



Published in final edited form as:

*Am J Health Behav.* 2010 ; 34(3): 374–384.

## Social Self-control, Sensation Seeking and Substance Use in Samples of US and Russian Adolescents

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### Abstract

**Objective**—To compare the relations of social self-control and sensation seeking with substance use across samples of US and Russian adolescents.

**Methods**—Cross-sectional data were obtained from 362 tenth-graders from Ufa, Russia, and 965 tenth-graders from California.

**Results**—Lack of social self-control was significantly related with higher alcohol and hard drug use in the Russian sample and higher cigarette use in the US sample. Higher sensation-seeking showed significant associations with higher cigarette and alcohol use in the Russian sample and higher alcohol, marijuana, and hard drug use in the US sample.

**Conclusion**—As with US adolescents, prevention programs for Russian adolescents may also benefit from being tailored to higher sensation-seekers and including self-control skills training.

### Keywords

substance use; adolescents; social self-control; sensation seeking

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The markedly low life expectancy at birth for Russian males, which is estimated to be 59 years,<sup>1</sup> has been attributed primarily to the high levels of alcohol and cigarette consumption prevalent in the population.<sup>2,3</sup> Russia has one of world's highest percentages of heavy drinkers, including problem drinkers.<sup>4,5</sup> Binge drinking among Russian males has been associated with premature death due to natural causes as well as homicide.<sup>6</sup> In addition, age-adjusted estimates indicate that 63% of Russian males are likely to be regular smokers.<sup>7</sup> Although the substance use prevalence among Russian females is significantly lower than

among males, some findings suggest that the female cigarette and alcohol use rates might be on the rise.<sup>7,8</sup>

Because adolescent substance users are likely to develop into adult problem users,<sup>9</sup> enhancing adolescent substance-abuse-prevention research is one way to tackle the substance abuse problem in the general population. Sadly, relative to the US adolescents, Russian adolescents tend to initiate cigarette and alcohol use earlier,<sup>10–12</sup> receive fewer prevention messages from parents or other adults, and are generally exposed to fewer prevention interventions.<sup>11</sup> Compared with the US eighth-graders, the Russian seventh- to ninth-graders tend to show markedly higher prevalence of lifetime (51% versus 20.5%) and past-month (28% versus 6.7 for boys; 22% versus 6.7% for girls) cigarette use.<sup>13,14</sup> However, for alcohol and other drugs, this kind of direct comparison of prevalence estimates may lead to false conclusions as such data based on nationally representative samples are rarely available for the Russian adolescents.<sup>12</sup> In addition to the lack of reliable substance use prevalence data, extensive empirical research on the social, cultural, and behavioral correlates of Russian adolescents' substance use behaviors has been lacking.

Alcohol consumption in Russia, particularly spirits consumption, is traditionally known to be high, to the extent that heavy drinking is considered stereotypical of the Slavic people.<sup>6,15</sup> Russians in general are thought to have a high social tolerance for alcohol.<sup>3,6</sup> Vodka is accepted as an integral part of the Russian culture and is customarily consumed in most kinds of celebrations. Before the fall of the Soviet Union, alcohol sales were a chief source of the national revenue, as the state itself was involved in the manufacture and marketing of alcohol products.<sup>3</sup> After the fall of the Soviet Union, at least for some time, alcohol became more affordable for common Russians compared to the commodities necessary for day-to-day life.<sup>16</sup> Furthermore, homemade alcohol products are highly prevalent in Russia.<sup>3</sup> Anecdotally, the Russian government is known to only loosely monitor the production of homemade alcohol, which is easily accessible, even to minors. Legally, the minimum age of purchasing alcohol in Russia is 18 years.<sup>17</sup>

The high prevalence of cigarette use among men suggests that male cigarette smoking is highly acceptable socially in Russia.<sup>18</sup> Although the Russian government has been involved in tobacco control since 1993, most of the tobacco control laws and regulations are rarely enforced, particularly those concerning advertisement, smoking in public places, and the underage purchase of tobacco products.<sup>18</sup> Although the legal age of tobacco purchase is 18 years, save for large, well-regulated stores, minors can easily purchase tobacco products from neighborhood shops and street-stalls.<sup>18</sup> Reportedly, a total of 63% purchase cigarettes in a store or from a street vendor, 7% buy cigarettes from vending machines, 5% receive cigarettes as gifts from older persons, and 17% borrow cigarettes from a peer.<sup>19</sup> In addition, a total of 17% of high school-aged youth report having been offered free cigarettes by cigarette company representatives, and 50% are well aware of tobacco advertising.

Limited available evidence suggests that, similar to US adolescents, negative peer and family influences and perceived stress might be strongly associated with higher substance use in the population. A study among older adolescents (average age=16.5 years) from Central and eastern European countries found higher perceived peer drinking associated with higher levels of drinking.<sup>20</sup> Another study found that compared with a sample of US fifth-graders, a matching sample of Russian adolescents reported higher lifetime and recent alcohol use and perceived peer drinking.<sup>11</sup> In addition, significantly more Russian adolescents reported that they expected their parents to allow them to drink by the time they were high school seniors. The study also found Russian parents to be more tolerant toward under-age drinking. Moreover, significantly fewer Russian adolescents in the study reported having received alcohol-related prevention messages from their parents. Research further

indicates that the reasons that Russian adolescents provide for their drinking behavior may include coping with stress, peer approval, and defiance against school authority.<sup>21</sup> In addition, Russian adolescents may drink because they believe that drinking alcohol enhances sexual experience, makes one feel more comfortable or gregarious in social situations, and makes one feel more powerful and aggressive.<sup>21,22</sup>

The present cross-sectional study compares the effects of social self-control and sensation seeking on the substance use behaviors (cigarette, alcohol, marijuana, and hard drug use) of the Russian and US samples of adolescents. *Sensation seeking* has been defined as the tendency to seek varied, novel, and stimulating experiences or taking risks in order to undergo such experiences.<sup>23</sup> Individuals high in sensation seeking have difficulty delaying the gratification of immediate novelty experience and tend to have lower general self-control.<sup>24</sup> Individuals high in sensation seeking generally tend to show biologically based high sensitivity towards the reinforcing effects of pleasurable stimuli associated with drugs of abuse.<sup>25</sup> Bardo and colleagues<sup>25</sup> have argued that the rewarding effects of drugs of abuse have the same neurological mediators (eg, mesolimbic dopamine system) as those of other novelty experiences. Studies conducted in the United States have consistently found higher sensation-seeking to be a significant predictor of adolescent substance use.<sup>26,27</sup> Some evidence suggests that these findings may also be applicable to Russian adolescents. Among a sample of delinquent boys from Arkhangelsk, Russia, sensation seeking was found to correlate with problem drinking and high positive alcohol expectancies.<sup>22,28</sup> Similarly, in a cross-sectional sample of regular adolescents from Novosibirsk, Kyazev<sup>29</sup> found behavioral activation system (BAS), a measure that taps impulsive sensation seeking, to be the strongest personality-based predictor of substance use (ie, tobacco, alcohol, and illicit drug use).

*Social self-control* refers to adolescents' self-control in social or interpersonal situations.<sup>30</sup> Individuals lower in social self-control tend to exhibit attitudes and behaviors that favor immediate gratification of urges at the cost of possible social alienation (eg, arguing with people).<sup>30</sup> In addition, social self-control represents tendencies such as speaking one's mind without thinking and being insensitive and self-centered in social interactions.<sup>30</sup> In US samples of adolescents, social self-control has been found to be a robust concurrent and prospective predictor of cigarette, alcohol, marijuana, and hard drug use.<sup>30,31</sup>

Adolescents lacking social self-control may be prone to use drugs for the immediate gratification of positive expectancies or as a means of avoidant coping.<sup>24,32</sup> Further, due to poor social skills and the tendency to alienate others, adolescents with lower social self-control are more likely to experience negative life events (eg, trouble with school authority, fights with peers) and associate with deviant peers, themselves lacking in self-control and prone to experiencing negative life events and using drugs.<sup>33</sup> In a sample of Russian adolescents, Parker et al<sup>10</sup> found that antisocial orientation, assessed in terms of deviance tolerance and deviant peer affiliation, significantly moderated the relation between early onset and high levels of alcohol use. In addition, low self-directedness, which taps low impulse control and irresponsible behavior, and lack of cooperativeness have been associated with problem drinking among Russian delinquent boys.<sup>22,28</sup>

So far no study has examined the effects of social self-control on the substance use behaviors of adolescents outside the United States. Moreover, no study has tested the effects of social self-control on adolescent substance-use behavior accounting for the effects of other self-control-related variables such as sensation seeking. In the present study, we expect that (a) higher social self-control will predict lower cigarette, alcohol, marijuana, and hard drug use across both samples of youth, controlling for peer and family substance use variables and 4 demographic variables (ie, age, gender, socioeconomic status, and ethnicity);

(b) higher sensation seeking will predict higher substance use across both samples of youth, controlling for peer and family substance use variables and the 4 demographic variables; and (c) each social self-control and sensation seeking will uniquely predict substance use across both samples, after controlling for each other, the peer and family substance use variables, and the 4 demographic variables.

## METHODS

### Data Collection

A convenience sample of 6 regular high schools of approximately equal numbers of students was selected from Ufa, Russia, and 4 high schools of approximately equal numbers of students was selected in the Los Angeles Basin. Tenth-grade (15- to 16-year-old) students were selected from both sites. Ufa is an industrial city and capital of Bashkortostan republic in western Russia, known for its oil refineries, petrochemical industries, and engineering industries that produce a variety of machinery items including mining machinery and telephones.<sup>34</sup> The population of Ufa, which is estimated to be over 1 million, comprises mostly Slavic Russians, Tatars, and Bashkirs.<sup>34</sup>

Data in Ufa were collected from 2 classes per school. In Los Angeles, data were collected from 8 classes at each school. Participation was anonymous, and assent/consent was obtained for all subjects and their parents, through the Bashkir State Medical University Institutional Review Board (IRB) for the Ufa data and the University of Southern California Health Science Center IRB for the Los Angeles data. Data were collected from the spring of 2007 through the spring of 2008. Data collection took place in the classroom over one class period (40 minutes). The questionnaire was developed in English, translated into Russian and back-translated into English<sup>35</sup> by 2 bilingual speakers, 1 in Los Angeles and 1 in Ufa. Except for the difference in language of the questionnaires (Russian versus English) and the construction of 2 items assessing ethnicity and language-based acculturation, the questionnaire contents used for this study at both sites were the same.

### Measures

**Demographics**—“What is your ethnic background?” was asked to elicit subjects’ ethnicity. The 7 response options in the US survey included non-Hispanic white, Hispanic/Latino, African American, Asian-American, Native American, and the open-ended Other and Mixed options. The 5 response options in the Russian survey included Russian, Tatar, Bashkir, and the open-ended Other and Mixed options. Other demographic indicators measured were age, gender, and parents’ education. Parents’ education was assessed in terms of the highest educational level reached across father/stepfather or mother/stepmother, using two 6-point scales (one for each parent), ranging from not completed elementary school to completed graduate school.<sup>36</sup>

**Sensation seeking**—The sensation-seeking measure included 6 of the 11 items from the Impulsive Sensation Seeking subscale of the Zuckerman-Kuhlman Personality Questionnaire.<sup>37</sup> This shorter version of the 11-item was based on the 6 items that loaded highest on the sensation-seeking factor in our previous studies.<sup>38</sup> Participants were asked to respond true or false to statements that they might use to describe themselves: “I like to have new and exciting experiences and sensations even if they are a little frightening”; “I like doing things just for the thrill of it”; “I sometimes like to do things that are a little frightening”; “I sometimes do ‘crazy’ things just for fun”; “I prefer friends who are excitingly unpredictable”; and “I like ‘wild’ uninhibited parties” (Cronbach alpha, Russian sample= 0.71; US sample= 0.75).

**Social self-control**—Social self-control was assessed using the following 10 items of Sussman’s social self-control scale:<sup>30</sup> “I enjoy arguing with people”; “If I am angry I act like it”; “Sometimes I provoke people just for the fun of it”; “My mouth gets me in trouble a lot”; “I express all of my feelings”; “If I think something someone says is stupid I tell them so”; “I do things just to get attention”; “My feelings get hurt easily”; “I hate being wrong”; and “I say things that I regret later” (Cronbach alpha, Russian sample=0.73; US sample=0.74). For each question, the response options included (1) Always to (4) Never.

**Peer and family substance use influence**—Perceived peer substance use was measured on a 6-point scale (0–5) using the following item: “How many of your 5 closest friends have used each of these drugs in the last month?” The list of drugs included cigarettes, alcohol, marijuana, and hard drugs (see below for hard drug categories). Presence of a drug-abusing member in subject’s family was ascertained in terms of “yes or no” response to the following question: “Are any members of your family drug abusers or alcoholics?” This measure intended to tap negative family environment.

**Substance use**—The substance use measures included self-reported past-30-day cigarette, alcohol, marijuana, and hard drug use behaviors that were assessed on 12-point scales (0, 1–10, 11–20, ..., 91–100, over 100 times).<sup>39</sup> Hard drug use was an index composed of the following 7 categories of hard drugs: cocaine (crack), hallucinogens (LSD, acid, mushrooms), stimulants (ice, speed, amphetamines), inhalants (rush, nitrous, glue), ecstasy (MDMA, XTC, Adam), opiates (Vicodin, OxyContin, morphine, heroin, opium), and other (depressants, PCP, steroids, etc) (Cronbach alpha=0.86). Simple rating scale items such as these show adequate test-retest reliability and predictive validity.<sup>39</sup> For analysis purposes, the drug use items were binary coded as any 30-day use or nonuse.

## Subjects

Demographics of the students in both locations are shown in Table 1. Data were collected from 362 adolescents in Ufa of whom 55% were female, 38% were Slavic Russian, 31% were Tatar, 18% were mixed (eg, Tatar/Bashkirian, Russian/Tatar, Bashkirian/Tatar), 9% were Bashkirian, and 4% were other (Georgian, Vietnamese, primarily). In the Los Angeles sample, data were collected from 965 adolescents from 4 high schools; of whom 49% were female, 40% were Hispanic, 31% white, 17% mixed, 5% African American, 7% other. The average age of the Russian subjects was slightly but statistically significantly higher than that of the US subjects. More females were represented in the Russian sample (55% versus 49%), and higher percentage of the Russian subjects had parents with college or higher level of education (68% versus 28%).

## Data Analysis

Data were analyzed using SAS 9.1.3.<sup>40</sup> First, t-tests and chi-square tests were used to examine the between-sample differences in descriptive statistics for all variables presented in Table 1 except ethnicity. Chi-square tests were used to assess the gender differences in substance use prevalence for each sample separately. Two-tailed tests at alpha=0.05 were used to test hypotheses involving differences in means or proportions. Next, 3 regression models were analyzed for each substance use outcome separately for each sample. Model 1 examined the effects of social self-control on each substance use type (ie, cigarette, alcohol, marijuana, and hard drug use), controlling for the 4 demographic (ie, age, gender, ethnicity, and parents’ education) variables and the perceived peer and family variables. Model 2 examined the effects of sensation seeking on each substance use type, controlling for the 4 demographic variables and the peer and family variables. Model 3 examined the effects of social self-control and sensation seeking on each substance use type, adjusting for each other, the 4 demographic variables, and the peer and family variables. Across the 2 school-

based samples, the intraclass correlations (ICC) for the substance use outcomes were relatively high, ranging between 0.02 and 0.08.<sup>41</sup> Hence, in order to account for the school-level random effects, multilevel logistic regressions were conducted using the GLIMMIX procedure on all substance use outcomes for both samples except the marijuana and hard drug use outcomes in the Russian sample. In the Russian data, one or more schools had one or none recent marijuana or hard drug users. Thus, for these 2 drug use outcomes in this sample, the data were analyzed only at the subject level using the LOGISTIC procedure. To make the interpretation of the results easier, the 4 continuous independent variables (ie, sensation seeking, social self-control, perceived peer substance use, and age) were standardized preceding the regression analyses. The 1-tailed test of significance at  $\alpha=0.05$  was used to test the unidirectional hypotheses involving social self-control, sensation seeking, and substance use. The 2-tailed test of significance at  $\alpha=0.05$  was used to test the relationships between demographic variables and substance use.

## RESULTS

A significantly higher percentage of Russian adolescents reported having smoked cigarettes in the past 30 days compared to the US sample (36% versus 16%). On the other hand, significantly higher percentages of US adolescents reported having used marijuana (26% versus 8%) or hard drugs (14% versus 6%) in the past 30 days (Table 1). However, no significant difference was found between the samples in terms of past-30-day alcohol use. Russian adolescents tended to show significantly lower levels of mean social self-control and sensation seeking (Table 1).

Table 2 shows the gender differences in past-30-day substance use prevalence within each sample. For all drugs except alcohol, significantly higher percentages of Russian boys than girls tended to report use. However, among US adolescents, only marijuana use was found to be more prevalent among boys than girls; no significant gender differences were found in other types of substance use.

Table 3 presents the results of the regression analyses. Model 1 tested the first hypothesis (H1): Higher social self-control will predict lower cigarette, alcohol, marijuana, and hard drug use across both samples of youth, controlling for the peer and family substance-use variables and the 4 demographic variables. Model 1 results indicated that social self-control showed significant inverse associations with cigarette, alcohol, and hard drug use in the Russian sample and with cigarette and hard drug use in the US sample. In the Russian sample, the odds of use with each standard deviation increase in social self-control were 0.53 times less (95% CI: 0.32, 0.87) for hard drugs, 0.72 times less for cigarette use (95% CI: 0.55, 0.93), and 0.70 times less for alcohol use (95% CI: 0.53, 0.93). The odds ratios for social self-control in the US sample were 0.76 (95% CI: 0.65, 0.89) and 0.78 (95% CI: 0.66, 0.93) for cigarette and hard drug use, respectively.

Model 2 tested the second hypothesis (H2): Higher sensation seeking will predict higher substance use across both samples of youth, controlling for the peer and family substance-use variables and the 4 demographic variables. Model 2 results suggested that higher sensation-seeking was a significant concurrent predictor of higher substance use for all types of substance in the US sample and higher cigarette, alcohol, and hard drug use in the Russian sample (Table 3). Model 3 tested the third hypothesis (H3): Social self-control and sensation seeking each will uniquely predict substance use across both samples, after controlling for each other, family and peer substance-use variables, and the 4 demographic variables. Model 3 results suggested that after controlling for sensation seeking, social self-control was no longer significantly associated with cigarette use in the Russian sample and hard drug use in the US sample (Table 3). In addition, with social self-control included in

the model, sensation seeking no longer significantly predicted hard drug use in the Russian sample and cigarette use in the US sample (Table 3).

Model 3 results also suggested that perceived friend's substance use was the most consistent predictor of subjects' concurrent substance use across both samples ( $P < 0.01$ ). For the Russian adolescents, the odds of having used cigarettes, alcohol, marijuana, and hard drugs in the past 30 days were 3.11 (95% CI: 2.08, 4.65), 2.97 (95% CI: 2.09, 4.22), 5.69 (95% CI: 2.92, 11.06), and 1.88 (95% CI: 1.15, 3.08), times higher, respectively, with every standard deviation increase in perceived peer use of these substances. Similarly, for the US adolescents, the odds ratios for perceived peer cigarette, alcohol, marijuana, and hard drug use were 3.55 (95% CI: 2.83, 4.46), 3.10 (95% CI: 2.54, 3.77), 3.11 (95% CI: 2.52, 3.85), and 2.01 (95% CI: 1.32, 3.05), respectively. The presence of a drug-abusing member in the family was positively associated with alcohol use (OR= 1.91; 95% CI: 1.35, 2.70), marijuana use (OR= 1.44; 95% CI: 1.02, 2.03), and hard drug use (OR= 2.01; 95% CI= 1.32, 3.05) among US adolescents. Interestingly, Russian adolescents who reported the presence of a drug-abusing member in the family were less likely to use alcohol (OR= 0.18; 95% CI= 0.06, 0.57). For other substance use outcomes in this sample, the effects of the presence of a drug-abusing family member were not significant.

Furthermore, being male in the Russian sample significantly increased the risks of cigarette use (OR= 3.10; 95% CI: 1.60, 5.98), alcohol use (OR= 1.98; 95% CI: 1.08, 3.61), and hard drug use (OR= 8.63; 95% CI: 1.82, 40.92); whereas in the US sample, being male increased the risk of cigarette use (OR= 1.82; 95% CI: 1.25, 2.65) and marijuana use (OR=1.64; 95% CI: 1.17, 2.32). Ethnicity was not found to relate with substance use in the Russian sample. However, among US adolescents, being Hispanic increased the chances of past-30-day hard drug use by almost twice (OR= 1.55; 95% CI: 1.02, 2.32). Parental education was not found to be associated with substance use in either sample.

## DISCUSSION

Few studies have examined the prevalence and correlates of substance use among general adolescent population in Russia outside Moscow. The present study is one of the first substance use studies on adolescents from Ufa. In addition, this is one of the few studies to comparatively examine the effects of demographic and self-control related variables on the substance use behaviors of Russian and US adolescents. Recent cigarette use prevalence in the present Russian sample was significantly higher than in the US sample. In addition, significantly lower percentages of Russian adolescents reported recent marijuana or hard drug use. However, recent cigarette use in the present Ufa sample was higher at 36% compared with the 22% for the Russian Federation (all regions combined).<sup>13</sup> Further, the gender difference in recent cigarette use prevalence in the Global Youth Tobacco Survey (GYTS, 2004) data was much lower (25% for boys versus 21% for girls) than in the present data (44% for boys versus 29% for girls). One might speculate that the relatively large gender difference in smoking prevalence among adolescents in the Ufa region better mirrors the traditional smoking-related gender discrepancy in the general Russian population.

The present study extended the findings of previous studies on the relations between social self-control and adolescent substance use.<sup>30,31</sup> Sussman and colleagues<sup>30</sup> demonstrated that social self-control tends to represent a construct not tapped by some of the established indicators of personality disorders (eg, paranoid, schizoid, schizotypal, histrionic, narcissistic, borderline, antisocial), thus implying that social self-control represents a unique aspect of general self-control related to individuals' ability to better regulate emotions in interpersonal interactions. However, the redundancy/nonredundancy of social self-control as a predictor of adolescent substance use with respect to another indicator of general self-

control such as sensation seeking was yet to be examined. Further, the cross-national validity of social self-control as a predictor of adolescent substance use remained to be explored.

The results only partly supported our hypotheses. Even after adjusting for sensation seeking, peer and family influence variables, and demographic variables, social self-control was found to be significantly associated with lower levels of alcohol and hard drug use in the Russian sample. However, neither social self-control nor sensation seeking was found to associate with marijuana use in this sample, either before or after adjusting for each other. In the Russian sample, accounting for each other, sensation seeking was a significant predictor of cigarette use but not social self-control whereas social self-control was a significant predictor of hard drug use but not sensation seeking. The hypothesis that social self-control and sensation seeking are unique predictors of substance use was supported only for alcohol use in the Russian sample.

In the US sample, when included in the same model, social self-control was found to uniquely associate with cigarette use but not sensation seeking. On the other hand, sensation seeking was found to be a significant predictor of alcohol, marijuana, and hard drug use but not social self-control. Hence, there were clear differences in the associations of social self-control and sensation seeking with cigarette and hard drug use between the 2 samples. In the Russian sample, sensation seeking was a stronger predictor of cigarette use whereas in the US sample, social self-control was a stronger predictor of cigarette use. Conversely, in the US sample, sensation seeking was a stronger predictor of hard drug use whereas in the Russian sample, social self-control was a better predictor of hard drug use. One might speculate that social self-control is more strongly related with drugs that are considered more “deviant” within a social context. It is well-known that the social norms regarding cigarette smoking have undergone a major change in the United States over the past decade or more.<sup>14</sup> Because cigarette use has become less acceptable socially in the United States, it is possible that cigarette has become a drug of choice for adolescents who are less likely to be accepted by prosocial peers, including adolescents lacking in social self-control. Greater social acceptability of cigarette smoking could be a reason why social self-control was not associated with cigarette use in the Russian sample. Certainly, further research is required to better understand the differential relations of social self-control across substance use types and subgroups. One step in this direction would be to examine whether the effects of social self-control involve different mediators (eg, deviant peer affiliation, negative life events, coping) for different types of substance use.

## Limitations

This study has several limitations. First, this was a cross-sectional study. Further longitudinal studies are needed to replicate our results in order to validate the causal implications of our findings. Second, our subjects were recruited based on a convenience sample of schools in each country. Hence, possible selection biases may limit the generalizability of our findings to other Russian or US high school students. Third, the size of our Russian sample was relatively small. The small sample size prevented us from examining the possible moderating effects of gender on the relations between social self-control, sensation seeking, and substance use. In addition, the size of the Russian sample was less than half of the US sample. Hence, because of the larger sample size, smaller effects were more likely to be detected in the US sample than in the Russian sample. Fourth, there was a noteworthy discrepancy between the samples in terms of parental education, which might have caused the samples to be less comparable than desirable. However, this particular limitation should be viewed in terms of the possibility that members of the current Russian middle-class, who were educated in the Soviet period, might be better educated, in terms of having obtained tertiary degrees, than their US counterparts.<sup>42</sup> Fifth, we failed to



measure binge drinking as a substance use outcome. Given the problem of male binge drinking in Russia, this outcome deserved a close attention. Despite the limitations, however, the findings of the current study might have important implications for adolescent substance abuse prevention in Russia.

### Implications for Prevention

Unlike the United States, the intervention research involving adolescent substance abuse behavior is still in its initial stages in Russia.<sup>11,18,43</sup> The findings of the present study have at least 3 important implications for future program development work involving adolescent substance abuse in Russia. First, we found that social self-control might be protective against alcohol and hard drug use among Russian adolescents. Thus, Russian adolescents are likely to benefit from prevention programs that incorporate social self-control skills training. In fact, a pilot study of a prevention program conducted on high-risk adolescents in Moscow suggests Russian adolescents' willingness to learn skills of emotional regulation.<sup>43</sup> Such training is likely to promote prosocial adolescent-peer and adolescent-adult interactions. Project Towards No Drug Abuse (TND) is an example of a school-based adolescent substance abuse prevention program that addresses social self-control and has been successful in reducing substance abuse among US adolescents.<sup>44</sup> The material for social self-control skills training may use elements of social problem solving and impulse control and anger management.<sup>45–47</sup>

Second, our findings suggested that as with US adolescents, negative peer influence has significant adverse effects on the substance use behaviors of Russian adolescents. Page et al.<sup>20</sup> also found similar associations among other central and eastern European adolescents. Thus, it seems that Russian adolescents are likely to benefit from health education materials that target normative and informational social influence associated with substance use.<sup>48</sup> These forms of social influence may be countered using techniques such as correcting adolescents' cognitive misperceptions or promoting refusal assertion skills. Finally, prevention programs tailored for high sensation-seekers that has been successful in the United States (eg, media-based interventions)<sup>49</sup> might prove effective among Russian adolescents too if translated properly to fit the Russian context.

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**Table 1**

## Demographic Characteristics of the Russian and US Samples

	US Sample (N=965)		Russian Sample (N=362)	
<b>Age</b>	Mean (SD)	15.1 (0.93) <sup>a</sup>		15.7 (0.75) <sup>b</sup>
<b>Female</b>	%	49 <sup>a</sup>		55 <sup>b</sup>
<b>Parents' education</b>	% with less than college education	72 <sup>a</sup>		32 <sup>b</sup>
<b>Ethnicity</b>	% Asian American	3	% Bashkir	9
	% Hispanic	40	% Tatar	31
	% African American	5	% Slavic Russian	38
	% Non-Hispanic White	31	% Mixed	18
	% Other	4		
	% American Indian	2		
	% Mixed	17		
	% Other	3		
<b>Cigarette use</b>	% past-30-day use	16 <sup>a</sup>		36 <sup>b</sup>
<b>Alcohol use</b>	% past-30-day use	43 <sup>a</sup>		47 <sup>a</sup>
<b>Marijuana use</b>	% past-30-day use	26 <sup>a</sup>		8 <sup>b</sup>
<b>Hard drug use</b>	% past-30-day use	14 <sup>a</sup>		6 <sup>b</sup>
<b>Social self-control</b>	Mean (SD)	2.8 (0.49) <sup>a</sup>		2.7 (0.46) <sup>b</sup>
<b>Sensation seeking</b>	Mean (SD)	0.65 (0.30) <sup>a</sup>		0.61 (0.30) <sup>b</sup>

Note.

S D = Standard deviation

<sup>a</sup> = Across row indicates no significant difference between means or percentages at P≤0.05 (2-tailed)

<sup>b</sup> = Across row indicates a significant difference between means or percentages at P≤0.05 (2-tailed)

**Table 2**

## Gender Differences in Substance Use Across Samples

	Russian Sample (N=362)		US Sample (N=965)	
	Male	Female	Male	Female
% Cigarette use	44 <sup>a</sup>	29 <sup>b</sup>	18 <sup>a</sup>	14 <sup>a</sup>
% Alcohol use	49 <sup>a</sup>	45 <sup>a</sup>	40 <sup>a</sup>	46 <sup>a</sup>
% Marijuana use	13 <sup>a</sup>	4 <sup>b</sup>	30 <sup>a</sup>	21 <sup>b</sup>
% Hard drug use	11 <sup>a</sup>	2 <sup>b</sup>	15 <sup>a</sup>	13 <sup>a</sup>

Note.

% drug use indicates past-30-day use

<sup>a</sup> = Across row indicates no significant gender difference between at  $P \leq 0.05$  (2-tailed)

<sup>b</sup> = Across row indicates a significant gender difference between at  $P \leq 0.05$  (2-tailed)

**Table 3**  
Social Self-control and Sensation Seeking as Concurrent Predictors of Substance Use

	Odds Ratio (95% Confidence Interval)							
	Russian sample (N=362)			US sample (N=965)				
	Cigarette	Alcohol	Marijuana <sup>a</sup>	Hard drug <sup>a</sup>	Cigarette	Alcohol	Marijuana	Hard drug
<b>Model 1</b> Social self-control	0.72 (0.55, 0.93)*	0.70 (0.53, 0.93)*	0.73 (0.46, 1.16)	0.53 (0.32, 0.87)**	0.76 (0.65, 0.89)**	0.92 (0.79, 1.07)	0.81 0.81 (0.70, 0.94)	0.78 (0.66, 0.93)*
<b>Model 2</b> Sensation seeking	2.34 (1.71, 3.20)***	1.66 (1.29, 2.14)**	1.06 (0.62, 1.82)	1.88 (1.04, 3.40)*	1.33 (1.08, 1.63)**	1.66 (1.40, 1.97)***	1.59 (1.33, 1.90)**	1.58 (1.25, 2.00)***
<b>Model 3</b> Social self-control	0.86 (0.65, 1.14)	0.76 (0.57, 0.99)*	0.72 (0.45, 1.16)	0.56 (0.33, 0.95)*	0.82 (0.69, 0.96)*	1.08 (0.92, 1.26)	0.90 (0.77, 1.04)	0.90 (0.76, 1.07)
Sensation seeking	2.20 (1.60, 3.03)***	1.53 (1.19, 1.97)**	0.96 (0.55, 1.67)	1.61 (0.87, 2.99)	1.22 (0.99, 1.50)	1.71 (1.43, 2.05)***	1.53 (1.28, 1.84)***	1.52 (1.20, 1.93)***

Note:

\*\*\* ≤ 0.001;

\*\* ≤ 0.01;

\* ≤ 0.05 (1-tailed)

Higher value of social self-control denoted higher social self-control. Higher value of sensation seeking denoted higher sensation seeking. All models controlled for perceived peer substance use, presence of a drug-abusing member in the family, age, gender, parental education, and ethnicity.

<sup>a</sup>Regression did not involve multilevel analysis.