as this study shows. The inclusion of indicators measuring the frequency of alcohol and tobacco consumption, the circumstances of its use, the types of the licit drugs used, and other factors and their influence on the progression to the use of illicit drugs can be beneficial for the analysis.

Further comparison of risk factors for drug use can also include longitudinal analysis that look at changes in prevalence of drug use and in effects that adolescents' social environment have upon the expansion of drug use among youth over time. A longitudinal study allows collecting data about different times in young people's lives and exploring how drug use behaviours are influenced by social environment that in turn is affected by changes is social and economic contexts.

Future research can entail the identification of other countries with the purpose of making a comparative analysis of risk factors for drug use that exist in different countries. The current study includes countries with different economic, cultural, political, and social circumstances. Therefore, it makes Canada to be considered a control country due to its long-term political and economic stability and Russia to be considered as having a social climate that may generate a greater number of risks for various deviant behaviours due to the changes in political and economic orders and overall decrease in effectiveness of social institutions in the last decades. However, as the results shows, marijuana use is more common for the Canadian adolescents compared with the Russian ones. Thus, it could be assumed that external macro-level factors can affect the expansion of marijuana use in different ways; and in order to control for these factors and find out the differences in risk factors, countries with similar cultural, economic, and political circumstances can be taken for the analysis, such as the United States of America and Canada.

Finally, it can be beneficial for the analysis to look at the differences in the risk factors for marijuana use or some other drugs for different age and gender groups. As the analysis shows, males are at the higher risk to become a marijuana use as females;

therefore, former group may have some additional risk factors that take a role in mediating drug use compared with the latter one and that should be considered as well. Analysing gender groups and risk factors separately may give a better description of what risk factors female and male adolescents are being exposed to and what the differences are. Comparing age groups can provide an insight into the differences between the most important and influential risk factors for adolescents of different ages and identify the influence of each element of social environment on expansion of marijuana use in different stages of adolescents' lives. There is a hypothesis that some social institutions become most influential during different stages of adolescents' lives. Thus, it can be assumed that family is the most important social institute during the early stages and influences young people's behaviours and attitudes since early childhood. Then school takes part in the process of formation of youth's personalities and attitudes and may affect their experiences later. In spite of the fact that friends appear in our lives in the early childhood, they become influential in the later stages. For example, at the elementary school peers are not yet influential in term of affecting attitudes, behaviours, and decisions as much as at the later stages. Therefore, longitudinal analysis of risk factors for drug use for a particular cohort of adolescents together with the analysis of differences between adolescents of different ages can be done in order to get deep insight into the dynamics of the process of mediating drug use by social institutions and the importance of each of them during lifetime.

6.5. Conclusion

The purpose of this study is to examine what risk factors may provoke adolescent marijuana use in Canada and Russia, to determine which of them are the most influential, and to see if there are any differences in major predictors of adolescent marijuana use across countries. The main research focus has been made on the factors that lie in the social environment of adolescents: family, school, and peers, which have been determined in accordance with Hirschi's control and peer cluster theories. In addition, this research accounts for some additional factors measuring adolescents' own consumption of alcohol and tobacco, inclusion of which is validated by gateway theory. The comparative nature of this analysis and application of some theories developed by North American researchers to Russia represent the significance and contribution of this study.

This research yields several major findings. It demonstrates that despite the differences in cultural, political, economic, and social circumstances between Canada and Russia, the most influential element of adolescents' social environment in mediating marijuana use in both countries is peers, which corresponds with the assumptions of peer cluster theory. The degree to which adolescents are attached to their friends and trust them and also acceptance of drugs in friends circles create most risks for adolescent marijuana use.

In addition to the general finding, this analysis shows that adolescents' involvement in the use of alcohol and cigarettes, which is considered as an additional factor that may influence marijuana use in this study, have a strong impact on the expansion of marijuana use in both Russia and Canada. This finding does not contradict

the conclusions of precious studies about the importance of gateway drugs and suggests that alcohol and cigarettes are important gateway drugs among adolescents cross-nationally.

However, the analysis presented here provide little support for the assumption that family and school have strong influence on the development of adolescent marijuana use behaviours. Parents' use of licit drugs and low level of trust between parents and children can to some extent influence young people's marijuana use in Canada, while in Russia failure at school produce some risks for marijuana use. It should be also mentioned that these results partly affected by the fact that not enough variables were available for the compete estimation of the influence of these two elements of adolescents' social environment.

The findings of this study are beneficial for the reflection on the broader context of adolescent marijuana use and will hopefully provide the basis for further development of cross-national research useful for the elaboration of drug-prevention programs and policies directed on mitigation of adolescent deviant behaviours globally, including the use of marijuana and other drugs.

Bibliography

Adlaf, E. M. and Paglia-Boak, A. (2005). Drug Use among Ontario Students 1977-2005: Detailed OSDUS Finding. Toronto: Centre for Addiction and Mental Health. Retrieved April, 20, 2005 http://www.camh.net/Research/Areas_of_research/Population_Life_Course_Studies/OSDUS/OSDUS2005_DrugDetailed_final.pdf

Anslinger, J. H. and Cooper, C. R. (1995). Marijuana: Assassin of Youth. In Teweles, C. (eds.). The American Scene: An Anthology. Los Angeles: Roxbury Publishing Company. Pp. 88-93

Akers, R. L. (1977). Deviant Behavior: A Social Learning Approach. Second Edition. Belmont: Wadsworth

Akers, R. L. (1985). Deviant Behavior: A Social Learning Approach. Third Edition. Belmont: Wadsworth

Akers, R. L. (1994). Criminological Theories: Introduction and Evaluation. Los Angeles, CA: Roxbury

Akers, R. L. and Cochran, J. K. (1985). Adolescent Marijuana Use: A Test of Three Theories of Deviant Behavior. Deviant Behavior, 6; Pp. 323-346

Akers, R. L. and Lee, G. (1999). Age, Social Learning, and Social Bonding in Adolescent Substance Use. Deviant Behavior: An Interdisciplinary Journal, 19; Pp. 1-25

Akers, R. L., Krohn, M. D., Lanza-Kaduce, L., and Radosevich, M. (1979). Social Learning and Deviant Behavior: A Specific Test of a General Theory. American Sociological Review, 44; Pp. 636-655

Aref'ev, A.L. (2003). A Generation That Russia is losing. Russian Education and Society. Vol. 45, No. 11; Pp. 23-41

Barnes, G. M. and Welte, J. W. (1986). Patterns and Predictors of Alcohol Use among 7-12th Grade Students in New York State. Journal of Studies on Alcohol, 47; Pp. 53-62

Benda, B. B. (1994). Testing Competing Theoretical Concepts: Adolescent Alcohol Consumption. Deviant Behavior, 15. Pp. 375-396.

Bikov, S. A. (2000). Narkomaniya sredi molodeji kak pokazatel' desadaptirovannosti. Socioilogicheskie issledovaniya. (Drug Use among Young People as an indicator of disadaptation. Social Research), 4; Pp. 48-52.

Blaikie, N. (1991). A critique of the use of triangulation in social research. Quality and Quantity, 25. Pp. 115-136

Blaze-Temple, D. and Lo, S. K. (1992). Stages of Drug Use: A Community Survey of Perth Teenagers. British Journal of Addiction, 87, 2; Pp. 215-225

Brener, N. D., Kann, L., McManus, T., Kinchen, S. A., Sundberg, E. C. and Ross, J. G. (2002). Reliability of the 1999 Youth Risk Behavior Survey Questionnaire. Journal of Adolescent Health, 31; Pp. 336-342.

Brook, J. S., Brook, D. W., Gordon, A. S., Whiteman, M., and Cohen, P. (1990). The Psychosocial Etiology of Adolescent Drug Use: A Family International Approach. Genetic, Social, and General Psychology Monographs, 116 (Whole No. 2).

Butters, J. E. (2004). The Impact of Peers and Social Disapproval on High-Risk Cannabis Use: Gender Differences and Implications for Drug Education. Drugs: Education, Prevention and Policy. Vol. 11, No. 5; Pp. 381-390

Canadian Addiction Survey (2004): Prevalence of Use and Related Harms. Highlights Reports. Retrieved July, 28, 2006 http://www.ccsa.ca/NR/rdonlyres/B2C820A2-C987-4F08-8605-2BE999FE4DFC/0/ccsa0048042004.pdf

Carlini-Marlatt, B., Gazal-Carvalho, C., Gouveia, N., and Souza, M. de F. M. (2003). Drinking Practices and Other Health-Related Behaviors Among Adolescents of Sao Paulo City, Brazil. Substance Use and Misuse, Vol. 38, No. 7; Pp. 905–932

Cochran, J. and Akers, R. (1992). An Exploration of the Variable Effects of Religiosity on Adolescent Marijuana and Alcohol Use. Journal of Research and Crime and Delinquency, 26; Pp. 198-225

Coleman, J. C. The Adolescent Society. New York: The Free Press, 1961

Currie, C., Hurrelmann, K., Settertobulte, W., Smith, R., and Todd, J. (eds) (2000). Health and Health Behaviour among Young People. WHO Policy Series: Health Policy for Children and Adolescents Issue 1, WHO Regional Office for Europe, Copenhagen. Retrieved June, 10 2006. http://www.hbsc.org/downloads/Int_Report_00.pdf

Currie, C., Roberts, C., Morgan, A., Smith, R., Settertobulte, W., Samdal, O., and Rasmussen, V.B. (eds). (2004). Young People's Health in Context. Health Behaviour in School-aged Children (HBSC) Study: an International Report from the 2001/2002 Survey. Health Policy for Children and Adolescents, No. 4. Retrieved July, 20 2006 http://www.euro.who.int/eprise/main/who/informationsources/publications/catalogue/20040518_1

Novins, D. K. and Mitchell, C. M. (1998). Factors Associated with Marijuana Use Among American Indian Adolescents. Addiction, 93 (11); Pp. 1693-1702

Du, Y., Akritas, M.G., Arnold, S.F., and Osgood, D.W. (2002). Nonparametric Analysis of Adolescent Deviant Behavior. Sociological Methods and Research, Vol. 30 No. 3; Pp. 309-340

Durkin, K. F., Wolfe, T. W., and Clark G. A. (2005). College Students and Binge Drinking: An Evaluation of Social Learning Theory. Sociological Spectrum, 25; Pp. 255-272

Elliott, D. S., Huizinga, D., and Ageton, S.S. (1985). Explaining Delinquency and Drug Use. Beverly Hills, CA: Sage.

Evidence to the Home Affairs Committee Inquiry into drug policy (2001). Cannabis and the Gateway Hypothesis. Retrieved December 1, 2006 http://www.drugscope.org.uk/druginfo/evidence-select/cannabisgateway.htm

Eylesa, J., Brimacombeb M., Chaulkc P., Stoddartd G., Prangere T., and Moasee O. (2001). What Determines Health? To Where Should We Shift Resources? Attitudes towards the Determinants of Health among Multiple Stakeholder Groups in Prince Edward Island, Canada. Social Science & Medicine, 53; Pp. 1611–1619

Federal Drug Circulation Control Service of Russian Federation. (2005) Dangerous dose: online article. Retrieved July 28, 2005 http://ugnk.mos.ru/stat12_10_2005.shtml

Federal State Statistics Service. Russia. (2007). International Migration. Retrieved August 6, 2007 http://www.gks.ru/wps/portal/!ut/p/.cmd/cs/.ce/7_0_A/.s/7_0_3Q9/_th/J_0_9D/_s.7_0_A/7_0_2BD/_me/7_0_2BC-7_0_A/_s.7_0_A/7_0_3Q9

Fleming, J. P., Kellam, S. G., and Brown, C. H. (1982). Early Predictors of Age at First Use of Alcohol, Marijuana and Cigarettes. Drug and Alcohol Dependence, 9; Pp. 285-303.

Fox, J. A. and Tracy, P. E. (1986). Randomized Response: a Method for Sensitive Surveys. Beverly Hills: Sage.

Gerevich, J. and Bacskai, E. (1996). Protective and Risk Predictors in the Development of Drug Use. Journal of Drug Education, Vol. 26(1); Pp. 25-38.

Goode, E. (1973). The Drug Phenomenon: Social Aspects of Drug Taking. New York: The Bobbs-Merrill Company, Inc.

Grinspoon L. and Bakalar J. (1995). Marijuana: The Forbidden Medicine. In Teweles, C. (eds.). The American Scene: An Anthology. Los Angeles: Roxbury Publishing Company. Pp. 100-105

Gvozdeva G. P., Korotkikh M. V., Harchenko I. I. (2004). Social'noe okrujenie shkol'nikov i opasnost' priobshenia k narkotikam. Region: ekonomika i sociologiya. (Social environment of schoolchildren and risks of turning to drugs. Region: economics and sociology), 2; Pp. 79-95

Guba, E. G. and Lincoln, Y.S. (1994). Competing Paradigms in Qualitative Research. In Denzin, N. and Lincoln, Y.S. (eds.). Handbook of Qualitative Research. Thousand Oaks: Sage: Pp.105-117.

Hanson, G., Venturelly, P. J., Fleckenstein, A. E. (2001). Drugs and Society. (Sixth Edition). Boston: Jones and Bartlett Publishers

Hawkins, J. D., Catalano, R. F., and Miller, J. Y. (1992). Risk and Protective Factors for Alcohol and Other Drug Problems in Adolescence and Early Adulthood: Implications for Substance Abuse Prevention. Psychological Bulletin, Vol. 112, No. 1; Pp.64-105.

Hayes, M. V. and Dunn, J. R. (1998). Population health in Canada: A systematic review. Ottawa: Canadian Policy Research Networks, CPRN study H01.

Hays, R. D. and Revetto J. P. (1990). Peer Cluster Theory and Adolescent Drug Use: a Reanalysis. Journal of Drug Education. Vol. 20 (3); Pp. 191-198

Health Canada (1995). Horizons Three Young Canadians' Alcohol and Other Drug Use: Increasing Our Understanding. Edited by David Hewitt, Garry Vinje& Patricia MacNeil. Retrieved April 15, 2005 http://www.hc-sc.gc.ca/dhp-mps/substan/alc-can/overview-apercu/index_e.html

Health Canada (2000). Straight Facts about Drugs and Drug Abuse. Retrieved July, 28, 2006 http://www.hc-sc.gc.ca/ahc-asc/alt_formats/hecs-sesc/pdf/pubs/drugs-drogues/straight_facts-faits_mefaits/facts-faits_e.pdf

Helweg-Larsen, K., Sundaram, V., Curtis, T., and Larsen, H. B. (2003). The Danish Youth Survey 2002: Asking young people about sensitive issues. Circumpolar Health. Pp. 147-152.

Hertzman, C. and Wiens, M. (1996). Child Development and Long-Term Outcomes: A Population Health Perspective and Summary of Successful Interventions. Social Science and Medicine, Vol. 43, No. 7; Pp. 1083-1095

Hirschi, T. (1969). Causes of Delinquency. Berkeley and Los Angeles: University of California Press, Ltd.

Human Development Report: Economic Growth and Human Development (1996). Retrieved July 28, 2006. http://hdr.undp.org/reports/global/1996/en/

Human Development Report: Globalization with a Human Face (1999). Retrieved July 28, 2006. http://hdr.undp.org/reports/global/1999/en/

Human Development Report: Human Rights and Human Development (2000). Retrieved July 28, 2006. http://hdr.undp.org/reports/global/2000/en/

Human Development Report: Making New Technologies Work for Human Development (2001). Retrieved July 28, 2006. http://hdr.undp.org/reports/global/2001/en/

Human Development Report: Deepening Democracy in a Fragmented World (2002). Retrieved July 28, 2006. http://hdr.undp.org/reports/global/2002/en/

Human Development Report: Millennium Development Goals: A Compact among Nations to End Human Poverty (2003). Retrieved July 28, 2006. http://hdr.undp.org/reports/global/2003/

Human Development Report: Cultural Liberty in Today's Diverse World (2004). Retrieved July 28, 2006. http://hdr.undp.org/reports/global/2004/?CFID=1661513&CFTOKEN=77657305

Human Development Report: International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World (2005). Retrieved July 28, 2006. http://hdr.undp.org/reports/global/2005/

Jo, M.-S. (2000). Controlling Social-Desirability Bias via Method Factors of Direct and Indirect Questioning in Structural Equation Models. Psychology & Marketing, 17; 2. Pp. 137–148.

Juravleva, L.A. (2000). Factori i Usloviya Narcotizacii Molodeji. Sociologicheskie Issledovaniya (Factors for and Circumstances of Drug Use among Young People. Social Research), 6; Pp. 43-48.

Kandel, D.B. (1975). Stages in Adolescent Involvement in Drug Use. Science, 190; Pp. 912-914

Kandel, D. B. (1978). Homophily, Selection and Socialization in Adolescent Friendships. American Journal of Sociology, 84; Pp. 427-436.

Kandel, D.B. (2002). Stages and Pathways of Drug Involvement: Examining the Gateway Hypothesis. New York, NY: Cambridge University Press.

Kandel, D. B. and Andrews, K. (1987). Processes of Adolescent Socialization be Parents and Peers. International Journal of Addictions, 22; Pp. 319-342.

Kang, S.-Y., Goldstein, M.F., and Deren, S. (2006). Health Care Utilization and Risk Behaviors among HIV Positive Minority Drug Users. Journal of Health Care for the Poor and Underserved, 17; Pp. 265–275

Lisovskii, V. T. and Yadov, V. A. (1975). Molodeg i sovremennost (Youth and the present). Leningrad: Znanie.

Maddahian, E., Newcomb, M. D., and Bentler, P.M. (1988). Adolescent Drug Use and Intention to Use Drugs: Concurrent and Longitudinal Analyses of Four Ethnic Groups. Addictive Behaviors, 13; Pp. 191-195.

Malikova, N. N. (2000). Tipologiya Otnoshenii Studentov k Narkomanii. Sociologicheskie Isselovaniya (Typology of Students' Attitudes to Drug Use. Sociological Research), 7; Pp. 50-58.

Materials for the Government Committee meeting (April – June 2001). (2001). Retrieved July 15, 2006. http://www.narkotiki.ru/committee_740.html

Matza, D. (1969). Becoming Deviant. Englewood Cliffs, N.J.: Prentice-Hall.

Nagasawa, R., Qian, Z., and Wong, P. (2000). Social Control Theory as a Theory of Conformity: The Case of Asian/Pacific Drug and Alcohol Nonuse. Sociological Perspectives, Vol. 43, Number 4; Pp. 581-603

Oetting, E. R., Beauvais, F. (1986). Peer Cluster Theory: Drugs and Adolescent. Journal of Counseling and Development, Vol. 65; Pp. 17-22.

Oetting, E. R., Beauvais, F. (1987a). Common Elements in Youth Drug Abuse: Peer Clusters and Other Psychosocial Factors. Journal of Drug Issues, spring; Pp. 133-151.

Oetting, E. R., Beauvais, F. (1987b). Peer Cluster Theory, Socialization Characteristics, and Adolescent Drug Use: A Pass Analysis. Journal of Counseling Psychology, 34; Pp. 205-213

Oetting, E. R., Swaim, R.C., Edwards, R.W., and Beauvais, F. (1989). Indian and Anglo Adolescent Alcohol Use and Emotional Distress: Path Models. American Journal of Alcohol and Drug Abuse, 15(2); Pp. 153-172

Ompad, D.C., Galea, S., Fuller, C.M., Edwards, V., and Vlahov, D. Ecstasy Use among Hispanic and Black Substance Users in New York City. Substance Use & Misuse, 40; Pp.1399–1407

Oxford, M. L., Harachi, T. W., Catalano, R. F., and. Abbott, R. D. (2000). Preadolescent Predictors Of Substance Initiation: a Test of Both the Direct and Mediated Effect of Family Social Control Factors on Deviant Peer Associations and Substance Initiation. American Journal of Drug and Alcohol Abuse, 27(4); Pp. 599-616.

Pishulin, N. P. and Pishulin, S. N. (2003). Moskvichi o Vliyaniyah Social'nih Faktorov na Uroven' Detskoi Besprizornosti, Voprosah Ee Profilaktiki, Problemah Narkomanii i Prostitucii. Pul's (Moscowers' Opinions about Influence of Social Factors on the Level of Child Neglect and Its Prevention, About Drug Use and Prostitution Problems. Pulse), 10 (282). Retrieved July 30, 2006. http://www.mos.ru/cgi-bin/pbl_web?vid=1&osn_id=0&subr_unom=2252&datedoc=0#Раздел%201.%20Состояние%20и%20динамика%20детской%20безнадзорности,%20отношение%20к%20данному%20социальному%20явлению%20%20московской%20общественности

Pozdnyakova, M. E. (1999) Narkomania: Situaciya, Tendencii I Problemi (Drug Use: Circumstances, Tendencies, and Problems). In Pozdnyakova M. E. (Eds.) Deti Podzemelya (Children of Vault). Moscow: Institute of Sociology of Russian Academy of Science; Pp. 73-86.

Rebellon, C. J. and Gundy, K. V. (2006). Can Social Psychological Delinquency Theory Explain the Link Between Marijuana and Other Illicit Drug Use? A Longitudinal Analysis of the Gateway Hypothesis. Journal of Drug Issues, Vol. 36, No. 3; Pp. 515-539

Rose, C. D. (1999). Peer Cluster Theory and Adolescent Alcohol Use: An Explanation of Alcohol Use and a Comparative Analysis between Two Casual Models. Journal of Drug Education, Vol. 29 (3); Pp. 205-215

Rosenberg, M. (2006). Population Decline in Russia. Retrieved August 3, 2007. http://geography.about.com/od/obtainpopulationdata/a/russiapop.htm

Schulenberg, J., Bachman, J. G., O'Malley, P. M., and Johnston, L. D. (1994). High School Educational Success and Subsequent Substance Use: A Panel Analysis Following Adolescents into Young Adulthood. Journal of Health and Social Behaviour, Vol. 35, No. 1; Pp. 45-62.

Shcherbakova, E.M. (2005). The Narcotics Invasion in Russia: What the Statistics Say. Sociological Research, Vol. 44, No. 5; Pp. 53-63

Selivanova, Z. K. (2002). Smislojiznennie Orientatcii Podrostkov. Sociologicheskie Issledovania. (Vital Semantic Orientations of Teenagers. Sociological Research), 2; Pp. 87-92.

Sellers, C.S. and Winfree, L.T., Jr. (1990). Differential Associations and Definitions: A Panel Study of Youthful Drinking Behavior. International Journal of The Addictions, Vol. 25, No. 7; Pp. 755-771

Social Encyclopedia. (2000). Edited by Gorkin, A. P. et al. Moscow: Large Russian Encyclopedia.

Spicer, L. (2002). Historical and Cultural Uses of Cannabis and the Canadian "Marijuana Clash". Prepared For The Senate Special Committee On Illegal Drugs. Law and Government Division. Retrieved August 1, 2007 http://www.parl.gc.ca/37/1/parlbus/commbus/senate/Com-e/ille-e/library-e/Spicer-e.htm#B.%20%20Cannabis%20Use%20in%20Canada

SPSS Base 9.0 User's Guide. Chapter 14, Crosstabs. Retrieved February 20, 2007. http://web.uccs.edu/lbecker/SPSS/ctabs1.htm

Statistics Canada. (2006). Components of population growth, by province and territory. Retrieved August 6, 2007. http://www40.statcan.ca/l01/cst01/demo33a.htm?sdi=migration

Statnotes: Topics in Multivariate Analysis, by G. David Garson. Logistic Regression. Retrieved January 28, 2007. http://www2.chass.ncsu.edu/garson/pa765/statnote.htm

Swaim, R. C. (1991). Childhood Risk Factors and Adolescent Drug Use and Alcohol Abuse. Educational Psychology Review, Vol. 3, No. 4; Pp. 363-397.

Swaim, R. C., Oetting, E. R., Thurman, P. J., Beauvais, F., and Edwards, R. (1993). American Indian Adolescent Drug Use and Socialization Characteristics: A Cross-Cultural Comparison. Journal of Cross Cultural Psychology, 24(1); Pp. 53-70

Swaim, R. C., Nemeth, J., Oetting, E. R. (1995). Alcohol Use and Socialization Characteristics among Hungarian Adolescents: Path Models. In Leukefeld Carl G. & Clayton, Richard (Ed.), Prevention Practice in Substance Abuse (pp. 47-63). New York: The Haworth Press, Inc.

Tabachnick G. B. and Fidell, L. S. (2001). Using Multivariate Statistics. Boston: Allyn & Bacon

Thompson, W. E., Mitchell, J., and Dodder, R. A. (1984). An Empirical Test of Hirschi's Control Theory of Delinquency. Deviant Behavior, Vol. 5, No. 1-4; Pp. 11-22

UCLA Academic Technology Services. Annotated SPSS Output. Logistic Regression. Retrieved January 16, 2007. http://www.ats.ucla.edu/stat/spss/output/logistic.htm

United Nations Organization World Drug Report. (2006). Retrieved August 25, 2006. (http://www.unodc.org/unodc/world_drug_report.html)

Winfree, L. T., Jr. and Bernat, F. P. (1998). Social Learning, Self-Control, and Substance Abuse by Eighth Grade Students: A Tale of Two Cities. Journal of Drug Issues, 28, No. 2; Pp. 539-538

Winfree, L. T., Jr. and Griffiths, C. T. (1983). Social Learning and Adolescent Marijuana Use: A Trend Study of Deviant Behavior in a Rural Middle School. Rural Sociology, 48(2); pp. 219-239

Winfree, L. T., Jr., Sellers, C. S., and Clason, D. L. (1993). Social Learning and Adolescent Deviance Abstention: Toward Understanding the Reasons for Initiating, Quitting, and Avoiding Drugs. Journal of Quantitative Criminology, Vol. 9, No. 1; Pp. 101-125

Yadov, V. A. (1995). Sociologicheskoe Issledovanie: Metodologiya, Programma, Metodi. Samara: Samarskii Universitet (Sociological Investigation: Methodology, Programme, Methods. Samara: Samara University).

Yang, X., Latkin, C., Celentano, D., and Luo, H. (2006). Prevalence and Correlates of HIV Risk Behaviors among Drug Users in China. AIDS and Behavior, Vol. 10, No. 1; Pp. 71-81

Young, T. K. (2005). Population health. New York: Oxford University Press

Appendix 1. Health Behaviour in School-Aged Children. Questionnaire.

* Only those questions that have been used in the analysis are included in the appendix. The questionnaire for Russia was not available; therefore, the Canadian version of the questions is shown below. The omitted parts of the questions that have not been used in the analysis marked with the sign "…..".

1. Are you male or female?

1 Male
2 Female

3. What year were you born? _____

6. Now we'd like to ask you about who you live with. Not everyone lives with both their parents. Sometimes people live with just one parent, sometimes they have two homes or two families. Please fill in column A for your main or your only home. ….

A Main or only home
Please mark all the people who live here. Adults:

1 Mother
2 Father
3 Stepmother (or father's girlfriend)
4 Stepfather (or mother's boyfriend)
…..

40. How easy is it for you to talk to the following persons about things that really bother you? (Please mark one box for each line)

	very	easy easy	difficult	very difficult	don't have or see this person
a. Father	□	□	□	□	□
b. Stepfather (or mother's boyfriend)	□	□	□	□	□
c. Mother	□	□	□	□	□
d. Stepmother (or father's girlfriend)	□	□	□	□	□
…..					
g. Best friend	□	□	□	□	□
h. Friends of the same sex	□	□	□	□	□
i. Friends of the opposite sex	□	□	□	□	□

41. At present, how many close male and female friends do you have? (Please mark one box each column)

Males	**Females**
1 None	1 None
2 One	2 One
3 Two	3 Two
4 Three or more	4 Three or more

42. How many days a week do you usually spend time with friends right after school?

1 0 days
2 1 day
3 2 days
4 3 days
5 4 days
6 5 days

43. How many evenings per week do you usually spend out with your friends?

1 0 evenings
2 1 evening
3 2 evenings
4 3 evenings
5 4 evenings
6 5 evenings
7 6 evenings
8 7 evenings

45. In your opinion, what does your class teacher(s) think about your school performance compared to your classmates?

1 Very good
2 Good
3 Average
4 Below average

47. How do you feel about school at present?

1 I like it a lot
2 I like it a bit
3 I don't like it very much
4 I don't like it at all

49. Here are some statements about the students in your class(es). Please show how much you agree or disagree with each one. (Please mark one box for each line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. The students in my class(es) enjoy being together	□	□	□	□	□
b. Most of the students in my class(es) are kind and helpful	□	□	□	□	□
c. Other students accept me as I am	□	□	□	□	□
d. When a student in my class(es) is feeling down, someone else in class tries to help	□	□	□	□	□

…..

50. Here are some statements about your teacher(s). Please show how much you agree or disagree with each one. (Please mark one box for each line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. I am encouraged to express my own views in my class(es)	□	□	□	□	□
b. Our teachers treat us fairly	□	□	□	□	□
c. When I need extra help, I can get it	□	□	□	□	□
d. My teachers are interested in me as a person	□	□	□	□	□
e. Most of my teachers are friendly	□	□	□	□	□

…..

51. Please show how much you agree or disagree with the following statements. (Please mark one box for each line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. If I have a problem at school, my parents are ready to help	□	□	□	□	□
b. My parents are willing to come to school to talk to teachers	□	□	□	□	□
c. My parents encourage me to do well at school	□	□	□	□	□
d. My parents are interested in what happens to me at school	□	□	□	□	□
e. My parents are willing to help me with my home work	□	□	□	□	□
…..					
g. I find school work difficult	□	□	□	□	□
h. I find school work tiring	□	□	□	□	□
i. I look forward to going to school	□	□	□	□	□
j. I like being in school	□	□	□	□	□
k. There are many things about school I do not like	□	□	□	□	□
l. I wish I didn't have to go to school	□	□	□	□	□
m. I enjoy school activities	□	□	□	□	□

52. How pressured do you feel by the schoolwork you have to do?

1 Not at all
2 A little
3 Some
4 A lot

58. How often have you been bullied at school in the past couple of months?

1 I haven't been bullied at school the past couple of months
2 It has only happened once or twice
3 2 or 3 times a month
4 About once a week
5 Several times a week

66. How often do you smoke tobacco at present?

1 Every day
2 At least once a week, but not every day
3 Less than once a week
4 I do not smoke

68. How many of your friends smoke tobacco?

1 All or almost all
2 More than half
3 Half
4 Less than half
5 Almost none
6 None

70. Do any of the following people smoke? (Please mark one box for each line)

	Smokes daily	Smokes sometimes	Does not smoke	Don't know	Don't have or see this person
1. Mother	□	□	□	□	□
2. Father	□	□	□	□	□

…..

72. At present, how often do you drink anything alcoholic, such as beer, wine or spirits like rum, vodka or gin? Try to include even those times when you only drink a small amount.
(Please mark one box for each line)

	Every day	Every week	Every month	Rarely	Never
a. Beer	□	□	□	□	
b. Wine	□	□	□	□	
c. Liquor/Spirits (i.e., rum, gin, vodka, etc.)	□	□	□	□	

75. How well off do you think your family is?

1 Very well off
2 Quite well off
3 Average
4 Not very well off
5 Not at all well off

87. Please show how much you agree or disagree with the following statements. (Please mark one box for each line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a. My parents understand me	□	□	□	□	□
….					
c. I have a happy home life	□	□	□	□	□
…..					
i. My parents trust me	□	□	□	□	□
….					
m. I have a lot of arguments with my parents	□	□	□	□	□
….					
o. There are times I would like to leave home	□	□	□	□	□
…..					
q. What my parents think of me is important	□	□	□	□	□
….					

88. Have you ever used or taken cannabis (e.g., hashish/marijuana/pot/grass)? (Please mark one box for each line)

	Never	Once or twice	3 to 5 times	6 to 9 times	10 to 19 times	20 to 39 times	40 times or more
a. In your life	□	□	□	□	□	□	□
…..							

94. How many of your friends do the following statements describe?

	None	A few	Some	Most	All
….					
b. My friends like school	□	□	□	□	□
c. My friends think getting good marks at school is important	□	□	□	□	□
d. My friends get along with their parents	□	□	□	□	□
….					
f. My friends use drugs to get stoned	□	□	□	□	□
g. My friends have been drunk	□	□	□	□	□
h. My friends play for sports teams	□	□	□	□	□

Appendix 2. Bivariate Correlation Matrixes

Table 1. Correlation Matrix for the Canadian Sample. Part 1

Correlations

		School Pressure	Attachment to Teachers	Attachment to Friends	Trust to Friends	Number of Friends	Friends' smoking	Friends' Negative Influence	Peer Rejection	Use of Tobacco	Use of Alcohol
Use of Marijuana	Pearson Correlation	.077**	-.215**	.200**	.075*	.060*	.280**	.520**	.049	.448**	.322**
	Sig. (2-tailed)	.009	.000	.000	.011	.042	.000	.000	.095	.000	.000
	N	1142	1135	1141	1148	1149	1148	1128	1151	1149	1147
Gender	Pearson Correlation	.020	.020	-.153**	.080**	-.017	.021	-.028	-.076**	-.013	-.071*
	Sig. (2-tailed)	.489	.498	.000	.005	.549	.473	.347	.008	.647	.013
	N	1212	1204	1210	1220	1221	1214	1142	1223	1216	1212
Economic Status	Pearson Correlation	-.091**	.134**	.047	.104**	.121**	-.004	-.076*	-.030	-.077**	-.040
	Sig. (2-tailed)	.002	.000	.105	.000	.000	.880	.011	.305	.007	.164
	N	1193	1184	1190	1200	1201	1201	1133	1203	1202	1201
Family Structure	Pearson Correlation	.069*	-.087**	.043	-.010	-.043	.041	.051	.057*	.057*	.006
	Sig. (2-tailed)	.017	.003	.141	.722	.139	.162	.086	.049	.049	.846
	N	1181	1173	1178	1188	1189	1183	1113	1191	1185	1181
Trust to Parents	Pearson Correlation	-.160**	.407**	-.031	.069*	.103**	-.141**	-.284**	-.137**	-.248**	-.141**
	Sig. (2-tailed)	.000	.000	.290	.019	.000	.000	.000	.000	.000	.000
	N	1141	1132	1139	1152	1147	1149	1102	1150	1151	1149
Parents' Involvement in Children's School Life	Pearson Correlation	-.102**	.373**	-.049	.054	.118**	-.097**	-.145**	-.083**	-.200**	-.065*
	Sig. (2-tailed)	.000	.000	.090	.064	.000	.001	.000	.004	.000	.025
	N	1192	1183	1187	1195	1196	1190	1120	1199	1192	1188
Parents' Smoking	Pearson Correlation	.016	-.124**	.171**	.044	-.050	.147**	.228**	.065*	.236**	.045
	Sig. (2-tailed)	.593	.000	.000	.144	.095	.000	.000	.030	.000	.131
	N	1115	1106	1108	1120	1119	1121	1054	1122	1122	1121
School Performance	Pearson Correlation	.054	-.224**	.076**	-.001	-.018	.121**	.156**	.054	.212**	.161**
	Sig. (2-tailed)	.060	.000	.008	.962	.540	.000	.000	.060	.000	.000
	N	1204	1196	1207	1212	1217	1206	1134	1216	1208	1204
Liking School	Pearson Correlation	-.270**	.470**	-.119**	.081**	.044	-.124**	-.234**	-.064*	-.239**	-.175**
	Sig. (2-tailed)	.000	.000	.000	.006	.128	.000	.000	.029	.000	.000
	N	1164	1157	1163	1167	1172	1163	1096	1171	1166	1161

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2. Correlation Matrix for the Canadian Sample. Part 2

Correlations

		Use of Marijuana	Gender	Economic Status	Family Structure	Trust to Parents	Parents' Involvement in Children's School Life	Parents' Smoking	School Performance	Liking School
Use of Marijuana	Pearson Correlation	1.000**	-.067*	-.052	.068*	-.257**	-.133**	.210**	.182**	-.245**
	Sig. (2-tailed)	.000	.023	.081	.022	.000	.000	.000	.000	.000
	N	1156	1156	1147	1126	1114	1132	1066	1148	1109
Gender	Pearson Correlation	-.067*	1.000**	-.003	-.023	-.103**	.019	-.008	-.124**	.105**
	Sig. (2-tailed)	.023	.000	.919	.426	.000	.507	.798	.000	.000
	N	1156	1228	1208	1196	1154	1203	1126	1220	1175
Economic Status	Pearson Correlation	-.052	-.003	1.000**	-.194**	.253**	.231**	-.102**	-.099**	.129**
	Sig. (2-tailed)	.081	.919	.000	.000	.000	.000	.001	.001	.000
	N	1147	1208	1208	1177	1146	1183	1114	1200	1157
Family Structure	Pearson Correlation	.068*	-.023	-.194**	1.000**	-.050	-.107**	.121**	.043	-.014
	Sig. (2-tailed)	.022	.426	.000	.000	.091	.000	.000	.140	.627
	N	1126	1196	1177	1196	1125	1172	1099	1189	1144
Trust to Parents	Pearson Correlation	-.257**	-.103**	.253**	-.050	1.000**	.514**	-.110**	-.230**	.378**
	Sig. (2-tailed)	.000	.000	.000	.091	.000	.000	.000	.000	.000
	N	1114	1154	1146	1125	1154	1132	1068	1146	1108
Parents' Involvement in Children's School Life	Pearson Correlation	-.133**	.019	.231**	-.107**	.514**	1.000**	-.170**	-.148**	.236**
	Sig. (2-tailed)	.000	.507	.000	.000	.000	.000	.000	.000	.000
	N	1132	1203	1183	1172	1132	1203	1104	1195	1160
Parents' Smoking	Pearson Correlation	.210**	-.008	-.102**	.121**	-.110**	-.170**	1.000**	.143**	-.156**
	Sig. (2-tailed)	.000	.798	.001	.000	.000	.000	.000	.000	.000
	N	1066	1126	1114	1099	1068	1104	1126	1118	1078
School Performance	Pearson Correlation	.182**	-.124**	-.099**	.043	-.230**	-.148**	.143**	1.000**	-.317**
	Sig. (2-tailed)	.000	.000	.001	.140	.000	.000	.000	.000	.000
	N	1148	1220	1200	1189	1146	1195	1118	1220	1171
Liking School	Pearson Correlation	-.245**	.105**	.129**	-.014	.378**	.236**	-.156**	-.317**	1.000**
	Sig. (2-tailed)	.000	.000	.000	.627	.000	.000	.000	.000	.000
	N	1109	1175	1157	1144	1108	1160	1078	1171	1175

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3. Correlation Matrix for the Canadian Sample. Part 3

Correlations

		School Pressure	Attachment to Teachers	Attachment to Friends	Trust to Friends	Number of Friends	Friends' smoking	Friends' Negative Influence	Peer Rejection	Use of Tobacco	Use of Alcohol
School Pressure	Pearson Correlation	1.000**	-.222**	.005	-.060*	-.044	-.001	.082**	.095**	.086**	.067*
	Sig. (2-tailed)	.000	.000	.872	.037	.128	.963	.006	.001	.003	.021
	N	1212	1190	1195	1205	1205	1200	1128	1208	1202	1198
Attachment to Teachers	Pearson Correlation	-.222**	1.000**	-.061*	.075**	.072*	-.105**	-.230**	-.100**	-.239**	-.136**
	Sig. (2-tailed)	.000	.000	.036	.010	.013	.000	.000	.000	.000	.000
	N	1190	1204	1187	1196	1197	1191	1122	1200	1193	1189
Attachment to Friends	Pearson Correlation	.005	-.061*	1.000**	.146**	.099**	.124**	.150**	-.037	.178**	.102**
	Sig. (2-tailed)	.872	.036	.000	.000	.001	.000	.000	.204	.000	.000
	N	1195	1187	1210	1202	1207	1196	1129	1205	1198	1194
Trust to Friends	Pearson Correlation	-.060*	.075**	.146**	1.000**	.143**	.116**	.089**	-.092**	.081**	.066*
	Sig. (2-tailed)	.037	.010	.000	.000	.000	.000	.003	.001	.005	.021
	N	1205	1196	1202	1220	1213	1206	1134	1215	1208	1204
Number of Friends	Pearson Correlation	-.044	.072*	.099**	.143**	1.000**	.071*	.060*	-.054	.001	.001
	Sig. (2-tailed)	.128	.013	.001	.000	.000	.014	.045	.061	.981	.980
	N	1205	1197	1207	1213	1221	1209	1136	1216	1209	1206
Friends' smoking	Pearson Correlation	-.001	-.105**	.124**	.116**	.071*	1.000**	.422**	-.018	.219**	.185**
	Sig. (2-tailed)	.963	.000	.000	.000	.014	.000	.000	.533	.000	.000
	N	1200	1191	1196	1206	1209	1214	1137	1210	1212	1209
Friends' Negative Influence	Pearson Correlation	.082**	-.230**	.150**	.089**	.060*	.422**	1.000**	.060*	.389**	.322**
	Sig. (2-tailed)	.006	.000	.000	.003	.045	.000	.000	.044	.000	.000
	N	1128	1122	1129	1134	1136	1137	1142	1137	1136	1136
Peer Rejection	Pearson Correlation	.095**	-.100**	-.037	-.092**	-.054	-.018	.060*	1.000**	.051	.063*
	Sig. (2-tailed)	.001	.000	.204	.001	.061	.533	.044	.000	.077	.029
	N	1208	1200	1205	1215	1216	1210	1137	1223	1212	1207
Use of Tobacco	Pearson Correlation	.086**	-.239**	.178**	.081**	.001	.219**	.389**	.051	1.000**	.203**
	Sig. (2-tailed)	.003	.000	.000	.005	.981	.000	.000	.077	.000	.000
	N	1202	1193	1198	1208	1209	1212	1136	1212	1216	1209
Use of Alcohol	Pearson Correlation	.067*	-.136**	.102**	.066*	.001	.185**	.322**	.063*	.203**	1.000**
	Sig. (2-tailed)	.021	.000	.000	.021	.980	.000	.000	.029	.000	.000
	N	1198	1189	1194	1204	1206	1209	1136	1207	1209	1212

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4. Correlation Matrix for the Russian Sample. Part 1

Correlations

		School Pressure	Attachment to Friends	Trust to Friends	Number of Friends	Peer Rejection	Use of Tobacco	Use of Alcohol
Use of Marijuana	Pearson Correlation	.035	.140**	.074**	.037	.030	.376**	.251**
	Sig. (2-tailed)	.084	.000	.000	.070	.146	.000	.000
	N	2427	2110	2417	2422	2426	2428	2423
Gender	Pearson Correlation	-.061**	-.088**	-.026	-.140**	-.049*	-.106**	-.103**
	Sig. (2-tailed)	.002	.000	.180	.000	.012	.000	.000
	N	2582	2250	2571	2577	2581	2583	2578
Economic Status	Pearson Correlation	-.053**	.054*	.074**	.086**	-.034	.019	-.027
	Sig. (2-tailed)	.008	.011	.000	.000	.087	.327	.172
	N	2580	2248	2570	2575	2580	2581	2576
Family Structure	Pearson Correlation	.033	.016	.016	-.043*	.019	.080**	.041*
	Sig. (2-tailed)	.095	.465	.413	.032	.333	.000	.037
	N	2544	2214	2533	2539	2543	2546	2540
Trust to Parents	Pearson Correlation	-.044*	.066**	.168**	.097**	-.032	-.046*	-.023
	Sig. (2-tailed)	.027	.002	.000	.000	.101	.019	.238
	N	2577	2249	2571	2576	2576	2578	2573
School Performance	Pearson Correlation	.081**	.065**	-.037	.039*	.035	.183**	.095**
	Sig. (2-tailed)	.000	.002	.059	.049	.077	.000	.000
	N	2579	2247	2568	2574	2577	2579	2574
Liking School	Pearson Correlation	.075**	.089**	-.019	-.013	.054**	.083**	.105**
	Sig. (2-tailed)	.000	.000	.331	.513	.006	.000	.000
	N	2581	2248	2569	2575	2579	2581	2576

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5. Correlation Matrix for the Russian Sample. Part 2

Correlations

		Use of Marijuana	Gender	Economic Status	Family Structure	Trust to Parents	School Performance	Liking School
Use of Marijuana	Pearson Correlation	1.000**	-.142**	.021	.067**	-.014	.089**	.069**
	Sig. (2-tailed)	.000	.000	.312	.001	.484	.000	.001
	N	2429	2429	2427	2392	2424	2425	2427
Gender	Pearson Correlation	-.142**	1.000**	-.022	-.007	-.125**	-.077**	-.013
	Sig. (2-tailed)	.000	.000	.267	.727	.000	.000	.510
	N	2429	2584	2582	2546	2579	2580	2582
Economic Status	Pearson Correlation	.021	-.022	1.000**	-.116**	.174**	-.041*	-.050*
	Sig. (2-tailed)	.312	.267	.000	.000	.000	.038	.011
	N	2427	2582	2582	2544	2577	2578	2580
Family Structure	Pearson Correlation	.067**	-.007	-.116**	1.000**	-.139**	.020	.023
	Sig. (2-tailed)	.001	.727	.000	.000	.000	.306	.254
	N	2392	2546	2544	2546	2541	2542	2544
Trust to Parents	Pearson Correlation	-.014	-.125**	.174**	-.139**	1.000**	-.095**	-.047*
	Sig. (2-tailed)	.484	.000	.000	.000	.000	.000	.017
	N	2424	2579	2577	2541	2579	2576	2577
School Performance	Pearson Correlation	.089**	-.077**	-.041*	.020	-.095**	1.000**	.123**
	Sig. (2-tailed)	.000	.000	.038	.306	.000	.000	.000
	N	2425	2580	2578	2542	2576	2580	2580
Liking School	Pearson Correlation	.069**	-.013	-.050*	.023	-.047*	.123**	1.000**
	Sig. (2-tailed)	.001	.510	.011	.254	.017	.000	.000
	N	2427	2582	2580	2544	2577	2580	2582

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6. Correlation Matrix for the Russian Sample. Part 3

Correlations

		School Pressure	Attachment to Friends	Trust to Friends	Number of Friends	Peer Rejection	Use of Tobacco	Use of Alcohol
School Pressure	Pearson Correlation	1.000**	.049*	.004	.004	.002	.068**	.068**
	Sig. (2-tailed)	.000	.020	.823	.838	.922	.001	.001
	N	2582	2248	2569	2575	2579	2581	2576
Attachment to Friends	Pearson Correlation	.049*	1.000**	.156**	.089**	-.021	.182**	.149**
	Sig. (2-tailed)	.020	.000	.000	.000	.329	.000	.000
	N	2248	2250	2241	2248	2248	2249	2244
Trust to Friends	Pearson Correlation	.004	.156**	1.000**	.121**	-.031	.088**	.108**
	Sig. (2-tailed)	.823	.000	.000	.000	.112	.000	.000
	N	2569	2241	2571	2568	2568	2570	2565
Number of Friends	Pearson Correlation	.004	.089**	.121**	1.000**	-.061**	.052**	.034
	Sig. (2-tailed)	.838	.000	.000	.000	.002	.008	.081
	N	2575	2248	2568	2577	2574	2576	2571
Peer Rejection	Pearson Correlation	.002	-.021	-.031	-.061**	1.000**	.044*	.013
	Sig. (2-tailed)	.922	.329	.112	.002	.000	.026	.523
	N	2579	2248	2568	2574	2581	2580	2575
Use of Tobacco	Pearson Correlation	.068**	.182**	.088**	.052**	.044*	1.000**	.343**
	Sig. (2-tailed)	.001	.000	.000	.008	.026	.000	.000
	N	2581	2249	2570	2576	2580	2583	2577
Use of Alcohol	Pearson Correlation	.068**	.149**	.108**	.034	.013	.343**	1.000**
	Sig. (2-tailed)	.001	.000	.000	.081	.523	.000	.000
	N	2576	2244	2565	2571	2575	2577	2578

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).