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Regular Article

Beyond delinquency and drug use: Links of peer pressure to long-term adolescent psychosocial development

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Abstract

This study examined the predictors and sequelae of exposure to peer pressure from close friends in adolescence. Adolescents (99 female; 85 male) were followed from age 13 to 24 utilizing peer, parent, and romantic partner reports and observational data. Participants who were exposed to high levels of peer pressure as teens were more likely to experience higher levels of coercive behavior from romantic partners (as reported by those partners), as well as lower levels of parent-reported functional independence. All findings held even after accounting for baseline levels of teen assertiveness. Adolescents at risk for increasing exposure to peer pressure were characterized by poor-quality parent and peer relationships, as well as baseline deficits in ability to assert autonomy. Results suggest that exposure to peer pressure, aside from its potential effects on deviant or risky behavior, may reflect a powerful threat to the autonomy development process as adolescents transition from parents to peers as primary sources of support and interaction.

Keywords: Adolescence; autonomy; coercion; peer pressure; romantic relationships

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Introduction

Learning to establish autonomy while maintaining close relationships is well-recognized as a core social-developmental task of adolescence (Steinberg, 2019). Although most research regarding autonomy development has focused on parent–teen interactions (Allen et al., 1994; Kobak & Cole, 1994; Smetana & Gettman, 2006), adolescents' relationships with their peers provide an equally compelling context in which the challenge of establishing autonomy and maintaining relationships plays out. Peer pressure, defined as a peer's active efforts to alter a teen's behavior, creates an inherent threat to a teen's developing autonomy. Whether or not such pressure is effective, it reflects a peer's attempt to substitute their judgment for that of the targeted teen. Given the growing centrality of peer relationships as a context of social development in adolescence, such a threat to autonomy is likely to be highly salient; indeed, adolescents have long reported peer pressure to be the single greatest source of stress in their daily lives (Brown, 1982; Gao et al., 2021).

Peer pressure is conceptually distinct from the more oft-studied construct of peer *influence*. Peer influence reflects the degree to which *exposure* to peers' behavior alters teens' behaviors but need not involve any pressure at all. Peer influence *may* occur as a result of pressure but appears far more likely to occur simply as a result of social learning – teens choosing to follow or imitate the behavior of peers whom they admire or whose approval they would like to gain (Field & Prinstein, 2023). Similarly, teens may be susceptible to peer influence (i.e., easily influenced), whether or not they are actually pressured by peers.

Sequelae of exposure to peer pressure

Although the possible long-term effects of controlling (i.e., autonomy-impinging) behaviors on autonomy development have been well documented with respect to parental pressures (Kins et al., 2012; Loeb, Kansky, et al., 2021), they have received relatively little attention with regard to peer pressure. Yet, there are several reasons to expect such effects to be substantial. Repeated exposure to pressuring behavior in a close friendship is likely to lead a teen to see such behavior as normal and expected in social relationships. Attachment theory suggests that individuals will both recreate behavioral scripts in new relationships and alter their behaviors in expectation of the behavior of others (Fraley & Davis, 1997).

In the near term, as teens come to expect that assertions of their autonomy will be met by pressure from their friends, they may respond by being less likely to display such autonomy when they disagree with the pressuring friend. In the longer term, repeated exposure to peer pressure from close friends in late adolescence makes it more likely that teens will enter and remain in future romantic relationships in which their autonomy is undermined, having come to experience this condition as normal. The lack of demonstrated autonomy in close peer relationships, particularly in late adolescence, has been repeatedly linked to similar deficits in later romantic relationships (Allen, Narr, et al., 2020; Oudekerk et al., 2015). This connection appears part of a broader pattern of linkage between late adolescent peer relationship qualities and later qualities of adult romantic interactions (Roisman et al., 2004;

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Simpson et al., 2011). Similarly, adult romantic partner coercion has been previously associated with deviancy training in adolescent friendships (Ha et al., 2019) and identified as a potent risk factor for intimate partner violence, as well as overall relationship dissatisfaction (Capaldi et al., 2012).

More broadly, the experience of having close friends who repeatedly seek to direct one's behavior is anathema to the type of agentic and self-determining behavior necessary for adaptive adult functioning. Key social relationships have long been recognized to play a critical role in determining an individual's self-concept (see, e.g., Rosenberg, 2017). At least one study, albeit based entirely on self-reports, has found that exposure to peer pressure is linked to lower self-efficacy (Kiran-Esen, 2012). In the family context, exposure to overly controlling and autonomy-inhibiting behavior by parents in adolescence has been linked to a range of difficulties with emotional and behavioral functioning in adulthood in domains ranging from daily functioning to career and occupational success (Kins et al., 2012; Luyckx et al., 2007; Manzeske & Stright, 2009). The premise that similar downstream sequelae may be observed following extended exposure to autonomy-undermining behavior from a peer in late adolescence has never been examined, however.

Predictors of exposure to pressuring behavior

Considering the range of potential sequelae of peer pressure, a key question then becomes which teens, with which characteristics, are most likely to experience it? Unlike autonomy threats from parents, being pressured by peers is unique in that it reflects at least some willingness to tolerate or even encourage such behavior by those with whom one chooses to associate. As with the potential sequelae of pressure, it makes sense to also view exposure to peer pressure as linked to teens' progress in establishing autonomy and relatedness in key relationships.

Both facets of this developmental task – establishing autonomy *and* relatedness – are likely to be important. Teens lacking autonomy, and being unable or unwilling to assert themselves with peers, send an implicit message to those peers that efforts to alter the teen's behavior are unlikely to receive significant pushback. Adolescents who lack fundamental assertiveness skills may even be more comfortable in relationships where their friends take the lead. Although this possibility has never been directly tested, studies that assess peer *influence*, as opposed to pressure, provide some support for this proposition: The notion that some teens are particularly easily influenced by their peers is now well-established (Choukas-Bradley et al., 2014; Prinstein et al., 2011; Teunissen et al., 2016). Further, cross-lagged longitudinal studies have found that teens who display low levels of autonomy and assertive traits are most likely to be influenced (Allen et al., 2006, 2012). Although this evidence is only indirect, it is consistent with the idea that less assertive adolescents may be more vulnerable to further impingements on their autonomy via peer pressure.

Adolescents may also be willing to tolerate a peer's pressuring behavior for fear of undermining key relationships if they do not, especially if other social connections appear tenuous. Scholars have long noted the precarious relationship status of adolescents, who are seeking to rely less upon parental relationships while not yet having established strong, long-term relationships outside the family (Brown et al., 1986; Steinberg & Monahan, 2007). Given the critical importance of peer relationships at this stage of development, an adolescent appears more likely to tolerate pressuring behavior from a peer to the extent that the adolescent does not feel confident that they have other strong relationships on which they can rely. When parent–teen relationship quality is poor, for example, this is likely to increase the teen's dependence upon peers as sources of social interaction and potential support as they seek to compensate for the lack of support in the parental relationship (Bailey et al., 2024; Collins & Steinberg, 2008). Although teens are in the process of beginning to transition their primary bonds and sources of social interaction from parents to peers, parents remain important sources of support (Rosenthal & Kobak, 2010). To the extent an adolescent feels particularly dependent upon peer relationships for support that is lacking from parents, they are likely to be less comfortable pushing back or moving away from a pressuring peer.

Similarly, adolescents who are less accepted as companions in their broader peer group and have fewer peers interested in spending time with them are also more likely to feel dependent on those friends they do have. This dependence, in turn, is likely to make them more willing to tolerate a friend's pressuring behavior, lest the teen lose a remaining source of potentially scarce social interaction and companionship. This latter notion is consistent with research on adolescent deviance, which finds that teens who fare poorly with 'normal' peers are more likely to end up rejected by those peers and instead associate with peers who behave coercively toward them (Dishion et al., 2004; Snyder et al., 2008).

To date, the potential effects of problematic social relationships on the likelihood of exposure to peer pressure have received scant empirical consideration. Although there was a burst of research on peer pressure in the 1980s and early 1990s, this research focused primarily on whether peer pressure was a driver of risky and deviant adolescent behavior (Brown, 1982; Hansen & Graham, 1991; McGloin & Thomas, 2019). Even this early research focused almost exclusively on whether pressure, as reported by a teen or in hypothetical scenarios, succeeded in influencing the teen's immediate behavior or attitudes, as opposed to its potential impact on longer-term autonomy development. More recent research has largely focused on examining which teens are more likely to be influenced by peers (Allen, Loeb et al., 2020; Gommans et al., 2017; Müller et al., 2017), but this research has also not typically examined which teens are more likely to be *pressured* by their peers.

Although the bulk of extant peer pressure research has been in regard to deviant behavior, the range of domains about which adolescents may be pressured extends well beyond deviancy. Interpersonal choices such as the selection of friends, of which clubs to join, and of how to spend time are all areas where peers are viewed as having significant expertise (Smetana, 2017). Teens may at times even encourage their peers *not* to engage in antisocial behaviors of which they do not approve (e.g., fighting and aggressive teasing). These pressures may not encourage deviance, but they may nevertheless create significant stress for teens and impinge on their autonomy, just as seemingly well-meaning but controlling parenting behaviors pushing teens to behave better can do (Oudekerk et al., 2015). Although these forms of nondeviant pressure may be more mundane, they may also be more common. Yet, relatively little research has addressed the potential effects of peer pressure outside of the sphere of deviant behavior.

The present study

This study utilized a measure of peer pressure that extended beyond deviant behavior to examine the precursors and long-term sequelae of exposure to pressuring behavior by close friends in adolescence. Given the degree to which acknowledging that one is

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being pressured by peers is known to be socially undesirable (Brown et al., 1986) and thus likely to be underreported, this study utilized close friends' reports of the degree of effort they made to influence a participant's behavior across a range of social, familial, and behavioral domains. In addition, given that qualities of peer interactions can vary substantially over time, particularly as one's friends change, this study utilized friend reports obtained repeatedly across multiple years and aggregated to gain a portrait of the adolescent's overall experience of pressure from multiple peers. The study used a prospective, multimethod approach within a demographically diverse community sample assessed repeatedly from age 13 to 24. Although the relative lack of prior research in this area renders this study as exploratory, four overarching hypotheses were assessed regarding the precursors and long-term sequelae of exposure to adolescent peer pressure:

Hypothesis 1. Experiences of pressure from close friends in late adolescence will be concurrently associated with an adolescent's failure to assert their autonomy in disagreements with those friends.

Hypothesis 2. Experiences of pressure from close friends in late adolescence will predict an increased likelihood of exposure to coercive behavior from future romantic partners and lower levels of functional independence in early adulthood, even after accounting for baseline levels of adolescent autonomy assertion.

Hypothesis 3. Adolescent experiences of relative increases in peer pressure over time will be predicted by teens' inability to assert autonomy when disagreeing with a close friend early in adolescence, by a poor-quality mother–adolescent relationship, and by a relative lack of standing as a desired companion in the broader peer group.

Hypothesis 4. Each of these predictors will contribute uniquely to understanding relative increases in peer pressure over time.

Method

Participants

This report is drawn from a larger longitudinal investigation of adolescent social development in familial and peer contexts. Original participants included 184 seventh and eighth graders (85 identified as male and 99 as female) followed over a 10-year period from ages 13 to 24, along with collateral data collected from mothers, close friends, and romantic partners of these adolescents. The sample was racially/ethnically and socioeconomically diverse: 107 adolescents (58%) identified as White, 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 annual family income in the $40,000–$59,999 range at the initial assessment, in line with the national median annual family income in the United States at that time of $42,000. Adolescents were living with both biological parents in 51% of households.

Adolescents were initially recruited from the 7th and 8th grades of a public middle school drawing from suburban and urban populations in the Southeastern United States. Students and their peers were recruited via an initial mailing to all parents of students in the school along with follow-up contact efforts at school lunches. Families of adolescents who indicated they were interested in the study were contacted by telephone. If a student was identified as a close peer of a participant and agreed to participate in that capacity, they were no longer eligible to participate as primary participants, to reduce redundancies in the data. Of all students eligible for participation, 63% agreed to participate as either target participants or as peers providing extensive collateral information in a 3-hr session. Given that both roles involved substantial time commitments and that accepting one role precluded accepting the other role, the 63% figure is considered a reasonable estimate of the overall participation rate. All participants provided informed assent/consent (depending upon whether they were an adolescent or an adult) before each interview session, and parents provided informed consent for adolescents. Initial interviews took place in private offices within a university academic building. Follow-up assessments were conducted in the same setting or, for participants living at a distance, either in local settings (e.g., hotel conference rooms), via mail or virtually.

Participants were first assessed annually over a 5-year period across adolescence from ages 13 to 17 (mean age at first assessment = 13.35, $SD = .64$; mean age at last assessment = 17.32, $SD = .88$). Each year in adolescence, participants also nominated the person they currently identified as "the peer to whom they were closest" *at that particular assessment* to be included in the study.

Close friends within adolescence were specified to be same-gender friends, but the same friend need not be specified across different waves. Close friends came in during a visit along with the target participant during adolescence. Friends were close in age to participants (i.e., their average age differed by less than a month from the target adolescents' ages). Close friends in adolescence reported that they had known participants for an average of 4.3–5.7 years ($SD = 3.1$ to 3.8) across the adolescent assessment periods.

Data were also obtained from the adolescents' parents (at participant mean ages 13.35 ($SD = .64$) and 22.80 ($SD = .96$)).

Romantic partner observations were obtained for participants who were in a relationship for at least 3 months' duration and for which the romantic partner was willing to come into our offices for an observational assessment. Romantic relationship assessments were obtained whenever a participant was in such a relationship and willing to participate during three, 3-year windows. The result was that assessments were obtained at participant ages 18.30 ($SD = 1.27$), 20.97 ($SD = 1.08$), and 23.8 ($SD = 1.12$). At each age, one participant was in a romantic relationship with a same-gender partner; the remainder of the relationships was heterosexual.

Attrition analyses

Parent-report data at age 23 was obtained from at least one parent for 81% of the original sample ($N = 150$; 150 mothers; 79 fathers). Romantic partner reports were obtained across ages 18–24 for at least one romantic partner from 74% of the original sample ($N = 140$; 81 at ages 18–20, 120 at ages 20–22, and 102 at ages 22–24). Attrition analyses examined whether those who did vs. did not have either parent-report data or romantic partner-report data differed in terms of any of the measures assessed at baseline or in terms of demographic characteristics. No differences were found between those who did vs. did not have either parent-report data or romantic partner-report data in these analyses. Further analyses examined whether those with father-report data differed from those without it. The only difference observed was that those without father data reported lower household income in adolescence. Analyses also examined whether those with more vs. fewer romantic partner reports differed on any baseline measures; no differences were found.

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Procedure

In the initial introduction and throughout all sessions, confidentiality was assured to all study participants, and adolescents were told that their parents and friends would not be informed of any of the answers they provided. Participants' data were protected by a Confidentiality Certificate issued by the US Department of Health and Human Services, which protected information from subpoena by federal, state, and local courts. Transportation and childcare were provided if necessary. Adolescent/adult participants, their parents, and their romantic partners and peers were all paid for participation.

Measures

Peer pressure from close friend (friend-rated, ages 13–17). This 17-item peer-report measure was developed for this study to assess the degree to which a close friend exerted effort to alter the participant's behavior in a variety of areas. Peers indicated how much they actively try to influence their friend in domains ranging from social to behavioral to familial, on a 4-point Likert scale, ranging from "*Not at all*" to "*A lot*." Five items addressed pressure toward relatively neutral topics (e.g., dress, choice of friends); five items addressed pressure toward more prosocial activities (e.g., not teasing others); and seven items addressed classic deviance-related items (e.g., smoking, fighting). All items are presented in Supplemental Table 1.

We first examined the psychometric properties of these items. Analyses suggested acceptable distributions for neutral and prosocial items; however, all items regarding peers pressuring adolescents toward deviant behavior had extremely low rates of positive responding (i.e., on average fewer than 10% of peers endorsed any given item, with little discrepancy across waves of the study). We then tried summing all seven of the antisocial items at each wave, but even then, almost two-thirds (64.5%) of close peers endorsed *no* items regarding pressure toward deviant behavior, on average. Given this, these items were not examined further.

The remaining items were examined via confirmatory factor analyses to assess whether the a priori division into neutral and prosocial items was held. Separate factor analyses of the items were examined for each wave of the study. Overall, confirmatory analyses supported the two-factor structure, with analyses indicating average Bentler comparative fit index's across years = .95 and average root mean sqaure error of approximation's = .06, consistent with guidelines suggesting a comparative fit index of .90 and a root mean sqaure error of approximation of .08 indicate a reasonable fit (Kline, 2005). However, these analyses also revealed that the resulting two factors were very highly correlated (average $r = .63$). Given this high correlation and the resulting problems with collinearity it would create in the principal analyses, we examined the psychometric feasibility of combining these two sets of items onto a single scale. The combined scale demonstrated high levels of internal consistency, with Cronbach's alpha averaging .82 across waves (range: .79–.84), suggesting it was valid to consider these items as part of a single scale. Consistency of exposure to peer pressure between subsequent assessments was also examined across each 1-year period of the study and averaged $r = .44$ (range from $r = .22$ to $r = .54$, all p's $< .005$), which was considered adequate given that different close peers were reporting their own behaviors at each year, and thus were not necessarily expected to be similar from year to year. This general pressure scale was then used for the study, constructed as the average of scores for the items that loaded on it. To minimize the impact of any single peer on scores for an adolescent, items were aggregated across years as described in the Results section.

Maternal relationship quality (mother-rated, Aae 13). The Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987) was used to assess mothers' perceptions of the quality of their overall attachment to their teens. Relationship quality was calculated as the sum of 14 five-point Likert items capturing communication and trust and seven 5-point items capturing alienation in the relationship (reverse-scored). This measure demonstrated good internal consistency (Cronbach's $\alpha = .91$).

Desirability as a peer companion (sociometric, age 13). Adolescents' capacity to establish themselves as desirable social companions with a range of their peers was assessed using a limited nomination sociometric 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." When these ratings were combined across the entire sample of participants and their peers, a large cohort of peer nominators was thus obtained. 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 15–30 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 instead wrote in the 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 converted to a z-score within grade level (so that differences in number of nominators in different grades would not bias results) 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 yield ratings that are 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, 2007; McElhaney et al., 2008).

Adolescent autonomy with friend (observed, ages 13–17). Adolescents and their named closest friend at each age (not necessarily the same friend) participated in a revealed differences task in which they were presented with a hypothetical dilemma, requiring them to each separately come up with proposed solutions. For example, at one assessment, this involved deciding which 7 out of a possible 12 fictional patients with a rare disease should be selected for a limited amount of antidote, which was based on the sinking-ship dilemma (Pfieffer & Jones, 1974). The content of the dilemmas was modified each year to maintain participant interest. After making their decisions separately, adolescents and their close friends were then brought together to compare their answers (Strodtbeck, 1951). They were then asked to try to come up with a consensus response to the dilemma. These interactions were videotaped and then transcribed.

The Autonomy–Relatedness Coding System for Peer Interactions was used to code these interactions for both adolescent and peer autonomy behaviors (Allen, Porter, & McFarland, 2006). This coding system is an adaptation of the Autonomy and

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Relatedness Coding System (described above; Allen et al., 2020). Consistent with that system, it captures behaviors Displaying Autonomy by assessing an individual's ability to state reasons and exhibit confidence when defending their position. Each interaction was coded as an average of the scores obtained by two trained raters blind to other data from the study. Different coders rated adolescent autonomy scores with different partners at each time point. Intraclass correlations for adolescents' displays of autonomy with a close peer ranged from .73 to .98 across this period.

Functional independence (parent-rated, age 23). Participants were rated by each parent on their degree of functional independence using the 5-item scale from the Young Adult Adjustment Inventory (Capaldi et al., 1992). Items included "Is a responsible adult," "Is able to take care of himself/herself," and "Manages his/her finances well." Internal consistency of the scale was high (Cronbach's α's = .83 and .85 for father and mother ratings, respectively). Parent ratings were averaged to come up with the final score for Functional Independence.

Romantic partner coercive behavior (romantic partner-reported, ages 18, 21, 24). The use of coercive behavior in romantic interactions was reported by the participant's romantic partner using the abuse/coercion scale from the Conflict in Relationships Measure (Wolfe et al., 1994, 1998). This study used the 15-item verbal aggression scale which captured threats, insults, and similarly coercive behaviors during conflicts (Cronbach's α's ranged from .74 to .83).

Results

Preliminary analyses

Means and standard deviations for all substantive variables and intercorrelations among predictor variables are presented in Table 1.

For descriptive purposes, the extent to which participants had the same close peer or romantic partner provide data across assessment waves was also assessed. Participants had the same romantic partner in 22% of cases from the age 18 to the age 21 assessment and in 34% of cases from age 21 to 24. Participants brought in the same peer as their closest peer in a succeeding year on average 42% of the time (ranging from 36% from age 13 to 14 to 44% from age 16 to 17). Consistency of romantic partners was unrelated to any other variable in the study. Average stability of close friendships was linked to lower peer pressure experienced from 14 to 17, lower displays of teen autonomy at age 13, and lower family income. Participant gender and baseline family income were included as covariates in all analyses. We also examined the possible moderating effects of all of these factors on each of the relationships described in the primary analyses below. Moderating effects were assessed by creating interaction terms based on the product of the centered main effect variables. After correcting for the number of analyses examined, no effects beyond what would be expected by chance were detected.

Analyses of primary hypotheses

Analytic plan. For all primary analyses, SAS PROC CALIS (version 9.4, SAS Institute, Cary, NC) was employed using full information maximum likelihood handling of missing data for assessment of key relations in hierarchical regression models. This approach has 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. Participant gender and baseline family income were entered in the first step, followed by primary predictive variables. In cases where significant moderating effects were detected, these were then entered as a final step in analyses. Post hoc power estimates indicate that 80% power would be obtained for standardized estimates equal to or greater than .23.

Hypothesis 1. Experiences of pressure from close friends in late adolescence will be concurrently associated with an adolescent's failure to assert their autonomy in disagreements with those friends.

Analyses first examined concurrent links between pressure from close friends in late adolescence (aggregated pressure scores from ages 16 and 17) and observations of adolescent displays of autonomy during a lab-based disagreement task, aggregated across those ages. As shown in Table 2, after accounting for adolescent gender and income, the experience of peer pressure was found to be significantly concurrently related to adolescents' inability to express their autonomy in a disagreement task with their close friends.

Hypothesis 2. Repeated experiences of pressure from close friends in late adolescence will predict an increased likelihood of exposure to coercive behavior from future romantic partners, and lower levels of functional independence in early adulthood even after accounting for baseline levels of adolescent autonomy.

Analyses next examined predictions to coercive behavior on the part of romantic partners assessed up to three times between ages 18 and 24. After accounting for adolescents' capacity to display autonomy in disagreements with a close friend, peer pressure at ages 16–17 predicted romantic partners' reports of their use of coercive behaviors in the romantic relationship (left-hand columns of Table 3).

Analyses next assessed predictions from peer pressure experienced toward the end of adolescence to functional independence, as assessed by parents at participant age 23. Results indicated that peer pressure predicted lower levels of young adult functional independence, even after accounting for levels of autonomy displayed in adolescence (right-hand columns of Table 3).

Hypothesis 3. Adolescent experience of relative increases in peer pressure over time will be predicted by a poor-quality mother–adolescent relationship, by relative lack of standing as a preferred peer companion in the broader peer group, and by inability to assert autonomy when disagreeing with a close friend.

Models next examined several predictors of relative increases in exposure to peer pressure from age 13 to ages 14–17. Demographic factors were entered first in these models, followed by exposure to peer pressure at age 13. Female adolescent gender was consistently predictive of future levels of peer pressure. After accounting for demographic factors and baseline experience of peer pressure, having a lower-quality mother–adolescent relationship, as rated by adolescents' mothers, predicted a relative increase in exposure to peer pressure (left-hand columns of Table 4). Using the same analytic approach, being less desirable as a peer companion, assessed sociometrically at age 13, also predicted relative increases in exposure to peer pressure (middle columns of Table 4). Finally, using the same approach, adolescents who were observed to be less assertive of their autonomy in a laboratory disagreement task with their closest friend at 13 experienced relative increases in peer pressure over subsequent years, after accounting for baseline levels of exposure to peer pressure at 13 (right-hand columns of Table 4).

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Table 1. Correlations among primary constructs

	Mean	*SD*	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Gender (1 = M, 2 = F)	–	–	−.12	.17*	.29***	.20**	.02	.04	−.10	.14	.10
2. Family income (13)	6.10	1.96	–	−.24***	−.25***	−.19*	−.01	.32***	.23**	.09	−.28***
3. Peer pressure (cf, 13)	2.11	0.59		–	.20**	.17*	−.06	−.09	−.13	.01	.12
4. Peer pressure (cf, 14–17)	1.75	0.41			–	.84***	−.22**	−.23**	−.34***	−.15	.31***
5. Peer pressure (cf, 16–17)	1.69	0.50				–	−.21**	−.21**	−.27***	−.28***	.35***
6. Maternal rel. quality (m, 13)	104.2	10.0					–	.06	.03	.05	−.19*
7. Desirability as peer companion (soc, 13)	0.96	1.35						–	.26***	.23**	−.07
8. Autonomy with friend (obs, 13–17)	2.37	0.92							–	.11	−.15
9. Functional independence (par, 23)	19.37	4.30								–	−.09
10. Reported romantic partner coercive behavior (rp, 18–24)	18.13	3.37									–

Note. Participant age(s) at the time of assessment are in parentheses along with reporter source: cf = close friend report; m = maternal report; soc = sociometric; obs = observed; rp = romantic partner report; par = parents combined report. ***$p < .001$. **$p < .01$. *$p < .05$.

Table 2. Concurrent relation between autonomy struggles and adolescent-era exposure to peer pressure from a close friend

	Observed autonomy displayed with close friend (ages 16–17)		
	β	ΔR^2	R^2
Step I.			
Gender (1 = M; 2 = F)	.04		
Family income	.09		
Statistics for step		.021	.021
Step II.			
Peer pressure (ages 16–17), close friend report	−.30***		
Statistics for step		.084***	.105***

Note. ***$p < .001$. **$p < .01$. *$p < .05$. β weights are from final full model.

Table 3. Predicting adult autonomy difficulties in romantic relationships and functional independence from late adolescent exposure to peer pressure from a close friend

	Romantic partner coercive behavior (ages 18–24) (partner report)			Functional independence (age 23, parent report)		
	β	ΔR^2	R^2	β	ΔR^2	R^2
Step I.						
Gender (1 = M; 2 = F)	.02			.24***		
Family income	−.21**			.07		
Statistics for step		.080**	.080**		.043*	.043*
Step II.						
Observed adolescent autonomy with close friend (ages 13–17)	−.00			−.08		
Statistics for step		.007	.087**		.000	.043
Step III.						
Peer pressure (ages 16–17), close friend report	.25**			−.34***		
Statistics for step		.045**	.132***		.098***	.141***

Note. ***$p < .001$. **$p < .01$. *$p \leq .05$. β weights are from final full model.

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Table 4. Predicting relative increases in exposure to peer pressure from age 13 to ages 14–17

	Peer pressure toward participant (ages 14–17) (close friend reported)								
	Model 1a: Prediction from quality of maternal relationship (age 13)			Model 1b: Prediction from desirability as a peer companion (age 13)			Model 1c: Observed autonomy displayed with close friend (age 13)		
	β	ΔR^2	R^2	β	ΔR^2	R^2	β	ΔR^2	R^2
Step I.									
Gender (1 = M; 2 = F)	.26***			.27***			.24***		
Family income	−.21**			−.13			−.13		
Statistics for step		.130***	.130***		.130***	.130***		.130***	.130***
Step II.									
Peer pressure from friend (age 13) (close friend report)	.09			.10			.10		
Statistics for step		.014	.144***		.014	.144***		.014	.144***
Step III.									
Predictor specified in column heading	−.23***			−.19**			−.26***		
Statistics for step		.053*	.197***		.030**	.174***		.054***	.208***

Note. ***$p < .001$. **$p < .01$. *$p < .05$. β weights are from final full model.

Table 5. Conjoint prediction of increases in exposure to peer pressure from a close friend from age 13 to ages 14–17

	Peer pressure toward participant (ages 14–17) (close friend reported)		
	β	ΔR^2	R^2
Step I.			
Gender (1 = M; 2 = F)	.26**		
Family income	−.11		
Statistics for step		.130***	.130***
Step II.			
Peer pressure from friend (age 13) (close friend report)	.07		
Statistics for step		.014	.144***
Step III.			
Quality of maternal relationship (age 13)	−.22***		
Desirability as a peer companion (age 13)	−.14*		
Observed autonomy displayed with close friend (age 13)	−.23***		
Statistics for step		.132***	.276***

Note. ***$p < .001$. **$p < .01$. *$p < .05$. β weights are from final full model.

Hypothesis 3. Each of these predictors will contribute uniquely to understanding relative increases in peer pressure over time.

When each of the predictors identified above was entered into a model simultaneously to predict relative changes in peer pressure over time, all three predictors uniquely contributed variance to explaining relative increases in levels of peer pressure (see Table 5). Together, these factors accounted for 13% of the variance in peer pressure experienced at ages 14–17 after accounting for demographic factors and baseline experience of peer pressure.

Post hoc analyses

To consider whether predictions to future adult functioning from exposure to peer pressure might also occur from pressure experienced at earlier ages in adolescence, the analytic approach used to test Hypothesis 2 was repeated using exposure to peer pressure from ages 13 to 15 as the predictor. Neither predictions to coercive romantic partner behavior nor to adult functional independence were significant in these analyses, indicating that it was only exposure to peer pressure in late adolescence that was predictive of adult outcomes.

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Discussion

This study found that exposure to peer pressure in adolescence was both predictable from prior markers of autonomy struggles and insecure maternal and peer relationship status and, in turn, predicted future exposure to coercive behavior in romantic relationships and difficulties with independent functioning as an adult. As such, this study extends the long line of existing research on autonomy processes in parent-adolescent interactions (Allen et al., 1994; Kobak & Cole, 1994; Smetana & Gettman, 2006) by now identifying ways in which pressure from close peers is also integrally linked to the autonomy development process in adolescence. Each of these findings is discussed in detail below followed by consideration of their implications and limitations.

The experience of pressure from close friends in adolescence was linked to difficulties in autonomy-related processes both during and beyond adolescence. Concurrently, adolescents whose close friends reported significant efforts to change their behavior were observed to behave less autonomously when disagreeing with those friends. Going forward, even after accounting for adolescents' inability to assert autonomy, experiences of pressure from close friends predicted lower levels of adult functional independence, which was assessed in terms of their ability to independently handle basic life tasks, such as taking care of themselves, behaving responsibly, and managing their finances. These findings are strikingly consistent with prior research findings that *parental* behavior undermining an adolescent's autonomy is linked to future social, educational, and career difficulties (Hare et al., 2015; Kins et al., 2012; Loeb et al., 2019). This study suggests that close friends may potentially exert similar influences on autonomy development. Given that difficulty establishing autonomy in close relationships has been linked to everything from academic achievement to cardiovascular reactions to stress (Loeb et al., 2020; Loeb, Davis, et al., 2021), recognizing that peers are an important potential influence in this regard is non-trivial.

Equally striking was the finding of continuity observed from close relationship experiences in adolescence to early adult romantic relationship qualities. Adolescents who were exposed to high levels of pressuring behavior by their close friends in late adolescence later found themselves in relationships where their romantic partners behaved coercively toward them. This finding remained significant even after accounting for adolescents' lack of ability to assert autonomy with their close friends. This is important, given the links of partner coercion to future risk for intimate partner violence and given that adolescence may represent a promising era in which to intervene to prevent such behavior (Capaldi et al., 2012; Whitaker et al., 2006). Overall, these findings are consistent with the view that individuals learn problematic relationship scripts in close peer relationships, which may then scaffold the nature of future relationships, even many years later (Fraley & Davis, 1997).

It is notable that both sets of predictions of future functioning were obtained from peer pressure experienced in late adolescence, but not earlier in adolescence. It may be that it is only adolescents who are not able to eventually reduce their exposure to peer pressure who are most at risk for future difficulties. The relative lack of stability of peer pressure from age 13 to age 14 is also consistent with the idea that pressure is just "coming online" as a significant factor linked to adolescents' own behavior during this period.

It was also notable that the pressure teens experienced was *not* about encouraging deviant behaviors but rather focused on encouraging more normative behaviors and even avoidance of deviant behavior. Reported instances of pressure to engage in deviant behavior were exceedingly rare across all ages. This is noteworthy but also precluded the ability to examine pathways to or from such deviant pressures empirically. This does not at all mean such pressure is unimportant, though it may be more salient in more at-risk samples than in the normative community sample in this study.

As peer relations grow in centrality in adolescence, a key facet – that these relationships in part reflect the adolescent's own behavior and choices in selecting peers – becomes important in understanding which adolescents will be exposed to peer pressure. This study strongly supports a cumulative continuity perspective (Rutter & Sroufe, 2000), in which adolescents' own social experiences predict their experience of higher levels of peer pressure over time, which in turn predicts their future capacity to function autonomously. Although it is not possible in a correlational study to establish causal relations, a clear linkage was found between adolescent insecurity in key social relationships and vulnerability to increasing experience of peer pressure over time.

To be clear, this study did not focus on actual influence, but rather on which teens had friends who exerted significant effort to *try* to influence them. We cannot know for sure whether these attempts at influence occur for a given teen because that teen enables them directly via submissive behavior (e.g., lack of assertiveness) or perhaps because the teen feels socially vulnerable and lacking in strong relationships and is thus willing to tolerate extensive peer attempts at influence. Evidence from this study suggests that both processes may be at play. Teens who would go on to experience high levels of peer pressure had less strong relationships with their mothers and were less desired as companions within the peer world. Also, although not hypothesized, these teens also had less stable close friendships, which is consistent with the hypothesized relationship predictors. These findings suggest that teens who end up with close peers who are pressuring them may feel some degree of desperation to maintain their close friendships at any cost. Notably, when considered jointly, each of the examined predictors added unique variance to explaining future levels of peer pressure experienced by a teen. Together, these findings are at least consistent with the conclusion that some teens contribute to the conditions under which it becomes easy for a close friend to exert pressure upon them.

Although not hypothesized, it was also notable that female adolescents appeared to experience more pressure from close friends than males. One explanation is that this finding reflects differences that have sometimes been observed in female versus male friendships. For example, female friendships have been found to have higher levels of intimacy and intensity but also higher levels of relational aggression (Buhrmester & Furman, 1987; Crick & Grotpeter, 1995), either of which could contribute to greater exposure to peer pressure. Further research in this area is clearly warranted.

One of the more striking aspects of these findings is the extent to which linkages between peer pressure and its precursors and sequelae were strong enough to be observed even when assessed by completely independent sources. Notably, none of the measures used in this study was based on adolescent self-report. This approach was taken not just to avoid the problem of correlated error; rather, given the social undesirability of acknowledging that one is pressured by one's peers, it was judged that adolescents would likely be the *least* reliable potential reporters of peer pressure (Nisbett & Wilson, 1977). Similarly, questions on the close friend report were worded so as to minimize social desirability bias. Thus,

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the word "pressure" was never used, but rather the focus was on "attempts to influence" that could range from a little to a lot. Although future research may be useful in fleshing out more precisely the nature of these attempts, having a friend exerting significant effort to change one's behavior is almost invariably likely to be experienced as pressuring, especially within the socially vulnerable period of adolescence.

The approach taken in this study also relied primarily upon aggregating measures of pressure obtained across multiple years. This is likely to be more important in peer studies than in family/parenting studies, as in family studies, parenting may remain at least somewhat stable over the course of adolescence. In contrast, for adolescent peer relationships, not only can a given close friend's behavior change, but who the closest friend is may also be likely to change over time (Bowker, 2011; Poulin & Chan, 2010). From this perspective, assessments of peer pressure at given points in time should be taken not as markers of a single, stable construct, but rather as indicators of a series of experiences most likely to have an effect cumulatively.

Several limitations of these findings also warrant mention. As noted above, correlational findings, even over multi-year periods, are not sufficient to establish causal relations. One viable possibility is that this study is primarily capturing markers of autonomy difficulties in a developmental cascade extending from adolescence onward. From this perspective, predictors at any one stage are not causal drivers of future pressure or autonomy difficulties, but rather indicators of underlying dysfunction in a fundamental developmental process. It is also possible that some unmeasured quality of pressured adolescents (e.g., learned helplessness, low self-esteem) accounts for both their experience of peer pressure as well as their longer-term outcomes.

In addition, the measure of peer pressure developed for this study defined pressure in terms of a friend's reported efforts to alter the behavior of a participant, but without specifying *how* the friend sought to accomplish this. Although a range of approaches (e.g., direct pressure, modeling, indirect efforts, etc.) all could leave a teen feeling pressured given they reflect the friend's stated efforts to alter their behavior, it may well make a significant difference which approaches friends are using, and this is an important area for research to consider. A related issue is that reliance upon a friend's reports, while removing participant-report biases, leaves open the question of whether and how much it matters the extent to which a teen *feels* pressured by their friend. This is also an area where further research could be quite clarifying.

Also, the measure of desirability as a peer companion is in some ways less robust than traditional peer preference measures in that it only captured results from a minority of students (albeit a sizeable number) at each grade level. In addition, the use of aggregated data on peer pressure and autonomy behavior, though sensible from a theoretical perspective, can make peer effects appear larger than they actually are at any given point in time. It is important to remember that these findings are not showing that any single instance of a relationship with a pressuring peer is necessarily of significant import. Such single relationships can and likely do to some extent come and go at random; it is only when a consistent set of experiences *accumulates* that the continuities observed in this study are obtained. Finally, this study focused on close friendships, and it appears likely that somewhat different phenomena might apply regarding pressure from the broader peer group.

Although peer influences have been frequently studied regarding deviant behavior, the most productive lines of research have come to focus on processes, such as social learning or modeling, in which autonomy is not necessarily threatened or implicated (Field & Prinstein, 2023; Simons-Morton & Chen, 2006). Though useful, this research largely ignores the intense distress teens feel regarding peer pressure, regardless of whether it leads to deviant behavior (Brown, 1982). It has also been recognized that under many conditions, peer influences (though not peer pressure) can even be positive in nature (Allen, Loeb et al., 2020). In contrast, this study focused on efforts of peers to directly alter the behavior of their friends (even when the behavior is not deviant in nature) and found that such experiences, rather than appearing benign, both reflect prior social difficulties and forecast future problems in autonomy development. Overall, these findings mark a significant extension of our understanding of the development of autonomy processes in adolescence from the family realm to the peer realm and suggest a further need for examination of these processes.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0954579424001482.

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