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Vocational Education Paths, Youth Activities, and Underage Drinking in Russia: How Early Does the Trouble Start?

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Abstract

Working-class educational paths tend to be associated with elevated drinking. Little research has examined whether disproportionate alcohol use among vocationally oriented youth begins before or after the start of their vocational education. The present study analyzes a large sample of Russian middle-school students (N=1,269; mean age=14.9), comparing the patterns of drinking among middle-schoolers oriented towards vocational educational, and their peers who do not plan a vocational education path. Results suggest that the orientation towards vocational education is associated with disproportionately high alcohol involvement among Russian middle-school students, even before they enter vocational schools. We studied if such difference could be partially explained by how youth orient towards extracurricular activities: discretionary peer time in risky contexts, reading for pleasure, working for pay, and religious activities. Reading demonstrated the strongest (negative) association with alcohol use, while religious activity unexpectedly revealed a positive (though weak) association with drinking. Research and policy implications are discussed.

Underage drinking remains a pressing public health problem globally (Roberts, Siegel, DeJong, Naimi, & Jernigan, 2015; DeWit, Adlaf, Offord, & Ogborne, 2014). Extensive research has examined adolescent alcohol behavior as a function of a wide range of variables, including alcohol-related expectancies and attitudes (Turrissi, Jaccard, Taki, Dunnam, & Grimes 2001), cultural norms and customs (Guilamo-Ramos, Jaccard, Johansson, & Turrissi, 2004), and youth exposure to alcohol advertising (Collins, Ellickson, McCaffrey & Hambarsoomians, 2007). Much less research has examined underage drinking in association with adolescents' choice of educational and career paths. One exception to this is the substantial literature that documents increases in drinking by college students,

mostly undergraduates at four year institutions in the U.S. (e.g. Slutske, 2005). Longitudinal data suggests that college drinking tends to be a temporary phenomenon in most youths' lives (White, Labouvie, & Papadaratsakis, 2005); in the long term, higher education trajectories, tend to predict less, not more, pervasive alcohol use, as follows from a number of U.S. longitudinal studies (Blanco, Okuda, Wright, Hasin, Grant, Liu, & Olfson, 2008; White et al., 2005).

By contrast, long-term patterns of problematic alcohol use are considerably more likely to develop among adolescents around the world who pursue working-class educational paths, e.g. students in vocational/trade schools (VTSs) (Chaveepojcamjorn, 2012; Hanke, Ulbricht, Freyer-Adam, Hohn, Meyer, & Haug 2013; Holmberg & Hellberg, 2007). The terms "vocation" and "trade" have been used interchangeably in the context of working-class occupations; so we will use the term vocational/trade schools (VTS) to include all types of schools providing training for blue-collar careers. For example, according to Chaveepojcamjorn (2012), lifetime alcohol consumption among vocational school students in Thailand exceeded that among general population peers by over one third. Similarly, according to Hanke et al. (2013), VTS students in Germany are about 30 percent more likely to engage in unhealthy drinking compared with their general-population peers. Several studies have linked vocational-school backgrounds to lifelong trajectories of health risk behaviors in many countries including Russia (Cockerham, 2000) and Netherland (Schrijvers, Stronks, van de Mheen, & Mackenbach, 1999). In a survey of over 15,000 Dutch residents, Schrijvers et al. (1999) found that VTS graduates had significantly higher prevalence of untimely deaths compared to university graduates, and higher indices of hazardous risk behaviors, including alcohol use.

Little research has examined mechanisms linking working-class educational trajectories to alcohol problems. One important question is whether underage drinking is enabled by the context of vocational training institutions, or whether youths who enter VTSs tend to already be disproportionately involved in alcohol use. The latter would suggest that the decision to dedicate one's life to a blue-collar career is somehow associated, in at least some cultures, with a set of beliefs and attitudes conducive to elevated drinking independent of actually attending vocationally oriented schools. The present study for the first time empirically addresses this critical question.

In Russia, a country long affected by notable alcohol-related problems (Leon, Saburova, Tomkins, Andreev, Kiryanov, McKee, & Shkolnikov, 2007; Razvodovsky, 2015), underage drinking has been pervasive for many generations (Koposov, Ruchkin, Eisemann & Sidorov, 2005). Research suggests that underage drinking is high among Russian adolescents and that drinking is initiated earlier than by adolescents in the United States and Western European countries (Gunning, Sussman, & Rohrbach 2009; Pokhrel, Massagutov, Kniazev & Sussman, 2012; Koposov et al., 2005; Ruchkin, Koposov, Eismann & Hägglöf, 2002). Especially problematic are patterns of alcohol consumption among students of Russian VTSs, who account for about 4.2 million students or over 25% of Russian youth (Savitskaya & Davydova 2006; Cherednichenko, 2005). According to Egorov & Sofronov (2009), lifetime use of alcohol and other substances among St. Petersburg VTS students is three times higher than among regular middle school students of the same age. Mortality from

lifestyle-related causes, such as heavy drinking, is substantially greater among Russian male industrial workers, largely VTS graduates, than any other segment of society (Cockerham, 2000; Tomkins, Saburova, Kiryanov, Andreev, McKee, Shkolnikov & Leon, 2007). No studies to date, however, have examined mechanisms associated with Russian VTS experiences that contribute to alcohol use, and no research has specified the developmental stage at which Russian VTS-bound youths start developing tendencies for elevated drinking.

The present research analyzes a large sample of Russian middle school students aged 14–15 (N=1,269) to examine whether VTS-oriented youth are disproportionately involved in drinking while still attending regular middle school, before the actual transition to the VTS. Alcohol consumption among VTS-oriented middle-schoolers is compared to alcohol use among their middle school peers with non-VTS education aspirations.

We test a model of the effect of VTS-related educational intentions among middle school students on their current patterns of underage drinking and how these are related to a number of theoretically relevant extracurricular activities, namely (a) unstructured peer activities in risk-inducing environments (“hanging-out”); (b) working for money, (c) religious-related activities, and (d) reading for pleasure (per Figure 1).

Educational Intentions and Alcohol Consumption

Mid-adolescents’ long-term academic intentions tend to predict, with reasonable accuracy, future educational paths that students end up taking (Eccles, Vida, & Barber, 2004). As noted, little research examined association between mid-adolescent educational intentions/aspirations and patterns of alcohol use, with existing evidence being inconsistent (Barry, Chaney, & Chaney, 2011; Crum, Storm, and Antony, 2005). Barry et al. (2011) linked adolescents’ low educational aspirations to elevated drinking in a predominantly White U.S. sample. In contrast, Crum et al. (2005), analyzing a sample of mostly Black U.S. middle-schoolers’, reported no association between college aspirations and alcohol consumption. Apparently, the association between educational intentions and drinking may vary across cultures. Little research has identified mechanisms that link adolescent educational intentions and alcohol use, especially in Russian middle-school students.

Russian middle-school graduates have a choice of two further academic paths: (1) two more academic years of regular “general-educational” school, potentially leading to college enrollment, or (2) transition to a VTS, which reduces the likelihood of later college admission (Bolotnikov, 2007; Cherednichenko, 2005). Russian VTSs are associated with lower social prestige (Bolotnikov, 2007). The present study tests a hypothesis that mid-adolescents in Russian middle schools who are planning to transition to a VTS, will report, on average, more pervasive alcohol behavior relative to peers whose educational plans exclude VTS. To evaluate this hypothesis, we analyzed data from a sample of 1,269 middle-school students in a large Siberian city, Tomsk. Youth were classified by their educational intentions, yielding a taxonomy of four groups: (1) adolescents who reported no articulated educational intentions (No Intent group); (2) youth who intend to transition to VTSs without long-term college plans (VTS Only group); (3) those who plan to attend VTS after regular school and later transition to college, or are open to both VTS and college paths (VTS-

College group); and (4) students who intend to proceed to college without ever attending VTS (College Only group). Alcohol use differences between these four groups were examined. Additionally, we sought to explain group differences in drinking by comparing each group's typical involvement in a number of theoretically relevant extracurricular activities. The guiding theoretical model is in Figure 1. Underage drinking is thought to be directly associated with unstructured/discretionary peer activities, or "hanging-out" (path a), a known proximal determinant of underage drinking (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007). Time spent "hanging-out" is thought to be impacted by engagement in competing activities, such as reading books for pleasure (path b), performing paid work (path c), and participating in religious activities (path d). These latter activities are expected to relate to alcohol consumption both directly (paths e, f and g) and by mediation through "hanging-out" (paths a-d). Finally, engagement in the above activities, and the intensity of alcohol consumption, are compared across the four educational-intentions groups (paths h-l).

Adolescent Activities and Alcohol Consumption

Unstructured activities with peers ("hanging-out").

Multiple studies have linked underage drinking to unstructured/unsupervised social activities with peers in natural environments e.g. parks, streets, and each other's homes (Barnes et al., 2007; Crawford & Novak, 2008). According to Barnes et al. (2007), engagement in such activities are among the most important predictors of underage drinking in the U.S. Additionally, studies conducted in multiple countries have consistently tied underage drinking to peer-based activities in alcohol-serving venues e.g. night dance clubs, discotheques, and bars (Egginton, Williams, & Parker, 2002; Guilamo-Ramos, Jaccard, McCarthy, Quinones, Lushin, Skinner-Day, Padilla, & Meisterlin, 2013; Kiely & Barry, 2002). These dynamics have not been studied in Russia youth, but it seems reasonable to expect the relationship to hold in Russia as well. Thus, we hypothesize that Russian adolescents' engagement in unstructured peer activities in natural environments and alcohol venues are directly associated with underage drinking (path a in Figure 1).

Paid work and underage drinking.

A substantial literature associates paid work during adolescence with higher risk behaviors including alcohol use (Bachman & Schulenberg, 1993; McMorris & Uggen, 2000; Zimmer-Gembeck & Mortimer, 2006). Younger adolescents, and boys, seem to be more susceptible to alcohol-inducing effects of work involvement (Wright, Cullen, & Williams, 1997). Several explanations have been suggested. First, time spent on paid work may compete with youth's schoolwork hindering cognitive development, a known correlate of adolescent risk behavior (Zimmer-Gembeck & Mortimer, 2006). Additionally, adolescents may adopt adult co-workers' risky tendencies by acquiring from them beliefs/attitudes about education and/or drinking (McMorris & Uggen, 2000). Also, paid work enables adolescents to purchase alcohol and attend alcohol venues (Zimmer-Gembeck & Mortimer, 2006). Non-linear relationships have been suggested between adolescent work involvement and risk behavior: Alcohol use is elevated when work time exceeds 20 hours per week, but more moderate work involvement produces weaker effects (Zimmer-Gembeck & Mortimer, 2006). Some studies explain the association between work and drinking by selection effects

(Paternoster, Bushway, Brame, & Apel, 2003). Very little research has considered relationships between youth work and underage drinking in Russia. The present study posits a direct relationship between adolescents' work involvement and alcohol consumption (Figure 1, path f), and tests whether this relationship is mediated by its effects on "hanging-out" (paths c and a). We control for some selection effects by including socio-demographic covariates in the modeling. We also test for non-linearities between work involvement and alcohol consumption.

Religious activities and underage drinking.

Studies consistently associate adolescent involvement in religious-related activities with lower alcohol consumption (Sinha, Cnaan, & Gelles, 2007; Steinman & Zimmerman, 2004). Longitudinal analysis suggests a role of religious activities in reducing underage drinking, rather than vice versa (Steinman & Zimmerman, 2004). Two mechanisms are generally suggested: (1) time use and (2) moral development. The former contends that involvement in religious-related activities leaves adolescents a smaller budget of discretionary time to spend with alcohol-consuming peers (Steinman & Zimmerman, 2004). The latter contends that religious activities foster in adolescents moral values such as empathy and responsibility that discourage self-gratifying pursuits like drinking (Steinman & Zimmerman, 2004). Little research has considered the effects of religious involvement on alcohol consumption among Russian adolescents. The present study tests a hypothesis that the association of religious activities with drinking is negative and is partially mediated by discretionary peer activities.

Book reading and underage drinking.

Book reading has been implicated as a positive adaptive activity in many domains of child and adolescent development (Hargrave & Senechal, 2000; Reese & Cox, 1999; Verhoeven & Snow, 2001). Time spent on reading for pleasure (above and beyond the required academic curricula) considerably fosters cognitive and moral development, increases the likelihood of favorable educational outcomes, and deters delinquent behavior in children (Delaney, Pitcher, Gillis, & Walker, 2014; Wasik & Bond, 2001). Conversely, decreased reading among kindergarten and elementary school students predicts externalizing and internalizing problems (Morgan, Farkas, Tufis, & Sperling, 2008). Surprisingly little research has examined the association of adolescent reading involvement with alcohol use; no such research has been conducted among Russian adolescents. We hypothesize that alcohol consumption is negatively related to reading (Figure 1, path b). We also expect this effect to be mediated by its association with unstructured peer activities: more time spent reading will leave less time for "hanging-out", thus reducing alcohol use (paths b, a).

In sum, the present research examines the association between adolescent decisions to attend VTS and alcohol use in Russian youth. Four qualitatively different types of adolescent intentions/trajectories are examined and will allow us to determine if increased drinking tendencies are established in VTS-bound youth before they actually attend a VTS. We also evaluate whether the estimated effects of VTS intentions/trajectories and current alcohol use are mediated, in part, by different activities that youth engage in, including "hanging out," working, book reading, and engagement in religious activities.

Method

Respondents

From a roster of 64 middle schools in Tomsk, 16 schools were randomly selected. The sample consisted of 1,269 students in their second year of study at the middle school. The mean age of the students was 14.9, ($SD=0.39$), 48.7% were female, and 7.9% represented ethnic minorities (the most frequently represented ethnic minority groups were Tatars (2.4%); Azerbaijanis (2.2%) and Armenians (2%)). Sixty two percent of respondents had mothers who had completed college, 6.9% of the mothers' highest completed education was partial college attendance; for 19% of the mothers it was either completed high school or VTS; for 12.1% of the mothers, it was middle school or unfinished vocational school.

Procedures

All data were collected while the students were still in middle school. Students were provided with a description of the survey and gave written consent for completing it. Confidentiality was assured. Self-administered questionnaires were administered in classrooms during a regular class time of 45 minutes. The topics covered in the questionnaires were diverse, covering mental health issues, extracurricular involvement, peer networks, decision-making processes, family composition, educational aspirations and orientations, employment experience, substance use, and delinquent activities.

Measures

Alcohol use.—Alcohol use was measured by four 4-point items assessing the frequency of use across four categories of alcohol products relevant to Russian culture: (1) hard liquor; (2) wine/champagne; (3) beer and (4) tin-can “cocktails.” In the Russian cultural context, “champagne” denotes a range of sparkling wines, including inexpensive, accessible domestic products. Tin-can cocktails represent a distinct category of alcoholic beverages consisting of hard liquor diluted in soda-like substrates, e.g. “gin-and-tonic”. For each class of drinks, participants reported frequency of use by choosing among the following 4 options: “Never tried” (coded as 0), “Tried only once, or a couple of times” (1), “I drink occasionally, but rather infrequently” (2), and “I drink rather frequently” (3). Responses were averaged across categories of drinks. The resulting measure was construed as formative, hence alpha coefficients are not relevant. Research has demonstrated good test-retest reliability of similarly worded measures of alcohol use frequency (Miller, Neal, Roberts, Baer, Cressler, Metrik, & Marlatt, 2002; Skinner & Sheu, 1982).

Educational intentions.—Adolescents were asked to choose from nine options that exhausted the full range of possible educational paths available to Russian middle school graduates. Examples of these options include: Finish middle school, then attend a 2-year VTS; Finish high school, then go to college; Finish middle school, then attend a 2-year VTS, then go to college. Participants were allowed to indicate more than one option. Additionally, youth could enter an open-ended educational intention. We recoded all combined responses to produce the following four-class taxonomy of participants by educational intentions: (1) adolescents who reported no articulated educational intentions (No Intent class); (2) youth who intend to transition to VTSs without long-term college plans (VTS Only class); (3)

those who plan to attend VTS after regular school and later transition to college, or are open to both VTS and college paths (VTS-College class); and (4) students who report intentions to apply to college without ever attending VTS (College Only class). These four classes were mutually exclusive, and therefore feasible for dummy variable analysis.

Adolescent activities.—Youth's propensities to engage in different activities was measured in the form of self-reports of the number of hours allocation for each activity per week. We are cautious not to conceptualize these measures as "time use," appreciating that effects of thus measured behavioral involvement are likely to represent effects of multiple social and psychological determinants of each behavior, not merely of the lengths of time spent on each behavior. Adolescents were asked: On average, how many hours per week do you spend on the following activities: (1) Working for pay; (2) Engaging in activities at a church, mosque, or temple; (3) "Strolling" with friends (which, in Russian wording, is synonymous to unstructured activities in natural social environments such as parks, playgrounds, and friends' houses); and (4) Going to cafes, bars, discotheques, clubs. The reports were Winsorized at 95th percentile (Tukey, 1962). The two latter activity variables (## 3 and 4) were averaged to construct a formative composite index reflecting involvement in peer activities in two types of risk contexts: (a) adolescent natural environments, and (b) alcohol-serving venues ("Hanging-out" index).

Adolescent reading involvement—was measured separately, by asking participants to rate their average daily time reading for pleasure on a five-point scale; the five options ranged from "None" (coded as 0) to "Over two hours per day" (coded as 4).

Demographics.—Students also were asked a range of demographic questions including the education levels of their mother and father, family language (non-Russian language used in the family represented ethno-cultural minority status), and their current age.

Analytic Strategy

The analysis used structural equation modeling (Ullman & Bentler, 2003) with the Mplus software package (Muthén & Muthén, 2017). Structural equation modeling (SEM) enables analysis of complex causal models while indicating how well the hypothesized model fits the data (Ullman & Bentler, 2003). Global model fit indices used were RMSEA, CFI and Standardized RMR. Additionally, we examined more focused indices of fit (model modification indices) and identified points of ill fit in the model by considering residual covariance matrices. Robust maximum likelihood estimation in the context of Mplus was used. Missing data were accommodated using full information maximum likelihood (FIML) algorithms described in Enders (2010), in the context of Mplus. Dummy variable analysis was used to document differences in alcohol use, and patterns of extracurricular activities among the four groups of middle school students classified by educational intentions. Multiple group SEM analyses were conducted to document differences in model path coefficients for females versus males. Possible non-linear effects of work on hanging-out were tested using quadratic analysis with a squared work predictor term. All of the demographic variables in Table 1 were used as covariates for each endogenous variable in

the model. Margins of error are reported for each statistic based on the half width of the 95% confidence interval for the statistic.

Results

Descriptive Analyses

Table 1 presents demographic information as well as means for the core variables in Figures 1 and 2. The amount of missing data on all variables was below 1.6%. Parental occupation data had been collected, but had large proportions of missing data; therefore their use in the analyses was unfeasible. In contrast, less than 1.6% of cases missed data on mothers' education level; and this variable was used as a covariate. Education of parents is among the most important socio-economic predictors of multiple adolescent outcomes (Dubow, Boxer, & Huesmann, 2009).

Structural Equation Modeling

The model in Figure 1 was fit to the data. Four dichotomous dummy variables (scored 1 or 0) for each of the educational intention classes (No Intent, VTS Only, VTS-College, and College Only) were defined; The dummy variable for college only was the referent group and hence omitted from the model. Model fit used Huber-White robust estimation algorithms as implemented in Mplus. The overall model provided good fit to the data (RMSEA = 0.028, CFI = 0.99, SRMR = 0.01). More focused fit tests (modification indices and standardized residuals between predicted and observed correlations) revealed no theoretically meaningful statistically significant points of stress. The statistically significant path coefficients are shown in Figure 2. Firstly, analysis of the total effects in the model indicated significantly greater average alcohol consumption among the VTS-only oriented group compared to the college-only oriented group (total effect = 0.245 ± 0.122 , critical ratio (CR) = 0.0316, $p < 0.001$), and significantly greater average alcohol consumption in the VTS-college oriented group compared to the college-only oriented group (total effect = 0.138 ± 0.092 , CR = 0.024, $p < 0.005$). The interpretation is that, overall, the average difference in alcohol use between VTS-only oriented group compared to the college-only oriented group of middle school students is 0.245 on the alcohol use scale. This is a considerable difference, given the sample mean drinking level of 0.98. No significant differences in alcohol consumption were found between the VTS-only and the VTS-college groups. These differential patterns of underage drinking formally associate middle-schoolers' alcohol use with their immediate vocational educational orientation not with more distal college aspirations.

Several statistically significant mediation effects partially explained these alcohol use differences through adolescent involvement in extracurricular activities. Drinking was statistically significantly related to the composite "hanging-out" index (coefficient = 0.22 ± 0.036 , CR = 0.009, $p < 0.001$), which, in turn, mediated the effect of work involvement on drinking (work to "hang-out" coefficient = 0.03 ± 0.018 , CR = 0.005, $p = 0.001$), and partially mediated the effect of reading on drinking (reading to "hang-out" coefficient = -0.13 ± 0.056 , CR = 0.014, $p < 0.001$; reading to drinking coefficient = -0.05 ± 0.03 , CR = 0.008, $p < 0.001$). Total effect of reading on alcohol use was -0.075 , meaning that for each

one-unit increase of the reading engagement scale (about 30 additional minutes of daily reading) average alcohol use decreases by about 0.08 on the alcohol use scale. This is a non-trivial effect, given the sample mean drinking level of 0.98. VTS-only oriented youth's involvement in paid work was, on average, significantly greater compared to that of their college-only oriented peers (coefficient = 0.9 ± 0.8 , CR = 0.22, $p < 0.05$), and in reading, significantly lower, compared to college-only oriented students (coefficient = -0.450 ± 0.21 , CR = 0.054, $p < 0.001$). The "hanging-out" index was statistically significantly larger among the VTS-college group than among the college-only group (coefficient = 0.19 ± 0.14 , CR = 0.03, $p < 0.05$); this difference operated over and above the three other behavioral mediators. Reading was, on average, statistically significantly greater among girls than among boys (coefficient = 0.388 ± 0.14 , CR = 0.038, $p < 0.001$), and girls worked significantly less than boys (coefficient = -0.169 ± 0.088 , CR = 0.023, $p < 0.05$). Additionally, there was a statistically significant alcohol use difference between the VTS-only and the college-only groups, over and above the behavioral mediators (coefficient = 0.167 ± 0.112 , CR = 0.029, $p < 0.01$); a similar difference was found between the VTS-college and college-only groups (coefficient = 0.100 ± 0.088 , CR = 0.023, $p < 0.05$).

Multiple group SEM analyses did not reveal significant gender differences in any of the path coefficients.

Supplemental analysis: It is possible that the causal effects depicted in Figure 1 are bi-directional rather than unidirectional. Limited information instrumental variable analyses was performed to gain perspectives on this. To evaluate this, the dummy variables representing educational choices in the main analysis were transformed into a single index: "no articulated educational choice" was coded as 0; the choice of "vocational education only" was coded as 1; openness to both/either VTS and/or college tracks was coded as 2, and the choice of "college education only" was coded as 3. A reciprocal causal relationship was then tested between this index and drinking using instrumental variables. The composite index of unstructured peer activities ("hanging out") was used as an instrument for drinking, and a composite index of intellectual support accounting for access to books and intellectually strengthening extracurricular activities, as an instrument for educational aspirations. Gender and migrant status were included as covariates. The model yielded statistically significant effect of educational aspirations on drinking (coefficient = -0.41 , $p < 0.01$), but no reverse causal effect. Similar analyses were conducted for the other causal paths in the main model with similar conclusions. Although not problem-free, the analyses provide at least some evidence for the hypothesized unidirectionality in the model. Additionally, non-linear relationships of work involvement with "hanging-out," and of work with drinking, were tested through the use of quadratic terms in the relevant linear equations, and were not supported by the data.

Discussion

The current study had a number of interesting and consequential results. First, we report, for the first time, that patterns of alcohol consumption diverge among middle school students orientated towards different educational paths even before these paths are actually taken. Specifically, middle-schoolers who were planning to continue to a vocational school tended

to drink alcohol significantly more frequently compared to peers who planned to attend college and not a VTS. Interestingly, a sub-group of VTS-oriented adolescents who also reported more distal college aspirations tended to drink, on average, more frequently compared to no-VTS college oriented peers. In contrast, no significant difference in drinking was found among VTS-oriented youth with and without distal college aspirations. Apparently, adolescents' willingness to opt for vocational educational track is related with patterns of elevated drinking, while aspirations for higher education in the more distant future don't play an important role in shaping current drinking behavior among such youth. This finding expands the extant knowledge about disproportionate alcohol vulnerability among vocational students by tracing the roots of this vulnerability for many youth to an earlier stage of development, at middle school. An important implication for public health policy is that preventive interventions to address blue-collar youth's disproportionate alcohol involvement should start before youth actually enter VTS, at least as early as middle school, when decisions to pursue vocational careers are made by some students.

Our data highlight nuances of the role that college aspirations may play in shaping mid-adolescent alcohol use. In our study, middle-schoolers with immediate focus on higher education tended to drink significantly less, compared to vocationally oriented peers. On the other hand, more distal college plans among youth currently opting for VTS were not significantly associated with their drinking. An immediate, clear plan for college attendance may shape youth's behavior more strongly, compared with delayed college educational aspirations. Presumably, time-intensive activities in preparation to an imminent college transition may leave college-oriented youth less time for alcohol-related behaviors. This interpretation corresponds with our finding of a difference in reading involvement between college-bound vs. VTS-only-oriented youth, which, in turn, was associated with less "hanging-out" and drinking. Apparently, heightened reading involvement could be a mechanism by which immediate college aspirations divert middle-schoolers from alcohol behavior. The present study also points to a possible protective role of reading for all groups of youth. These findings carry potential value for positive youth development programs and suggest that encouragement of sustainable reading habits may not only affect school performance more generally but may also reduce adolescent problem behaviors such as early involvement in drinking.

Surprisingly, involvement in religious activities was statistically significantly, though modestly, *positively* associated with "hanging-out" in negative contexts and, through it, with drinking. One possible explanation is that, in an overwhelmingly pro-alcohol socio-cultural context such as Russia, religious activities may provide adolescents additional access to adult role models who engage in alcohol-related behavior, and to peers to "hang out" with who drink with. Future research is needed to explore this intriguing finding.

Like any research, this study has limitations. One drawback is the cross-sectional nature of the data. A second is the reliance on self-reports, although multiple steps were taken to ensure youth would provide honest answers. Specification error in modeling always is a concern, so this also must be taken into account, and this also is true of measurement error and imprecision. Also, the role of peer influences for alcohol involvement is important (Lushin, Jaccard, & Kaploun, 2017), and has been reported among post-Soviet populations

(Murphy, Roberts, Kenward, De Stavola, Stickley, & McKee (2014); so it would be optimal to account for alcohol peer dynamics, as part of this study. Given the mainly activity-oriented nature of the data set it was not feasible to include peer variables related to the many activities measured in it. To be sure, in our recent longitudinal analyses, peer influences strongly predicted underage drinking, but did not necessarily confound other theoretically based effects. Further studies should explore the role of peer dynamics for shaping pervasive drinking among VTS-oriented middle-schoolers, in Russia and beyond.

Despite these limitations, the research produced numerous interesting results that inform policy and intervention, and form the foundation for future studies on alcohol consumption in Russian youth in different educational contexts.

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Key contributions to public health policy and research

Our study for the first time documents that the tendency for elevated alcohol consumption typical for vocational students in Russia and beyond, emerges before the adolescents actually enter the vocational schools. The choice of vocational education trajectory among middle-schoolers appears to be associated with pervasive drinking. This necessitates a profound re-thinking of public health policy solutions aimed at preventing blue-collar youth's massive plunge into alcoholism. Our findings call for innovative preventive interventions that would start before youth actually enter VTS, preferably at early adolescence, a stage at which youth's beliefs and attitudes are more malleable than at later developmental phases (Guilamo-Ramos et al., 2004). Our data encourage prevention efforts tailored to middle-school youth who contemplate vocational education track, and targeting specific sets of alcohol-related beliefs and attitudes typical for this youth subpopulation. Further research should examine such sets of beliefs and attitudes, and their causal links to the choice of vocational education track, and expand the enquiry beyond Tomsk region of Russia.

Another major contribution is highlighting adolescent reading involvement as a possible protective mechanism against problem behaviors such as early engagement in drinking. Our data highlight reading during mid-adolescence as a possible appropriate target for preventive interventions. Positive youth development programs may succeed by forming sustainable reading habits as early as pre-adolescence and early adolescence, when long-term behavioral trajectories tend to shape up (Jaccard & Levitz, 2015). One attractive feature of this approach is that strengthening youth's reading engagement is likely to contribute to multiple positive outcomes, beyond protection from drinking behavior, e.g. increasing adolescents' academic performance. Future research should explore causal links between reading and youth sobriety; there are likely many nuanced explanations for this effect, in addition to a simplistic mechanism suggested by our model, namely that more reading leaves less time for "hanging-out" with negative peers and in negative contexts. Our data highlight reading during mid-adolescence as a possible appropriate target for preventive interventions.

Figure 1:
Main model

Figure 2:
Main model with coefficients

Table 1:**Sample Statistics**

Variable	Statistic	
	M	%
Females		48.7
Ethnic minority status		7.9
Of them:		
Tatars		2.4
Azerbaijanis		2.2
Armenians		2
Adolescent age	14.9 (SD=0.39)	
Mother's education	3.187	
completed college		62
unfinished college		6.9
completed high school or VTS		19
completed middle school or unfinished VTS		12.1
Adolescent alcohol use	0.980	
Never used alcohol		13
No Educational Aspirations		6
VTS Only Aspirations		22
VTS-College Aspirations		24
College Only Aspirations		48
Adolescent Reading Involvement	2.388	
Adolescent Work Involvement	1.280	
Adolescent Religious Activities Involvement	0.269	
Adolescent Involvement in Unstructured Peer Activities	1.881	
Adolescent involvement in Alcohol-Serving Venues	1.412	
Composite Index of Unstructured Peer Involvement	1.680	

Note: Adolescent alcohol use ranged from 0 to 3. Adolescent Reading Involvement ranged from 0 to 4. Mothers' education ranged from 1 to 4