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Beyond Susceptibility: Openness to Peer Influence is Predicted by *Adaptive* Social Relationships

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Abstract

This study examined the hypothesis, derived from theories highlighting the importance of group harmony and sense of belonging in human relationships, that the adolescents who are most likely to be influenced by their close friends are those who have the *highest* quality social relationships. Potential moderators of close friend influence on adolescent substance use were examined in a sample of 157 adolescents followed across a one-year period in mid-adolescence using a combination of observational, sociometric, and self- and peer-report measures. As hypothesized, the degree to which adolescents changed their levels of substance use in accord with a close friend's levels of use at baseline was predicted by multiple, independent markers of higher quality social relationships including: having a higher quality maternal relationship, being identified as a socially desirable companion within the broader peer group, and having a close friend who handled disagreements with warmth and autonomy. Notably, influence processes were neutral in valence: Teens displayed relative reductions in substance use when their close friends had low levels of use and the opposite when their friends had high levels of use. Results are discussed as suggesting the need to distinguish overall normative and adaptive peer influence processes from the sometimes maladaptive effects that can occur when teens associate with specific deviant peers or with a problematic adolescent subculture.

The idea of adolescent 'susceptibility' to peer influence has ominous overtones. A host of problems, from drug use to risky behavior to delinquent activity, have been linked to peer influences (Gardner & Steinberg, 2005; Windle, 2000). Indeed, short-term deviancy training effects have now been well-documented among delinquent peers, and are of sufficient magnitude to even bring about iatrogenic effects in some peer-focused interventions (Dishion, Poulin, & Burraston, 2001; Dishion, Spracklen, Andrews, & Patterson, 1996). Large scale network analyses have now repeatedly demonstrated peer influence effects that are clearly distinct from the effects of selecting similar peers (Sijtsema & Lindenberg, 2018). The idea that some teens are particularly easily influenced by their peers is also now well-established, having been demonstrated repeatedly in experimental research (Choukas-Bradley, Giletta, Widman, Cohen, & Prinstein, 2014; Prinstein, Brechwald, & Cohen, 2011; Teunissen et al., 2016). Cross-lagged longitudinal studies have found that teens who display low levels of autonomy and assertive traits are most likely to be influenced (Allen, Chango, Szwedo, Schad, & Marston, 2012; Allen, Porter, & McFarland, 2006).

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Notably, however, although these cross-lagged studies have often been framed in terms of *negative* influences, their findings have typically not actually been directional in nature: Most find simply that teens with the identified traits became more like their peers over time, *whether their peers' behaviors were adaptive or not*. From a purely logical standpoint, influence can of course be either positive or negative in valence. In every dyad in which a teen is being exposed to a more deviant peer, that peer in turn is being simultaneously exposed to a less deviant teen. This recognition is consistent with a dawning awareness that peer influence likely also has a more positive side (Brechwald & Prinstein, 2011; Brown, Bakken, Ameringer, & Mahon, 2008; Kam & Wang, 2015). Knowing that a given teen is susceptible to being influenced by a peer thus tells us nothing about the direction of this influence—whether it should be a source for concern or reason for reassurance.

More broadly, however, being open to influence by others, rather than being a unique and problematic vulnerability in adolescence, seems more accurately viewed as a defining *and highly adaptive* characteristic of the human species. Our ability to cooperate and form cohesive groups, in which individual behaviors are carefully calibrated to group norms, appears likely to have been a key factor leading to the success of our species (Baumeister & Leary, 1995). Indeed, human brains appear uniquely wired to detect potential conflict and to avoid it in the interest of preserving the group harmony that was likely to have been essential to human survival in evolutionary times (Cascio, Scholz, & Falk, 2015; Lieberman & Eisenberger, 2009). In prehistoric times exclusion in adulthood likely meant death, and even now social isolation is associated with increased mortality (Holt-Lunstad, Smith, & Layton, 2010). Given that adolescents were historically often treated quite similarly to adults (Schlegel & Barry, 1991; Schlegel & Hewlett, 2011), there is little reason to believe they would have been immune to selection pressures leading them to tune their behaviors to be in harmony with those around them. Indeed, it appears that the onset of adolescence, as reflected in pubertal development, is directly linked to an increase in peer influence (Franken et al., 2016). In short, it should be unsurprising that attaining status and acceptance among peers is a central human motivation in both adolescence and adulthood—one likely to enhance group harmony, increase openness to peer influence, and reflect overall positive social adaptation (Baumeister & Leary, 1995; Dijkstra, Cillessen, & Borch, 2013; LaFontana & Cillessen, 2010).

But what about all of the links of peers to problematic behavior? This study proceeds from the premise that the peer influence literature (and to an even greater extent the popular culture) has tended to suffer from a failure to distinguish between two independent phenomena. First, there is the natural and adaptive human propensity to join groups, embed oneself within them, and harmonize with other group members. Second, in Western society currently, an adolescent *subculture* exists which has features that are problematic from an adult perspective, such as engaging in, and thus modelling, significant levels of adolescent substance use, minor forms of deviance, and risky behavior. Exposure to and becoming embedded within aspects of this subculture may therefore also be somewhat problematic. Yet, we would argue that it is this *subculture,* not individual adolescents' focus on harmonizing with others, that is problematic. A simple analogy: If the air within a community is polluted, those who breathe it will be at risk for a number of illnesses. It is the air that is the problem, however, not the need to breathe! The idea that being open to

influence by others may be *adaptive* (and essentially as natural and as healthy as breathing) has received far less attention, however, in research to date (Brown et al., 2008).

This perspective suggests that, contrary to popular beliefs, being open to influence by one's peers is likely to be associated with positive social relationships and general markers of social adaptation. At the dyadic level, longstanding literatures in other fields and dealing with other types of relationships suggest that the relationships likely to have the largest influence on values and behavior are those that are more likely to handle disagreements with warmth and support more than by pressure and threat. For example, parents who have good relationships with their teens are more likely to influence them (Kaminski, Valle, Filene, & Boyle, 2008) and indeed these parents are most likely to produce teens who are well-socialized themselves (Oudekerk, Allen, Hessel, & Molloy, 2015). More importantly, positive relationships with parents in adolescence have been repeatedly and directly related to strong, connected relationships with peers (Hare, Szwedo, Schad, & Allen, 2015; Parke & Ladd, 2016). Positive parental relationships have even been associated with acceptance and desirability within the broader peer group, which in turn has been linked to apparent heightened influence toward both prosocial and minor deviant behaviors (Allen, Porter, McFarland, Marsh, & McElhaney, 2005). Conversely, to the extent poor parental relationships reduce teens' ability to establish significant and close peer relationships (Oudekerk et al., 2015), the likelihood of peer influence even with regard to maladaptive behaviors would decrease (although overall levels maladapative behaviors might well still be high). These findings suggest that rather than strong parent-teen relationships being seen as reducing peer influence, they may in fact be seen as promotive of the types of connected relationships likely to be influential—as part of a healthy socialization process. This premise has never been tested empirically however.

Within peer relationships, several indirect lines of evidence suggest that relationships characterized by autonomy and support, as opposed to coercion and pressuring behavior, are most likely to be influential. For example, therapists who have the best relationships with their patients also have the greatest influence on them (Hukkelberg & Ogden, 2013; McLeod, 2011). Conversely, exposure to coercive parental behaviors in adolescence is generally linked to adolescent *non*compliance (Kaminski et al., 2008), and highly controlling behaviors, in particular, have been found to backfire under some conditions (Tilton-Weaver, Burk, Kerr, & Stattin, 2013). This perspective leads to perhaps the most direct challenge to popular notions regarding peer pressure in that it suggests that teens will be most influenced *not* by peers who tend to be coercive and pressuring, but rather by peers who are supportive and validating. To the best of our knowledge, however, this notion has also never been empirically examined.

In terms of adaptation within the broader peer group, the available evidence is relatively minimal, but also supports the overarching hypothesis that greater social adaptation within this broader group will be associated with greater openness to influence. One study, though relying on teen reports of both teen and peer behaviors, found that teens who were dominant and 'cooler' were more likely to appear influenced by their peers' behaviors (Müller, Hofmann, & Arm, 2017). A second found some evidence that teens who were both more popular and more likeable—two strong indicators of successful social adaptation within the

broader peer group--were more likely to be influenced (Gommans, Sandstrom, Stevens, ter Bogt, & Cillessen, 2017). This latter finding is consistent with research finding that teens rated as desirable companions by their peers were more likely to adopt behaviors (both positive and negative) that were generally approved of within their peer subculture (Allen et al., 2005).

In sum, in spite of widespread concerns about peer influences in adolescence, a considerable body of theory and some research suggests that being 'open' to such influences (a term we believe is more apt than 'susceptible') may largely reflect normal and healthy adolescent socialization and relationship processes. From this perspective, the adolescents who are most open to peer influence would be likely to be those who have the strongest individual social relationships and/or who appear to be most well-adapted to the broader peer group. This proposition has received scant attention, however.

This study used longitudinal, multi-method data obtained from adolescents and their peers to examine the extent to which openness to peer influence regarding substance use was linked to a variety of markers of adaptation and peer relationship quality. It was specifically hypothesized that adolescents would be most open to influence by a close friend when they: a) had a strong positive relationship with their mothers; b) were viewed as desirable companions by their peers; and c) had interactions around disagreements with a close friend characterized by warmth and support. Close friend interactions characterized by coercive processes were predicted to lead to lower levels of openness to influence by that peer. Finally, influence processes were hypothesized to be relatively symmetrical in nature: teens would both be influenced by friends with low levels of substance use as well as by friends with high levels. These factors were all examined within a diverse community sample that was followed longitudinally in mid-adolescence. The roles of adolescent gender and family income were also considered as potential moderators of effects observed.

Methods

Participants and Participant Selection Procedures

This report is drawn from a larger longitudinal investigation of adolescent social development in familial and peer contexts. The full original sample included 184 seventh and eighth graders (86 male and 98 female) and their parents. The sample was racially/ethnically and socioeconomically diverse: 107 adolescents (58%) identified themselves as Caucasian, 53 (29%) as African American, 15 (8%) as of mixed race/ethnicity and 9 (5%) as being from other minority groups. Adolescents' parents reported a median family income in the $40,000 - $59,999 range. Adolescents were originally recruited from the 7th and 8th grades at a public middle school drawing from suburban and urban populations in the Southeastern United States. Students were recruited via an initial mailing to all parents of students in the school along with follow-up contact efforts at school lunches. Adolescents who indicated they were interested in the study were contacted by telephone. Of all students eligible for participation at the initial seventh/eighth assessment, 63% agreed to participate either as target participants or as peers providing collateral information (once a student was identified as a participating peer at baseline they were no longer eligible to be selected as a target participant). Interviews took place in private offices within a university academic

building. Teens completed questionnaires by themselves at both age 15 and age 16 (though an interviewer was present to answer any teen questions) and were paid $15 for their participation.

For the purposes of the present study, 157 (85%) of the original adolescents provided data on levels of substance use at the age 15 assessment (M age = 15.2, SD =.81) and 148 provided data on substance use at the age 16 assessment (M age = 16.3, SD = .87). At the age 15 assessment, adolescents were also asked to nominate their "closest friend" of the same gender to be included in the study. Each of the 157 target adolescents named a close friend, defined as a person "you know well, spend time with and who you talk to about things that happen in your life." For adolescents who had difficulty naming a closest friend, it was explained that naming their "closest" friends did not mean that they were necessarily very close to this friend, just that they were close to this friend *relative* to other acquaintances they might have. This procedure was designed to address two issues. First, asking about a 'best' friend was problematic as, for many teens, this term implies a special degree of intimacy that doesn't always exist (i.e., "Mary is my closest friend but I still wouldn't consider her my 'best' friend."). Relatedly, some teens are either hesitant to define any of their friendships as being particularly 'close,' as a matter of either perception, definition, or actual reality. Hence, we wanted to give them an instruction that allowed them to list their closest friend without having to make judgments about the degree of closeness that term implied. In all cases, adolescents were able to name at least one friend using these criteria. Close friends reported that they had known the adolescents for an average of 5.0 years (SD = 3.2) at the age 15 assessment.

Attrition analyses indicated that the 157 adolescents who reported data on substance use at age 15 had somewhat higher family income at age 13 than the 27 adolescents in the original study for whom age 15 data were not available. Family income was thus examined as a covariate and potential moderator in all analyses. No differences were found between the 157 adolescents who provided substance use data at age 15 and the 147 who provided substance use data at age 16 on any of the other measures used.

For all data collection, adolescents and their peers provided informed assent, and their parents provided informed consent before each interview session. Interviews took place in private offices within a university academic building. Adolescents and peers were all paid for their participation. Participants' data were protected by a Confidentiality Certificate issued by the U.S. Department of Health and Human Services, which further protects information from subpoena by federal, state, and local courts. If necessary, transportation and child care were provided to participants.

Measures

***Substance Use* (Age 15 and 16).—**Adolescent and close friend use of alcohol and marijuana were assessed with the Alcohol and Drug Use Questionnaire (Johnston, O'Malley, & Bachman, 1987), a self-report measure that includes items assessing the frequency of adolescent use of alcohol and/or marijuana in the past 30 days: "In the last 30 days how often have you had alcohol to drink [or] consumed marijuana?" Participants answered on a 5-point scale ranging from none (0) to 10 or more times (5). Answers for alcohol

and for marijuana use were summed to yield the measure of substance use. The measure was completed independently by both target teens and their closest friend at age 15 and again by the target teen at age 16. This measure is based on the "Monitoring the Future" surveys (Johnston, O'Malley, & Bachman, 1987). Johnston and colleagues found high reliability from year to year and consistency between related measures within the same questionnaire administration. Construct validity in their research was demonstrated as self-reported substance use was related to attitudes, beliefs, and related behaviors and under-reporting appeared to be minimal.

Desirability as a Companion **(Age 15).—**Adolescents' capacity to establish themselves as desirable social companions with a range of their peers was assessed using a limited nomination procedure. Each adolescent, their closest friend, and two other target peers were asked to nominate up to 10 peers in their grade with whom they would "most like to spend time on a Saturday night." This study used grade-based nominations (e.g., students could nominate anyone in their grade at school) rather than classroom based nominations due to the age and classroom structure of the school that all participants attended. As a result, instead of friendship nominations being done by 15 to 30 children in a given classroom, each teen's nominations were culled from among 72 to 146 teens (depending on the teen's grade level; these nominators comprised approximately 38% of the entire student population in these grades). All participating students in a given grade were thus potential nominators of all other students in that grade, and an open nomination procedure was used (i.e. students were not presented with a roster of other students in their school, but wrote in names of liked and disliked students). Students used this procedure easily, producing an average of 9.1 liking nominations (out of 10). The raw number of 'like' nominations each teen received was standardized within grade level as a measure of desirability as a social companion in the broader peer group following the procedure described in Coie et al (1982). This approach to assessing social acceptance has been previously found to be relatively stable over time and related to adolescent attachment security, qualities of positive parental and peer interactions, and short-term changes in levels of deviant behavior (Allen et al., 2005; Allen, Porter, McFarland, McElhaney, & Marsh, 2007; McElhaney, Antonishak, & Allen, 2008).

Quality of Maternal Relationship **(Age 15).—**The Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987) was used to assess adolescents' perceptions of the quality of their overall attachment to their mother. Relationship quality was calculated as the sum of 14 5-point Likert items capturing communication and trust and seven 5-point items (reverse scored) capturing alienation in the relationship. Internal consistency for this measure was good (Cronbach's $\alpha = .94$).

Observed Close Friend Autonomy & Relatedness During Disagreements **(Age 15).—**Participants and their closest friend participated in a revealed differences task in which they were presented with a hypothetical dilemma in which they were first asked to decide which characters would win vs. lose on a reality-show "survivor" contest. After making their decisions separately, adolescents and their close friends were then brought together and told of their differences and asked to try to come up with a consensus answer

(Strodtbeck, 1951). These interactions lasted eight minutes and were video recorded and then transcribed.

The coding system employed yields a rating for the friend's overall behavior toward the participant in the interaction (Allen et al., 2000; Allen, Hauser, Bell, & O'Connor, 1994). Ratings are molar in nature, yielding overall scores for friends' behaviors across the entire the interaction; however, these molar scores are derived from an anchored coding system that considers both the frequency and intensity of each speech during the interaction in assigning the overall molar score. Specific interactive behaviors were coded then summed together on *a priori* grounds into a primary scale for the extent to which friends displayed and promoted autonomy and relatedness with their partners, reflecting both direct statements explaining their reasoning as well as interest, validation, and support for the participant's statements. Examples of behaviors that went into ratings included statements of reasons behind one's position, acknowledgement of the validity of the other person's reasons, and treatment of the disagreement as a collaborative (vs. competitive) process. Each interaction was reliably coded as the average of scores obtained by two trained raters blind to other data from the study. Inter-rater reliability was calculated using intraclass correlation coefficients and was in what is considered "good" range for this statistic, which accounts for both rank order similarities in ratings, but also any potential overall mean differences between raters (intraclass $r = .64$) (Cicchetti & Sparrow, 1981).

***Observed Close Friend Pressuring Behavior During Disagreements* (Age 15).**—Using the same revealed differences task described above, close friends were coded for the extent to which they engaged in behaviors pressuring the target teen to change their position. Inter-rater reliability was calculated using intraclass correlation coefficients and was in what is considered "good" range for this statistic (intraclass $r = .66$) (Cicchetti & Sparrow, 1981).

***Perceived Social Competence* (Age 15).**—The Adolescent Self-Perception Profile (Harter, 1988) was used to assess the target adolescents' perceptions of their social competence with their peers. Self-reported social competence was assessed using a slightly modified version of a subscale from the Adolescent Self-Perception Profile (Harter, 1988). Participants choose between two contrasting descriptors and then rate the extent to which their choice is "really true" or "sort of true" of them (e.g., "Some people are well liked by other people"/"Some people are not well liked by other people"). The scale demonstrated good internal consistency (Cronbach's $\alpha = .77$).

Results

Preliminary Analyses

Means and standard deviations for all substantive variables are presented in Table 1. The increase in teens' level of substance use from age 15 to age 16 was highly significant (t=3.79, $p < .001$). For descriptive purposes, Table 1 also presents the results of simple univariate (or point-biserial where relevant) correlations among the key variables of interest in the study. These reveal a significant overall relation between teen substance use at both ages and close friend reports of their own substance use at age 15. Adolescent gender and

family income were also related to several variables in the study and hence were included as covariates in all analyses below.

Primary Analyses

Analyses were designed to assess the extent to which a teen's future level of substance use could be predicted from baseline levels of close friend substance use, after controlling for baseline levels of teen substance use. This approach of predicting the future level of a variable while accounting for predictions from initial levels (e.g., stability), yields one marker of change in that variable: increases or decreases in its final state relative to predictions based upon initial levels (Cohen & Cohen, 1983). Analyses focused upon the question of whether predictions from baseline close friend substance use to future teen substance use would be stronger for some teens than for others (i.e., would teen characteristics moderate the predictive strength of close friend substance use on their own future changes in substance use).

To best address any potential biases due to attrition and missing data in longitudinal analyses, Full Information Maximum Likelihood methods were used, with analyses including all variables that were linked to future missing data (i.e., where data were not missing completely at random). Because these procedures have been found to yield less biased estimates than approaches (e.g., simple regression) that use listwise deletion of cases with missing data, the entire original sample of 184 for the larger study was utilized for these analyses. This analytic technique does not impute or create any new data nor does it artificially inflate significance levels. Rather it simply takes into account distributional characteristics of data in the full sample so as to provide the least biased estimates of parameters obtained when some data are missing (Arbuckle, 1996). Alternative longitudinal analyses using just those adolescents without missing data (i.e., listwise deletion) yielded results that were substantially identical to those reported below.

Main Effects.—All models first entered adolescent gender and family income, followed by measures of both adolescent and close friend substance use at age 15 as predictors of adolescent substance use at age 16. Gender and family income were unrelated to later substance use, whereas both adolescent and friend substance use at 15 were each predictive of adolescent substance use at 16 in all models below.

Moderating Effects of Quality of Maternal Relationship.—Analyses first examined the moderating effects of the target teen's ongoing relationship with their mothers. Results are presented in the first set of columns in Table 2. As hypothesized, maternal relationship quality moderated the effect of close friend substance use on relative changes in teen substance use over the following year. Results are depicted in Figure 1, which presents regression lines for teens one standard deviation above and below the mean in maternal relationship quality, using standardized scores on the x- and y-axes. Lines shown were tested via simple slopes analysis using the PROCESS macro, version 3.3 (Hayes, 2019) in SAS (Sas Institute, 2015). Only the line reflecting higher quality maternal relationships was significant ($p < .001$). As Figure 1 shows, close friend substance use was more likely to

predict future relative changes in teen substance use for teens who had experienced higher maternal relationship quality at age 15.

Moderating Effects of Observed Close Friend Behaviors During a Disagreement.—Analyses next examined the extent to which a close friend's behavior in an observed disagreement task with the target adolescent would moderate the relation between that friend's substance use and relative changes in target teen use over the following year using the same approach described above. As shown in the second set of columns in Table 2, close friend behavior displaying autonomy and relatedness in interactions and (in the opposite direction) peer pressuring behavior significantly moderated the relation between close friend substance use and relative changes in target teen substance use over the following year. Figure 1 depicts both moderating effects, with simple slopes analyses showing highly significant direct effects of peer use on teen future use (both p's < .001) only when peers displayed high levels of autonomy and support and low levels of pressuring behavior.

Moderating Effects of Desirability as a Companion among Peers and Perceived Social Competence.—Analyses next examined the moderating effects of *desirability as a companion among peers and perceived social competence.* Results are presented in the final set of columns in Table 2. Desirability as a companion in the broader peer group was found to be a significant moderator of the relation between close friend substance use and relative changes in teen substance use over the following year. Social competence displayed only a trend, in the same direction as desirability as a companion, toward moderation. Figure 1 depicts the moderating effect of desirability as a companion and simple slopes analysis showed that relative changes in teen substance use were more likely to be predicted by baseline levels of close friend substance use when that teen is viewed as a desirable companion among other adolescents (p < .001).

Assessing Whether Potential Influence Factors Were Relatively Symmetrical in Nature.—To assess whether potential influence processes might matter more at the high end than the low end of peer use (e.g., with teens being influenced by peer use but not by peer non-use), we added a quadratic term to the main and moderation effects for each of the three moderators identified above. This term allows for examination of the possibility that peer influences would be stronger at levels of close friend substance use that were particularly high for example. In none of these analyses were either the main or the moderating effects of this quadratic term significant. This indicates that potential influence was as likely to appear with respect to teens' exposed to peers with low levels of use as to teens' exposed to peers with average or high levels of use. This result was also confirmed by dichotomizing data at the median and examining relative changes in teens with high vs. low levels of peer use (not depicted).

Post-hoc tests

Creating and Testing a Summary Measure of Teen Positive Social Relationships.—Finally, on a post-hoc basis, we created a composite measure so as to reflect an adolescents' overall positive social relationships in a way that would not

create tolerance/covariance issues in analyses. We created this by standardizing each of the identified predictors (i.e., maternal relationship quality, desirability as a peer companion, and close friend autonomy and relatedness and (reverse-scored) close friend pressuring behavior toward teen) and then summing them together. As shown in Table 3, this factor strongly interacted with close friend substance use to predict relative changes in future teen substance use and accounted for 7.4% of the total variance in adolescent substance use at age 16, even after accounting for baseline use, demographic factors and main effects of peer level of use.

Post-hoc test of demographic moderators.—Finally, we considered whether potential moderating effects of teen gender and family income might add to explained variance in predicting future teen substance use. When interactions of gender and family income with close friend substance use were added to the final model above, no moderating effects were found for either of these demographic factors.

Discussion

This study found consistent support for the hypothesis that the adolescents who are likely to be most open to influence by their close friends are those who have the highest quality social relationships. Adolescents who grew most similar to their close friend's level of substance use across a one-year period were those who: a. reported the most positive relationships with their mothers, b. were most likely to be identified as desirable companions within their broad peer group, and c. were observed to have a close friend who provided high levels of support and validation in the midst of a disagreement. The effects observed were sizeable, with hypothesized moderating effects typically explaining for more than half of the variance attributable to close friend substance use. Importantly, effects were also valence-neutral: Adolescents were as likely to display relative decreases in substance use when a close friend used substances at low levels as they were to display relative increases when associating with a peer with high levels of use.

Findings regarding close friend behavior during a disagreement were perhaps most striking as they fly directly in the face of popular conceptions that peer influence most typically reflects pressuring behavior. This study directly assessed such peers who engaged in pressuring behavior during a disagreement with a teen and found that such peers had *lower* levels of apparent peer influence (i.e., teens were less likely to become more similar to pressuring peers). In contrast, this study found that teens were most likely to grow more similar to close friends who were most autonomous, validating and warm during disagreements. Although contrary to popular notions of peer pressure, this finding is actually quite consistent with research on behavior influence in other contexts. Coercive parenting styles, for example, are now widely recognized to be ineffective in achieving behavioral control over children, whereas parental warmth is considered a fundamental ingredient of successful parent influence efforts (Kaminski et al., 2008). Even more broadly, longstanding reactance theory makes clear that overt pressuring strategies are unlikely to achieve lasting behavioral change and may even do the opposite (Brehm & Brehm, 2013). It is important to note, however, that this study examined the qualities of adolescents and their relationships linked to peer influence, but did not examine influence processes directly. Thus, these findings do not mean that pressuring interactions would never be influential;

indeed, pressuring and coercive behaviors often achieve short-term effects in other contexts (Kaminski et al., 2008) and these shorter-term influence processes appear likely to differ from the longer-term processes observed in this study (Weerman, Wilcox, & Sullivan, 2018). Rather these findings simply mean that peers who engage in pressuring behaviors in a laboratory assessment believed to reflect general patterns of handling disagreements may be less likely to be influential overall.

Beyond the qualities of close friend approaches to handling disagreements, we found that openness to peer influence was also associated with stronger maternal relationships and with being a more desirable social companion within the broader peer group. To be clear, this is *not* showing that stronger maternal relationships or desirability as a companion make a teen more vulnerable to substance use. Rather, these findings indicate that teens with these qualities are more likely to appear influenced by their peers' level of use, such that when peers have relatively low use, teens' display relative decreases in use, and when peers have high use, the opposite is seen.

In sum, it appears that across several different, independent indicators, assessed via different methods and reporters, teens who became most like their peers over time were those who were the most well-adjusted in relational terms. These findings suggest an important potential qualification to prior findings linking apparent peer influence to evidence of lower levels of adolescent autonomy and assertiveness (Allen et al., 2012). Although these prior findings were initially interpreted in a negative light, it now seems quite possible that what was being observed may have simply reflected well-socialized teens who were willing to go along to a degree with their peers' norms and behaviors. This interpretation receives further support from findings that such 'pack behaviors' in adolescence, including traits such as acting more as a follower than a leader, have been found predictive of greater physical health into young adulthood (Allen, Uchino, & Hafen, 2015). Although autonomy and independence are highly valued traits in Western culture, there is a clear basis for also recognizing the value of a more harmony-focused approach to group interactions (Talhelm et al., 2014), a value which may well apply to adolescents as much as to adults.

There are legitimate concerns about aspects of adolescent peer culture, but the current findings suggest we would be wrong to believe that it is poorly functioning adolescents who are most influenced by their close friends—indeed this study found quite the opposite. This point is critical, as exposure to the peer world is both essential and unavoidable during adolescence, and failure to form strong bonds by the time one reaches adulthood has been linked to a range of negative outcomes including depression, conflictual marital relationships, and even an increased risk of early mortality (Holt-Lunstad et al., 2010; Klerman, Weissman, Rounsaville, & Chevron, 1984; Miller, Smith, Turner, Guijarro, & Hallet, 1996). Peers provide the vast majority of most teens' daily stimulation, and adolescents appear uniquely biologically primed to attune themselves to and to learn from their peers (Forbes & Dahl, 2010). The current findings suggest that the challenge is not that adolescents are being socialized by peers—a natural, generally healthy, and in all likelihood unstoppable process—but rather that some aspects of the peer culture into which they are being socialized, or some particular sub-cultures within the broader peer world, contains values that are of significant concern from the vantage point of the adult world. To be fair,

however, many aspects of peer culture are also positive. Communication skills, generosity, and lack of physical aggression are all also valued by peers in adolescence, and while socially accepted adolescents have been found to be more likely to increase in substance use over time, they are also more likely to decrease in aggressive behavior (Allen et al., 2005).

None of this is to deny that there are situations in which peer influence can be particularly detrimental. Dishion's (1999) work, for example, has shown that deviant peer socializing forces are often sufficient to overcome even the most thoughtful efforts of interventions that place such peers together. In addition, an adolescent subculture that supports behaviors such as minor delinquency and risky behavior clearly is problematic for the adolescents being socialized into it. In all of these cases, however, the problem is most aptly recognized and addressed as being located in the deviant peer associations and the deviant subculture, rather than in an individual adolescent's openness to socializing influences. This suggests a need for greater attention to *which* socializing forces individual adolescents are being exposed to, rather than to whether these individual adolescents are open to socialization. In particular, a more nuanced understanding of the role of peer influences in adolescence suggests a need for future research that examines both adaptive and maladaptive norms within peer groups, and that also considers differences between different peer groups with respect to these norms.

Several limitations to these findings must also be kept in mind. Most importantly, as noted above, nothing in this study should be taken as suggesting that adolescent socializing forces are always benign. In addition, this study examined behavior change over a one-year period; socializing forces may well work quite differently in the short term. For example, coercive peer behaviors that might undermine a given peer's influence in the longer term may well have a substantial impact on behavior in a given situation (and indeed may be important in understanding short-term risky behaviors (Dishion et al., 1996). This study also did not account for differences in the extent to which a peer *attempts* to be influential, though these attempts have appeared important in other research (Kerr, Van Zalk, & Stattin, 2012).

Relatedly, this study addressed potential influence processes among an identified closest friend, and future research might well consider whether differences in the actual closeness of the friendship are important. In addition, broader group influence processes, whether coercive or not, may well behave differently. For example, under certain situations, such as when groups of dysfunctional peers are placed together, we know that an amplification process can exist, in which they encourage one another to engage in increasingly deviant behavior (Costello, Narr, Tan, & Allen, in press; Dishion et al., 2001), a process in which the net result of socializing forces is *not* neutral.

Finally, this study focused on 15- and 16-year-olds, for whom substance use rates were still relatively low; results will not necessarily generalize to other ages. For example, one study of 13-year-olds found that teens who received more maternal support were less influenced (Allen et al., 2012), which may reflect that at 13, focusing primarily on parents, not peers, as socializing forces may be more developmentally normative. The current findings suggest that by ages 15 to 16, the maternal relationship may be more influential via its link to

the qualities of developing peer relationships (i.e., a stronger maternal relationship predicts stronger peer relationships (Oudekerk et al., 2015)).

More generally, it is important to remember that this was not an experimental study and thus causal conclusions cannot be drawn from its results; specifically, we can only discuss *apparent* socializing influences. Although we identified conditions under which teens became more like their peers, we did not directly establish that this was due to influence by that particular peer and cannot rule out the possibility that other unmeasured factors affecting both teens and their close friends may have been at play. In addition, these findings were examined in a community sample, and thus do not necessarily generalize to more deviant samples of the type that have supported studies of deviant behavior entrainment.

Notwithstanding these limitations, the finding that apparent influence processes were both neutral in valence and were strongest for the teens who appeared to be the most well-adjusted as assessed via four distinct, independent and robust measures, strongly challenges the assumption that peer influence processes in adolescence are necessarily reflective of adjustment problems or deficiencies in the influenced teens. On the contrary, by adulthood, being well-socialized by definition requires being open to influence by one's peers. The current findings suggest that to the extent substantial peer influence processes are observed in adolescence, they are likely to reflect an overall adaptive developmental phenomenon, even if their immediate effects, depending on context, are not always beneficial.

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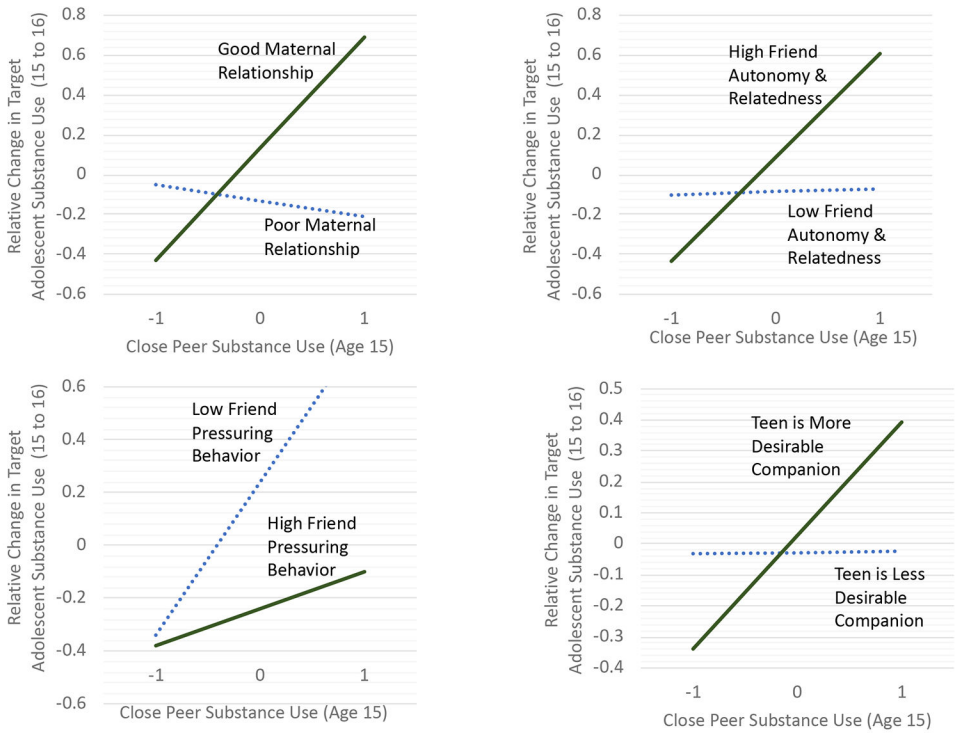

Figure 1.

Interaction of Close Friend Substance Use and Social Moderators Predicting Relative Change in Adolescent Substance Use (all measures are standardized).

N = 184

Table 1

Univariate Statistics and Intercorrelations Among Primary Constructs

	Mean	SD	Range	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Teen Substance Use (Adol.; Age 15)	.76	1.43	0 - 6.00	70***	49***	−11	12	−02	−02	07	−15	14
2. Teen Substance Use (Adol; Age 16)	1.24	1.89	0 - 8.00	--	54***	−06	15	02	−06	−03	−13	20*
3. Close friend Subst, Use (Peer; Age 15)	.96	1.71	0 - 7.00		--	−16	−00	−02	−02	06	−26**	15
4. Quality of Mother-Teen Relationship (Adol; Age 15)	101.1	15.9	55 - 125			--	10	35***	04	−10	03	−08
5. Teen Desirability as a Peer Companion (Sociometric; Age 15)	−.17	1.31	−1.70 – 3.80				--	23**	16	−17*	−17*	35***
6. Teen Social Competence (Adol; Age 15)	13.3	2.47	5 - 16					--	01	−14	04	−02
7. Close Friend Autonomy & Relatedness During Disagreements (Obsvd; Age 15)	2.44	0.42	1.00 - 3.75						--	09	−04	16
8. Close Friend Pressuring Behavior (Obsvd; Age 13)	1.46	0.92	0 - 3.50							--	−03	04
9. Adolescent Gender (1- Male; 2-Female)	--	--	--								--	−11
10. Family Income	43,600	22,400	<$5,000 - $60,000+									--

Note: Assessment Method and target adolescent age at time of assessment are in parentheses. All correlations are multiplied by 100.

*** p < .001.

** p < .01.

* p < .05.

N = 184.

Table 2

Hierarchical Regression Models Examining Potential Moderators of Friend Use in Predicting Relative Change in Teen Substance Use

	Teen Substance Use (Age 16)								
	Model 1: Quality of Mother-Teen Relationship (Age 15)			**Model 2: Observed Peer Behaviors During a Disagreement (15)**			**Model 3: Teen Desirability as a Peer Companion (Age 15)**		
	β [C.I.]	**ΔR^2**	**R^2**	**β [C.I.]**	**ΔR^2**	**R^2**	**β [C.I.]**	**ΔR^2**	**R^2**
I. Gender (1=M; 2=F)	−.01 [−.12, .10]			−.02 [−.13, .09]			−.07 [−.05, .19]		
Family Income (Age 13)	.06 [−.06, .17]			.10 [−.02, .22]			.06 [−.06, .18]		
Summary Statistics for Step		.057*	.057*		.057*	.057*		.057*	.057*
II. Teen Substance Use (Age 15)	.63*** [.51, .76]	.440***	.497***	.57*** [.44, .69]	.440***	.497***	.63*** [.51, .75]	.440***	.497***
III. Close Friend Substance Use (Age 15)	.37*** [.24, .51]	.054**	.541***	.27** [.13, .40]	.054**	.541***	.19** [.04, .33]	.054**	.541***
Model 1:									
IV. Maternal Relationship Quality	.11 [.00, .22]	.013	.554***						
V. Close Friend Substance Use X Maternal Relationship Quality	.31*** [.18, .44]	.070***	.624***						
Model 2:									
IV. Peer Autonomy & Relatedness				.09 [−.05, .22]					
Peer Pressuring				−.12 [−.25, .00]					
Summary Statistics for Step					.017	.558			
V. Close Friend Substance Use X Peer Autonomy and Relatedness				.25*** [.11, .40]					
Close Friend Substance Use X Peer Pressuring				−.17* [−.31, −.02]					
Summary Statistics for Step					.041***	.597***			
Model 3:									
IV. Desirability as a Companion							.03 [−.10, .15]		

	Model 1: Quality of Mother-Teen Relationship (Age 15)			Teen Substance Use (Age 16) Model 2: Observed Peer Behaviors During a Disagreement (15)			Model 3: Teen Desirability as a Peer Companion (Age 15)		
	β [C.I.]	ΔR^2	R^2	β [C.I.]	ΔR^2	R^2	β [C.I.]	ΔR^2	R^2
Social Competence							.04 [−.07, .16]	.018	.559***
Summary Statistics for Step									
V. Close Friend Substance Use X Desirability							.18** [.05, .31]		
Close Friend Substance Use X Social Competence							.11 [−.02, .24]		
Summary Statistics for Step								.059***	.607***

Note:

*** p < .001.

** p < .01.

* p < .05.

β weights are from final models. *N* for all models is 184. [C.I.] - Confidence intervals are calculated at the α = .05 level.

Table 3

Predicting Relative Change in Substance Use from Close Friend Use Interacting with Composite Measure of Positive Social Relationships

	Teen Substance Use (Age 16)		
	β Final [C.I.]	**Δ*R*2**	**Total R^2**
Step I.			
Gender (Male=1; Female =2)	−.02 [−.13, .08]		
Family Income	.05 [−.06, .16]		
Summary Statistics for Step		.057*	.057*
Step II.			
Target Teen Substance Use (Age 15)	.66*** [.54, .78]	.440***	.497***
Step III.			
Close friend substance Use (Age 15)	.28*** [.14, .41]	.054***	.541***
Step IV.			
Teen Positive Social Relationships	.07 [−.04, .18]	.001	.552***
Summary Statistics for Step			
Step V.			
Close friend substance Use X Teen Positive Relationships	.29*** [.17, .41]	.074***	.626***

Note.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

$N = 184$. Confidence intervals are calculated at the $\alpha = .05$ level.