

Concordance of Adolescent Reports of Friend Alcohol Use, Smoking, and Deviant Behavior as Predicted by Quality of Relationship and Demographic Variables*

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ABSTRACT. Objective: The strongest predictor of adolescent alcohol use is affiliation with friends who drink, use other drugs, or engage in deviant behavior. Most studies measure this variable using adolescent perceptions of friend problem behavior, but some research suggests these perceptions may be inaccurate. The current study's objective was to determine the concordance between adolescent perceptions of their friend's drinking, smoking, and deviant behavior and the friend's self-report. Relationship characteristics and demographic variables were explored as predictors of report concordance. **Method:** Participants (targets) were 232 adolescents ages 13 or 15 (53% girls) from Wave 9 of the Tween to Teen Project. At least one reciprocally endorsed friend participated for 59% of target adolescents ($n = 232/390$). Targets completed computer-assisted interviews. Friends completed telephone interviews. **Results:** The relations between target perceptions of friend and friend self-reports

of drinking and smoking were statistically significant ($p < .001$), but concordance was driven largely by agreement regarding the absence of behavior. Although 22% of friends drank and 8.6% smoked, fewer than 60% of targets perceived these behaviors. Deviant behavior reports correlated moderately ($r = .45$), with 51% of adolescents underreporting friend deviance. There were few predictors of report concordance. **Conclusions:** Adolescents and their friends generally provided concordant reports of one another's drinking and smoking behaviors, but most agreement concerned the absence of behavior; most targets provided underreports of their friend's engagement in deviant behaviors. These findings suggest that adolescent perceptions of friends' problem behavior do not exaggerate the involvement of their friends in these behaviors. (*J. Stud. Alcohol Drugs*, 71, 253-257, 2010)

ACCORDING TO the Monitoring the Future Study (Johnston et al., 2008), 39% of 8th-grade students and 72% of 12th-grade students have used alcohol. Although some alcohol use in adolescence is normal, alcohol use before age 15 may be a risk factor for continued problem behavior, including adolescent problem drinking (Gruber et al., 1996; Hawkins et al., 1997; Johnston et al., 2008; Pedersen and Skrondal, 1998) and adult alcohol-use disorders (DeWit et al., 2000; Grant and Dawson, 1997).

Friends play an important role in socializing adolescents into alcohol use, other substance use, and deviant behavior by modeling behavior; shaping norms, attitudes, and values; and providing opportunities for use (Ennett and Bauman, 1991; Graham et al., 1991; Kandel, 1985; Kandel and Andrews, 1987). Furthermore, various problem behaviors commonly co-occur (Donovan and Jessor, 1985; Jessor and Jessor, 1977), and friend influence (i.e., the role of friends in the initiation of problem behaviors) and friend selection

(i.e., the tendency to associate with friends who engage in the same problem behaviors) are both important components in the development of maladaptive behaviors in adolescence.

The vast majority of studies of friend influence have relied on adolescents' perceptions of friend use rather than on friend self-reports (Chassin et al., 2004). Adolescent perceptions may be biased or inaccurate (Bauman and Koch, 1983), but very little research has directly addressed this issue. Research has shown that adolescent perceptions of friend substance use may be a stronger predictor of adolescent substance use than the friends' actual behavior (Bauman and Fisher, 1986; Iannotti et al., 1996). Although the perception of friend behavior may contribute importantly to the development of alcohol and drug use among teens, little research has addressed which variables affect the accuracy of adolescent perceptions of friend behavior. Assessment of accuracy per se is difficult, because it depends on the veracity of the friend's self-report; however, assessment of the concordance of adolescents' reports of one another's behavior should serve as a feasible approximation. In one of the few studies to examine report concordance for alcohol use, Laforge and colleagues (2005) found that amount of time spent with collateral reporters and level of relationship intimacy predicted report concordance in a sample of college students. A more thorough understanding of report concordance and of the predictors of report concordance among adolescents might ultimately aid prevention studies that seek to mitigate the

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impact of risk factors on early adolescent alcohol and drug use by focusing attention on those adolescents most likely to exaggerate friends' alcohol and substance use.

Method

Data were drawn from Wave 9 of the Tween to Teen Study, an ongoing prospective longitudinal study of the risk factors for early onset alcohol use. A total of 452 families from Allegheny County, PA, with a child ages either 8 or 10 years old were sampled at Wave 1, using targeted-age directory sampling and random digit dialing (see Donovan and Molina, 2008, for procedures used). At Wave 9 (5 years later), 390 target adolescents (86.3% of the originally recruited sample) and at least 1 reciprocally endorsed friend ($n = 232$; 59.5%) participated. Mean ages were 14.20 ($SD = 1.04$) years old for targets and 14.25 ($SD = 1.33$) years old for friends. Human subject procedures were approved by the University of Pittsburgh Institutional Review Board. A Certificate of Confidentiality was also obtained from the National Institute on Alcohol Abuse and Alcoholism.

For the current study, measures of interest completed by the target and friends about themselves and about each other were the following: Lifetime drinking and smoking behavior, assessed by the following questions: "Have you ever had a drink of beer, wine, or liquor (not just a sip or a taste of someone else's drink) in your life?" and "Have you ever tried smoking a cigarette (even just a puff)?" These variables were dichotomized for analysis (never used vs. used). Concordance variables, one for drinking and one for smoking, were created to reflect the agreement (coded 1) or nonagreement (coded 0) between friend self-report and target perception of friend behavior. Deviant behavior (Donovan et al., 1991) assessed the frequency of involvement in nine deviant behaviors (e.g., lying, cheating, stealing, and aggression) in

the last 6 months ($\alpha_{\text{target}} = .81$; $\alpha_{\text{friend}} = .79$). The deviant behavior variable was a count of behaviors (zero to nine) in which the friend engaged, calculated separately for target perception and for friend self-report. Report agreement was calculated as the difference between target perceptions of friend behavior and friend self-reported behavior (negative scores = *target underreport*; 0 = *agreement*; positive scores = *target overreport*). Friends did not report perceptions of target deviance.

The positive and negative composite scales of the Network of Relationships Inventory (Furman and Buhrmester, 1985, 1992) and the intimacy subscale were used to examine relationship quality as a predictor of agreement. Composite and subscale values were averaged, with higher values indicating more positivity, negativity, or intimacy in the relationship, respectively. Length of friendship was assessed by asking, "How many months have you been friends with X?" ($M = 6.86$ years, $SD = 3.99$). Time spent with friends was an average of two questions: "Outside of school time, how much time do you spend doing things with your friends on weekdays (Monday through Thursday)?" and "How much time do you spend doing things with your friends on weekends (Friday after school through Sunday)?" (higher values indicate more time spent with friends). Age and gender were provided by self-report (*male* = 1, *female* = 2).

Results

Target perceptions were significantly associated with friends' self-reports of drinking, $\chi^2(1) = 53.71, p < .001$, and smoking, $\chi^2(1) = 27.61, p < .001$ (Table 1). These statistically significant associations were driven by the high percentage of reports that agreed about the absence of drinking (69%) or smoking (82%) behavior. Fewer reports agreed about the presence of drinking (13%) or smoking (5%) behavior. When

TABLE 1. Report concordance for drinking and smoking behavior

Variable	χ^2	Agreement		Disagreement	
		Absence of behavior	Presence of behavior	Under-report	Over-report
Target perception and friend self-report					
Drinking, y/n ^{a,b}	53.71***	161	30	20	21
Smoking, y/n ^{a,c,d}	27.61***	190	11	19	12
Heavy drinking, ≥ 7 drinking episodes	18.60***	182	5	45	0
Friend perception and target self-report					
Drinking, y/n	53.05***	166	19	7	40
Smoking, y/n	40.62***	192	12	7	21

Notes: y/n = yes/no. ^aAge as predictor of concordance; ^btime spent with friends as predictor of concordance; ^cnegative relationship quality as predictor of concordance; ^dtarget problem behavior as predictor of concordance.

*** $p < .001$.

friends reported having used a substance, target perceptions agreed with friend self-reports in 60% of cases of drinking and in 36.7% of the cases of smoking. An additional analysis assessing the concordance of drinking frequency (zero to six times vs. seven or more episodes in the past 6 months) was also statistically significant, $\chi^2(1) = 18.60, p < .001$, and the pattern of findings was not appreciably different (78% agreed on the absence of behavior; 10% agreed on the presence of high intake).

Results in Table 1 for the concordance between friend perception of target substance use and target self-reported substance use were similar to those above, $\chi^2_{\text{drinking}}(1) = 53.05, p < .001$; $\chi^2_{\text{smoking}}(1) = 40.62, p < .001$, respectively, and were largely driven by agreement about the absence of the behavior (drinking = 72%; smoking = 83%). Again, few reports agreed on the presence of behavior (drinking = 19/232 or 8%; smoking = 12/232 or 5%).

With respect to deviant behavior, although target perception and friend self-report of deviant behavior correlated significantly ($r = .45, p < .001$), most targets underreported the extent of their friends' deviant behavior (underreport = 119/232 or 51%; overreport = 70/232 or 19%; agreement = 43/232 or 30%).

Predictors of concordance

Drinking. Logistic regression analyses found that target age, Wald $\chi^2(1) = 5.18, p < .05$, and the amount of time spent with friends, Wald $\chi^2(1) = 4.22, p < .05$, were significant bivariate predictors of concordance on drinking status. Report concordance decreased for every 1-year increase in target age (odds ratio [OR] = 0.67, 95% CI [0.47, 0.95]) and for every 1-unit increase in the amount of time spent with friends (OR = 0.62, 95% CI [0.40, 0.98]). When all variables were entered into a final multivariate model, $\chi^2(7) = 11.53, p = .12$, time spent with friends (OR = 0.64, 95% CI [0.40, 1.02], $p = .06$) was marginally significant. This model accounted for just 8.6% of the variance in report concordance.

Smoking. Using logistic regression, target age, Wald $\chi^2(1) = 5.53, p < .05$, and perceived relationship negativity, Wald $\chi^2(1) = 5.57, p < .05$, significantly predicted concordance on smoking status. Report concordance decreased for every 1-year increase in target age (OR = 0.62, 95% CI [0.41, 0.92]) and for every 1-unit increase in target-reported relationship negativity (OR = 0.54, 95% CI [0.33, 0.90]). Report concordance also increased when targets were nonsmokers (OR = 0.33, 95% CI [0.14, 0.80]). In the final multivariate model, $\chi^2(7) = 14.00, p < .001$, age was the only statistically significant predictor (OR = 0.63, 95% CI [0.42, 0.97], $p < .05$), and negative relationship quality was marginally significant (OR = 0.59, 95% CI [0.35, 1.0]). This model accounted for 11.6% of the variance in report concordance.

Deviant behavior. Using ordinary least squares regression, increases in target's own deviant behavior ($\beta = .25, p <$

.001) related to target overreport of friend deviant behavior, accounting for 6% of the variance in the discrepancy score. This association remained after controlling for target age and gender.

Discussion

Many research studies ask adolescents to report their perceptions of their friends' problem behavior as a proxy for direct measurement—a technique that provides valuable information regarding adolescent *perceptions*. The current results, however, suggest that this is probably not the best method for collecting accurate information about friend behavior (particularly when a behavior is present) in early adolescence. It may be more useful to collect collateral reports provided by an adolescent about a friend's behavior (assessment of perception) and the friend's self-report of behavior (assessment of behavior) separately. Research should directly compare prediction of adolescent problem behavior using these different reporting paradigms to determine if each source of data provides unique prognostic value.

The present findings lead to speculation about the meaning of misperception. Low concordance, a marker of low awareness of a friend's behavior, does not necessarily indicate an absence of friend influence. Although an adolescent may be unaware of certain of their friends' behaviors, he or she may still perceive, and be influenced by, other risk factors present in the social milieu, such as behavioral disinhibition (risk taking and/or poor judgment) or difficulty in school (modeling detachment from conventional social goals). In addition, friends may exhibit attitudes and beliefs that support problem behavior; for example, perceived friend approval of problem behavior influences such adolescent problem behaviors as drinking and drug use (Jessor and Jessor, 1977).

The fact that drinking and smoking occur infrequently among 13- to 15-year-olds (Substance Abuse and Mental Health Services Administration, 2007) makes it difficult to capture meaningful predictors of report concordance. Indeed, gender, intimacy, positive relationship quality, and length of friendship were not significant predictors. Although few predictors were significant, older adolescents' perceptions of their friends' substance use were less concordant with friend self-reports than were younger adolescents' perceptions. This unexpected finding may be the result of the observed increase in the size and complexity of social networks as adolescents progress through secondary school (Brown et al., 1986). Observation of a friend's behavior (even a close friend) may therefore become increasingly difficult with age, particularly if that friend engages in problem behaviors in a nonoverlapping peer group (Ennett and Bauman, 1994). Observational data on the pervasiveness of substance use throughout an adolescent's multiple social networks, if available, would help to clarify why perceptions might be

inaccurate if adolescents “try on” different social roles as they gravitate from one social setting to another.

An increase in the amount of time spent with friends related to lower levels of report concordance for alcohol use. This finding may also reflect the increase in size of social networks with which adolescents become involved as they age. Had we measured the context of social interactions, we would have been able to determine the influence of friend interactions in organized sports or at community social functions, where problem behaviors are unlikely to occur. It is also possible that spending less time with friends may be a proxy for other factors that contribute to risk for problem behavior.

The target adolescent’s own involvement in smoking and in deviant behavior (but not drinking) predicted report concordance for these behaviors (although for smoking the association was marginally significant). This finding is consistent with previous research (Bauman and Koch, 1983) that found that adolescent problem behavior is likely to be projected onto friends. This projection is significant because adolescents who have social and cognitive deficits that may bias their perceptions of their friends’ behaviors are also more likely to have subsequent substance-use problems (Sher, 1991). Future research testing whether distorted perceptions mediate temperamental/cognitive vulnerability might prove fruitful, particularly for the development of targeted interventions. Our finding that negativity in the friendship dyad also predicted discordant reporting about smoking behavior also fits with this line of thinking. Researchers (Patterson, 1986; Sher, 1991) have shown that adolescents who are at risk for engaging in problem behaviors have a profile of social, academic, and cognitive impairments that may include friendships characterized by negativity. The most vulnerable adolescents may have an accelerated trajectory of problem behavior, in part, because of misperceived friend modeling compounded by the influence of other risk factors.

Taken together, these findings provide intriguing evidence that adolescents at risk of early onset drinking are unlikely to be knowledgeable about the drinking and smoking of their friends. Although our substance-use reports were not confirmed by biological measures and may contain some inaccuracies, the methods we used are typical in survey research with adolescents. The findings suggest that disclosure and awareness cannot be assumed in reciprocal friendships, which has interesting implications for parental management of friend relationships. Future research into the longer-term implications of adolescent perceptions and parental management strategies for youth with pre-existing behavioral and cognitive vulnerability could be particularly useful.

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