



HHS Public Access

Author manuscript

J Health Soc Behav. Author manuscript; available in PMC 2017 August 15.

Published in final edited form as:

J Health Soc Behav. 2012 ; 53(2): 150–164. doi:10.1177/0022146511433507.

Drinking, Socioemotional Functioning, and Academic Progress in Secondary School

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Abstract

Secondary schools are sites of academic instruction but also contexts of socioemotional development, and the intertwining of these two functions has consequences for adolescents' future health and education. Drawing on nationally representative data from the National Longitudinal Study of Adolescent Health ($n = 8,271$), this study explored the bidirectional associations among indicators of adolescents' alcohol use and their feelings of social integration at school.

Socioemotional problems did not predict increased drinking over time, but drinking predicted declining socioemotional functioning, with negative implications for adolescents' academic grades by the end of high school. These associations, however, were conditioned by aspects of school context, with drinkers feeling more marginalized in schools characterized by dense networks with low rates of drinking.

Keywords

Add Health; drinking; peers; school; socioemotional health

In the United States, schools are not just educational institutions. They are also social contexts, housing many activities that, at least on face value, have little to do with academic instruction (Bearman and Bruckner 2001; Coleman 1961; Falci and McNeely 2009). For example, schools are sites of peer relations and opportunity structures, such as clubs and sports, shaping engagement in nonacademic behaviors (e.g., alcohol use) with direct contributions to health. In these ways, schools act as settings of socioemotional development that, along with curriculum and pedagogy, have implications for whether adolescents complete their education in the K-12 system and are prepared to continue it beyond high school (Crosnoe 2011).

To this end, this study examines the feedback between adolescents' psychosocial well-being in secondary school (as indicated by feelings of loneliness and marginalization in school) and their rates of drinking (as indicated by levels of alcohol use and binge drinking). The goal is to decipher whether (1) negative socioemotional functioning can lead youth into drinking as a form of self-medication, (2) drinking can facilitate or disrupt socioemotional

functioning, or (3) both processes are occurring simultaneously. We also investigate how any bidirectional exchanges between socioemotional functioning and drinking during the secondary school years are ultimately associated with grades, those key end-of-school academic outcomes established as an important marker of future educational and socioeconomic prospects. Finally, recognizing that schools can differ markedly in the peer cultures that develop within them (including their drinking cultures), we also examine whether the links among adolescents' socioemotional functioning, alcohol use, and academic progress vary as a function of the degree to which network ties in the school are densely organized around drinking.

These aims are examined with school, network, and health data from the National Longitudinal Study of Adolescent Health (Add Health) and academic data from the Adolescent Health and Academic Achievement (AHAA) transcript study (Harris et al. 2003; Muller et al. 2007). This research is relevant to school efforts to identify nonacademic processes that can disrupt the ability of schools to pursue their educational missions as well as theoretical efforts to view the health and learning of young people as intertwined and contextualized (Crosnoe 2011).

BACKGROUND

Schools as Social Contexts

As Coleman (1961) noted decades ago, secondary schools house vibrant peer cultures that serve as the backdrop for the formal educational activities that are intended to be the focus of students' days. This school peer culture is the arena in which the social dynamics of adolescence play out. Although much has changed about American youth in the intervening decades, the basic role of schools as adolescent relationship markets and sites of youth culture remains strong (Eder, Evans, and Parker 1995; Giordano 2003; Moody 2001; Wilkins 2008).

In school, youth gather resources and experiences that help, or hinder, the achievement of major developmental tasks of adolescence, such as establishing an identity independent of parents and preparing for adult roles. Key aspects of the school peer culture include the structural characteristics of social networks, the prevailing norms of peers, the layout of peer crowds (e.g., jocks, Goths), and the nature of status hierarchies, including the groups that have esteem, power, and popularity in any given school (Barber, Eccles, and Stone 2001; Ennett and Bauman 1996; Moody 2001; Staff and Kreager 2008; Wilkins 2008). Factors on the individual level include popularity, network position (e.g., who is well connected, who is isolated), status position (e.g., which groups that a student associates with or is associated with by others), and match/mismatch between adolescents and schools, such as youth whose characteristics are or are not aligned with the prevailing norms in the student body (Crosnoe 2011; Giordano 2003; Kreager 2004; South, Haynie, and Bose 2007).

Even when efforts are taken to account for the differential selection of adolescents into schools or social positions within the larger student body, these dimensions of school contexts have implications for adolescent functioning (Harden et al. 2008). As an example, boys' mental health declines as their school networks grow in size *and* cohesiveness. Girls'

mental health, however, declines when their networks grow in size but become less cohesive (Falci and McNeely 2009). As another, social isolation in schools is associated with riskier behavior, but moderate engagement in risky behavior can improve popularity in school (Allen et al. 2005; Kreager 2004).

In recent years, more attention has been paid to the exchange between schools' formal academic processes and informal peer-related processes. Much of this work, including oppositional culture research on race and schooling, has focused on peers' academic norms; essentially, hanging out with or attending school with peers who value education can be a resource for youth that helps them perform at a higher academic level, with the opposite pattern for peer groups devaluing education (Frank et al. 2008; Harris 2006). This link between school peer culture and academic progress also goes beyond the academic messages received from peers. Regardless of peer values about academics, adolescents' social experiences in school—how well they fit in, their centrality in peer networks—can disrupt or support their academic pursuits (Benner 2011; South et al. 2007; Staff and Kreager 2008). For example, adolescents who feel as though they do not fit in at school are less likely to go to college, even when peers value academic success, because they become more focused on their social circumstances than their academic activities (Crosnoe 2011). In other words, the link between social experiences and academic outcomes is not necessarily dependent on peers' academic norms. In this study, therefore, we try to connect nonacademic social experiences in school to academic progress.

A Focus on Drinking

Alcohol use is a major public health issue in which the interplay between schools as educational institutions and social contexts is clearly apparent. It becomes increasingly common during adolescence, and although schools do not usually serve as a physical setting of adolescent alcohol use, they do house the peer cultures in which norms, attitudes, and values around alcohol use are formulated and reinforced that contribute to drinking outside of school (Bachman et al. 1997; Schulenberg and Maggs 2002). In short, peers are perhaps the major social factor in adolescent substance use, including drinking, and schools are where peers come together (Aseltine 1995; Crosnoe, Muller, and Frank 2004; Gaughan 2006).

Given the acceptance and status of drinking during adolescence and the tendency for drinking to organize social activities in this developmental stage, drinking can serve as a route to social integration in school. Adolescents may use drinking as a way of meeting people and connecting to others. Drinking may also be a shared activity that binds peers together as well as a strategy for gaining popularity (Allen et al. 2005; Testa, Kearns-Bodkin, and Livingston 2009; Tucker et al. 2011). Despite the well-documented health-related risks of adolescent drinking (Miller et al. 2007; Truong and Sturm 2009), it could play a role in one dimension of positive socioemotional adjustment: becoming socially integrated at school. At the same time, ample evidence indicates that drinking is often a coping mechanism for young people in trouble, an active or passive attempt to deal with pain and discomfort (Aseltine and Gore 2000; Hussong et al. 2001; Kirby 2002). To the extent that adolescents feel marginalized in their schools and/or disconnected from others and these

feelings are a source of distress for them, then drinking may be a self-medicating response. In these ways, drinking and socioemotional functioning in school are likely to be reciprocally related to each other.

The first objective of this study, therefore, is to look into these reciprocal relations between socioemotional functioning and alcohol use. Specifically, we estimate the degree to which drinking and binge drinking predict changes in peer-related socioemotional functioning (feelings of not fitting in, loneliness) and the degree to which a lack of social integration predicts increases in drinking and binge drinking. The first path captures the social integration mechanism; the second, the self-medication mechanism.

Given that the socioemotional components of schooling are not divorced from academic processes, connecting these social integration and self-medication paths to academic progress is important. Evidence of such connections would lend support to the argument that schools should consider nonacademic dimensions of school life and youth development when attempting to meet academic accountability benchmarks (Crosnoe 2011).

First, consider the inverse association between alcohol use and academic progress during secondary school, which has been shown to be reasonably robust to selection biases (Balsa, Giuliano, and French 2011; Schulenberg et al. 1994). The social integration path just described could play an interesting role in this association. For the most part, social integration supports academic pursuits, freeing young people from many social distractions, giving them the sense of security and belongingness they need to meet academic challenges, and providing a larger pool of social capital on which they can draw while making their way through the curriculum (Barber et al. 2001; Frank et al. 2008; Riegle-Crumb, Farkas, and Muller 2006). If drinking provides adolescents with opportunities for more integration and integration supports academic progress, then social integration would suppress the link between alcohol use and academic progress. In other words, the academic gap between drinkers and nondrinkers would be even bigger if not for the social benefits of drinking that might chip away at the many other risks posed by drinking.

Second, as already described, peer-related socioemotional difficulties can lead to truncated educational attainment, as some ways that adolescents cope with these difficulties bring short-term relief but long-term costs (Crosnoe 2011). Drinking would be one such coping mechanism. It might provide some comfort or escape to adolescents who feel marginalized at school, but given the aforementioned tendency for drinking to disrupt educational pursuits in general (Balsa et al. 2011), drinking as self-medication would also be counterproductive in the long run in terms of educational attainment, not to mention health trajectories.

The second objective of this study, therefore, is to examine whether changes in socioemotional functioning and drinking, and the connections between these changes, ultimately are related to a key dimension of academic status: cumulative grade point average (GPA). An indicator of adolescents' success in meeting the performance and behavioral goals of schools, cumulative GPA factors into college admissions, preparedness for college, and work prospects (Farkas et al. 1990; Lee, Smith, and Croninger 1997). Figure 1 captures the conceptual model of this study, including the social integration (Paths A1-2) and self-

medication pathways (Paths B1-2) and their links to an end-of-school academic outcome (Paths C1-3).

Considering Peer Context

Up to this point, the discussion of the feedback between socioemotional development and drinking has not recognized variability among schools, especially in the ways that peer cultures support or constrain drinking. Ignoring such variability is problematic. After all, schools differ in both the prevalence and status of drinking among their students. In many schools, drinking has a crucial organizing role in peer activities and/or is the product of peer activities. In a minority of schools, it is peripheral or even stigmatized. In both cases, adolescents' drinking can contribute to or result from their social integration at school (Barber et al. 2001; Crosnoe 2011; Staff and Kreager 2008). For example, Crosnoe and colleagues (2004) reported that associations of drinking with academic achievement and depression depended on whether drinking was normative in a school or not. Drinking had less of a negative impact on youth in schools in which it was widespread, and abstaining had a less positive impact in schools in which drinking was rare. The peer context gave adolescent drinking meaning, indicating whether it was likely to be marginalizing or integrating, a marker of maladjustment or a casual social activity, an accessible behavior or one that was hard to pull off regardless of motivation.

In other words, the social integration and self-medication pathways in Figure 1 likely differ in strength—and possibly direction—as a function of characteristics of peer networks in the school. In looking into this moderating role of school peer culture, we focus on two factors: the density of peer networks in the school and the prevalence of alcohol use in the student body. Density refers to the degree to which students are interconnected, with multiple cliques and crowds overlapping considerably and any individual adolescent tied to many others directly and indirectly (Wasserman and Faust 1994). Dense networks facilitate the diffusion of peer attitudes and values and increase social control. As a result, adolescents will suffer more socially from not following prevailing peer norms—they will have far fewer alternative arenas for social activity (Falci and McNeely 2009; Haynie 2001). The prevalence of alcohol use gauges the degree to which drinking is an accepted and likely high-status behavior in a school as well as the opportunities available for drinking in social activities linked to schools. As a result, adolescents will be more likely to drink when attending schools in which drinking is common, somewhat independently of their own motivations or inclinations to drink (Crosnoe et al. 2004).

The third objective of this study, therefore, is to examine whether peer network density and alcohol use prevalence in schools condition the reciprocal associations between drinking and socioemotional functioning. Importantly, we view these two dimensions of school peer context as connected to each other, as coming together to create unique settings for adolescents that more holistically define whether schools facilitate drinking or not. In other words, dense networks might mean something different for adolescents depending on whether drinking is common in these networks or not, and the prevalence of alcohol use among peers may have weaker or stronger implications for adolescents depending on

whether the density of networks allows for peer groups organized around drinking versus peer groups organized around other activities.

DATA AND METHODS

Data and Sample

Add Health is a nationally representative study of adolescents in grades 7 through 12 in 1994 (Harris et al. 2003). With a multistage, stratified, school-based cluster design, high schools were selected based on region, urbanicity, school type (public vs. private), racial composition, and size. High schools that did not include 7th and 8th grades were matched to a feeder school based on the number of students moving through the feeder pattern. The final sample included 132 schools. In-School Surveys were collected at each school during the 1994–1995 school year from all available students ($N = 90,118$). This round of data collection was intended to create a sampling frame for later data collection and to identify respondents for planned oversamples. About one year later, a nationally representative sample was selected from the In-School Survey for in-home interviews at Wave I (1995), Wave II (1996), Wave III (2001–2002), and Wave IV (2007–2008). As part of the companion AHAA study, Wave III participants were asked to sign a transcript release form, providing researchers with access to their high school transcripts. Approximately 90 percent of participants signed these waivers (Muller et al. 2007).

Given our focus on secondary school, we draw from Wave I ($N = 20,475$) and Wave II ($N = 14,738$, an 88 percent retention rate for non-seniors) as well as the AHAA transcripts ($N = 12,000$). All Wave I adolescents were selected if they persisted to Wave II and had valid longitudinal sampling weights, which correct for the oversampling of some populations and for differential attrition from the sample across waves. Applying these filters resulted in a study sample of 8,271 adolescents in 126 schools, with the weights accounting for cross-wave attrition bias and missing data techniques (explained in the following section) used to estimate all item-level missingness across waves. Table 1 provides demographic characteristics for sample youth and their schools.

Measures

Table 2 presents all descriptive statistics and bivariate correlations for the primary constructs of interest (i.e., all but the sociodemographic covariates).

Alcohol use—Following Add Health conventions (Johnson 2004; Resnick et al. 1997), we used self-reports to create Wave I and II measures of alcohol use and binge drinking—having five or more drinks in one sitting—in the past year, ranging from 0 (*none*) to 6 (*nearly everyday*). Because analyses revealed no differences in focal results for drinking and binge drinking, we present results for drinking only. Of note is that ancillary analyses experimented with categorical measures of drinking (e.g., frequent, occasional, no drinking), which revealed few nonlinearities in observed drinking effects. These analyses also revealed that the large number of adolescents in the 0 category on this measure did not drive the final results.

Socioemotional functioning—Adolescents' feelings of not fitting in were assessed with five items at Waves I and II related to social psychological experiences in, and orientations to, school (see Crosnoe 2011): whether they did not feel socially accepted, loved, wanted, close to people at school, and a part of things at school. Items were rated on a scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Adolescents also indicated how often they had trouble getting along with other students, rating the item from 0 (*never*) to 4 (*everyday*); this scale was recoded to a one to five scale for consistency with the other items. Scores were averaged across the five indicators, with higher mean scores reflecting greater feelings of not fitting in ($\alpha = .68$ for Waves I and II). We also experimented with latent variables for not fitting in rather than composites, but the use of latent variables reduced model fit compared to the models with the composites. In both waves, adolescents' feelings of loneliness were assessed with an item querying how often they felt lonely during the past week. Ratings ranged from 0 (*rarely or never*) to 3 (*most of the time or all of the time*).

Cumulative GPA—Achievement data came from AHAA (see Riegle-Crumb et al. 2006). For each course in each semester, adolescents' grades were coded on a scale ranging from 0 (*F*) to 4 (*A*). Grades were averaged across all courses for all semesters of high school.

School peer context—Add Health has several publicly available network measures constructed from adolescents' friendship nominations on the In-School Survey (Haynie 2001; Moody 2001). Network density was calculated by dividing the number of ties in the adolescent's send-and-receive network by the number of possible ties in the total send-and-receive network (adjusted for the total number of friends that could be nominated, or 10). Here, we use the schoolwide network density measure, which characterizes all network ties in the school. Because the In-School Survey was a near census of each school, adolescent responses on In-School items can be aggregated to the school level by taking the average response across students in a school. Through this aggregation method, we also calculated the average level of drinking in each school, using the In-School Survey version of the drinking scale described previously. These two school measures were combined after splitting each variable into high or low with a median cut-point (.008 for school density, 1.129 for school alcohol use). The resulting categories were high density/high alcohol use schools, high density/low alcohol use schools, low density/high alcohol use schools, and low density/low alcohol use schools.

Sociodemographic covariates—Analyses included a standard set of covariates. On the individual level, adolescents reported their gender, age, race-ethnicity (white, African American, Latino, Asian American, other race-ethnicity), generational status (first, second, third-plus generations), family structure (1 = lives with both biological parents, 0 = other family composition), and parent education (1 = eighth grade or less, 9 = professional training, highest in household taken). We also included percentile scores on the Add Health Picture Vocabulary Test. On the school level, sector (1 = public, 0 = private), size, region (West, Midwest, South, Northeast), and urbanicity (urban, rural, suburban) were measured.

Plan of Analyses

The first step was to build a model with reciprocal relations between drinking and socioemotional functioning. To do so, a path analysis in a structural equation modeling (SEM) framework estimated a model in which Wave II measures of drinking, feelings of not fitting in, and loneliness were each regressed on the Wave I versions of these variables and the covariates. This cross-lagged model employed autoregressive techniques to determine whether early alcohol use was associated with adolescents' later socioemotional functioning (social integration) net of the degree to which early challenges to socioemotional well-being were associated with later alcohol use (self-medication), and vice versa.

The second step involved extending this model to include an end-of-school outcome. Cumulative GPA was regressed on the Wave I and II indicators of drinking and socioemotional well-being as well as the sociodemographic covariates. This model gauged the degree to which differences in academic progress by socioemotional functioning were mediated by drinking and the degree to which differences in academic progress by drinking status were mediated/suppressed by socioemotional functioning.

In the third step, the Wave I drinking, feelings of not fitting in, and loneliness measures were interacted with the four categorical measures of school peer culture (i.e., the combined network density and schoolwide alcohol use prevalence categories). These interactions were modeled, along with main effects, as predictors for all cross-lagged associations (i.e., Wave I Drinking \times School Type Predicting Wave II Loneliness, Wave I Feelings of Not Fitting in \times School Type Predicting Wave II Drinking). We rotated through all possible reference groups to make all pairwise comparisons. These interactions assessed whether the self-medication and social integration paths varied as a function of the degree to which high or low alcohol use was present in dense or diffuse networks at school.

All analyses were conducted in Mplus (Muthén & Muthén 1998–2008). The full-information maximum likelihood (FIML) method allowed data for all cases to be estimated, regardless of missingness (Arbuckle 1996). All models employed longitudinal sampling weights, which accounted for threats to representativeness through differential attrition and planned oversamples. The CLUSTER feature in Mplus addressed violations to independence assumptions related to the multilevel nature of the data (e.g., the clustering of students within schools), thereby achieving more robust standard errors. For models in which school-level variables were included as *focal* predictors and interactions, an explicit multilevel framework (TWOLEVEL) was also employed. Comparison of the multilevel and CLUSTER models revealed no differences in observed school effects.

RESULTS

Drinking and Socioemotional Functioning

Following the first objective of this study, we began with the cross-lagged model of drinking and both indicators of socioemotional functioning in Waves I and II (see Figure 2). This model fit the data well (Comparative Fit Index [CFI] = .97, root mean square error of approximation [RMSEA] = .04). Results indicate that Wave I drinking was associated with adolescents' Wave II feelings of loneliness and not fitting in at school, even after taking into

account multiple covariates and the autoregressive associations that parceled out individual change in these constructs over time.

In short, adolescents who drank more one year were more likely to report greater loneliness and felt less like they fit in at school approximately one year later, with effect sizes of about 6 percent of a standard deviation in Wave II loneliness for every one unit change in Wave I drinking and 9 percent of a standard deviation in Wave II feelings of not fitting in at school. As a point of comparison, the difference between youth in two-parent families and other family types equaled 4 percent of a standard deviation in Wave II loneliness and 7 percent of a standard deviation in Wave II feelings of not fitting in, while each additional year of parent education was associated with a decrease in these outcomes of 6 percent and 9 percent of a standard deviation, respectively.

Thus, the social integration path was significant in the opposite direction than predicted. Drinking appeared to marginalize and isolate youth over time, at least in their own perceptions. As for the self-medication path, Wave I feelings of loneliness and not fitting in were not associated with Wave II drinking, net of the covariates and autoregressive associations. Youth did not appear to self-medicate such emotionally troubling feelings with alcohol.

Drinking, Socioemotional Functioning, and Academic Progress

After testing the social integration and self-medication paths, we introduced an end-of-school academic outcome. This model fit the data well (CFI = .97, RMSEA = .02). The pattern of associations between early drinking and later socioemotional functioning (and the reverse) remained consistent with the initial model from Figure 2. In examining direct linkages of drinking and socioemotional functioning to cumulative GPA within the full model, both Wave I ($\beta = -.06, p < .001$) and Wave II drinking ($\beta = -.07, p < .001$) predicted lower GPA at the end of school, as did Wave I ($\beta = -.09, p < .001$) and Wave II ($\beta = -.06, p < .001$) feelings of not fitting in at school. Adolescents' feelings of loneliness (Wave I or II) were not related to GPA.

In addition to examining these direct links, we also explored the pathways by which early drinking and socioemotional functioning during secondary school were associated with cumulative GPA. Results for the indirect paths are presented in Table 3. Inferences for the indirect paths were based on the Mplus estimation of indirect effects with delta method standard errors (Muthén and Muthén 1998–2008) as well as the more conservative Sobel (1982) asymptotic *z*-test. We observed significant, but partial, mediation for the links of both early drinking and feelings of not fitting in with cumulative GPA. First, mediation emerged via the autoregressive paths, such that Wave I drinking was associated with GPA, in part via its association with Wave II drinking. An identical pattern was observed for feelings of not fitting in at school. In addition, we found that Wave I drinking also was related to GPA via its association with Wave II feelings of not fitting in at school. The inverse was not true, as Wave I feelings of not fitting in were not associated with GPA through Wave II drinking. In other words, academic disparities related to drinking appeared to be partly channeled through decreased socioemotional functioning.

As an additional exploratory analysis, we examined whether the focal associations in our model differed across key groups defined by gender, parent education, and race/ethnicity. Here, multiple group analyses were employed with the GROUP command, which computed parameter estimates based on individual groups but standard errors based on all cases (Cochran 1977). We introduced constraints on model parameters (e.g., constraining a parameter to be equal for boys and girls) and then observed whether doing so led to a significant decrease in the overall model fit. Omnibus tests (e.g., chi-square difference tests and comparisons of CFI and RMSEA values across models) gauged changes in model fit.

Model parameters did not significantly differ by gender or parent education. Race-ethnic differences were found ($\chi^2_{\text{diff}}(39) = 101.7, p < .001$) but only for autoregressive paths for drinking ($\chi^2_{\text{diff}}(3) = 43.0, p < .001$) and feelings of not fitting in ($\chi^2_{\text{diff}}(3) = 9.4, p < .05$). For Wave II alcohol use, the β coefficients for Wave I alcohol use ranged from .48 to .50, with the minimum for African American youth. Differences in the Wave I to II autoregressive path for feelings of not fitting in were somewhat larger, a minimum β of .43 for Asian American youth and maximum of .52 for whites. These findings suggest some variation in the stability of drinking and feelings of not fitting in over time. This variation is small overall, difficult to interpret, and requires more thorough investigation. The take-home point, however, is that the focal paths (the cross paths *between* drinking and fitting in) did not differ by race-ethnicity.

The Role of School Peer Context

To introduce the school peer context, the school-level density/alcohol use dummy variables were first included as predictors of the Waves I and II drinking and socioemotional factors. The appendix contains the full results for this model (note: because the results for covariates did not change substantially across model iterations, coefficients in this Appendix roughly approximate the covariate coefficients from the models in Figure 2 and Table 3). Next, the model incorporated interactions for all combinations of the focal Wave I variables with the school-level dummy variables. Two sets of interactions were significant.

First, for loneliness, we observed a significant coefficient for the interaction of Wave I drinking with attendance at low density/high alcohol use schools as compared to attendance at high density/low alcohol use schools ($\beta = -.08, p < .01$). As depicted at the top of Figure 3, the Wave II loneliness of adolescents attending low density/high alcohol use schools was similar regardless of their level of alcohol use at Wave I. Youth who used little to no alcohol at Wave I while attending high density/low alcohol use schools, however, reported less loneliness at Wave II than did their peers in these same kinds of schools who reported higher alcohol use at Wave I.

Second, the trend was similar for Wave II feelings of not fitting in (see bottom of Figure 3). Although greater alcohol use was linked to higher feelings of not fitting in at school across all four school types, this association was significantly stronger in high density/low alcohol use schools than in high density/high alcohol use schools ($\beta = .08, p < .01$), low density/high alcohol use schools ($\beta = .09, p < .01$), and low density/low alcohol use schools ($\beta = .04, p < .05$).

Thus, abstainers' feelings of loneliness were lower—and drinkers' feelings of marginalization were higher—in schools in which peer networks were characterized by tight connections and low levels of drinking than in schools with other combinations of network density and student drinking. When drinking was not a common feature of a peer context with few alternatives, it posed more risk to socioemotional functioning.

CONCLUSION

Two tasks of adolescence in the United States are to accrue the academic credentials necessary to long-term socioeconomic attainment and to integrate into the peer world as a means of establishing independent identities that can be carried into adulthood. The connection between the processes surrounding these tasks can be healthy or problematic depending on the circumstances (Steinberg and Morris 2000). Drinking plays a role in these processes. Because schools are the setting of academic endeavors and peer relations, they often serve as the context in which the links among drinking, social integration, and academic progress play out. As a result, seemingly nonacademic concerns like socioemotional development and risky behavior become academic concerns, and health interventions targeting mental health and drinking are increasingly situated in schools (Barber et al. 2001; Harden, Oakley, and Oliver 2001).

The results of this study suggested that drinking is not so much a symptom of socioemotional problems as a factor in such problems, yet in a different way than expected. We had speculated that drinking might be a means of social integration and, furthermore, that this potential benefit of drinking might chip away at some of the risks of drinking. Yet, longitudinal cross-lagged models with Add Health data revealed that drinkers (and binge drinkers) experienced increasing socioemotional problems over time, suggesting that drinking might push youth to the social margins of school, perhaps by engendering behavioral problems that alienate others or because it becomes a solitary activity that pulls youth out of peer interactions. Such social factors could add to the direct medicinal effects of alcohol, which, as a sedative, can affect emotionality, information processing, and cognition. Further analyses revealed that this link from alcohol use to socioemotional functioning seemed to be a mechanism for the academic risks posed by drinking that have been documented in Add Health and other data, providing insight into the ways in which drinking can become an academic liability for schools in a time of heightened accountability (Crosnoe et al. 2004; Schulenberg et al. 1994). Importantly, this mediational pathway from drinking to academic progress through socioemotional functioning was more similar than different across diverse segments of the population, as defined by demographic factors, socioeconomic circumstances, and school transition patterns.

The caveat, however, is that such social deintegration was sensitive to the makeup and organization of the school student bodies in which adolescents were embedded. Specifically, it was primarily found in schools in which students were closely connected to each other in peer networks that did not foster drinking. In other words, drinking appeared to be a socioemotional risk factor mostly in schools in which it made young people stand out from the crowd. These patterns, however, do not necessarily imply that school peer networks tightly organized around drinking are somehow good environments for adolescents. Clearly,

such schools are not conducive to healthy development or academic progress. Instead, the results suggest that we need to pay attention to youth in problematic school environments in general but also to those who may have trouble in seemingly positive school environments.

Of course, these conclusions can only be viewed as preliminary, considering the non-negligible threats to causal inference common to this kind of research. Even though past research suggests that genetic factors do not seem to completely account for observed associations between peers and drinking (Harden et al. 2008), some heritable traits could conceivably contribute to adolescent behaviors and characteristics across multiple developmental domains. Moreover, educational research suggests that young people may be selected into different schools in ways that produce the appearance of school effects on behavior (Frank 1998). Our autoregressive strategy with school fixed effects provided some leverage in addressing these threats to causal inference, but clearly more work is needed. Building on this research, therefore, will require efforts to combine genetically informed designs (e.g., ACE twin models) with tools to mitigate the potential for misattributing causality related to nongenetic unobserved heterogeneity (e.g., instrumental variables, robustness indices). More theoretically, more can be done to place the links of alcohol use to socioemotional and academic functioning in school to a broader domain of problem behavior, including delinquency and other forms of substance use. Comparing results for different behaviors within this general domain could reveal useful insights into their symbolic value and status within the relationship market of adolescence.

If future studies report similar results after correcting these limitations and pursuing these new avenues, then more confidence can be gained in our conclusions. Those conclusions would then lend credence to theoretical arguments about how social contexts attach meaning to behaviors and, as a result, influence the degree to which they serve as risks or resources (Allen et al. 2005; Steinberg and Morris 2000). At the same time, they will speak to concerns in the applied arena that the implementation of school-based substance use and other interventions requires careful consideration of the peer networks and norms within those schools that may support or undermine those interventions (Crosnoe and McNeely 2008).

Acknowledgments

FUNDING

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by the Center for the Analysis of Pathways from Childhood to Adulthood (CAPCA), funded by the National Science Foundation (Grant 0322356; PI: Pamela Davis-Kean). The authors also acknowledge the support of a faculty scholar award from the William T. Grant Foundation to the first author as well as grants from the National Institute of Child Health and Human Development (F32 HD056732; PI: Aprile Benner; R24 HD42849, PI: Mark Hayward) and National Institute of Alcohol Abuse and Alcoholism (R21AA020045-01; PI: Robert Crosnoe) to the Population Research Center at the University of Texas at Austin. Opinions reflect those of the authors and not necessarily the opinions of the granting agencies.

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APPENDIX. Results for Model with Alcohol, Socioemotional, and Academic Outcomes

	Wave II Alcohol Use	Wave II Loneliness	Wave II Lack of Fit	Cumulative GPA
	β (SE)	β (SE)	β (SE)	β (SE)
Focal predictors				
Wave I alcohol use	.51 (.02) ***	.04 (.01) *	.05 (.02) **	-.06 (.02) ***
Wave II alcohol use				-.07 (.02) ***
Wave I loneliness	.00 (.01)	.29 (.02) ***		.00 (.01)
Wave II loneliness				-.03 (.02)
Wave I feelings of not fitting in	.00 (.01)		.49 (.02) ***	-.06 (.02) **
Wave II feelings of not fitting in				-.09 (.02) ***
High density/high alcohol use school	.01 (.02)	-.03 (.02)	.01 (.02)	
High density/low alcohol use school	.01 (.02)	-.01 (.02)	-.01 (.03)	
Low density/low alcohol use school	.02 (.02)	-.02 (.03)	.02 (.03)	
Covariates				
Female	-.02 (.01)	.07 (.01) ***	.00 (.01)	.21 (.01) ***
Age	.09 (.02) ***	.08 (.02) ***	-.06 (.02) ***	.01 (.02)
Latino/a	.02 (.02)	.02 (.02)	.03 (.02)	-.06 (.02) **
African American	-.08 (.02) ***	.01 (.01)	.01 (.01)	-.12 (.03) ***
Asian American	-.02 (.01) *	.02 (.01)	.01 (.01)	.02 (.02)
Other race/ethnicity	-.03 (.01) *	.03 (.02)	.04 (.02) *	-.02 (.02)
First generation	-.03 (.01) *	.01 (.01)	-.01 (.01)	.08 (.02) ***
Second generation	-.00 (.01)	-.02 (.02)	-.03 (.01) *	.03 (.02)
Intact family	-.04 (.01) ***	-.03 (.01) *	-.04 (.01) ***	.10 (.02) ***
Parent education	.01 (.01)	-.04 (.01) **	-.05 (.01) ***	.19 (.02) ***
School size	-.01 (.02)	-.01 (.01)	.04 (.01) **	-.01 (.02)
Private school	.01 (.02)	.02 (.01) *	.00 (.01)	.01 (.02)

Urban	-.03 (.01)**	-.01 (.01)	-.01 (.01)	-.05 (.03)
Rural	-.01 (.01)	-.00 (.01)	.00 (.01)	.02 (.03)
West	-.02 (.01)	.02 (.02)	.01 (.01)	.08 (.02)***
Midwest	-.02 (.02)	-.02 (.02)	.00 (.02)	.01 (.03)
South	-.03 (.02)	.01 (.02)	-.02 (.02)	.10 (.04)**

Note: $n = 8,271$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Biographies

Robert Crosnoe is the Elsie and Stanley E. (Skinny) Adams, Sr. Centennial Professor in Liberal Arts at the University of Texas at Austin, where he is a faculty member in the Department of Sociology, Department of Psychology (by courtesy), and Population Research Center. His main field of interest is the life course and human development, with a special emphasis on connections among health, child/adolescent development, and education and how these connections factor into socioeconomic and immigration-related inequalities. His books include *Mexican Roots*, *American Schools: Helping Mexican Immigrant Children Succeed* (Stanford) and *Fitting In, Standing Out: Navigating the Social Challenges of High School to Get an Education* (Cambridge).

Aprile D. Benner is an assistant professor in the Department of Human Development and Family Sciences at the University of Texas at Austin. A developmental psychologist, her research interests center on race-ethnic- and poverty-related educational disparities, children and adolescents' school transition experiences, and influences of social contexts on adolescents' academic and socioemotional development.

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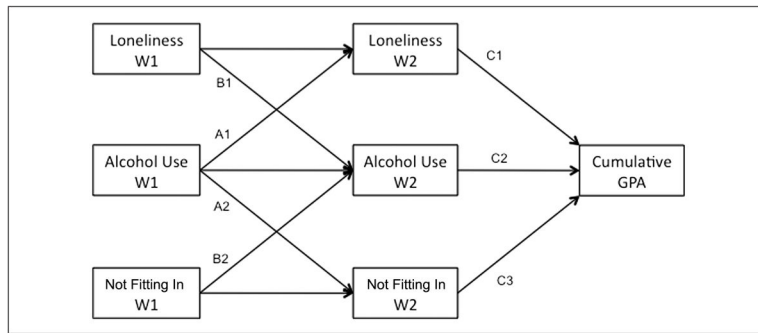


Figure 1.
Conceptual Model of Study

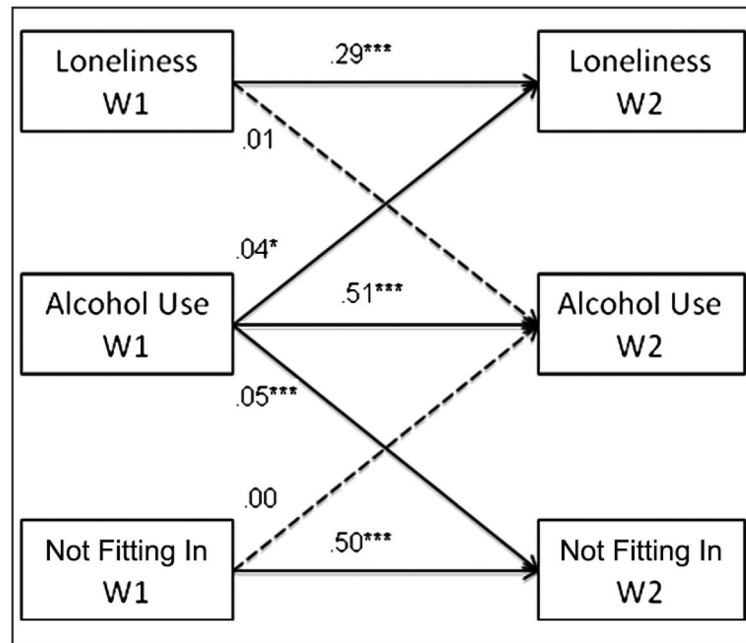


Figure 2.

Associations between Adolescent Drinking and Socioemotional Functioning over Time

Note: Dashed lines denote nonsignificant paths. All models controlled for adolescent gender, age, race-ethnicity, immigrant generational status, family structure, parent education, and Picture Vocabulary Test percentile as well as school sector, size, region, and urbanicity. Comparative Fit Index = .97; root mean square error of approximation = .04.

* $p < .05$. ** $p < .01$. *** $p < .001$.

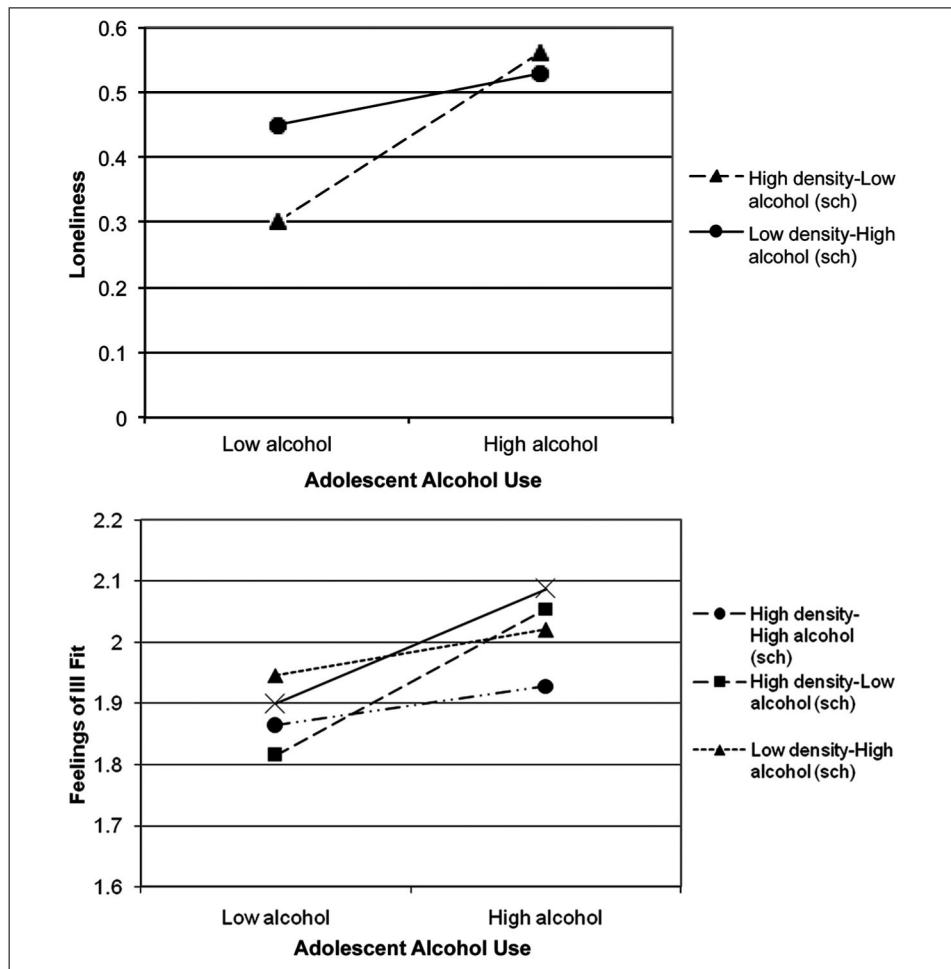


Figure 3. Differences in the Association between Adolescent Drinking and Socioemotional Functioning, by the Combination of School-Wide Peer Network Density and Drinking Rates

Table 1

Demographic Characteristics of Adolescents and Their Schools

	Frequency (percentage)	<i>M</i>	<i>SD</i>
Adolescent characteristics			
Female	54.0		
Age		15.74	1.56
Race/ethnicity			
White	52.5		
African American	21.8		
Latino	15.4		
Asian American	7.6		
Other race/ethnicity	2.7		
Generational (immigration) status			
First generation	7.8		
Second generation	14.0		
Third generation	77.9		
Live with both biological parents	57.0		
Highest parent education		3.01	1.25
Picture Vocabulary Test percentile		51.32	27.75
School characteristics			
Network density		.02	.04
Schoolwide alcohol use		1.11	.46
Private school	7.7		
Enrollment		1,15.52	802.58
Region			
West	22.5		
Midwest	24.5		
Northeast	14.1		
South	39.0		
Urbanicity			
Urban	27.0		
Suburban	53.5		
Rural	19.5		

Note: Adolescent characteristics are at the adolescent level ($n = 8,271$). School characteristics are at the school level ($n = 126$).

Table 2

Means, Standard Deviations, and Correlations for Focal Variables

	1	2	3	4	5	6	7
1 Wave I alcohol use	—						
2 Wave II alcohol use	.53***	—					
3 Wave I not fitting in	.12***	.08***	—				
4 Wave II not fitting in	.09***	.08***	.52***	—			
5 Wave I loneliness	.11***	.06***	.30***	.21***	—		
6 Wave II loneliness	.08***	.09***	.21***	.28***	.34***	—	
7 Cumulative GPA	-.13***	-.11***	-.13***	-.15***	-.06***	-.08***	—
<i>M</i>	.94	1.04	1.97	1.94	.44	.44	2.63
<i>SD</i>	1.36	1.47	.58	.58	.68	.68	.82

Note: *n* = 8,271.

p < .001.

Table 3

Results for Tests of Mediation

	β_{ind} (SE)	Sobel <i>p</i> value
Wave I drinking → Wave II drinking → Cumulative GPA	-.04 (.01) ***	.000
Wave I drinking → Wave II not fitting in → Cumulative GPA	-.01 (.00) **	.002
Wave I not fitting in → Wave II not fitting in → Cumulative GPA	-.05 (.01) ***	.000
Wave I not fitting in → Wave II drinking → Cumulative GPA	.00 (.00)	.897

Note: Results for loneliness not shown, as no indirect effects were significant. $n = 8,271$.

**
 $p < .01$.

 $p < .001$.