

The role of drunken older siblings and drunken peers in the alcohol–violence nexus

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Background: It is common knowledge that alcohol use and violence in adolescence is interrelated. However, less is known about variables which modify the link between alcohol use and violent behaviours in adolescence. The present study investigates how the interaction of intraindividual [adolescent risky single occasion drinking (RSOD)], intrafamilial (risky drinking of older siblings) and extrafamilial (risky drinking among peers) alcohol-related risk factors contributes to adolescents' violence and delinquency. **Methods:** Multiple linear regression analyses including two- and three-way interactions were conducted based on a national representative sample of 3711 8–10th graders in Switzerland (mean age 15.0, SD=0.95) who had older siblings. **Results:** All three alcohol-related risk factors and the three-way interaction contributed significantly to the frequency of violence and delinquency. Adolescents who frequently engage in RSOD and have both drunken peers and drunken older siblings had the highest levels of violence and delinquency. Moreover, their association between own drinking and violence increased the steepest. **Conclusion:** The present study confirmed the occurrence of cumulative risk processes and demonstrated that excessive alcohol consumption among older siblings and peers represents a crucial contextual factor for the link between adolescents' risky drinking and violence and delinquency. For prevention, the findings suggest that a focus on peers alone may not be effective if the familial background is not taken into consideration.

Keywords: delinquency, drunkenness, peers, siblings, violence.

Introduction

It is common knowledge that alcohol use and violence in adolescence are interrelated. Longitudinal evidence, for example, demonstrated that alcohol use in early adolescence led to subsequent violent behaviour,^{1,2} that violent behaviour in early adolescence led to alcohol use in later life,³ and that both processes occur in parallel.⁴ However, less is known about variables which modify the link between alcohol use and violent behaviours in adolescence. The present study investigates whether the presence of risky drinking among persons in the adolescent proximal social environment modifies the link between the adolescent's risky drinking and his or her violent and delinquent behaviour.

Previous research demonstrated that violent behaviour often occurs in the context of peer groups in which drinking is common,^{5,6} with longitudinal studies suggesting mutual influences among alcohol use, own problem behaviour and peer problem behaviour.⁷ Rossow and colleagues⁶ concluded from their study that frequent intoxication and violent and delinquent behaviour are 'closely related to attachment with peers who behave similarly and who tolerate or reinforce such behaviours' (p. 1028).⁶ The authors argue that alcohol use in adolescents' social environment is 'a provocative setting for violent behaviour and that violence may easily be triggered by others' drunkenness' (p. 1028).⁶ However, previous studies mainly concentrated on drinking parents and peers, neglecting the potential influence of drinking siblings.

Only recently have siblings received attention as a form of peer influence. That siblings often behave similarly has been shown for delinquency and for the use of alcohol and other substances.^{8–12} Thus, deviant activity in one sibling seems to increase deviance in another sibling. Siblings, particularly older ones, exert their influence as role models and through active reinforcement, such as supply of alcohol and drugs and instigation of violent behaviour.^{11,13,14} Research on boys' development of anti-social behaviour has shown that brothers' direct practicing of coercive behaviours (e.g. aggression and violence) and cascading negative reinforcement processes contribute to the manifestation of problem behaviour.^{13,15} These coercive sibling interaction patterns during middle childhood are even predictive of antisocial and delinquent behaviour later in life.¹³ Older siblings were also found to set standards of 'acceptable' behaviour that influences adolescents' choice of friends, which in turn affects problem behaviour.¹⁶ Some siblings have mutual friends and, by sharing the same risk-supportive peer environment, increase their similarity in problem behaviour.^{11,12} Overall, older siblings are important for modelling, reinforcing and actively practicing deviant behaviour such as risky drinking, violence, delinquency, as well as shaping adolescents' peer groups.

However, exposure to both drunken peers and siblings, in addition to adolescents' own risky drinking, may further increase the likelihood of violence and delinquency among adolescents. For example, a study by Brook and colleagues¹⁴ demonstrated that younger brothers had the lowest level of drug use when both older brothers and peers showed low use or non-use of drugs. It could also be assumed that having both substance using older siblings and peers leads to high levels of adolescent substance use. Such findings support the notion of cumulative risk factors: the more risk factors an adolescent is exposed to, the more likely he/she is to develop problem behaviour.^{17,18}

Despite a predominance of research examining male/brothers' deviance,^{13–15} direct sibling effects on deviance have been shown for brother and sister pairs^{11,12} and both

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male and female delinquency were predicted by siblings' offending.⁹ The few variations found in associations by gender (e.g. influence of sibling hostility on deviance) have been related to gender differences in the rate of progression and timing of such pathways and its surrounding social environment (e.g. later peak in delinquency in girls).^{12,19} Despite lower absolute levels of alcohol use and violence and delinquency among females,^{1,2} gender differences in associations between alcohol use and other factors are relatively small, and it can be assumed that such models hold for both males and females.^{12,19} In fact, some researchers have advised to construct similar models for male and female development but recommended the need for gender-specific models to be empirically assessed.²⁰

To summarize, little is known about how the interaction of intraindividual [e.g. risky single occasion drinking (RSOD)], intrafamilial (e.g. siblings) and extrafamilial (e.g. peers) risk factors contribute to adolescents' violence and delinquency. Drawing on the cumulative risk perspective,^{17,18} we expect particularly high levels of violent and delinquent behaviour among adolescents who have both older siblings and peers who drink heavily (called drunken siblings and drunken peers hereafter), and who drink heavily themselves. Although we do not hypothesize any gender differences for the proposed associations, we will test for gender differences via interaction terms (see Statistical analysis section) and, depending on the outcome (i.e. many significant interactions with gender), will explore the model separately by gender.

Methods

Study design

Data for this study come from the 2003 Swiss participation in the 'European School Survey Project on Alcohol and Drugs' (ESPAD).²¹ The survey used a stratified sample of classes based on cantons in which classes were randomly sampled proportionate to the size of each canton. Once permission to conduct the survey was obtained from the relevant cantonal education authorities, principals of the schools to be sampled were informed. Self-completion questionnaires were administered in school classes between the end of April and the end of June 2003. Teachers who supervised the questionnaire completion in the classroom were advised only to respond to students' queries about the procedure. They were also expected to guarantee that all participants could complete the questionnaire independently without interference from classmates. Participants were given one school lesson (~45 min) to fill in the questionnaires. Following the Helsinki Declaration, the students could freely choose to participate. Confidentiality was guaranteed at all stages of data collection.

Sample and missing value imputation

The response rate was 83.1%, resulting in a total sample of 7193 adolescents born between 1984 and 1990, which was representative of 8, 9 and 10th graders in state schools across all three main linguistic regions in Switzerland. Since older siblings are important socialization agents due to their higher social status, greater experience and mentoring capacity, having an older sibling provides a very different social context than growing up without one.²² Consequently, participants were excluded from the analysis if their responses indicated not having an older sibling ($n=2835$, 39.4%) or was missing ($n=607$, 8.5%). The amount of missing values regarding variables included in this study (cf. below) varied between 0.4% and 1.4% and those participants with two or more

responses missing ($n=40$, 1.1%) were excluded from the analyses. Thus, the final sample consisted of 3711 13- to 17-year-old students.

Some students in the final sample had still one item missing ($n=103$, 2.7%). These missing values were imputed by means of a Markov Chain Monte Carlo (MCMC) approach²³ by using the LISREL 8.51 programme.²⁴ This approach uses the maximum available information for an individual from other items in the imputation model.

Measures

An interdisciplinary research group from the participating countries developed the ESPAD core questionnaire,²¹ including questions about older siblings' drunkenness, drunkenness among peers and RSOD. In Switzerland, the ESPAD Deviance Module,²⁵ incorporating questions about violence and delinquency, was additionally included. The resulting questionnaire was translated under the supervision of SIPA into the three languages most frequently spoken in Switzerland: German, French and Italian.

Drunken older siblings

Participants answered the question 'Do any of your older siblings get drunk?' with either 'no' (coded as 0) or 'yes' (coded as 1).

Drunken peers

The answer categories to 'How many of your friends would you estimate get drunk at least once a week?' were dichotomized, with 'none' or 'few' coded as 0 and 'some', 'most' or 'all' coded as 1.

RSOD

The question was 'Think back over the last 30 days. How many times (if any) have you had five or more drinks in a row?' To create a linear measure, mid-points were used to code the answer categories: 'None'=0, '1'=1, '2'=2, '3-5'=4, '6-9'=7.5 and '10 or more times'=11.25 {10 times plus half range to mid-point of adjacent category: $10 + [(10-7.5)/2]$ }.

Violence and delinquency

To assess violent behaviour, three questions were used: 'During the last 12 months, how often have you (1) participated in a group bruising an individual?, (2) participated in a group starting a fight with another group? and (3) started a fight with another individual?'. For delinquent behaviour, the following three questions were used: 'During the last 12 months, how often have you (1) stolen something (worth at least 40 Francs)?, (2) broken into a place to steal? and (3) sold stolen goods?'. To create a linear measure, mid-points were used to code the answer categories: '0'=0, '1-2'=1.5, '3-5'=4, '6-9'=7.5, '10-19'=14.5, '20-39'=29.5 and '40 or more'=45.25 (40 times plus half range to mid-point of adjacent category). Subsequently, the three violence questions and the three delinquency questions were added up and divided by three. Internal consistency, using Cronbach's- α , was 0.89 for violence and 0.84 for delinquency, respectively (note that values above 0.7 are considered as satisfactory internal consistency²⁶). To counteract skewness, the violence and the delinquency indicators were transformed with logarithm naturalis.²⁷ One occasion was added before taking the logarithms (e.g. $\text{violence}_{\ln} = \ln(\text{violence} + 1)$), because the logarithm naturalis of zero is not defined. After adding one occasion, the minimum useful value of the logarithmic transformation reverts to zero.

Statistical analysis

Multiple linear regression analysis using unweighted ordinary least squares was applied. Violent behaviour and delinquent behaviour were separately regressed on drunken older siblings, drunken peers, RSOD and all two-way and the three-way interactions between the three variables. Since violent and delinquent behaviours were found to be higher among boys and in early adolescence,^{6,28} both regression models were adjusted for gender and age effects. To examine whether the relationships that emerged from these models were similar for boys and girls and for younger (aged 13–14 years) and older (aged 15–17 years) adolescents, additional gender and age interactions with drunken older siblings, drunken peers, RSOD and all two-way and the three-way interactions between the three variables were included by means of a backward selection *post hoc* stepwise regression in which the inclusion criteria was Bonferroni corrected. Due to the cluster sampling of study participants, all regression analyses were adjusted for design effects of clusters (school classes) by using the Huber–White sandwich estimator for standard errors. All analyses were performed using the statistical software package STATA 9.1.²⁹

Results

Descriptive results revealed that half of the participants were boys and half were girls, with an overall mean age of 15 years (table 1). About one-third of the participants had drunken older siblings, and one-third indicated that at least some of their peers were drunk at least once a week. In the last 30 days, more than one-third of the participants had at least one risky drinking occasion. RSOD adolescents had on average three risky drinking occasions. In the 12-month period, about one in three participants acted violently at least once and 11.7% displayed delinquent behaviour at least once. Violent adolescents acted on average three times violently. Delinquent adolescents were on average five times delinquent.

Results from the multiple regression analyses revealed that participants with older drunken siblings and those with drunken peers had a higher frequency of violence and delinquency (table 2). Moreover, the higher the frequency of RSOD, the higher the frequency of violence and delinquency. Three-way interactions, rather than two-way interactions, were significant, i.e. the combination of having drunken older siblings, drunken peers and a high level of RSOD was associated with a particularly high frequency of violence and delinquency.

Subsequently, we examined whether these relationships were similar for boys and girls and for younger and older adolescents. For violent behaviour, the gender*peers interaction ($B=0.124$, $SE=0.040$, $t=3.0$) and the age*RSOD interaction ($B=-0.048$, $SE=0.015$, $t=-3.2$) were significant. This means that particularly among boys, there was a high level of violent behaviour when having drunken peers, and that among older adolescents (15- to 17-year olds) the link between individual RSOD and violent behaviour was less pronounced. However, no additional three-way and no four- or five-way interactions were found. For delinquent behaviour, no additional gender or age interaction was found at all. Thus, no further exploration of gender-specific models was warranted.

Illustrating the regression results, figure 1 shows that those who had no drunken older siblings and no drunken peers had the lowest level of violence and delinquency if they had no risky drinking occasion themselves, followed by those with drunken siblings but no drunken peers. However, the latter group had a particularly low increase of violence and

Table 1 Statistical description of the variables used in the study

	Prevalence (n)	Mean frequency (SD)
Demographics		
Gender (males)	50.2 (1867)	–
Age (years)	–	15.0 (1.0)
Independent variables		
Drunken older siblings	32.0 (1187)	–
Drunken peers	33.3 (1235)	–
RSOD ^a	37.5 (1392)	3.0 (2.7)
Outcomes		
Violence ^b	29.8 (1106)	3.1 (7.1)
Delinquency ^b	11.7 (435)	4.8 (9.5)

n, number of participants in the group; prevalence is given in percentages

a: RSOD in the last 30 days

b: In the last 12 months

Table 2 Violence and delinquency regressed on drunken older siblings, drunken peers, RSOD and their interaction (unstandardized regression coefficients, standard errors and *t*-values in brackets and explained variance)

	Violence (ln)	Delinquency (ln)
Intercept	0.077 (0.014, 5.6)***	0.012 (0.012, 1.0)***
Main effects		
Drunken older siblings	0.087 (0.025, 3.5)***	0.043 (0.019, 2.2)*
Drunken peers	0.136 (0.031, 4.5)***	0.068 (0.022, 3.0)**
RSOD	0.038 (0.012, 3.2)**	0.044 (0.011, 4.1)***
Interactions		
Siblings*RSOD	–0.021 (0.018, –1.2)	–0.030 (0.015, 1.9)
Peers*RSOD	0.001 (0.019, 0.5)	–0.000 (0.019, –0.0)
Siblings*peers	–0.087 (0.053, –1.7)	–0.026 (0.045, –0.6)
Siblings*peers*RSOD	0.069 (0.029, 2.4)*	0.059 (0.026, 2.3)*
Explained variance (R^2) (%)	9.9	8.2

All models are adjusted for sex and age effects; explained variance (R^2) does not contain sex and age effects

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

delinquency with increasing RSOD. Those with drunken peers but no drunken older siblings had a high level of violence and delinquency even if they had no risky drinking occasion in the last 30 days. However, the increase in violence and delinquency with increasing RSOD was the same as among those with no drunken older siblings and no drunken peers (but at a higher level). Those with drunken peers and drunken older siblings had a high level of violence and delinquency even if they had no risky drinking occasion. Moreover, this group of adolescents showed a particularly steep increase in violence and delinquency with increasing frequency of RSOD.

Discussion

The aim of the present study was to investigate links between adolescent alcohol use and violence and delinquency in the context of perceived excessive alcohol consumption among older siblings and peers. The results showed that each individual risk factor was associated with the frequency of displaying violent and delinquent behaviour in the last 12 months. This is consistent with studies which demonstrated that adolescents' risky drinking,^{1–4} having older siblings who get drunk,^{10,30} and spending time with peers who get drunk^{5,6} are important risk factors for problem behaviours such as violence or delinquency. Moreover, our findings expand on the role of older siblings' alcohol use as being not only a

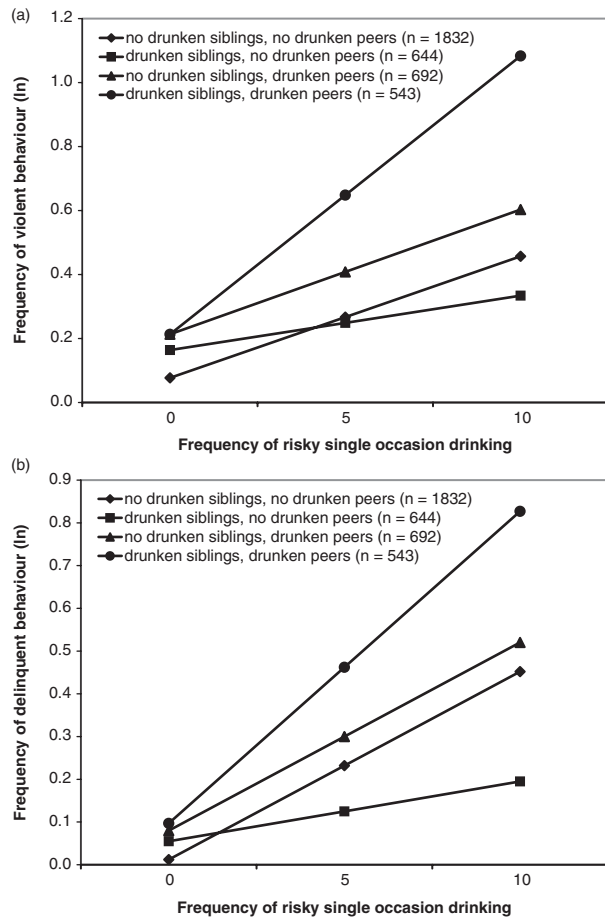


Figure 1 Association between violence (A) or delinquency (B) and risky single occasion drinking according to having drunken older siblings and drunken peers

predictor of younger siblings' drinking behaviour,^{11,16} but also their violence and delinquency.

Consistent with previous research on violent behaviour in adolescence,⁶ one gender and one age interaction were found in this respect. It seems likely that social norms, i.e. that violent behaviour is less socially acceptable for females than for males,³¹ make girls less likely than boys to act violently when being together with heavily drinking peers. In addition, young adolescents seem to be particularly prone to act violently when intoxicated. It might be that at the beginning of their drinking career individuals have not yet learned to control their actions and emotions when intoxicated and are therefore more likely to act aggressively.⁶ This might also explain why we did not find such an interaction for delinquent behaviour.

In addition, a three-way interaction effect emerged from the regression models. As expected, adolescents who frequently engage in RSOD and have both drunken peers and drunken older siblings had the highest levels of violence and delinquency. Moreover, their association between own drinking and violence and delinquency increased the steepest. This confirms the occurrence of cumulative risk processes.^{17,18} Since no further gender or age interactions were found, similar processes seem to hold true for both boys and girls and older and younger adolescents.

In general, it appears to be peers who make the decisive contribution to adolescents' levels of violence and delinquency in the presence of adolescents' RSOD. In the absence of an older drunken sibling, drunkenness among peers provides the supportive context for adolescent problem behaviour.^{5,6}

During adolescence, the peer context becomes increasingly important and more time is spent with peers than with family members. This further stresses the salience of the peer group for a variety of problem behaviours in adolescence, as highlighted in many other studies.^{32,33}

An unexpected finding was that among adolescents with drunken siblings but no (or few) drunken peers, violence and delinquency only slightly increased with increasing RSOD. One explanation might be that older siblings are generally less likely to be violent or delinquent, since such behaviour usually decreases during adolescence,²⁸ e.g. due to an increase in moral reasoning.³⁴ When adolescents are similar to their older siblings (e.g. both are heavy drinkers), it may be that older siblings promote non-coercive behaviours in a mentor-like manner,^{22,35} resulting in low levels of violence and delinquency. However, it may also be the case that in the absence of same age peers, 'hanging around' with older, physically more developed individuals reduces the risk of acting violently because of the unfair odds in fights. Thus, more research is needed before we can come to more definite conclusions about the effect of the interplay of younger and older siblings' RSOD on delinquency and violence.

Strengths and limitations

One of the strength of the present study is the large national representative sample of adolescents in Switzerland. Even when analysing subgroups of having drunken older siblings and peers in relation to participants' own frequency of RSOD, sufficiently large numbers were available. Nevertheless, it remains a cross-sectional study; investigating a causal interplay of different risk factors over time would require large longitudinal data sets. In the present study, information on the number of older siblings, their age and gender was lacking. These factors could be important because stronger behavioural resemblance in substance use and delinquency has been found for same sex, rather than opposite sex, siblings and for those closer in age.^{10,11} In future studies, it would also be important to further disentangle the effects of peers and older siblings, since the former are often chosen whereas the latter are genetically related and share the same parents and home environment.

Another limitation arises from all information being based on adolescent self-reports and perceptions of their social environment, which may result in inflated associations.^{36,37} Thus, it would be desirable to gather responses from peers and siblings, as well as adolescents, to avoid the problem of 'shared method variance'.³⁷

Moreover, the present research has been conducted in Switzerland, and it remains uncertain to what degree the presented results can be generalized to other countries. Yet, many associations found in this study confirm those from the American (by far the largest number), Dutch^{34,35} and Australian⁸ studies drawn upon here, thus suggesting that similar associations and interaction effects could be expected in other Western cultures. Consequently, we assume that our associations may also hold in other countries, but future replication in these countries remains essential.

Conclusions

The present study demonstrated that excessive alcohol consumption among older siblings and peers represents a crucial contextual factor for the link between adolescents' risky drinking and violence and delinquency. In particular, peer drunkenness was decisive for adolescents' deviance: such a peer context exacerbated the influence of a drunken older sibling and/or own RSOD. Nevertheless, there were synergistic effects,

i.e. effects over and above the additive effect of having drunken peers and drunken older siblings when both factors come together. Thus, it is important to also incorporate the family situation in preventative action due to its potential as a risk and protective factor for adolescent problem behaviour.^{38,39}

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Key points

- It is common knowledge that alcohol use and violence in adolescence is interrelated. However, less is known about variables which modify the link between alcohol use and violent behaviours in adolescence.
- Apart from the main effects, a three-way interaction effect emerged from the regression models. Adolescents who frequently engaged in RSOD and had both drunken peers and drunken older siblings had the highest levels of violence and delinquency. Moreover, their association between own drinking and violence increased the steepest. This confirms the occurrence of cumulative risk processes.
- The present study demonstrated that excessive alcohol consumption among older siblings and peers represents a crucial contextual factor for the link between adolescents' risky drinking and violence and delinquency. For prevention, the findings suggest that a focus on peers alone may not be effective if the familial background is not taken into consideration.

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