

The Intensity Effect in Adolescent Close Friendships: Implications for Aggressive and Depressive Symptomatology

Meghan A. Costello, Rachel K. Narr, Joseph S. Tan, and Joseph P. Allen
The University of Virginia

This study examined the effect of close friendship intensity as a potential amplifier of an adolescent's preexisting tendencies toward depressive and aggressive symptoms. A diverse community sample of 170 adolescents and their closest friends was assessed via multiple methods, and adolescents were followed from age 16 to 17. Results supported the hypothesized effect, with more intense close friendships interacting with higher baseline levels of behavioral symptoms to predict greater relative increases in symptoms over time. Effects were observed for both depressive and aggressive symptoms, and appeared with respect to multiple observational measures of friendship intensity. Findings are interpreted as suggesting that seemingly disparate phenomena (e.g., co-rumination for depression and deviancy-training for aggression) may both be dependent upon the intensity of the adolescent's social connections.

Adolescent close friendships have been associated with a range of positive outcomes (e.g., greater self-worth & lower levels of long-term social anxiety and depressive symptoms (Narr, Allen, Tan, & Loeb, 2019; La Greca & Harrison, 2005)), yet have also been linked to increases in both internalizing and externalizing symptoms under some conditions (Dishion, Nelson, Winter, & Bullock, 2004; Rose, 2002). This study examined a single observed factor—friendship intensity—that may help account for the processes through which both internalizing and externalizing symptoms develop over time. Specifically, it considers the hypothesis that both for adolescents experiencing internalizing symptoms and for those experiencing externalizing symptoms, intense friendships are particularly likely to amplify an adolescent's preexisting behavioral tendencies toward displaying these symptoms.

This amplification hypothesis is supported by current theories used to explain the development of both internalizing and externalizing symptoms. In terms of internalizing symptoms, co-rumination—a process in which close friend dyads reciprocally encourage one another to engage in extensive, nonproductive discussion of problems and related negative affect—has been consistently linked to increasing levels of depressive symptoms over time

(Byrd-Craven, Geary, Rose, & Ponzi, 2008; Rose, Schwartz-Mette, Glick, Smith, & Luebbe, 2014). Although co-rumination within dyads reflects mutual attempts to provide empathy and support, co-rumination also predicts the development of increasing levels of depressive symptoms among already depressed teens (Cortese, 2014). These increases appear to result from teens positively reinforcing one another's dysfunctional thought processes and behaviors (Fergusson, Horwood, Ridder, & Beautrais, 2005). Thus, although co-rumination occurs in close friendships and may appear to reflect a supportive, empathic social interaction, it can also reinforce and increase the incidence of maladaptive psychological behaviors.

In terms of externalizing symptoms, deviancy training, in which peers mutually reinforce one another's deviant and aggressive behaviors, has been identified as a primary socializing process (Dishion, Spracklen, Andrews, & Patterson, 1996; Natsuaki, Ge, Reiss, & Neiderhiser, 2009). Friendship in early adolescence that organize around externalizing behaviors—whether due to situational variables such as a dangerous neighborhood environment, or interpersonal variables such as difficulty fitting in with dominant social groups—amplify teens' already-existent risks for problem behavior. In these situations, teens “train” each other to engage in problem behavior through mutual encouragement and reinforcement (Dishion et al., 2004; Piehler & Dishion, 2007). Although deviancy training is often described as a social group process, observational work has shown that adolescent *dyads* engaging in deviancy training

This study was supported by grants from the National Institute of Child Health and Human Development and the National Institute of Mental Health (9R01 HD058305-16A1 & R01-MH58066).

Requests for reprints should be sent to Meghan A. Costello, The University of Virginia, PO Box 400400, Charlottesville, VA 22904. E-mail: mac4qe@virginia.edu

processes show increases in self-reported problem behaviors as well (Dishion et al., 1996).

Although they are not identical, co-rumination and deviancy-training share one critical common element: In both, reinforcement processes within friendships *amplify* teens' preexisting tendencies. The amplification hypothesis suggests that this process can push teens toward either internalizing or externalizing symptoms, depending upon their pre-existing level of symptomatology. This study examines the premise that this symptom amplification process hinges on intensity of best friends' social interaction.

Several aspects of close friendship intensity may facilitate this amplification process. Adolescents have a natural tendency to select friends who share similar views and key traits (Kossinets & Watts, 2009), and are likely to adjust their values or attitudes to enhance the match with their friends, thus amplifying similar preexisting characteristics, a phenomenon which has been shown in previous work regarding both depressive symptomatology as well as externalizing behaviors (Giletta et al., 2011; Molm, Collett, & Schaefer, 2007; Veenstra, Dijkstra, Steglich, & Van Zalk, 2013; Weisbuch, Ivcevic, & Ambady, 2009). This attitude-shift process has previously been most clearly identified within social group research. When groups come together in which members share similar attitudes, members then tend to reinforce these attitudes in one another, leading to a process (termed "polarization") wherein amplification of initially held attitudes occurs (Ledgerwood & Chaiken, 2007; Mordock, 1997). Most relevant to this study, this polarization process is most likely to occur within more intensely connected groups, just as we propose that amplification happens in more intensely connected close peer dyads (Ledgerwood & Chaiken, 2007). This reinforcement process appears likely to apply equally to teens who display internalizing and externalizing symptoms.

Although adolescent friendships may display closeness or intensity along a variety of dimensions, two seem particularly relevant to an amplification process. The first is the extent to which an adolescent actually shares his or her thoughts and attitudes with a friend in the context of a positive relationship, as beliefs can only be reinforced to the extent to which they are shared. This study employed an observational measure of a teen's capacity to put forth their thoughts during a disagreement discussion within a friendly relationship context (i.e., autonomous-relatedness; Allen et al., 2002). The second dimension is the extent to which

the relationship is one in which an adolescent's friend actually tends to engage with and support (i.e., reinforce) statements of the teen. These behaviors were observed on the part of a focal adolescent's friend in a supportive behavior task (Allen et al., 2001). Higher levels of both friendship intensity processes are generally linked to greater levels of adaptation (McElhaney, Atonishak, & Allen, 2008), consistent with the notion that peer amplification processes occur within well-adjusted, close friendships.

This study utilized multireporter data in a socio-demographically diverse community sample followed for a 1-year period in mid-adolescence to test the following hypotheses regarding the amplification effect: First, greater friendship intensity in observed interactions with a best friend was hypothesized to predict relative increases in depressive symptoms, but only for teens that had a higher baseline level of these symptoms. Second, greater friendship intensity in observed interactions with a best friend was hypothesized to predict relative increases in aggressive symptoms, but only for teens that had a higher baseline level of these symptoms.

METHOD

Participants

This study was part of The Kids, Lives, Family, and Friends Project, a large longitudinal investigation of adolescent social development in familial and peer contexts. Participants included 184 seventh and eighth graders (86 males and 98 females). Adolescents were assessed annually; this study utilizes the age 16 ($M_{\text{age}} = 16.35$ $SD = 0.87$) and age 17 ($M_{\text{age}} = 17.32$ $SD = 0.88$) assessments. Adolescents were recruited from the seventh and eighth grades of 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 (total school population was approximately 600 students). Families of adolescents who indicated interest in the study were contacted by telephone. Of all students eligible for participation, 63% agreed to participate either as target participants or as peers who participated in interactions tasks with the target teen. Once a student participated as a peer, they were no longer eligible to be a primary participant. Thirty-eight percent of the core sample of 184 participants were in the seventh grade at the start of the study and 62% were in the eighth grade. All participants provided

informed assent before each interview session, and parents provided informed consent. 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 identity groups, which approximately mirrors the distribution of the catchment area for the school from which the sample was drawn. Adolescents' parents reported an annual median family income in the \$40,000–\$59,999 range, relative to a national median household income of approximately \$39,000 at the time (US Census Bureau, 1999). At age 16, target adolescents nominated their top four closest friends to be included in observational measures with them in the study. Of participating close friends, 78% were first ranked (i.e., closest) friends, 14% were second ranked friends, 5% were third ranked friends, and 3% were fourth ranked friends. All participants nominated same-gender friends at the reported assessment time.

Procedures

In the initial introduction and throughout each session, confidentiality was explained to all family members, and adolescents were told that their parents would not be informed of any of the answers they provided. A Confidentiality Certificate, issued by the U.S. Department of Health and Human Services protected all data from subpoena by federal, state, and local courts.

Attrition Analysis

Ninety-four percent of the 170 teens who participated at Age 16 also participated at Age 17. Individuals who did not participate at age 17 did not differ from teens who did participate in baseline measures of symptomatology, gender, or familial income. Attrition is thus not likely to have distorted any of the findings reported. Despite this, to best address any possible biases due to attrition in longitudinal analyses or missing data within waves, we used full-imputation maximum-likelihood methods. These methods have been found to yield the least-biased estimates when all available data are used for longitudinal analyses (vs. listwise deletion of missing data; Arbuckle, 1996); thus, the entire original sample of 184 was utilized for these analyses. The full sample provides the best possible estimates of variances and covariances in measures of interest and was least likely to be biased by missing data.

Measures

Intensity of observed social interactions with peers (age 16). Target teens and their close friends participated in two observed social interactions in private offices within a University building. The first observational, “revealed differences” task required teens to discuss which individuals from a list of fictional characters they should vote off of an island in a hypothetical reality TV show, based on the descriptions provided. They were filmed for 8 min after being instructed to come to a consensus about which people should be voted off the island. These interactions were coded using the Autonomy-Relatedness Coding System for Adolescent Peer Dyads (Allen et al., 2001). *Autonomous-Relatedness* captures the degree to which the target teen states reasons in supporting their position while still maintaining positive connection in the relationship. Indicators of connection include the target teen's physical and verbal demonstrations of warmth and an absence of undermining statements as the teen makes his or her case. *Autonomous-Relatedness* is coded on a scale from 0–4. Scores of 0 indicates that the participant was unable to state reasons for disagreeing with their friend and did not appear confident, while also lacking in behaviors that promote connectedness between the dyad, such as employing information-seeking queries, offering validation or agreement, and appearing engaged in the task. Coders assign scores of 4 when a participant is able to employ behaviors that both offer support for their position in the disagreement while also maintaining a warm, connected relationship throughout. Interrater agreement, using the intraclass correlation coefficient, was in the good range (ICC = 0.65).

The second, 6-min task observed the target teen asking their close peer for advice on a self-selected topic. This interaction was then coded for the close peer's engagement using the Supportive Behavior Task Coding System for Adolescent Peer Dyads (Allen et al., 2012). Engagement codes range from 0, in which a supporter provides little or no physical or verbal indication of listening attentively or with interest (e.g., closed body posture, restricted eye contact, ignoring the support-seeker), to 4, which indicates that the supporter displays high investment and responsiveness to the support-seeker, both verbally and nonverbally (e.g., consistent eye contact, open posture, verbal follow-ups on the support-seeking statements). Interrater reliability was in the good range (ICC = 0.72).

Depressive symptoms (age 16 and 17). Adolescents reported their level of depressive symptoms using the Childhood Depression Inventory (Kovacs & Beck, 1977). This 27-item inventory based on the Beck Depression Inventory is useful in both clinical and nonclinical settings, and has been well-validated as a measure of depressive symptomatology linked to poor self-esteem, hopelessness, and negative cognitive attributions and ranks overall depressive symptoms on a raw scale from 0 to 54 (Kazdin, 1990). Internal consistency was good (Cronbach's $\alpha = .87, .86$ at ages 16 and 17, respectively).

Aggressive symptoms (age 16 and 17). Adolescents reported the degree of their aggressive symptoms using the Youth Self Report. The Youth Self Report is a self-report containing 112 items that measure both internalizing and externalizing behaviors (Achenbach & Edelbrock, 1981). Answers are given on a 3-point scale ranging from *not true* to *somewhat true*. Items measuring the teens' self-report of aggression were used in this study, which rates overall aggressive symptoms on a scale from 0 to 36. The Youth Self Report has been normed on a sample of 1,315 boys and girls between the ages on 11 and 18 and was shown to have a Cronbach's α of .74 (Achenbach & Edelbrock, 1979). In addition, adequate test-retest reliability and the measure's ability to discriminate between youth who have or have not been referred for mental health services has been established (Achenbach, 1991). Internal consistency was acceptable (Cronbach's $\alpha = .72, .68$ at ages 16 and 17, respectively).

RESULTS

Plan of Analyses

For all analyses, we used SAS PROC CALIS (Version 9.4; SAS Institute, Cary, NC) to assess key

relations in hierarchical regression models. Relative change scores were assessed in which future levels of an outcome (e.g., depressive symptoms) were examined after first accounting for baseline levels. Full-information maximum likelihood methods were used to handle missing data. All variables were standardized.

Preliminary Analyses

Means and standard deviations for all variables examined in the study are presented in Table 1. All variables were assessed for skewness and kurtosis. Only one, depression at age 16 displayed slightly elevated kurtosis (kurtosis = 2.67), but given regression's robustness against modest violations of the normality assumption and the advantages of retaining original measurement scaling, we completed our analyses using untransformed variables (Bohrstedt & Carter, 1971). Gender and family income at the start of the study were initially included as covariates in all analyses. We also examined possible moderating effects of these demographic factors on each of the relationships examined in the primary analyses by creating interaction terms from the product of the centered main-effect variables (see Tables S1 and S2 in Appendix S1). No main or moderating effects of gender or income on any of the primary relations observed were found. As no significant relationships were found between gender or income and the outcome variables, they were not examined further.

Hypothesis 1: Greater friendship intensity will predict relative increases in depressive symptoms, but only for teens that had greater baseline symptomatology.

To address the hypothesis that that adolescents experiencing more depressive symptoms at

TABLE 1
Raw Means, Standard Deviations, and Range for All Variables

Variable	M	SD	Range
Aggressive symptoms score (Age 16)	4.25	3.14	0–16
Aggressive symptoms score (Age 17)	4.34	2.92	0–14
Close-peer engagement score (Age 16)	2.49	0.63	0–4
Depressive symptoms score (Age 16)	6.75	6.42	0–33
Depressive symptoms score (Age 17)	1.17	6.10	0–29
Positive autonomous-relatedness score (Age 16)	2.44	0.47	0–3.75
Total familial income (Age 13)	6.10 (43,600)	1.96 (22,400)	1–8

baseline would experience greater relative increases in those symptoms if they were in more (as opposed to less) intense friendships, we examined interaction styles in friendships (autonomous-relatedness and engagement) as moderators of the link between depressive symptoms at 16 and relative change in symptoms from age 16 (see Table 2). In support of this hypothesis, observed autonomous-relatedness in a revealed differences task interacted with baseline levels of symptoms to predict relative changes in depressive symptoms over time (i.e., future levels of symptoms after accounting for baseline levels in regressions; $\beta = .22, p = .001$). Baseline symptom levels predicted greater relative increases in depressive symptoms for teens that displayed higher levels of autonomous-relatedness (see Figure 1).

Observed close peer’s engagement in an advice-seeking task interacted with baseline levels of symptoms to predict relative changes in depressive symptoms over time ($\beta = .16, p = .016$). Baseline symptom levels predicted greater relative symptom increases for teens with more engaged best friends (see Figure 2).

Hypothesis 2: Greater friendship intensity will predict relative increases in aggressive symptoms, but only for teens that had greater baseline symptomatology.

To address the hypothesis that adolescents experiencing more aggressive symptoms at baseline would experience greater relative increases in those symptoms if they were in more (as opposed to less) intense friendships, we examined interaction styles in friendships (autonomous-relatedness and engagement) as moderators of the link between aggressive symptoms at 16 and relative change in symptoms from age 16 (see Table 3). In support of this hypothesis, autonomous-relatedness in an observed task interacted with baseline levels of symptoms to predict relative changes in aggressive symptoms over time ($\beta = .20, p = .005$). Baseline symptom levels predicted greater relative increases in aggressive symptoms for teens who displayed higher levels of autonomous-relatedness (see Figure 3).

As hypothesize, observed close peer engagement in an advice-seeking task interacted with baseline levels of symptoms to predict relative changes in aggressive symptoms over time, with borderline statistical significance ($\beta = .14, p = .05$). Baseline levels of symptoms were more strongly predictive of future relative increases in symptoms for teens

TABLE 2
Predicting Age 17 Depressive Symptoms From Friendship Intensity

Step and Predictor	Autonomous-relatedness with best friend (Age 16)				Close friend engagement (Age 16)			
	β [95% CI]	ΔR^2	Total R^2 (Adj. R^2)	R^2	β [95% CI]	ΔR^2	Total R^2 (Adj. R^2)	R^2
Step I: Depressive symptoms (Age 16)	.69*** [.58-.78]	.37***	.37***		.61*** [.51 to .70]	.37***	.37***	.37***
Step II: Friendship intensity (Age 16)	.17** [.05-.30]	.03**	.40** (.39)		-.05 [-.18 to .07]	.00	.37 (.36)	
Step III: Baseline depressive symptoms \times Friendship intensity interaction (Age 16)	.22** [.10-.35]	.04**	.45** (.44)		.16* [.04 to .29]	.29*	.40* (.39)	

Note. Betas are from final model.
* $p < .05$; ** $p \leq .01$; *** $p < .001$.

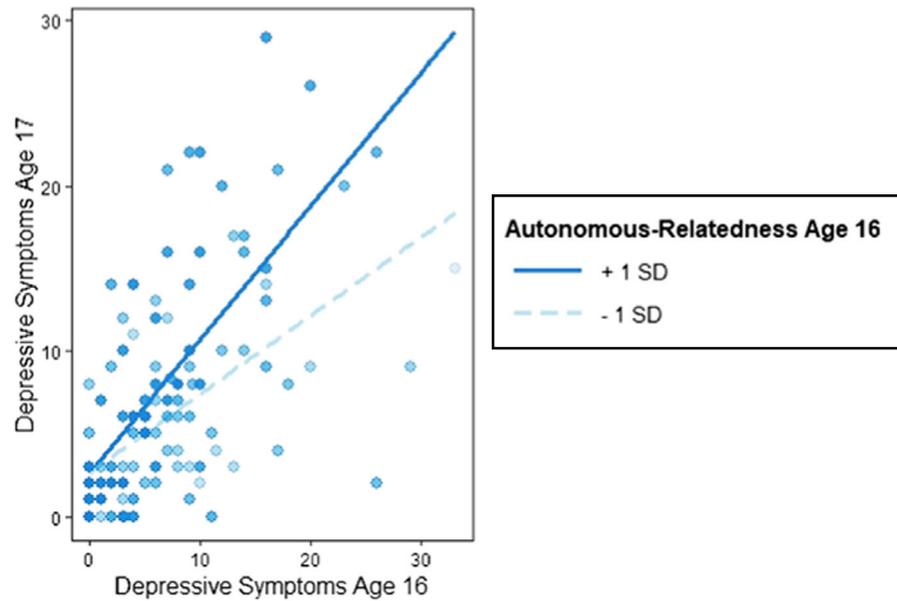


FIGURE 1 Predicting age 17 depressive symptoms from age 16 depressive symptoms and observed autonomous-relatedness.

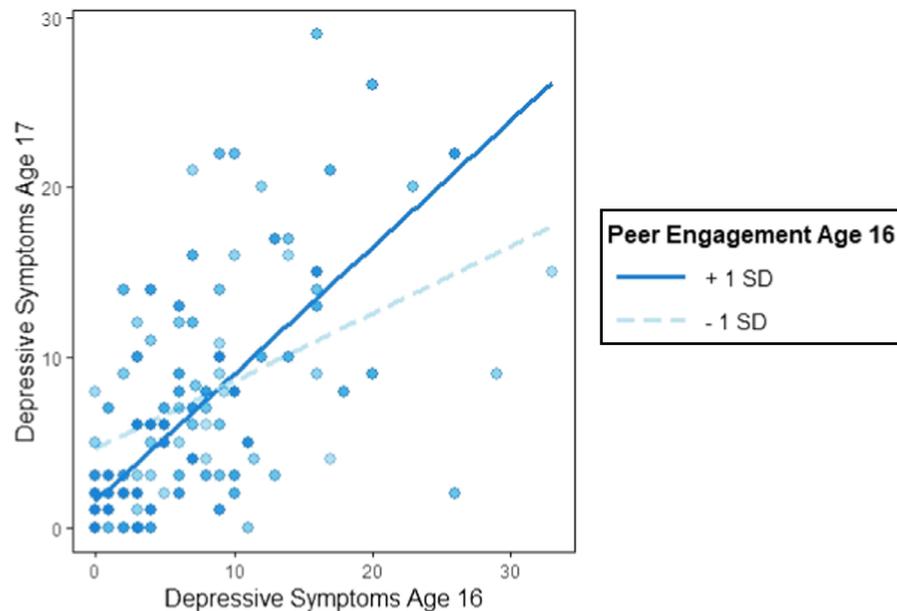


FIGURE 2 Predicting age 17 depressive symptoms from age 16 depressive symptoms and observed close peer engagement.

in friendships observed to display relatively higher levels of close friend engagement (see Figure 4).

Post hoc Tests

Although, we expected that target teen autonomous-relatedness and best friend engagement would be key explanatory mechanisms, we also considered the possibility that we may see similar patterns when analyzing the target teen's

engagement and the best friend's autonomous-relatedness as predictors (i.e., switching which member of the dyad was the focus of observations). Parallel tests to those described above were conducted to address these questions.

Analyses revealed that the close peer's autonomous-relatedness moderated change in the target teen's depressive symptoms ($\beta = .22, p < .001$) and aggressive symptoms ($\beta = .30, p < .001$) in the subsequent year (see Table 4). These relationships

TABLE 3
Predicting Age 17 Aggressive Symptoms from Friendship Intensity

Step and Predictor	Autonomous-relatedness with best friend (Age 16)			Close friend engagement (Age 16)		
	β [95% CI]	ΔR^2	Total R ² (Adj. R ²)	β [95% CI]	ΔR^2	Total R ² (Adj. R ²)
Step I: Aggressive symptoms (Age 16)	.59*** [.44 to .70]	.27***	.27***	.55*** [.40 to .63]	.27***	.27***
Step II: Friendship intensity (Age 16)	.07 [-.06 to .22]	.01	.28 (.27)	.016 [-.14 to .14]	.00	.27 (.26)
Step III: Baseline aggressive symptoms \times Friendship intensity interaction (Age 16)	.20** [.08 to .36]	.05**	.33** (.32)	.14* [.00 to .28]	.03*	.30* (.29)

Note. Betas are from final model.
* $p \leq .05$; ** $p \leq .01$; *** $p < .001$.

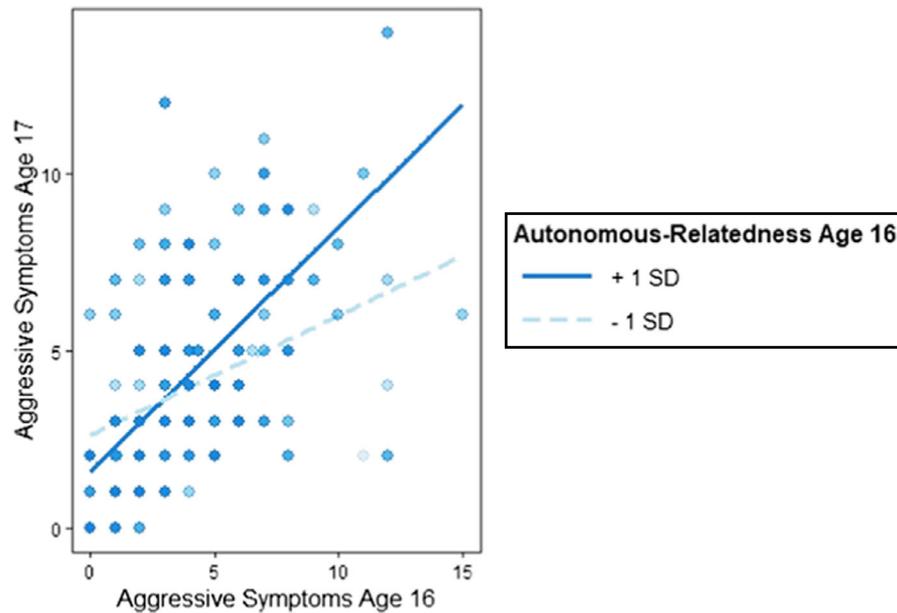


FIGURE 3 Predicting age 17 aggressive symptoms from age 16 aggressive symptoms and observed autonomous-relatedness.

showed identical patterns to those predicted by the teen’s autonomous-relatedness such that higher levels of autonomous-relatedness predicted greater relative *increases* in symptoms for teens who endorsed relatively high levels of symptomatology at baseline. We also analyzed the target teen’s engagement in the discussion as a moderator of changes in their own depressive and aggressive symptoms over the subsequent year, revealing non-significant statistical relationships.

Additionally, we examined the possibility that the observed moderation effects would be not linear, but quadratic in nature. In these analyses, only one quadratic relationship was revealed to be statistically significant: predicting age 17 depressive symptoms from the interaction between age 16 autonomous-relatedness with a close friend and

age 16 depressive symptoms ($\beta = -.48, p < .001$; see Table 5). This finding (depicted in Figure 5) suggests a ceiling effect, in which at very high levels of baseline depressive symptoms, the amplifying effect of friendship intensity ceases to increase.

DISCUSSION

These results suggest the presence of an amplification process in which adolescent close friendship intensity interacts with baseline levels of internalizing and externalizing symptoms to predict relative changes in symptom levels over time. The observed markers of intensity are similar to what one would expect to see in typical conversations among teenage friends, and in particular, in the

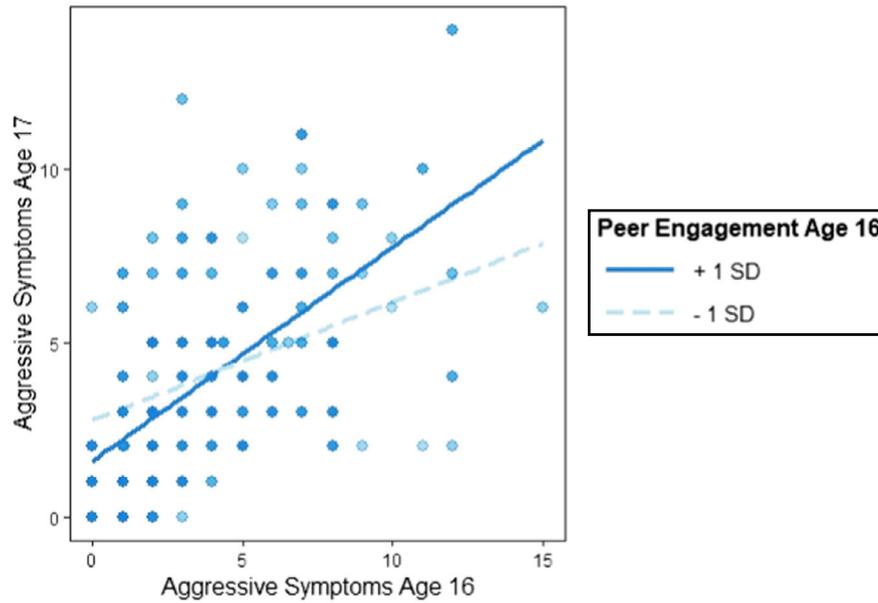


FIGURE 4 Predicting age 17 aggressive symptoms from age 16 aggressive symptoms and observed close peer engagement.

TABLE 4
Post hoc Analysis: Predicting Age 17 Symptomatology From Close Peer's Autonomous Relatedness

Step and Predictor	Predicting age 17 depressive symptoms			Predicting age 17 aggressive symptoms		
	β [95% CI]	ΔR^2	Total R^2 (Adj. R^2)	β [95% CI]	ΔR^2	Total R^2 (Adj. R^2)
Step I: Symptom levels (Age 16)	.65*** [.55-.75]	.37***	.37***	.55*** [.44 to .66]	.27***	.27***
Step II: Peer autonomous-relatedness (Age 16)	.14 [.02-.27]	.01	.38 (.37)	.08 [-.05 to .22]	.00	.27 (.26)
Step III: Baseline symptoms \times Peer AR interaction (Age 16)	.22*** [.09-.34]	.04***	.42*** (.41)	.31*** [.17 to .44]	.10***	.36*** (.35)

Note. Betas are from final model.
*** $p < .001$.

kinds of conversations which lead to co-rumination and deviancy training. As outlined below, we interpret the parallel findings in this study regarding both depressive and aggressive symptoms as suggesting that friendship intensity may be a common underlying factor implicated in otherwise disparate co-rumination and deviancy training processes.

When adolescent close friends interact with one another regularly and with intensity, they appear to reinforce preexisting qualities (e.g., psychological symptoms) via natural conversational practices. Symptom amplification may be particularly likely to occur in close friendships, given the likelihood that friends share similar attitudes and behaviors, and hence are open to supporting these in one another (Bagwell, Newcomb, & Bukowski, 1998; Carlivati & Collins, 2007; Giletta et al., 2012; Hamm, 2000). However, these findings suggest that

friendship intensity predicted changes in adjustment, regardless of whether or not teens shared similar characteristics (as this was not assessed). This study suggests that peer reinforcement processes can work in psychologically adaptive or maladaptive ways, and that the strength of these reinforcement processes may be directly linked to the intensity of the friendship.

Specifically, we see that a teen's autonomous-relatedness behaviors predict relative changes in levels of depression and aggression, contingent on the baseline level of these traits. Observed autonomy (i.e., the ability to freely voice one's thoughts) allows teens to make their values and feelings more evident to close peers, increasing the likelihood that their friends will be drawn into discussions about these values and feelings. Although this behavior has the potential to be adaptive if the

TABLE 5
 Post hoc Analysis: Quadratic Prediction of Age 17 Symptoms From Teen's Autonomous-Relatedness

Step and Predictor	Predicting age 17 depressive symptoms		
	β [95% CI]	ΔR^2	Total R^2 (Adj. R^2)
Step I: Symptom levels (Age 16)	.73*** [.58 to .88]	.36***	.36***
Step II: Teen autonomous-relatedness (Age 16)	.30 [.16 to .44]	.04	.40 (.39)
Step III: Baseline symptoms \times Teen AR interaction	.51*** [.27 to .74]	.05***	.45*** (.44)
Step IV: (Symptom levels) ² (Age 16)	-.20 [-.40 to .00]	-.01	.44 (.43)
Step V: (Symptom levels) ² \times Peer AR interaction	-.49*** [-.76 to -.21]	.05***	.49*** (.48)

Note. Betas are from final model.

* $p < .05$; ** $p \leq .01$; *** $p < .001$.

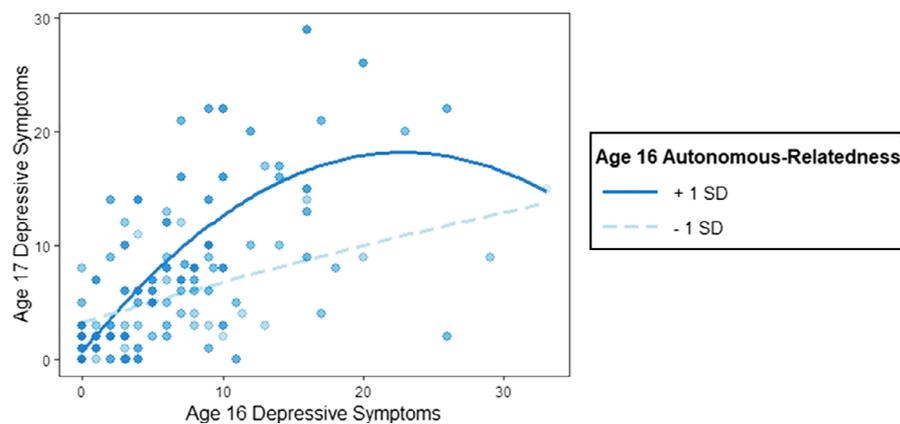


FIGURE 5 Post hoc analysis: quadratic relationship between age 16 depressive symptoms and observed autonomous-relatedness predicting age 17 depressive symptoms.

attitudes and behaviors being discussed (and therefore reinforced) are healthy, it also has the potential to lead to negative outcomes, even within a close, trusting friendship. A quite similar process occurs during co-rumination as friends reciprocally encourage nonproductive problem talk and dwelling about a particular problem (Starr, 2015), as well as during deviancy training, as friends reinforce aggressive or rule-breaking behaviors and values (Dishion, McCord, & Poulin, 1999). Conversely, teens low in autonomy may keep details about their feelings from their friends, impeding social reinforcement of those ideas or values because their opinions are not apparent to their close peers. In addition, having a close friend who exhibits higher levels of autonomy also interacted with baseline symptoms to predict relative increases in these symptoms, suggesting that both members of a dyad contribute to the intensity of the interaction and to the amplification process.

Relatedness between friends appeared as another important piece of the relationship. When two friends feel connected and similar to one

another, they are more likely to be influenced by what the other says or believes (Dishion & Tipsord, 2011). This is demonstrated here in that the more connected behaviors a teen displays toward their friend during a disagreement (and vice versa), the more likely that the friendship will be associated with reinforcement of their existing characteristics over time. This is consistent with recent findings that teens more readily engage in co-rumination with a best friend than with a stranger (Calvi, 2015; Raposa, Hammen, & Brennan, 2015).

In addition to target participant engagement, the level of engagement of a close peer in a supporting task also appeared linked to an amplification process. This may be in part because engagement by a friend in a conversation about a teen's problem demonstrates interest and caring to that teen. Highly engaged interactions are observably more intense; engaged teens listen deeply and express caring and investment in joint problem-solving. The nature of these interactions may make teens more likely to internalize the social reinforcement that they receive from a friend in an

interaction. Conversely, when a conversation partner seems disengaged, it becomes easier to dismiss opinions and values of that partner. This could be a primary mechanism by which close peer engagement operates to intensify preexisting psychological traits. Teens may value engaged friends' input more than that of disengaged friends; opening themselves up to mutual reinforcement processes of traits or attitudes. By highly engaging with one another across interactions, more opportunities arise for the reinforcement of partners' behavior. Within each interaction, there is also more chance that the topics and values explored will be reinforced (Oetting & Beauvais, 1987).

These findings also suggest a somewhat different and more modulated perspective on the role of peer influence processes in adolescence. Notably, although for simplicity we discuss effects in terms of exacerbation of existing high levels of symptoms, the largely linear moderating effects observed suggest that the inverse condition may also apply: intense friendships may be *protective* for those who begin at relatively low levels of symptoms and higher levels of functioning. This is important given that close peer relationships—and the influences they bring—are unavoidable, as these relationships are likely to ultimately serve primary attachment roles as adolescents move into adulthood (Allen & Tan, 2016; Doherty & Feeney, 2004). Having a fuller understanding of the conditions under which their influence is the strongest, and most likely to be positive vs. negative, is critical as we consider interventions to alter such relationships. If close friendships are seen primarily as amplifying preexisting tendencies (rather than serving as external drivers of maladaptation), this in turn suggests a more benign view of adolescent friendships' role in adaptation. Given growing evidence of the importance of close friendship quality in long-term adaptation (Narr et al., 2019), these results suggest value in supporting the naturally growing close friendship intensity in adolescence, while working to guide those adolescents most at-risk of maladaptation.

Several limitations to these findings should be noted. First, although these analyses of predictors of relative change can potentially disconfirm causal hypotheses, they are not sufficient to establish the presence of causal pathways. Additionally, the moderating effect in the outcomes tested accounted for a modest amount of variance (β 's = .14–.22). External, unmeasured factors in adolescents' lives could, for example, potentially help further explain changes in symptom levels

and close friendship dynamics. In addition, given the subclinical nature of the symptoms displayed by most of our sample, these findings may not generalize to adolescents with more serious psychopathology. We were also unable to investigate the relationship between friendship intensity and the behavioral symptomatology of the close peer (or the reverse: the relationship between the peer's symptomatology and the friendship intensity), as we do not have data on aggressive or depressive symptomatology on the best friend that participated. This study also did not include measures explicitly designed to measure the co-rumination and deviancy training processes. Although we believe that the social interaction attributes studied here are likely pertinent to those constructs, future work should more directly measure *both* co-rumination/deviancy training and the social components of peer amplification processes between adolescent peer groups more broadly. It would be valuable to further connect these theories of social interaction and explore the mechanisms by which friendships intensify psychological features of adolescents in both positive and negative ways.

REFERENCES

- Achenbach, T. M., & Edelbrock, C. S. (1979). The child behavior profile: II. Boys aged 13–16 and girls aged 6–11 and 12–16. *Journal of Consultation and Clinical Psychology, 47*(2), 223–233. <https://doi.org/10.1037/0022-006X.47.2.223>
- Achenbach, T. M., & Edelbrock, C. S. (1981). Behavioral Problems and Competencies Reported by Parents of Normal and Disturbed Children Aged Four Through Sixteen. *Monographs of the Society for Research in Child Development, 46*(1), 1–82.
- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist*. Burlington, VT: University of Vermont, Department of Psychiatry.
- Arbuckle, J. L. (1996). Full information estimation in the presence of incomplete data. In G. A. Marcoulides, & R. E. Schumacker (Eds.), *Advanced structural equation modeling: Issues and Techniques* (pp. 243–277). Mahwah, NJ: Lawrence Erlbaum Associates.
- Allen, J. P., Hall, F. D., Insabella, G. M., Land, D. J., Marsh, P. A., & Porter, M. R. (2001). *Supportive Behavior Task Coding manual*. Charlottesville, VA: University of Virginia.
- Allen, J. P., Marsh, P., McFarland, C., McElhaney, K. B., Land, D. J., Jodl, K. M., & Peck, S. (2002). Attachment and autonomy as predictors of the development of social skills and delinquency during midadolescence. *Journal of Consulting and Clinical Psychology, 70*(1), 56–66. <https://doi.org/10.1037/0022-006X.70.1.56>

- Allen, J. P., Chango, J., Szwedlo, D., Schad, M., & Marston, E. (2012). Predictors of Susceptibility to Peer Influence Regarding Substance Use in Adolescence. *Child Development, 83*(1), 337–350. <https://doi.org/10.1111/j.1467-8624.2011.01682.x>.
- Allen, J. P., & Tan, J. S. (2016). The multiple facets of attachment in adolescence. In J. Cassidy, & P. Shaver (Eds.), *Handbook of attachment* (3rd ed., pp. 399–415). New York, NY: Guilford.
- Bagwell, C. L., Newcomb, A. F., & Bukowski, W. M. (1998). Preadolescent friendship and peer rejection as predictors of adult adjustment. *Child Development, 69*, 140–153. <https://doi.org/10.1111/j.1467-8624.1998.tb06139.x>
- Bohrnstedt, G., & Carter, T. (1971). Robustness in regression analysis. *Sociological Methodology, 3*, 118–146. <https://doi.org/10.2307/270820>
- Byrd-Craven, J., Geary, D. C., Rose, A. J., & Ponzi, D. (2008). Co-ruminating increases stress hormone levels in women. *Hormones and Behavior, 53*(3), 489–492. <https://doi.org/10.1016/j.yhbeh.2007.12.002>
- Calvi, J. L. (2015). Male coalitional behaviors: An evolutionary framework for male friendships. ProQuest Information & Learning. 76 (2-), No Pagination Specified. Retrieved from RIS Format UTF-8 database.
- Carlivati, J., & Collins, W. A. (2007). Adolescent attachment representations and development in a risk sample. *New Directions for Child and Adolescent Development, 117*, 91–106. [https://doi.org/10.1002/\(ISSN\)1534-8687](https://doi.org/10.1002/(ISSN)1534-8687)
- Cortese, S. (2014). Here/In this issue and there/Abstract thinking: Depression in youths: From LMIC to rTMS. *Journal of the American Academy of Child & Adolescent Psychiatry, 53*, 823–824. <https://doi.org/10.1016/j.jaac.2014.05.006>
- Dishion, T. J., McCord, J., & Poulin, F. (1999). When interventions harm. Peer groups and problem behavior. *American Psychologist, 54*, 755–764. <https://doi.org/10.1037/0003-066X.54.9.755>
- Dishion, T. J., Nelson, S. E., Winter, C. E., & Bullock, B. M. (2004). Adolescent friendship as a dynamic system: Entropy and deviance in the etiology and course of male antisocial behavior. *Journal of Abnormal Child Psychology, 32*, 651–663. <https://doi.org/10.1023/B:JACP.0000047213.31812.21>
- Dishion, T. J., Spracklen, K. M., Andrews, D. W., & Patterson, G. R. (1996). Deviancy training in male adolescent friendships. *Behavior Therapy, 27*(3), 373–390. [https://doi.org/10.1016/S0005-7894\(96\)80023-2](https://doi.org/10.1016/S0005-7894(96)80023-2)
- Dishion, T. J., & Tipsord, J. M. (2011). Peer contagion in child and adolescent social and emotional development. *Annual Review of Psychology, 62*, 189–214. <https://doi.org/10.1146/annurev.psych.093008.100412>
- Doherty, N. A., & Feeney, J. A. (2004). The composition of attachment networks throughout the adult years. *Personal Relationships, 11*, 469–488. <https://doi.org/10.1111/j.1475-6811.2004.00093.x>
- Fergusson, D. M., Horwood, J., Ridder, E. M., & Beauvais, A. L. (2005). Subthreshold depression in adolescence and mental health outcomes in adulthood. *Archives of General Psychiatry, 62*(1), 66–72. <https://doi.org/10.1001/archpsyc.62.1.66>
- Giletta, M., Scholte, R. H. J., Burk, W. J., Engels, R. C. M. E., Larsen, J. K., Prinstein, M. J., & Ciairano, S. (2011). Similarity in depressive symptoms in adolescents' friendship dyads: Selection or socialization? *Developmental Psychology, 47*, 1804–1814. <https://doi.org/10.1037/a0023872>
- Giletta, M., Sholte, R. J. H., Prinstein, M. H., Rutger, C. M. E., Engels, E. R., & Burk, W. J. (2012). Friendship context matters: Examining the domain specificity of alcohol and depression socialization among adolescents. *Journal of Abnormal Child Psychology, 40*, 1027–1043. <https://doi.org/10.1007/s10802-012-9625-8>
- Hamm, Jill. V. (2000). Do birds of a feather flock together? The variable bases for African American, Asian American, and European American adolescents' selection of similar friends *Developmental Psychology, 36* (2), 209–219. <https://doi.org/10.1037/0012-1649.36.2.209>
- Kazdin, A. E. (1990). Childhood depression. *Journal of Child Psychology & Psychiatry & Allied Disciplines, 31*(1), 121–160. <https://doi.org/10.1111/j.1469-7610.1990.tb02276.x>
- Kossinets, G., & Watts, D. J. (2009). Origins of homophily in an evolving social network. *American Journal of Sociology, 115*(2), 405–450. <https://doi.org/10.1086/599247>
- Kovacs, M., & Beck, A. T. (1977). An empirical clinical approach toward a definition of childhood depression. In J. G. Schulterbrandt, & A. Raskin (Eds.), *Depression in children: Diagnosis, treatment and conceptual models* (pp. 1–25). New York, NY: Raven Press.
- La Greca, A. M., & Harrison, H. M. (2005). Adolescent peer relations, friendships, and romantic relationships: Do they predict social anxiety and depression? *Journal of Clinical Child and Adolescent Psychology, 34*(1), 49–61. https://doi.org/10.1207/s15374424jccp3401_5
- Ledgerwood, A., & Chaiken, S. (2007). Priming us and them: Automatic assimilation and contrast in group attitudes. *Journal of Personality and Social Psychology, 93*, 940–956. <https://doi.org/10.1037/0022-3514.93.6.940>
- McElhaney, K. B., Atonishak, J., & Allen, J. P. (2008). “They like me, they like me not”: Popularity and adolescents' perceptions of acceptance predicting social functioning over time. *Child Development, 79*(3), 720–731. <https://doi.org/10.1111/j.1467-8624.2008.01153.x>
- Molm, L. D., Collett, J. L., & Schaefer, D. R. (2007). Building solidarity through generalized exchange: A theory of reciprocity. *American Journal of Sociology, 113*, 205–242. <https://doi.org/10.1086/517900>
- Mordock, J. B. (1997). Skepticism, data, risky shift, polarization, and attitude change: Their role in implementing innovations. *The Psychologist-Manager Journal, 1*(1), 41–46. <https://doi.org/10.1037/h0095825>
- Narr, R. K., Allen, J. P., Tan, J. S., & Loeb, E. L. (2019). Close friendship strength and broader peer group desirability as differential predictors of adult mental

- health. *Child Development*, 90(1), 298–313. <https://doi.org/10.1111/cdev.12905>
- Natsuaki, M. N., Ge, X., Reiss, D., & Neiderhiser, J. M. (2009). Aggressive behavior between siblings and the development of externalizing problems: Evidence from a genetically sensitive study. *Developmental Psychology*, 45(4), 1009–1018. <https://doi.org/10.1037/a0015698>
- Oetting, E. R., & Beauvais, F. (1987). Peer cluster theory, socialization characteristics, and adolescent drug use: A path analysis. *Journal of Counseling Psychology*, 34(2), 205–213. <https://doi.org/10.1037/0022-0167.34.2.205>
- Piehler, T. F., & Dishion, T. J. (2007). Interpersonal dynamics within adolescent friendships: Dyadic mutuality, deviant talk, and patterns of antisocial behavior. *Child Development*, 78(5), 1611–1624. <https://doi.org/10.1111/j.1467-8624.2007.01086.x>
- Raposa, E. B., Hammen, C. L., & Brennan, P. A. (2015). Close friends' psychopathology as a pathway from early adversity to young adulthood depressive symptoms. *Journal of Clinical Child and Adolescent Psychology*, 44(5), 742–750. <https://doi.org/10.1080/15374416.2014.910788>
- Rose, A. J. (2002). Co-rumination in the friendship of girls and boys. *Child Development*, 73, 1830–1843. <https://doi.org/10.1111/1467-8624.00509>
- Rose, A. J., Schwartz-Mette, R., Glick, G. C., Smith, R. L., & Luebke, A. M. (2014). An observational study of co-rumination in adolescent friendships. *Developmental Psychology*, 50, 2199–2209. <https://doi.org/10.1037/a0037465>
- Starr, L. R. (2015). When support seeking backfires: Co-rumination, excessive reassurance seeking, and depressed mood in the daily lives of young adults. *Journal of Social and Clinical Psychology*, 34(5), 436–457. <https://doi.org/10.1521/jscp.2015.34.5.436>
- US Census Bureau (1999). Money income in the United States: Current population reports. *Consumer Income*, 0–206.
- Veenstra, R., Dijkstra, J. K., Steglich, C., & Van Zalk, M. H. (2013). Network-behavior dynamics. *Journal of Research on Adolescence*, 23(3), 399–412. <https://doi.org/10.1111/jora.12070>
- Weisbuch, M., Ivcevic, Z., & Ambady, N. (2009). On being liked on the web and in the “real world”: Consistency in first impressions across personal webpages and spontaneous behavior. *Journal of Experimental Social Psychology*, 45(3), 573–576. <https://doi.org/10.1016/j.jesp.2008.12.009>

Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Table S1. Predicting relative change in depressive symptoms from dimensions of friendship intensity.
Table S2. Predicting relative change in aggressive symptoms from dimensions of friendship intensity.