

What is Worse? A Hierarchy of Family-Related Risk Factors Predicting Alcohol Use in Adolescence

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The aim of the present study was to determine if family structure, perception of excessive drinking in the family, and family bonding hold a graduated importance in predicting adolescent alcohol use and their association with peers who drink excessively. Three nested linear structural models were calculated separately for frequent and excessive drinking, based on a sample of 3,127 eighth and ninth graders in Switzerland (mean age 15.3, SD 0.8) surveyed in spring 2002 in the context of the “Health Behavior in School-Aged Children (HBSC)” study. The results confirm that the perception of excessive drinking in the family is more closely related to both frequent and excessive drinking than family structure, and family bonding is more closely related than drinking perception. Adjusting for both socio-demographic variables and the association with peers who drink excessively only slightly changed the results. To predict an association with the latter, family structure was more important than the perception of drinking, but family bonding remained the predominant predictor. The results stress the graduated importance of family-related risk factors: by listening to their children’s worries, by spending their free time with them, and by providing help when needed, parents might have the possibility to actively minimize the risk of frequent and excessive drinking regardless of whether they are frequent excessive drinkers or live without a partner.

Keywords family structure; perception of parental drinking; family bonding; excessively drinking peers; alcohol; drunkenness; adolescence; Switzerland

Introduction

A review of research over the past 10 years revealed that among etiological variables the family environment is particularly important for adolescent substance use (Weinberg et al., 1998). Another review stresses that despite the overwhelming research on peer influence the family remains a strong factor in moderating adolescent substance use (Kington and O’sullivan, 2001) and, at least for initiation to drinking, parental influence is more important than peer behavior (Jung, 1995). Over the last 30 years, various family-based risk factors for adolescent substance use have been identified, such as family structure, substance using family members, and family atmosphere (Denton and Kampfe, 1994; Vakalahi, 2001). However, no attempt has been made to determine if some family-related risk factors are more closely related to adolescent substance use than others. In this article, we use multiple regression models to determine if family variables at different levels, such as family

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structure, perception of drinking habits in the family, and family bonding, have a graduated importance in predicting the frequency of alcohol intake and drunkenness of adolescents and their association with peers who drink excessively.

Three Family-Related Risk Factors for Adolescent Alcohol Use

Among family-related risk factors, the structure of the family can be a predictor of adolescent alcohol use. Numerous studies have found that living in a single-parent family increases the risk of adolescent alcohol use (Denton and Kampfe, 1994; Vakalahi, 2001; Isohanni et al., 1994; Ledoux et al., 2002). Studies have shown that adolescents from single-parent families consume alcohol at high rates (Griffin et al., 2000; Jenkins and Zunguze, 1998; Kuntsche and Silbereisen, 2004). Among adolescents in the United States, controlled for sex, age, race/ethnicity, family income, and residential mobility, the risk of frequent drinking was highest in father-custody families and lowest in mother-father families (Hoffmann and Johnson, 1998; Wallace et al., 1999). Epstein et al. (1999) argue that living in a two-parent family means the level of adult supervision is higher and thus opportunities to engage in drinking are restricted. In addition, the fact that single parents tend to have fewer financial and coping resources, and tend to suffer from greater social isolation than intact families, is also likely to contribute to high adolescent alcohol use rates (Griffin et al., 2000).

A second important risk factor for frequent and excessive adolescent drinking is the perception of excessive drinking in the family. Empirical evidence suggests that children who perceive excessive parental drinking are likely to consume alcohol at high levels (Jung, 1995; Vakalahi, 2001; Adalbjarnardottir and Rafnsson, 2001; Ellickson, 2001; Jackson et al., 1999; Li et al., 2002). In a Swiss study, Kuntsche and Meyer (2002) demonstrated that the risk of frequent alcohol use among 12- to 15-year-olds increases linearly with the number of persons in the family perceived as excessive drinkers. There are three lines of reasoning with regard to the influence of perception of parental drinking on their children's drinking. First, adolescents may initiate drinking by observing and adopting parental drinking habits (Li et al., 2002; Zhang et al., 1999; Beman, 1995). Adolescents whose parents drink are also more open or willing to drink when the opportunity arises (Gerrard, 1999). In this case, the parents serve as role models for an intended and valued behavior. Second, alcohol consumption among adolescents often occurs in accordance with parental values and norms (Beman, 1995; Coleman and Hendry, 1999). Third, adolescents from families in which excessive drinking is common are likely to suffer both physically and emotionally and may use substances as a means to cope (Beman, 1995).

Finally, the literature suggests that weak family bonds encourage frequent and excessive drinking among adolescents (Jung, 1995; Vakalahi, 2001; Crawford and Novak, 2002). Family bonding, defined as a feeling of closeness and intimacy toward one's parents, is reflected in perceived monitoring, communication, involvement, and joint activities in the family (Zhang et al., 1999; Bahr et al., 1995). In empirical studies, family bonding was repeatedly shown to be a main risk factor for frequent and excessive drinking among adolescents (Zhang et al., 1999; Bahr et al., 1995). In a multivariate study among 12- to 15-year-olds in Switzerland, poor family bonding could be identified as a predominant risk factor for adolescent excessive drinking (Kuntsche and Schmid, 2001). Crawford and Novak (2002) suggest that adolescents who spend substantial amounts of time with their parents drink less because their opportunities for engaging in drinking activities are restricted. Furthermore, talking about their personal worries and feeling close to their parents leaves children more open to their parents' influence and makes them more likely to have similar attitudes and values (see Steinberg, 2002, for a review). Correspondingly, Bell et al. (2000) argue that strong

bonds with parents promote and reflect the adolescent's adoption of conventional societal norms and values. The internalization of such norms and values, in turn, guards against engagement in deviant behaviors. In this way, parental closeness affects the similarity of drinking levels between parents and their children even in late adolescence (Jung, 1995). So, by feeling close to their parents, most adolescents adopt moderate drinking habits.

Three Levels of Family Predictors

The literature suggests that structural factors are less important in predicting adolescent drinking patterns than factors like the perception of parental drinking. Petraitis et al. (1995) state that substance-specific attitudes and behaviors of role models such as parents are more closely related to adolescent alcohol use than family characteristics like parental divorce or separation. Empirical evidence demonstrates that perception of parental drinking predicted subsequent high levels of alcohol use among adolescents over a five-year period, whereas family structure was only predictive over a two-year period (Ellickson et al., 2001).

Second, perception of parental drinking was found to be less important in predicting adolescents drinking than strong bonds among the family members. Adolescents are less likely to initiate excessive drinking when they have a close relationship with family members, even if they observe excessive drinking in the family (Zhang et al., 1999). Bahr et al. (1995) showed that family bonding has a direct effect on the frequency and the amount of alcohol consumed by adolescents, whereas the perception of excessive alcohol use in the family was only mediated by the association with frequently drinking peers. Also, in relation to the association with frequently drinking peers, family bonding appears to have a greater influence than the perception of excessive drinking in the family.

Third, family bonding appears to be more important than family structure. Studies showed that attachment to family members is a stronger factor for adolescent drinking than the presence of two parents at home (Vakalahi, 2001; McArdle et al., 2002). In other studies, family structure was found to have only an indirect effect—through family attachment—on adolescent frequent and excessive drinking (Sokol-Katz et al., 1997). The results of a multiple linear regression show that an unsupportive family environment was a suitable predictor of subsequent drinking levels two years later in adolescence, whereas family structure was not (Shucksmith et al., 1997).

To our knowledge, no attempt has been undertaken to include all three family-related risk factors for adolescent frequent and excessive drinking in a multiple model adjusted for socio-demographic variables and the association with peers who drink excessively. By empirically confirming the gradual importance of family-related risk factors for adolescent frequent and excessive drinking, key aspects can be identified that are assumed to be most effective for family-based prevention.

Family Factors and Drinking Peers

Even if parental influence is more important than peer behavior for the initiation of drinking (Jung, 1995), peer influence increases with age (Gerrard et al., 1999). Findings indicate that peer-related aspects are more important in predicting adolescent drinking levels than parent-related aspects, in particular as adolescents grow older (Crawford and Novak, 2002; Zhang et al., 1997). In late adolescence and early adulthood, peer influence becomes a predominant predictor of individual drinking (see Borsari and Carey, 2001, for a review). An association

with peers who drink further weakens the parental influence on adolescent drinking levels (Gerrard et al., 1999).

Hierarchy of Predictors

Even if all three family-related risk factors—living in a single-parent family, perception of excessive drinking in the family, and weak family bonds—are interrelated, each of them appears to predict, to a certain degree, frequent and excessive adolescent drinking in multiple analyses. The aim of the present article is to empirically confirm the described hierarchy of family-related risk factors in predicting adolescent frequent and excessive drinking. We suggest that the three family-related risk factors listed have a gradual importance in predicting the frequency of alcoholic beverage intake and drunkenness in adolescence: family bonding should be more strongly related to frequent and excessive drinking than the perception of excessive drinking in the family and this perception should be more strongly related to frequent and excessive drinking than family structure.

In addition, various studies show that the relation between family structure, perception of excessive drinking in the family and family bonding is moderated or mediated through drinking peers (Epstein et al., 1999; Adalbjarnardottir, and Rafnsson, 2001; Ellickson et al., 2001; Li et al., 2002; Bahr et al., 1995; Zhang et al., 1997; Farrell and White, 1998). Therefore, we added the association with peers who drink excessively in the final model of the hierarchy of family factors.

Finally, we also tested if the hierarchy of family factors can be established for the association with peers who drink excessively as a dependent variable. That means that, apart from the relation to individual frequent and excessive drinking, family bonding should be more strongly related to the association with peers who drink excessively than the perception of excessive drinking in the family, and this perception should have a stronger relation than family structure. Bahr et al. (1995), for example, observed that weak family bonds were more strongly related to the association with frequently drinking peers than the estimation of alcohol problems in the family.

Methods

Study Design and Sample Description

The database used for this analysis is part of the survey “Health Behavior in School-Aged Children (HBSC)” (Currie et al., 2004), which has been conducted every four years since 1982 in more than 35, mostly European countries, under the supervision of the World Health Organization (WHO). By collecting information on a wide range of health indicators and factors that may influence them, the HBSC study wishes to promote a better understanding of health behaviors and lifestyles of young people across different cultural contexts. In 2002, for the fifth time, the Swiss Institute for Prevention of Alcohol and Drug Problems (SIPA) conducted the survey for Switzerland which was funded by the Swiss Federal Office for Public Health and the cantons.

Data were collected by means of a paper-pencil questionnaire during April and May 2002. Fifteen months prior to the field work, we asked permission from the relevant cantonal administrations responsible for the regional school systems to conduct the survey in their canton. Subsequently, the school directors of sampled classes were informed. To avoid systematic errors, the exact date of the distribution of the questionnaires was not communicated to the school boards ahead of time. Teachers who administered the questionnaires in the

classroom were advised only to respond to adolescents' queries about the procedure and to guarantee the independent completion of the questionnaire without interference from classmates. The time frame for filling out the questionnaires was one school lesson (about 45 minutes). The study was undertaken in accordance with APA ethical standards (APA, 2002) and with the Helsinki Declaration (WMA, 2002). For example, the pupils could freely choose to participate and confidentiality was ensured at all stages of the study.

Cluster sampling was used, based on a list of all the 21,938 classes of Swiss schools from fifth to ninth grade compiled by the Swiss Federal Statistical Office; the classes served as the primary sampling unit. Six hundred and eighty-nine classes were randomly selected, stratified by canton (region) and grade. Out of these 689, 589 classes sent back their questionnaires in time, resulting in a response rate of 85.5%. Since frequent and excessive drinking is not prevalent in early adolescence in Switzerland, only eighth and ninth graders ($N = 3,861$) were chosen for the present study. Since gender and age were taken as independent variables, pupils who did not indicate their gender or age were pre-excluded ($n = 115$; 3.0%). The remaining sub-sample contained 1,712 eighth graders (45.7%) and 2,034 ninth graders; 1,846 pupils were boys (49.3%) and 1,900 were girls. The total mean age was 15.26 years ($SD = .80$).

Measures

The questions were developed by an interdisciplinary research group from participating countries. Since the aim of HBSC is to provide a comprehensive picture of health indicators in adolescence and factors that may influence them, questions were asked on topics such as socioeconomic inequality, family, peers, school, well-being, substance use, physical and sedentary activities, eating habits, body image and weight control, oral health, sexual activities, violence, and injuries. The resulting core questionnaire was translated under SIPA supervision in the four languages spoken in Switzerland: German, French, Italian, and Rumansch. The final Swiss questionnaires were pre-tested qualitatively and quantitatively to guarantee comprehension and smooth completion of questionnaires. Details on the construction of the international and national questionnaire can be found in Currie et al. (2001), online at www.hbsc.org, as well as in Schmid et al. (2003).

Family Structure. From the question "Now we'd like to ask you about who you live with. Please tick everyone who lives at the home where you spend the most time" the variable "Family Structure" was constructed with the categories "two-parent family" (coded as 1), "single-parent family" (coded as 2), and "other set-up" (coded as 3).

Perception of excessive drinking in the family. The questions on perception of excessive drinking in the family were introduced by: "We all have our ingrained habits; which ones best match the following people?" The pupils could indicate if their father or step-father, their mother or step-mother, their brothers or sisters (if applicable) "drink too much alcohol." This way of measuring excessive alcohol use in the family was shown to predict adolescent alcohol use better than self-reports by family members (Smith et al., 1999). A variable was constructed indicating whether, according to the pupil, at least one family member drinks excessively.

Family bonding. In line with previous research (Zhang et al., 1999; Bahr et al., 1995), we defined family bonding as communication, joint activities, and support. The following three questions were used for creating a latent variable in the linear structural models: "I tell them about my worries," "We spend our free time together," and "If I need help, she/he is at my disposal." The possible answers for the first two questions were "every day" (coded as 1), "1-6 times a week" (coded as 2), "1-3 times a month" (coded as 3), "less often"

(coded as 4), and “never” (coded as 5). For the third question, a 5-point Likert scale from “strongly agree” (coded as 1) to “strongly disagree” (coded as 5) was used. The reliability of Cronbach’s $\alpha = .61$ is comparable to previous research (Zhang et al., 1999) and indicates that different aspects of family bonding are measured.

Gender. The question “Are you a boy or a girl?” was used to define the gender of the respondents (coded 1 for girls; 2 for boys).

Age indicator. According to Bahr et al. (1995), both the pupils’ age and their respective grade was used to create a latent variable which accounts for their developmental stage.

Association with peers who drink excessively was measured by the question: “My male or female friends have already been drunk,” with the answer categories: “all of them” (coded as 5), “the majority” (coded as 4), “about half of them” (coded as 3), “few of them” (coded as 2), and “none of them” (coded as 1).

Frequency of alcoholic beverage intake was defined as the consumption of at least one glass or can of beer, one glass of wine, one shot of spirits, or one alcoholic pre-mixed drink, with the answer categories: “every day” (coded as 5), “every week” (coded as 4), “every month” (coded as 3), “less than once a month” (coded as 2), or “never” (coded as 1).

For *drunkenness*, the question was: “Have you ever had so much alcohol that you were really drunk?” with the answer categories “no, never” (coded as 1), “yes, once” (coded as 2), “yes, 2–3 times” (coded as 3), “yes, 4–10 times” (coded as 4), “yes, more than 10 times” (coded as 5).

Statistical Analyses

To take into account that the sample units were classes and not individuals, the usual 5% error level was restricted to 1% (cf. Kuntsche and Silbereisen, 2004; Bahr et al., 1995). This procedure avoids effects, such as more narrow confidence intervals due to cluster sampling, being reported as statistically significant. The 58 pupils (1.5%) who indicated that they live neither with their mother nor with their father could not be analyzed and were therefore excluded. Missing values in the other questions varied from 0.7%–1.8%, with the exception of those relative to perception of excessive drinking in the family. A selection bias for pupils who did not answer these questions and the remaining sample could not be found regarding gender ($\chi^2 = 0.83$, $df = 1$, $p > .01$), grade ($\chi^2 = 1.78$, $df = 1$, $p > .01$), and age ($t = 1.84$, $p > .01$). As it is not easy to judge or to acknowledge that a family member drinks too much, 10.6% of the adolescents refused to give an answer concerning the drinking habits of their family. However, also in this case, no selection bias could be found ($\chi^2_{\text{gender}} = 3.07$, $df = 1$, $p > .01$; $\chi^2_{\text{grade}} = 0.01$, $df = 1$, $p > .01$; $t_{\text{age}} = 2.51$, $p > .01$). The pupils who failed to answer all the questions were excluded from the analysis. The remaining sample contained 3,127 adolescents (1,516 boys and 1,611 girls). Characteristics of the final sample are given in Table 1.

Using structural equation modeling, we calculated three models (see Figure 1) for each of the two dependent alcohol measures separately. In the first model, we included family structure, perception of excessive drinking in the family, and family bonding. We tested differences in the relationship between the three independent variables and frequent and excessive adolescent drinking. In the second model, we tested whether the hierarchy in the relations between family structure, perception of excessive drinking in the family, family bonding, and frequent and excessive drinking remains stable after controlling for gender and age. In the third model, we added the association with peers who drink excessively to test (a) whether the hierarchy in the relations between the family variables and frequent and excessive drinking remains stable, and (b) whether the same

Table 1
Variables description

	Total sample (n = 3,127)	Boys (n = 1,516)	Girls (n = 1,611)
Mean age (SD)	15.2 (.80)	15.3 (.79)	15.2 (.80)
School grade			
8th grade	46.1%	45.2%	46.9%
9th grade	53.9%	54.8%	53.1%
Linguistic region			
German	70.3%	70.3%	70.3%
French	20.0%	20.3%	19.7%
Italian	9.5%	9.3%	9.7%
Rumansch	0.2%	0.1%	0.3%

hierarchy can be established for the relation between family structure, perception of excessive drinking in the family, family bonding, and the association with peers who drink excessively.

In each of the models, differences in the relations between the three family variables and adolescents' frequent and excessive drinking were tested using χ^2 difference tests (Kuntsche and Silbereisen, 2004; Ullman, 2001) that apply a nested goodness-of-fit strategy (Jaccard and Wan, 1996). In the linear structural models, two paths (e.g., the path between

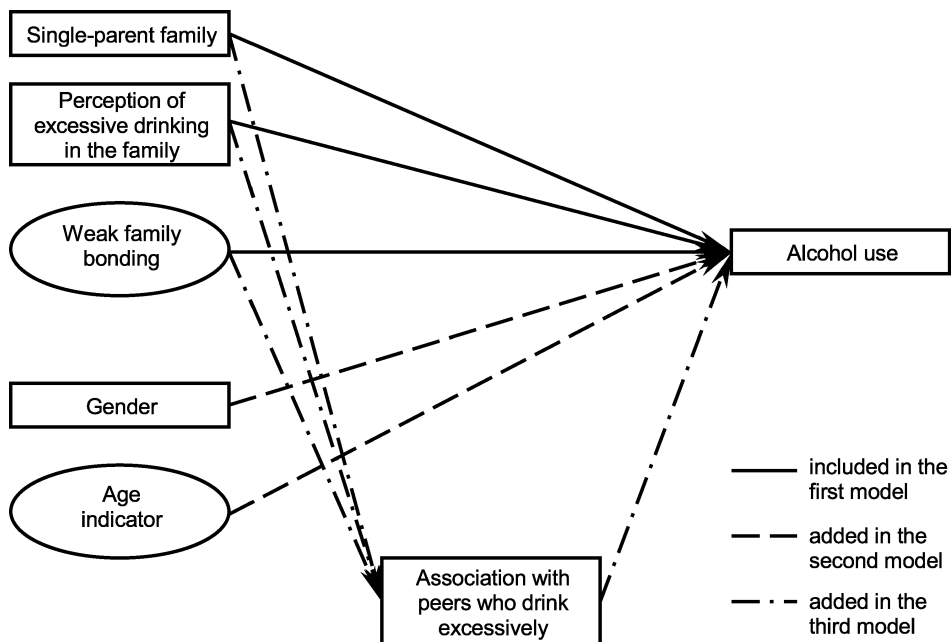


Figure 1. Graphical representation of the hypothesized models. *Note:* Measurement errors and covariance paths between the independent variables are suppressed. The operationalization of the variables is given in the method section.

family structure and drunkenness and that between perception of drinking and drunkenness) were set as equal, and the χ^2 -value of the resulting restricted model was compared with the χ^2 -value of the original unrestricted model, while taking into account the resulting degrees of freedom. If a significant difference emerges, the restricted model fits the data less well. Therefore, it can be concluded that one family variable is more closely related to frequent and/or excessive adolescent drinking than the former. χ^2 difference tests were equally applied to determine differences in the relation between family variables and the association with peers who drink excessively.

The models were estimated using the software AMOS 4 (Arbuckle and Wothke, 1999). The maximum-likelihood method was used and standardized regression coefficients (β) were displayed. This method is robust, performs well with samples of over 500 cases, and is widely used (Kuntsche and Silbereisen, 2004; Gerrard et al, 1999; Ullman, 2001). To evaluate the overall fit of the model the CFI and the RMSEA indices were used, as recommended by Ullman (2001).

Results

Variables Description

As shown in Table 2, every fifth adolescent indicated that he or she comes from a single-parent family. One out of ten perceived that one or more family members drink excessively. This perception increases as the adolescents grow older ($\chi^2 = 6.7$, $df = 1$, $p < .01$). Boys talk less often than girls to their parents about their worries ($\chi^2 = 8.1$, $df = 1$, $p < .01$), while girls disagree more often that their parents provide help when they need it ($\chi^2 = 7.4$, $df = 1$, $p < .01$). Concerning all drinking-related variables, a boy who is older is more likely to

Table 2
Variables description (in percent)

	Total sample (n = 3,127)	8th graders		9th graders	
		boys (n = 685)	girls (n = 756)	boys (n = 831)	girls (n = 855)
Independent variables					
Single-parent family	19.8	17.5	19.6	21.3	20.5
One or more family members drink too much	10.8	9.2	9.3	11.0	13.2
Weak family bonding					
I tell them about my worries ¹	14.4	16.4	13.1	16.1	12.3
We spend our free time together ¹	6.5	7.3	5.4	6.5	6.7
If I need help, she/he is at my disposal ²	8.4	6.3	10.2	7.6	9.2
Peers who drink excessively ³	32.8	22.9	19.3	47.8	38.2
Dependent variables					
Frequency of alcohol intake ⁴	22.8	17.7	11.5	36.3	23.9
Drunkenness ⁵	23.8	18.4	11.5	37.4	25.7

Note: ¹never, ²disagree, ³most of them, ⁴at least weekly, ⁵twice or more.

consume alcohol frequently (gender: $\chi^2 = 42.9$, $df = 1$, $p < .001$; grade: $\chi^2 = 107.0$, $df = 1$, $p < .001$), to report drunkenness (gender: $\chi^2 = 41.1$, $df = 1$, $p < .001$; grade: $\chi^2 = 119.7$, $df = 1$, $p < .001$), and to be associated with peers who drink excessively (gender: $\chi^2 = 18.3$, $df = 1$, $p < .001$; grade: $\chi^2 = 169.2$, $df = 1$, $p < .001$).

Family Variables and Adolescent Frequent and Excessive Drinking

Table 3 contains the results from the three linear structural models. In the first model, all three family variables are interrelated ($r_{\text{structure-perception}} = .10$, $p < .001$; $r_{\text{structure-bonds}} = .07$,

Table 3
Family, socio-demographic, and peer variables predicting adolescent alcohol use

	Frequency of drinking		Drunkenness	
	β (t)	$\Delta\beta$ ($\chi^2_{df=2}$)	β (t)	$\Delta\beta$ ($\chi^2_{df=2}$)
1. Model				
Single-parent family	.06 (3.7)	.04 (19.4)	.10 (5.7)	.02 (27.6)
Perception of excessive drinking in the family	.11 (6.0)	.11 (88.4)	.12 (6.5)	.12 (101.9)
Weak family bonding	.22 (9.1)		.24 (9.9)	
R ²		7.3%		9.5%
CFI		.95		.95
RMSEA		.06		.06
2. Model				
Single-parent family	.06 (3.5)	.04 (18.2)	.10 (5.6)	.02 (26.9)
Perception of excessive drinking in the family	.10 (6.0)	.09 (76.3)	.11 (6.6)	.11 (90.3)
Weak family bonding	.20 (8.5)		.22 (9.5)	
Male gender	.10 (5.8)		.11 (6.4)	
Age indicator	.25 (12.0)		.24 (12.7)	
R ²		14.3%		16.1%
CFI		.96		.96
RMSEA		.05		.05
3. Model				
Single-parent family	.02 [†] (1.4)	.04 [†] (8.5)	.05 (3.3)	.03 [†] (6.1)
Perception of excessive drinking in the family	.06 (4.8)	.03 (21.8)	.08 (5.4)	.03 (19.0)
Weak family bonding	.09 (5.4)		.11 (5.8)	
Male gender	.07 (4.4)		.07 (4.9)	
Age indicator	.13 (6.9)		.08 (5.0)	
Peers who drink excessively	.42 (24.5)		.53 (33.8)	
R ²		28.8%		39.7%
CFI		.96		.96
RMSEA		.05		.05

Note: All coefficients are significant at the .001 level except[†]: not significant.

$p < .01$; $r_{\text{perception-bonds}} = .16$, $p < .001$) and they show a significant relation to both the frequency of alcohol intake and drunkenness. In direct comparison, the perception of excessive drinking in the family is more closely related to both the frequency of alcohol intake and drunkenness than family structure is. The relevant χ^2 -test reveals that after having set the two paths equal, the model fit is significantly worse. In the same way, weak family bonding is more closely related to adolescent alcohol consumption than the perception of excessive drinking in the family. The results of the linear structural models are confirmed by those emerging from stepwise multivariate regressions. For both the frequency of drinking and drunkenness, weak family bonding was added as the most important predictor in the first step, in the second perception of excessive drinking in the family, and in the third family structure. Additionally, no two- or three-way interaction effects of the three family variables on frequent and excessive adolescent drinking could be found.

In the second model, gender and age were added. While boys and older adolescents drink and report being drunk more often, both variables only slightly affect the interrelation of the three family variables ($r_{\text{structure-perception}} = .10$, $p < .001$; $r_{\text{structure-bonds}} = .06$, $p < .01$; $r_{\text{perception-bonds}} = .16$, $p < .001$), as well as their relation to frequent and excessive drinking. Also, the hierarchy of the coefficients of the family variables persists: weak family bonding remains the strongest predictor, followed by drinking perception, and then family structure.

Additionally, in the third model, the association with peers who drink excessively was added. As drinking peers is a factor mediator for frequent and excessive adolescent drinking, the coefficients in the relation between the family variables and these uses are reduced. Nevertheless, with the exception of drinking frequency among adolescents raised in single-parent families, all family-related coefficients remain significant. As a consequence of the lower coefficients, the difference between family structure and drinking perception is no longer significant; the difference between weak family bonding and drinking perception persists.

Family Variables and the Association with Peers who Drink Excessively

In Table 4, the path coefficients from the third model are given in the relation between the family variables and the association with peers who drink excessively. According to

Table 4
Family variables predicting the association with peers who drink excessively
in the third model

	Association with peers who drink excessively ¹		Association with peers who drink excessively ²	
	β (t)	$\Delta\beta$ ($\chi^2_{df=2}$)	β (t)	$\Delta\beta$ ($\chi^2_{df=2}$)
Single-parent family	.09 (5.2)	-.03 (14.5)	.09 (5.2)	-.03 [‡] (9.7)
Perception of excessive drinking in the family	.06 (3.7)	.16 (80.1)	.06 (3.7)	.16 (70.1)
Weak family bonding	.22 (9.3)		.22 (9.3)	
R ²		7.0%		7.0%

Note: All coefficients are significant at the .001 level except[‡] $p < .01$; ¹in the model with frequency of drinking; ²in the model with drunkenness.

adolescent alcohol use, all three family variables are also significant predictors for the association with peers who drink excessively and among them, weak family bonding is the most important. In comparison to adolescent alcohol use, however, family structure is more closely related than drinking perception.

In all models, the CFI-value is about .95 and the RMSEA .05. The explained variance goes from 7 to 40%. In the third model, 7% of the variance in the association with peers who drink excessively could be explained by family variables.

Discussion

The aim of the present article was to derive an empirically based hierarchy of family risk factors in predicting frequent and excessive adolescent drinking. The results reveal that, although all three family factors predicted frequent and excessive adolescent drinking independently from each other in the multiple models, family bonding is more strongly related to frequent and excessive adolescent drinking than the perception of excessive drinking in the family, and this perception is more strongly related than family structure. This hierarchy of family factors could be established for both the frequency of alcohol intake and drunkenness, and persisted after adjusting for the socio-demographic variables of gender and age. After adding the association with peers who drink excessively as a predominant predictor of frequent and excessive adolescent drinking to the model, the hierarchy still appears to persist, with the only difference being that the coefficients between family structure and the perception of excessive drinking in the family did not remain significant. In addition, for predicting the frequency of alcohol intake, family structure was no longer significant. The level of explained variance is considerable (up to 40% in the final models) and even higher for drunkenness than for the frequency of drinking. All calculated models fulfill the criteria for a good fit to the data as recommended by Ullman (2001).

However, concerning the relationship between family variables and the association with peers who drink excessively, family structure is more closely related than the perception of excessive drinking in the family. Even if the coefficients are not very high, the difference is highly significant. The effect of living in a single-parent family on adolescent drinking appears to be mediated by the association with peers who drink excessively. Having included this variable in the third model, the direct path from family structure to the frequency of alcohol intake did not remain significant. It seems that adolescents growing up with only one parent are particularly at risk of associating with peers who drink excessively. Adolescents from single-parent families are more likely to spend time outside the family and have therefore more opportunities for engaging in drinking activities, particularly in the context of deviant peers (Epstein et al., 1999).

For adolescents living in a family whose members are perceived as excessive drinkers, the risk of an association with peers who drink excessively was lower than those living with only one parent, but their risk of frequent and excessive drinking is modified by drinking peers. In general, adolescents from a family whose members appear to be excessive drinkers are more at risk of frequent and excessive drinking than those from single-parent families. In line with previous studies (Li et al., 2002; Zhang et al., 1999; Beman, 1995), our results highlight parental function as role models for initiating drinking and adopting particular drinking habits, regardless of whether the parent is single or not. However, with reference to the association with peers who drink excessively, adolescents from single-parent families reveal a higher risk.

In line with previous research (Zhang et al., 1999; Bahr et al., 1995; Kuntsche and Schmid, 2001; McArdle et al., 2002), weak family bonding could be identified as the most important predictor for frequent and excessive drinking, as well as for the association with peers who drink excessively. Spending leisure time with their parents restricts opportunities to engage in drinking activities, particularly in the context of deviant peers (Crawford and Novak, 2002). Additionally, the literature suggests that by feeling close to their parents, most adolescents adopt parental values and are therefore more likely to develop moderate drinking habits (Jung, 1995; Steinberg, 2002; Bell et al., 2002).

Results of the study must be considered with regard to design limitations. Owing to the cross-sectional design of the study, reciprocal effects between parenting and adolescent drinking could not be examined and no causal conclusions can be drawn. Therefore, longitudinal designs are needed to disentangle parents' influences from the children's reactions. As HBSC is a multinational collaborative study that aims to monitor a broad variety of health behaviors among school-aged children, only a limited number of items on parenting and substance use could be included. Excessive alcohol use by family members, for example, was only assessed from the children's perspective. Even if the latter was shown to predict adolescent alcohol use better than self-reports by family members (Smith et al., 1999), a multiple informant approach would provide additional information on how family-related variables influence adolescent drinking. While the other items also cover important aspects of family bonding (Zhang et al., 1999; Bahr et al., 1995; Farrell et al., 1995) and excessive alcohol use (Gmel et al., 2003), more research is needed to further establish the hierarchy of family factors by using additional measures, particularly for drinking in the family, family bonding, and risky single occasion drinking. Finally, since drinking behaviors and associated factors are culture-sensitive (Gmel et al., 2003; Kuntsche et al., 2004), more research from different countries is needed to confirm the presented hierarchy for other drinking cultures.

Taken together, our results indicate that family bonding, defined as a feeling of closeness and intimacy toward one's parents, is a very important family-related factor in limiting frequent and excessive drinking in adolescence. For preventive efforts, it is thus important to stress that even single parents and those with excessive drinking habits might protect their children from frequent or excessive drinking. By listening to their children's worries, spending their free time with them, and providing help when needed, parents have the possibility to minimize actively the risk of frequent and excessive alcohol use by their children. In addition, for single parents, effective supervision of their children's activities appears to be particularly important. Yet, for them and for parents with excessive alcohol consumption, it is not always easy to provide enough time and help for their children. Sometimes, effective parenting skills may also be lacking. In such cases, support from all levels—the state, the community, and prevention organizations—is needed, particularly as these parents are likely to feel shame with regard to their situation and hesitate to seek professional help (Kuntsche and Schmid, 2001).

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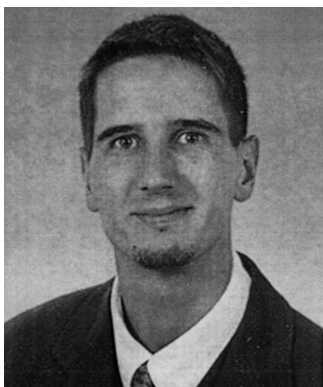
RÉSUMÉ

Le but de la présente étude était de déterminer si la structure familiale, la perception d'une consommation excessive au sein de la famille et la qualité des liens familiaux tiennent une importance graduelle dans la prédiction d'une part de la consommation d'alcool des adolescents et d'autre part de leur association à des pairs consommant de manière excessive. Trois modèles structurels linéaires imbriqués ont été calculés séparément pour la fréquence de consommation et pour la fréquence de consommation excessive d'alcool. Ces analyses se basent sur un échantillon représentatif de 3,127 élèves de 8^{ème} et 9^{ème} années (âge moyen 15.3, écart-type 0.8), interrogés dans toute la Suisse durant le printemps 2002 dans le cadre de l'enquête internationale Health Behaviour in School-Aged Children (HBSC). Les résultats confirment que la perception d'une consommation excessive au sein de la famille est plus grandement liée à la fois à une consommation fréquente et à une consommation excessive que ne l'est la structure familiale ; et que le lien familial est encore plus grandement lié à ces éléments que la perception d'une consommation excessive. Le fait d'ajuster nos modèles à la fois à des variables socio-démographiques et au fait d'être associé à des pairs consommant excessivement ne modifie que légèrement les résultats. Pour prédire une association avec ce type de pairs, la structure familiale était plus importante que la perception de consommation excessive au sein de la famille, mais le lien familial demeurerait le prédicteur prédominant. Les résultats insistent sur l'importance graduelle des facteurs de risque familiaux : en prenant le temps d'écouter les soucis de ses enfants, en passant du temps libre avec eux et en leur apportant une aide lorsque celle-ci est demandée, les parents ont la possibilité de minimiser activement le risque de consommations fréquente et excessive d'alcool chez leurs enfants, et ce indépendamment du fait qu'ils soient ou non perçus comme étant des consommateurs excessifs ou qu'ils vivent sans partenaire.

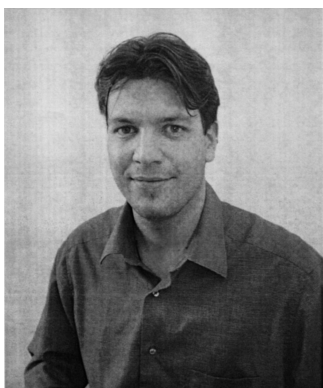
RESUMEN

El objeto del presente estudio era para determinar si la estructura familiar, sensibilidad de exceso de bebida en la familia y la calidad familiar mantiene una calificada importancia para predecir el uso de alcohol en un adolescente y su asociación con padres que beben excesivamente. Tres modelos estructurados linealmente fueron calculados en separado por la frecuencia y la bebida excesiva, basado en 3.127 alumnos de 8a y 9a promoción en Suiza (promedio de edad 15.3, desviación típica 0,8) la encuesta en la primavera 2002 en el contexto del estudio "Health Behaviour in School-Aged Children (HBSC)." Los resultados confirman que la percepción de bebida en exceso en la familia está más relacionado a la frecuencia y exceso de bebida que la estructura familiar y los lazos familiares están más relacionados que la percepción de bebida en exceso ajustando ambos socio-demografico variables y la asociación con excesivo bebedores sólo cambió ligeramente los resultados. Para predecir una asociación con los últimos, encontramos que la estructura familiar era mas importante que la sensibilidad de beber. Los lazos familiares fueron el factor predominante. Los resultados acentúan la graduada importancia del hecho de riesgo familiar: escuchando las preocupaciones de los niños, pasar tiempo con ellos y darles ayuda cuando la necesitan, los padres tienen la posibilidad de minimizar el riesgo de beber en exceso, independientemente de si ellos usan la bebida con frecuencia o viven sin una pareja.

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