



Proximal and distal social influence on alcohol consumption and marijuana use among middle school adolescents



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ABSTRACT

Objectives: This study assesses the independent and combined effects of (1) perceived peer norms, (2) best friend use, and (3) being in the presence of others who use on middle school adolescents' consumption of marijuana and alcohol, and how the effects of these sources of social influence evolve over time as youth progress through middle school.

Methods: The analytic sample consisted of 11,667 adolescents (50% female; >65% Hispanic) in 6th, 7th or 8th grade from 16 middle schools across three school districts in Southern California. Participants were assessed at 5 time points from 2008 to 2011.

Results: All sources of social influence were predictive of alcohol and marijuana consumption. As youth grew older, spending time with other adolescents who drink increased adolescents' likelihood of drinking alcohol, whereas perceived norms became less influential. Furthermore, as adolescents spent more time around other youths who drink, the predictive value of perceived norms on alcohol consumption decreased. Similarly, as youth grew older, the influence of best friend's use and spending time with other adolescents who use marijuana remain stable, whereas perceived norms became less influential.

Conclusion: Findings suggest that perceived peer norms may be more influential in early adolescence; whereas proximal social determinants (e.g., being in the presence of other peers who consume) become more influential as youth enter middle adolescence. Prevention programs should continue to address misperception of norms with younger adolescents to decrease the chances of initiation, but also utilize strategies such as refusal skills and alternate coping mechanisms for older adolescents.

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1. Introduction

The middle school years are peak years for substance use initiation and escalation (Johnston et al., 2007; Wittchen et al., 2008; Johnston et al., 2013; SAMHSA, 2013) and early use of substances is often associated with risk for problematic substance use in adulthood (Ellickson et al., 2004; D'Amico et al., 2005a; McCambridge et al., 2011). Recent work has shown that peers play a key role in contributing to both initiation and escalation of substance use during this pivotal developmental period (Simons-Morton and Farhat, 2010; Trucco et al., 2011; Kelly et al., 2012). The assumption that

peer influence is central to adolescent alcohol and other drug (AOD) use is reflected in the paradigm underlying programs combating drug and alcohol use. Specifically, these efforts have focused on correcting youths' perceptions of others' consumption as a strategy to reduce AOD use (D'Amico et al., 2005b; Lewis and Neighbors, 2006). These approaches are based on research on perceived norms, which suggests that youth overestimate the drug and alcohol use of their peers (Beck and Treiman, 1996; Thombs et al., 1997; Page et al., 2002; Borsari and Carey, 2003; Neighbors et al., 2007; Pedersen et al., 2013b). Studies with adolescents and college students suggest that these inflated perceptions make alcohol and drug use appear to be common and socially acceptable, which in turn influence youth's subsequent use (Collins et al., 1987; Graham et al., 1991; Hansen and Graham, 1991; Marks et al., 1992; Borsari and Carey, 2001; Olds et al., 2005; Perkins et al., 2005; D'Amico and McCarthy, 2006; Primack et al., 2007). These findings are consistent with those in other areas of risky behavior including smoking (Grube et al., 1986;

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Biener and Siegel, 2000; Zhang et al., 2000; Etcheverry and Agnew, 2008) and sexual behavior and practices (Baker et al., 1988; Fisher, 2007, 2009).

Although perceived peer norms are important, the way in which they influence youths' consumption may be somewhat removed from everyday experiences. Perceived norms may initially be based on direct observation of individuals' behavior in specific situations; however, these norms are perpetuated and inflated through word of mouth and social conversations (i.e., the influence is more remote). For example, a youth may notice the few outstanding "drunk" people at a party and then share with their friends that "everyone was drunk at the party last night." These conversations may increase the perception that many other teens are drinking heavily and the norms are perpetuated. However, while highly influential, the influence is more remote and if a youth does not have access to alcohol or any immediate pressures to drink, these perceptions may not be strongly linked to actual drinking behavior. Thus, the effect that these norms may exert is rather distal.

In contrast, *being in the presence of others who use/consume* and *best friends use*, are sources of influence that are directly observable. Youths in close relationships (friends) typically spend time together, observe each other's behavior, engage in behaviors together (co-engagement/co-consumption), and also share environments and opportunities where behaviors are engaged in (Borsari et al., 2001; Bot et al., 2005; Poelen et al., 2007; Simons-Morton and Farhat, 2010; Kelly et al., 2012; Ramirez et al., 2012). These proximal sources of social influence are likely to moderate the influence of peer norms on youths' substance use (Maxwell, 2002). For example, (mis)perceiving that a large proportion of "similar others" drink alcohol may not be sufficient to lead to consumption in the absence of proximal social factors such as spending time in company of others who drink or use drugs. Studies with college students support this contention.

Despite the recognition that both proximal and distal social influences exert a role on AOD consumption in adolescence, very little is known about the relative contribution and dynamic interaction between these social mechanisms. This is especially important given the mixed research on the direct influence of close friends and peers on substance use (Jaccard et al., 2005; Fujimoto and Valente, 2012; de la Haye et al., 2013). This dearth of research jointly examining proximal and distal social influences in early adolescence is surprising given that understanding how these factors operate on AOD use can help determine the type of intervention approaches that may be most successful for this age group. For example, the basic premise underlying norms interventions is that youth feel the need to conform to a drinking norm; thus, they will drink heavily if they believe that the norm is high, but will reduce their drinking if they are provided with accurate information that the norm is lower than they thought. It is important to note that the mere provision of accurate information to change perceived norms may not influence use among adolescents who accurately estimate their peers' substance use. Likewise, presentation of actual norms to correct misperceptions may be irrelevant to youth who do not pay much attention or care about what their non-salient, less familiar peers may or may not be doing. In this case, time spent around friends who drink or use drugs may be a more salient influence on actual behavior. Intervention strategies designed toward refusal skills and alternate coping mechanisms may be more indicated in such a situation.

No research to our knowledge has examined how both distal and proximal influences interact and how these sources of influence may change over time to predict alcohol consumption and drug use among young adolescents. Furthermore, one limitation inherent to previous research examining associations between social influences and AOD is that they cannot determine direct causation

between predictors and outcomes. Although longitudinal designs make it possible to examine how putative factors contribute to substance use and how they interact over time, these designs are still subject to omitted variable bias such as unmeasured or uncontrolled variables responsible for the relationship between beliefs and behavior. One approach to control for omitted variable bias is to examine the within-person relationship, rather than the between-person relationship using fixed effects regression modeling. Rather than seeing if students who have (for example) higher norms have greater drug use, we look at the within person relationships. In other words, at the time an individual has higher norms, does this person also have higher substance use? The advantage of this approach is that we control for all person-related covariates, thereby allowing us to draw causal conclusions with greater confidence.

The current study addresses gaps in the literature by examining the effects of proximal and distal influences and young adolescents' subsequent use in a racially and ethnically diverse sample of 11,667 adolescents between grades 6th and 8th. Specifically, this study examines the independent and combined effects of (1) perceived peer norms, (2) best friend use, and (3) being in the presence of others who use on middle school adolescents' marijuana use and alcohol consumption using fixed effects regression modeling. We contend that proximal social determinants moderate the distal influence of peer norms such that best friend use and spending time with others who use decreases the predictive value of peer norms on students' alcohol consumption and marijuana use. We further assess how the effects of these sources of social influences evolve over time as youth progress through middle school, hypothesizing that proximal and distal sources of influences operate differently on younger than on older adolescents. The basis for this contention is that substance use is initially motivated by youths' desire to fit in with others (i.e., engaging in behaviors similar to others will lead these others to like and accept them or to "fit in"). Conceivably, the importance of unfamiliar peers' approval may be greater when students start in a new school and are developing new relationships (6th grade) than when they have already formed stronger relationships with subgroups of students within the school. Furthermore, as students get older, and as they gain more "experience" with alcohol and marijuana, their consumption may become increasingly determined by availability and by direct offers from the peers closest to them rather than by what they believe their non-salient peers are doing.

2. Method

2.1. Participants and procedure

Participants completed measures as part of a larger research project evaluating CHOICE, a voluntary after-school prevention program implemented within three school districts in southern California for one year in 2008 (D'Amico et al., 2012). None of the sixteen schools initially contacted refused to participate. The research institution's Institutional Review Board approved all materials and procedures used in this study. A Certificate of Confidentiality from the National Institutes of Health protected survey responses.

Active parental permission was required for the study, and individuals could select into or out of the study at any time. At wave 1, a total of 14,979 students across all sixteen schools received parental consent forms to participate in the study with approximately 7271 students in the 8 control schools and 7708 students in the 8 intervention schools; 92% of parents returned this form ($n = 13,785$). Approximately 71% of parents gave permission for their child to participate in the study ($n = 9828$). Ninety-four percent of consented students completed the baseline survey ($n = 8932$), which is higher or comparable to other school-based survey completion rates with this population (Johnson and Hoffmann, 2000; Johnston et al., 2009; Kandel et al., 2004). The current study analyzes data from waves 1–5. At the 5th wave, individuals were in 8th, 9th, and 10th grade. Sixty-five percent of youth completed 3 or more surveys across all five waves. The initial sample for this study consisted of 12,940 adolescents. Of these participants, 1237 (9.8%) were eliminated because of only completing one survey giving a total analytic sample of 11,667.

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