



Moderation, mediation – or even both? School climate and the association between peer and adolescent alcohol use



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HIGHLIGHTS

- We examined the interaction of school climate, peer and adolescent alcohol use.
- The direct effect of peer on adolescent use was mediated by class climate.
- Student–teacher ratio had a buffering moderating effect on this direct effect.
- Percentage of at-risk students had an enhancing moderating effect.
- School climate comprises moderators and mediators for student alcohol use.

ARTICLE INFO

Article history:

Received 16 April 2015

Received in revised form 2 July 2015

Accepted 24 July 2015

Available online 26 July 2015

Keywords:

Early adolescence

School climate

Peer

Alcohol

Mediator

Moderator

ABSTRACT

Introduction: Ample studies discuss the enhancing effects of peer drinking on student alcohol use. In addition, there is vast research on school climate impact on student alcohol use. Though these two areas are intertwined for most young adolescents, it is heretofore not completely clear, in what way these characteristics functionally interact and affect drinking behavior.

Methods: In a longitudinal study, we analyzed a sample of 2490 German adolescents ($M_{age} = 13.32$, $SD = 0.57$, range = 8–13) from 5th (fall 2010) to 8th (fall 2013) grade. We discerned mediating (class climate) and moderating (school organization variables) functions of school on the association between peer and adolescent alcohol use, and finally combined them in direct effect moderated mediation models for a variety of outcomes (lifetime alcohol use, frequency and amount of drinking, binge drinking), adjusting for possible confounders.

Results: Class climate mediated a small significant part of the association between peer and adolescent alcohol use (1.8–2.4%), with the exception of lifetime drinking. Student–teacher ratio and percentage of at-risk students significantly moderated the peer–adolescent association, with the latter having an enhancing and the first having a buffering effect.

Conclusions: School life serves as an important context of adolescent development and as such, seems to have direct and indirect effects on behavior and health. Future research should pay attention to differentiating effects of school climate and include both forms of operationalization when analyzing school effects on student behavior.

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1. Introduction

Ample studies discuss the impact of school climate on student alcohol use: Explicit rules or strong social norms regarding alcohol use, for instance, have a protective effect, if present, but an accelerating effect for alcohol use onset, if not (Bonell et al., 2013; Weisshew & Peng, 1993). Also, school bonding and well-being at school reduce the probability and frequency of drinking among students, with school bonding having a contextual effect i.e., students at schools with high school bonding tend to drink less, even if accounted for

their individual school bonding level (Henry & Slater, 2007; Henry, Stanley, Edwards, Harkabus, & Chapin, 2009). Overall, students spend most of their days at school, wherefore it is undeniably an important context for individual and social development. In addition, many close friendships are formed at school and as studies have shown, peer substance use is one of the most solid predictors of alcohol use from childhood through adolescence, even into early adulthood (Hahm, Kolaczyk, Jang, Swenson, & Bhindarwala, 2012; Schulenberg & Wadsworth, 1996).

However, as school and peer influences are clearly intertwined, their relationship has yet to be satisfactorily defined (Marschall-Lévesque, Castellanos-Ryan, Vitaro, & Séguin, 2014). Furthermore, operationalization of school climate varies greatly, challenging the comparability of results (Bisset, Markham, & Aveyard, 2007; Bonell

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et al., 2013; Weisshew & Peng, 1993). It is mandatory to identify important components of school climate and consequently, connect them to peer influence at school in a theoretically and methodologically sound way.

1.1. School climate

School climate comprises two dimensions, school organization and class climate. School organization refers to structural components of school life, size of staff, student-to-teacher ratio or location of school (school is located in a social hotspot or not), for instance, while class climate refers to more personal connections like student-teacher relationship, atmosphere in class, perceived interaction, bonding or friendliness within classes (Fletcher, Bonell, & Hargreaves, 2008).

Most elements of school organization, like school violence policy or student-teacher ratio are indirectly linked to student alcohol use as they promote either a health-conscious environment or distinct opportunities for teachers and students to talk about health and risk behavior, which then encourages students to reflect and if necessary change their own health behavior. Besides, strict rules for deviant behavior and their enforcement reduce the overall prevalence of deviant behavior at school, and consequently alcohol and other substance use (Bisset et al., 2007). Meanwhile, class climate has direct influence on student alcohol use. Positive and accepting class climate lays the foundation for open communication in class, modeling functional communication behavior for all students. Therefore, students and their peers learn communication and coping skills, other than alcohol use (McNeely, Nonnemaker, & Blum, 2002).

A positive climate of acceptance has been proven as a protective force against early onset of use and increasing alcohol use among adolescents already drinking (Curcio, Mak, & George, 2013; Henry et al., 2009; Mayberry, Espelage, & Koenig, 2009; McNeely et al., 2002). Moreover, a positive, supportive student-teacher relationship decreases the likelihood of hazardous alcohol use, such as binge drinking in adolescents (Fletcher et al., 2008; Patrick & Schulenberg, 2013; Perra, Fletcher, Bonell, Higgins, & McCrystal, 2012). School climate also influences students' emotional state (Minkkinen, 2014), e.g., reinforcing depressive symptoms in schools with negative class climate, high bullying or violence, which, on their part, predict delinquency, and alcohol use among adolescents (Donath et al., 2012; Mushquash et al., 2013; Perra et al., 2012). Thus, it is hypothesized that a more positive class climate should be associated with a decrease in alcohol use.

H1.1. Positive class climate is negatively associated with peer alcohol use.

H1.2. Positive class climate is negatively associated with adolescent alcohol use.

1.2. Peer influence

As stated above, peer alcohol use is a valid predictor for adolescent alcohol use (Gross et al., 2014; Kelly et al., 2011). Indeed, a lot of school children and adolescents drink alcohol for social reasons, such as improving social status or being conform to peer expectations (Burke & Stephens, 1999; Coleman & Cater, 2005; Kuntsche, Knibbe, Gmel, & Engels, 2005). Moreover, popular or close peers serve as role models for students – imitating their behavior is assumed to lead to similar outcomes (Bot, Engels, Knibbe, & Meeus, 2005; Donath et al., 2012; Dumas, Graham, Bernards, & Wells, 2014; Llorens, Barrio, Sanchez, & Selves, 2011; Mushquash et al., 2013). Thus, peer alcohol use is expected to be strongly positively associated with adolescent alcohol use.

H2. Peer alcohol use is positively associated with adolescent alcohol use.

1.3. Moderation and mediation hypotheses

Shared school environment implies shared school climate for adolescents and their peers. Thereby, composition of student body and teaching staff, school health policy and school location affects all students in a similar manner. Since school organization variables vary between schools but not within them, they can be seen as a moderating influence (Dickens, Dieterich, Henry, & Beauvais, 2012; Mrug & Windle, 2009).

H3. School organization variables moderate the association between peer and adolescent alcohol use.

Class climate, on the other hand, as the other dimension of school climate, can vary greatly within schools. Being an integral part of school life, peers and friends also form the individual's evaluation of school life, and are at least partly responsible for perceived climate. Hence, deviant or substance using peers evoke a negative climate e.g., high acceptance of violence, while peers with high school bonding and lower substance use evoke a positive one (Dickens et al., 2012; Mrug & Windle, 2009). Consequently, a positive class climate may activate or strengthen adaptive norms, which lead to reduced risk behavior like underage substance use or binge drinking (Crosnoe, Erickson, & Dornbusch, 2002). Class climate can thus be seen as a mediating variable between peer and adolescent alcohol use.

H4. Class climate mediates the association between peer and adolescent alcohol use.

In fact, school organizational variables and class climate will always appear together, as they are both constitutive for students' school life. Hence, in a final model, both shall be integrated into a direct effect moderated mediation model, testing robustness of effects with simultaneously increased ecological validity.

1.4. Other influences

Since other variables like age, gender, sensation seeking, and socio-economic status have an effect on drinking, e.g., males drink more than females, students with higher SES tend to drink more frequently than others (Curcio et al., 2013; Donath et al., 2012; Schulenberg & Wadsworth, 1996), they will be included in the models.

2. Materials and methods

The sample comprises 3444 participants (52% male; 48% female; response rate: 72%) with a mean age of 10.37 (SD = 0.59; range: 8–13). It was recruited at baseline assessment of the “Eigenständig werden” (=“becoming independent”) prevention trial, a cluster-randomized controlled trial to assess effectiveness of a school-based program for grades 5 and 6, designed to delay onset of substance use, and foster development of personality among schoolchildren (Hansen, Hanewinkel, Maruska, & Isensee, 2011). Mediator and moderator models are tested for amount of and current alcohol use from baseline to 36-month follow-up for the remaining participants of the “Eigenständig werden” trial ($N = 2490$; $M_{age} = 13.32$ [SD = 0.57]; 51% male; follow-up retention rate: 72%), controlling for confounders and experimental condition, in order to adjust the results for potential long-term treatment effects. Sampling process and sample characteristics are described in detail elsewhere (Hansen et al., 2011). All measures were assessed by self-report questionnaires. Informed consent was obtained from all individual participants included in the study.

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