

The Cascading Development of Autonomy and Relatedness From Adolescence to Adulthood

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A developmental cascade model of autonomy and relatedness in the progression from parent to friend to romantic relationships across ages 13, 18, and 21 was examined among 184 adolescents (53% female, 58% Caucasian, 29% African American) recruited from a public middle school in Virginia. Parental psychological control at age 13 undermined the development of autonomy and relatedness, predicting relative decreases in autonomy and relatedness with friends between ages 13 and 18 and lower levels of autonomy and relatedness with partners at age 18. These cascade effects extended into adult friendships and romantic relationships, with autonomy and relatedness with romantic partners at age 18 being a strong predictor of autonomy and relatedness with both friends and partners at age 21.

The benefits of positive friendships and romantic relationships for developmental functioning and overall well-being in adulthood range from greater resistance to stress, to reductions in deviant behaviors, and to better physical and mental health (House, Landis, & Umberson, 1988; Laub, Nagin, & Sampson, 1998; Patterson & Veenstra, 2010). The ability to exercise autonomy and maintain relatedness within close relationships is one hallmark of normative relational development in adolescence and remains an important aspect of healthy functioning in adult relationships (Allen, Hauser, Bell, & O'Connor, 1994; Collins, 2003; Hill & Holmbeck, 1986; Taradash, Connolly, Pepler, Craig, & Costa, 2001).

Although examined as separate constructs at times, long-standing theory and evidence suggest that autonomy and relatedness can also be considered as a single overall construct within healthy close relationships, a state John Bowlby referred to as "autonomous-relatedness" (Hill & Holmbeck, 1986; Moore, 1987; Murphy, Silber, Coelho, Hamburg, & Greenberg, 1963). Indeed, autonomy and relatedness tend to be interconnected within close relationships (Allen et al., 1994; Taradash et al., 2001). Disagreement within close relationships is inevitable, and to effectively navigate disagreement, members of a

dyad must be able to confidently assert their own autonomous reasoning while simultaneously preserving the closeness of the relationship (Allen et al., 1994; McIsaac, Connolly, McKenney, Pepler, & Craig, 2008). Adolescents who fail to develop the capacity to establish autonomy and relatedness appear at risk for using hostile or autonomy-undermining methods of resolving conflict and for experiencing depression and loneliness in adulthood close relationships (Allen, Hauser, O'Connor, & Bell, 2002; Miga, Gdula, & Allen, 2012; Soenens, Vansteenkiste, Goossens, Duriez, & Niemiec, 2008; Wei, Shaffer, Young, & Zakalik, 2005).

As such, there is much interest in explaining why some people enter adulthood with the ability to exercise autonomy and relatedness within friendships and romantic relationships, whereas others struggle with this fundamental developmental task. Adult relational outcomes may be best understood within a developmental framework, whereby early experiences in close relationships throughout childhood and adolescence lay the foundation for functioning in adulthood relationships (Collins & Sroufe, 1999; Connolly & McIsaac, 2011; Pepler, 2012). Negative or positive experiences within early relationships are theorized to "cascade" or "spill over" into future relationships across different social domains (e.g., friend, romantic; Masten & Cicchetti, 2010; Pepler, 2012). Identifying features of

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early adolescent relational contexts as long-term markers of adulthood autonomy and relatedness processes can provide insight into who is most at risk for failing to develop healthy autonomy and relatedness in the long term.

Parental Psychological Control and Autonomy and Relatedness

Despite evidence documenting negative outcomes associated with failing to establish a healthy degree of autonomy and relatedness in adulthood close relationships, very little research has examined the developmental origins of deficiencies in autonomy and relatedness. A developmental cascade model suggests that parenting practices that undermine youth's development of healthy autonomy and relatedness skills in adolescence might render youth vulnerable to long-term trajectories of increasingly problematic handling of these issues across future close relationships. Parental psychological control involves the use of guilt, love withdrawal, anxiety, or other psychologically intrusive, coercive tactics aimed at controlling youth's motivations and behaviors (Barber, 1996; Schaefer, 1965). Within a self-determination framework, psychological control is posited to undermine volitional functioning by pressuring adolescents to think and make decisions consistent with their parents' needs and motivations rather than self-motivations (Deci & Ryan, 2000; Soenens & Vansteenkiste, 2010). Youth who are taught to prioritize others' motivations and needs are likely to acquire less practice in identifying, understanding, and asserting their own autonomous way of thinking. In addition, parents' use of psychologically controlling tactics has been linked to poorer quality parent-youth relationships, possibly the result of youth's resistance to the intrusive or overbearing parenting (Barber, Xia, Olsen, McNeely, & Bose, 2012; Galambos, Barker, & Almeida, 2003; Hodges, Finnegan, & Perry, 1999; Leondari & Kiosseoglou, 2002; Soenens & Vansteenkiste, 2010). Youth exposed to these tactics might find close relationships threatening and potentially avoid them as a result.

Within a developmental cascade framework, we expect parental psychological control in early adolescence to have *long-term* negative consequences for autonomy and relatedness processes that are first seen in adolescent relationships and that persist into adulthood relationships. In a cascade model, relational functioning in one social domain *alters* the course of development in future social domains (Masten & Cicchetti, 2010). Over time,

youth who experience parental psychological control are likely to acquire less practice asserting autonomy and expressing relatedness than their counterparts, and are thus likely to become *increasingly* less skilled at balancing autonomy and relatedness when disagreements arise in close relationships. This study is the first to test for developmental cascade effects whereby parental psychological control alters or predicts *relative decreases* over time in youth's ability to express autonomy and maintain relatedness during disagreements within friendships and romantic relationships over the transition to adulthood. This longitudinal lagged approach is critical to assessing links between parenting behavior and adolescent outcomes while ruling out the possibility that the links exist simply because concurrent adolescent behaviors are actually driving parenting behavior.

The Importance of Early Friendships and Romantic Relationships for Future Close Relationships

A developmental cascade model also suggests downstream effects among relationship qualities later in development. Throughout adolescence and into early adulthood, friendships and romantic relationships often co-occur, resulting in opportunities for relationships with friends to affect relationships with romantic partners and vice versa. However, whether one's ability to establish autonomy and relatedness during disagreements with friends can actually predict relative changes in experiences with future partners, or whether autonomy and relatedness with early partners can predict changes in experiences with future friends, has not been empirically investigated.

Longitudinal cross-over developmental cascade effects of friendship and romantic relationship qualities are particularly likely to emerge between adolescence and early adulthood. Youth continue to develop more independent, meaningful relationships with friends and partners as they grow older, and each relational context offers unique opportunities for autonomy and relatedness development (Collins, 2003; Steinberg & Silverberg, 1986). Early relationships with friends are theorized to serve as models and build capacity (or lack thereof) for healthy relationships with initial romantic partners (Collins & Laursen, 2004; Furman & Wehner, 1997). Once youth begin to establish romantic relationships, however, partners play an increasingly prominent role in meeting intimacy and companionship needs (Collins & Laursen, 2005; Laursen & Williams, 1997). The growing intensity

of romantic partner relationships makes resolution of disagreements within this social context important to consider within adolescence, and it is perhaps even more important to consider how patterns established in these early relationships might predict future more serious or lifelong romantic partnerships. Moreover, as expectations and experiences within close friendships and romantic relationships change over time, these changes provide opportunities for ongoing reciprocal influences in autonomy and relatedness development.

Initial research has identified concurrent associations between autonomy and relatedness within friendships and romantic relationships (Taradash et al., 2001). Significant correlations have also emerged between autonomy and relatedness in early adolescent friendships and future autonomy undermining behaviors during disagreements in late adolescent romantic relationships (Miga et al., 2012). However, a cascade model would suggest that relational difficulties at one developmental stage not only predict continuity to the next stage but also place adolescents at risk for *increasing* levels of difficulty as newer, more complex relationship challenges emerge over time. Youth who are unable to express autonomy and relatedness while navigating disagreement with close friends might instead resort to behaviors that further undermine the development of autonomy and relatedness during times of disagreement, such as aggression, disengagement, or submission. Over time, past problematic relational experiences potentially build upon one another (Masten & Cicchetti, 2010; Pepler, 2012). Autonomy and relatedness undermining behaviors practiced within the friend domain are also likely to generalize into future relationships, leading to decreases in youth's ability to show autonomy and relatedness within romantic relationships over time.

Conversely, developmental cascade theory posits that those who have opportunities to practice positive autonomy and relatedness skills within early close relationships are likely to gain increasing competency and confidence, and thus show improvements in these skills over time. Youth who develop the skills to establish healthy autonomy and relatedness during disagreement with close friends are likely to generalize these competencies into relationships with romantic partners. As positive experiences build upon one another over time, youth are likely to see relative increases in their ability to practice autonomy and relatedness with romantic partners.

Although friendships have long been thought to set the stage for future romantic relationships,

little attention has been paid to whether early romantic relationships are important for future nonromantic friendships (Collins & Sroufe, 1999; Furman & Wehner, 1997; Hazan & Shaver, 1994; Miga et al., 2012). Yet, even early on in dating, youth tend to perceive their romantic relationships as emotionally intense and intimate, and report spending significant amounts of time thinking about and interacting with their partners (Collins, 2003; Feiring, 1996; Laursen & Williams, 1997). As noted earlier, romantic relationships become more dominant than friendships over the transition to adulthood, as people begin to pair up in more serious, long-term relationships and think about starting a family together (Collins & Laursen, 2005). New intense and meaningful relationships with romantic partners offer new relational contexts to develop and practice healthy autonomy and relatedness skills. Alternatively, youth might experience negative autonomy and relatedness outcomes within these new relational contexts that cascade into future friendships and romantic relationships. Accordingly, experiences within romantic relationships are likely to affect the ability to demonstrate autonomy and relatedness in future adulthood friendships, although this possibility has never been empirically examined to our knowledge.

Overview of the Current Study

Using multimethod, longitudinal data collected over a 9-year period, we tested a cascade model of the development of autonomy and relatedness within close relationships across early adolescence (age 13), late adolescence (age 18), and early adulthood (age 21), in the progression from parent to friend to romantic relationships. Relational experiences with parents at age 13 were hypothesized to alter the course of future relational experiences across friend and romantic social domains as youth transition toward and into adulthood. Figure 1 illustrates this model, with the solid lines representing cascade pathways. The use of longitudinal data assessing the same constructs across multiple time points allowed for a rigorous test of developmental cascade effects. We controlled for baseline levels of the relational constructs of interest and examined how functioning in one social domain predicted *relative changes* in other social domains over time.

We hypothesized that parental psychological control would predict relative decreases in positive autonomy and relatedness during disagreements with *close friends* from ages 13 to 18 and ages 18 to

4 Oudekerk, Allen, Hessel, and Molloy

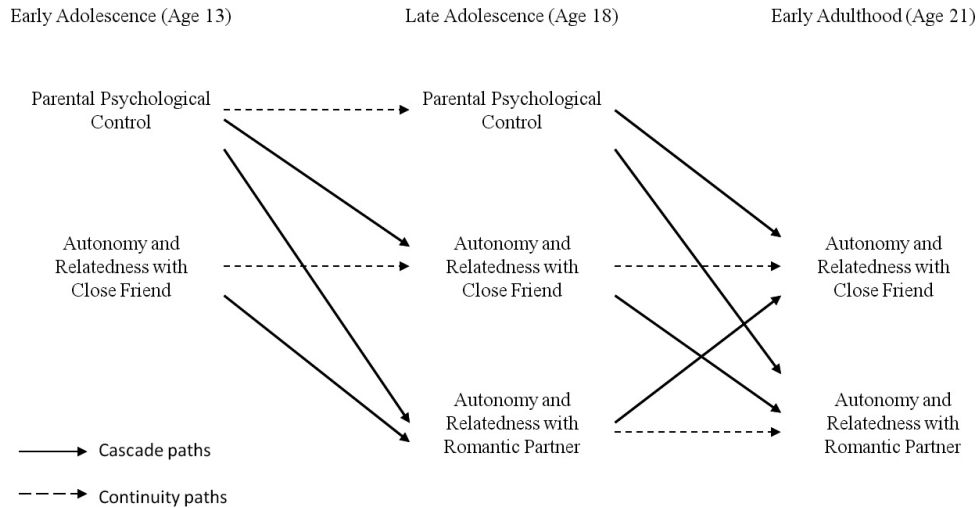


Figure 1. Hypothesized developmental cascade model. Although not illustrated, all covariations and significant income pathways were also accounted for in the model.

21. Similarly, we expected that parent psychological control at age 13 would predict less autonomy and relatedness during disagreement with future romantic partners at age 18 and *relative decreases* in autonomy and relatedness with partners from ages 18 to 21. In addition, we expected cross-over cascade effects where, after controlling for age 18 levels of autonomy and relatedness in friendships and romantic relationships: (a) age 18 autonomy and relatedness with close friends would predict relative changes by age 21 in autonomy and relatedness with romantic partners and (b) age 18 autonomy and relatedness with romantic partners would predict relative changes by age 21 in autonomy and relatedness with close friends. Finally, we hypothesized significant long-term indirect effects from ages 13 to 21 relational outcomes mediated by age 18 relational outcomes.

Method

Participants

Data were drawn from a longitudinal study of 184 adolescents (53% female) initially recruited from one public middle school. For the current analysis, data from three developmental periods were examined, when participants were ages 13 ($M = 13.35$, $SD = 0.64$), 18 ($M = 18.33$, $SD = 0.99$), and 21 ($M = 21.66$, $SD = 0.96$). The sample was racially/ethnically diverse: 107 (58%) of adolescents identified themselves as Caucasian, 53 (29%) as African American, 15 (8%) as of mixed race/ethnicity, and 9 (5%) as being from other minority groups. Partici-

pants' parents reported a median family income in the \$40,000–\$59,999 range at age 13.

Procedure

Participants were enrolled in a comprehensive, longitudinal study of development and functioning across the transition from early adolescence to adulthood. Adolescents were initially recruited from the seventh and eighth grades of a diverse public middle school in central Virginia. A recruitment letter was mailed to all eligible students' parents and follow-up efforts were made at school lunches. After adolescents received parental permission and enrolled in the study as a participant ($n = 184$), they were asked to identify a close friend, defined as someone "you know well, spend time with, and who you talk to about things that happen in your life." Researchers then recruited close friends to participate in the study. Once someone was identified and involved as a close friend in the study, they could no longer be selected as a target participant. Of all eligible students, 63% enrolled in the study either as target participants or as friends providing collateral information. This sample appeared generally comparable to the larger population of families in this school system in terms of both racial/ethnic composition (37% non-White in sample vs. ~40% in the school system) and socioeconomic status (mean household income \$44,900 in the sample vs. \$48,000 in the community).

The target participants completed self-report assessments at ages 13, 18, and 21. Participants also

nominated a close friend at ages 13, 18, and 21, and completed participant–friend interaction tasks. Participants usually nominated a different close friend at different ages, with only 2.2% bringing in the same close friend at ages 13, 18, and 21 and only 23.4% bringing in the same friend during at least two of these assessments. Participants were instructed that close friends could not be romantic partners. At ages 18 and 21, participants were also asked if they had been dating a romantic partner for at least 3 months. We followed precedents (e.g., Shulman, Levy-Shiff, Kedem, & Alon, 1997) and set a duration criteria to distinguish real dyadic romantic relationships that would likely involve some degree of autonomy and relatedness from relationships where partners had gone on only a few dates or not spent much time together. Those dating for 3 months or more were asked to invite their romantic partner in for an assessment, during which time participant–partner observational data were collected. Of those with romantic partners at ages 18 and 21, only 28.8% of participants were dating the same partner at both ages. One participant at age 18 and one participant at age 21 nominated same-sex romantic partners, the rest nominated opposite-sex romantic partners.

All assessments were completed in private offices within an academic institution, and transportation and child care were provided if necessary. Participants completed assessments with close friends and romantic partners during different sessions. All participants and their close friends provided informed assent and parental informed consent was obtained for everyone under age 18. All data were protected by a Federal Certificate of Confidentiality issued by the U.S. Department of Health and Human Services. Target adolescents, their friends, and their partners were all paid for participating.

Measures

Parent Psychological Control

At ages 13 and 18, participants completed the Psychological Control subscale of the Childhood Report of Parenting Behavior Inventory (CRPBI; Schaefer, 1965; Schludermann & Schludermann, 1988). This subscale (10 items) assessed the degree to which mothers and fathers used guilt, anxiety, love withdrawal, or other psychologically controlling behaviors (1 = *not like my mother/father*, 3 = *a lot like my mother/father*). Example items include “My mother/father is a person who is less friendly with me, if I do not see things her/his way,” and “My

mother/father is a person who says, if I really cared for her/him, I would not do things that cause her/him to worry.” Scores across items were summed, and averaged across mothers and fathers. Past work has demonstrated good validity and reliability for the CRPBI Parental Psychological Control subscale (Schludermann & Schludermann, 1970, 1988), and it was reliable herein: Cronbach’s α s = .87 at age 13 and .77 at age 18.

Autonomy and Relatedness During Disagreement With Friends

At ages 13, 18, and 21, adolescent–close friend dyads participated in an 8-min videotaped task during which they first answered questions separately, and then were brought together to discuss their disagreement in a revealed differences paradigm (Strodtbeck, 1951). The topic of discussion varied to be developmentally appropriate across ages 13, 18, and 21. Specifically, at age 13, participants and their close friends were instructed that 12 people were stranded on Mars and only 7 people would fit on the ship returning home. Adolescents and their friends first chose their 7 people separately, and then came together to discuss disagreement and make a final recommendation. At age 18, each member of the dyad was asked to select the top 7 of 12 people they would choose for a new television show they would be coproducing, and then came together to discuss their choices and create a final list. At age 21 each member of the dyad completed a series of hypothetical questions (e.g., “If you were able to live to the age of 90 and keep EITHER the body or mind of a 35-year-old, which would you keep?”), and then asked to discuss differences in answers and reach a consensus. Using the Autonomy–Relatedness Coding Manual developed by Allen and colleagues (Allen, Porter, & McFarland, 2001; Allen et al., 2000), researchers coded participants’ interaction styles for behaviors promoting autonomy (i.e., defined as using reasoning and expressing confidence) and relatedness (i.e., defined as showing warmth and collaborativeness). Although autonomy and relatedness could be examined as separate constructs, preliminary results supported examining autonomy and relatedness as a single construct, consistent with the notion that autonomy and relatedness are interrelated in close relationships (Allen et al., 1994; Murphy et al., 1963). Autonomy and relatedness were coded reliably across raters with intraclass correlation coefficient (ICC) values ranging from .73 to .81 across ages 13, 18, and 21, all within the range of values

considered to be good (.60–.74) or excellent (.75 or higher; Cicchetti & Sparrow, 1981).

Autonomy and Relatedness During Disagreement With Romantic Partners

Adolescent-partner dyads also participated in disagreement discussion tasks at ages 18 and 21 (no romantic relationship data were collected at age 13). At age 18, both partners were presented with 12 cases brought before a “dating court” and were instructed to decide which partner in each scenario was right. Partners then came together and discussed the cases on which they disagreed and attempted to reach consensus. At age 21, participants discussed topics of actual disagreement in their relationship (e.g., communication problems, money or budgetary disagreements, or jealousy within the relationship). All interactions lasted 8 min and were videotaped. Researchers then coded interactions using the Autonomy-Relatedness Coding Manual for Adolescent Romantic Partner Dyads, a coding system derived from the friend autonomy and relatedness coding system described earlier. Specifically, participants’ interactions were coded for expressions of reasoning and confidence (i.e., autonomy) as well as warmth and collaborativeness (i.e., relatedness; Allen et al., 2000; Allen et al., 2007). Intraclass correlation coefficients ranged from good to excellent, ICCs = .64–.80 across ages (Cicchetti & Sparrow, 1981).

Missing Data

Of the 184 youth who participated at age 13, data were available at age 18 for 137 participants for autonomy and relatedness with close friends, for 70 participants for autonomy and relatedness with romantic partners, and for 145 participants for parental psychological control. At age 21, data were available for 139 participants on autonomy and relatedness with close friends and for 96 participants for autonomy and relatedness with romantic partners. Across follow-up interviews at ages 18 and 21, friend or partner autonomy and relatedness observational data were available in at least one age for 167 (91%) participants. Across ages, missing data on friend-participant interactions was because close friends or participants did not complete assessments; all participants interviewed were able to identify a close friend. The majority of missing data on partner-participant interactions was because participants were not in a romantic relationship for at least 3 months (explains 56%–60% of

missing data across ages) or partners chose not to participate or complete assessments.

T-test and chi-square analyses were conducted to test for significant differences on income, gender, parent psychological control, and autonomy and relatedness with close friends at age 13 for those who completed ages 18 and 21 assessments and those who did not. Only 4 of 20 possible differences emerged as significant. Those who provided data at age 18 on friend autonomy and relatedness, compared to those who did not, experienced lower levels of psychological control at age 13 ($M = 14.86$ vs. $M = 16.22$, respectively), $t(181) = -2.33$, $p = .02$. In addition, participants who provided data on autonomy and relatedness with romantic partners at age 21, compared to those who did not, demonstrated less autonomy and relatedness with close friends at age 13 ($M = 2.26$ vs. $M = 2.46$, respectively), $t(175) = -2.10$, $p = .04$. Finally, those who provided data on parental psychological control at age 18, compared to those who did not, resided in higher income households ($M = 6.28$ vs. $M = 5.42$), $t(179) = 2.39$, $p = .02$, and reported less parental psychological control ($M = 14.92$ vs. $M = 16.38$), $t(181) = -2.27$, $p = .02$, at age 13.

To handle missing data, all analyses were conducted in Mplus using full information maximum likelihood (Muthén & Muthén, 2010). Full information maximum likelihood is well recognized as an effective method for analyzing longitudinal data sets with multiple patterns of missing data, and has been demonstrated to provide equivalent or less biased parameter estimates than other commonly used techniques, for example, listwise deletion (Enders, 2001; Little & Rubin, 1987). Full information maximum likelihood is particularly effective compared to other missing data procedures with greater amounts of missing data and when missing data can be explained by other variables in the model (e.g., parental psychological control in early adolescence; Arbuckle, 1996; Enders & Bandalos, 2001; Little & Rubin, 1987; Raykov, 2005). Full information maximum likelihood procedures allow for the use of all available data from each participant, and thus the full sample of $n = 184$ was retained in all primary analyses.

Results

Descriptive Statistics

Means and correlations among all study variables are presented in Table 1. Significant correlations emerged between income and (a) parent

psychological control at age 13, (b) autonomy and relatedness with close friends at age 13, and (c) autonomy and relatedness with close friends at age 18. Thus, we examined income as a control in primary analyses below. Income did not moderate any of the hypothesized pathways beyond what would be expected by chance. Preliminary results revealed that correlations between gender and all study variables were nonsignificant, all $ps > .41$, and no gender moderating effects were found beyond what would be expected by chance. Thus, gender was not examined further in analyses.

Primary Analyses

The hypothesized developmental cascade model depicted in Figure 1 was tested using Mplus version 6.12 (Muthén & Muthén, 2010). Specifically, we first assessed the four rank-order stability pathways to account for relative continuity in constructs measured over time, illustrated by dotted lines in Figure 1. Controlling for relative stability allowed us to examine predictors of change in the constructs over time, relative to initial levels of the constructs (Cohen & Cohen, 1983). For example, by controlling for autonomy and relatedness with friends at age 13, we are able to examine whether psychological control at age 13 predicts decreases in autonomy and relatedness by age 18, relative to autonomy and relatedness at age 13. The remaining seven pathways in Figure 1 represent the hypothesized cascade effects, that is, longitudinal linkages between parental psychological control, positive

autonomy and relatedness with close friends, and positive autonomy and relatedness with romantic partners over the transition to adulthood. We also examined all possible ($n = 5$) concurrent correlations between relational constructs within each developmental time period (not depicted to maintain clarity). We accounted for significant income pathways, described in the Figure 2 note.

The standardized solution to the model is summarized in Figure 2. The model demonstrated good fit (see the Figure 2 note) as indicated by a nonsignificant chi-square value, a root mean square error of approximation value $< .05$, and a standardized root mean square residual $< .08$ (Hu & Bentler, 1998; MacCallum, Browne, & Sugawara, 1996; MacKinnon, 2008). In addition, the model accounted for significant variance in late adolescent (age 18) and early adulthood (age 21) autonomy and relatedness outcomes. Below, we first describe the significant short-term cascade effects across two developmental time periods, that is, from early adolescence to late adolescence or from late adolescence to early adulthood. Then we describe the significant long-term cascade effects, that is, the significant indirect effects from age 13 relational outcomes to age 21 autonomy and relatedness within close relationships mediated by age 18 relational outcomes.

Short-Term Cascade Effects From Parental Psychological Control to Autonomy and Relatedness in Friendships

Figure 2 shows a significant cascade pathway such that higher levels of parental psychological

Table 1
Descriptive Statistics for All Study Variables

	M (SD)	1	2	3	4	5	6	7	8
Age 13 (early adolescence)									
1. Income	6.10 (1.96)	—							
2. Parental psychological control	15.21 (3.50)	-.32***	—						
3. Positive autonomy and relatedness with friends	2.36 (0.65)	.29***	-.27***	—					
Age 18 (late adolescence)									
4. Parental psychological control	15.30 (3.54)	-.05	.25**	-.06	—				
5. Positive autonomy and relatedness with friends	2.34 (0.56)	.24**	-.36***	.26**	-.18*	—			
6. Positive autonomy and relatedness with partners	2.38 (0.53)	.09	-.39**	.39**	.10	.28*	—		
Age 21 (early adulthood)									
7. Positive autonomy and relatedness with friends	2.66 (0.36)	.11	-.34***	.30***	-.12	.36***	.49***	—	
8. Positive autonomy and relatedness with partners	2.22 (0.44)	.18	-.26*	.25*	-.15	.37**	.43***	.27*	—

Note. Parental psychological control was assessed via participant self-report. All measures of autonomy and relatedness were assessed via observations of participant–friend or participant–partner dyadic interactions during a disagreement.
* $p < .05$. ** $p < .01$. *** $p < .001$.

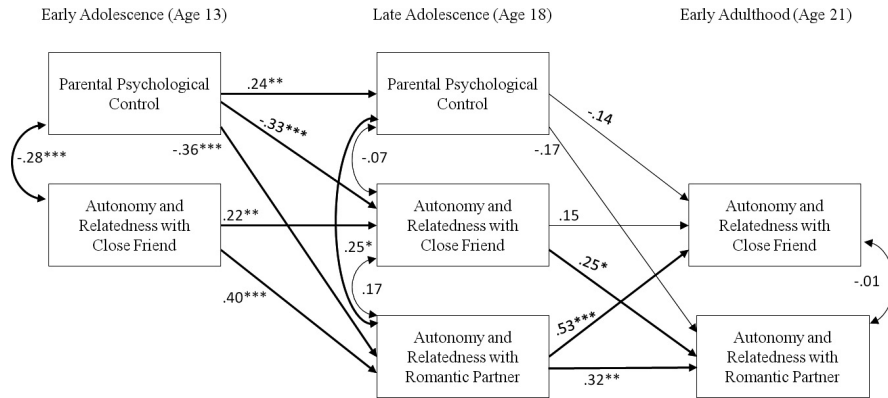


Figure 2. Standardized solution for the developmental cascade model of autonomy and relatedness. Significant income pathways were controlled for but not shown in the figure. At age 13, living in lower income households was concurrently significantly associated to greater parental psychological control, $r = -.32$, $p < .001$, and less positive autonomy and relatedness with close friends, $r = .29$, $p < .001$. Model fit was good: $\chi^2(10) = 4.27$, $p = .93$, root mean square error of approximation (RMSEA) = 0.00, 90% CI [0.00, 0.02], standardized root mean square residual (SRMR) = .03. $R^2 = .20$, $p = .002$ and $R^2 = .38$, $p < .001$ for autonomy and relatedness with close friends at ages 18 and 21, respectively, and $R^2 = .37$, $p < .001$ and $R^2 = .26$, $p = .004$ for autonomy and relatedness with romantic partners at ages 18 and 21, respectively.

* $p < .05$. ** $p < .01$. *** $p < .001$.

control at age 13 predicted decreases in positive autonomy and relatedness with close friends at age 18, relative to autonomy and relatedness with close friends at age 13. The concurrent association between psychological control and autonomy and relatedness with close friends fell to nonsignificant at age 18, after accounting for other variables in the model. Parental psychological control at age 18 did not predict significant relative changes in positive autonomy and relatedness with friends between ages 18 and 21, after accounting for other variables in the model.

Short-Term Cascade Effects From Parental Psychological Control to Autonomy and Relatedness Within Romantic Relationships

Figure 2 also illustrates a significant cascade pathway such that parental psychological control at age 13 predicted significantly lower levels of positive autonomy and relatedness within romantic relationships at age 18. In addition, the concurrent correlation between parental psychological control and autonomy and relatedness within romantic relationships at age 18 emerged as positive and significant. This was possibly a suppressor effect, given that the association was nonsignificant in simple correlations (see Table 1). Next, the cascade pathway between parental psychological control at age 18 and autonomy and relatedness with romantic partners at age 21 displayed a nonsignificant trend in the expected direction ($\beta = -.17$, $p = .080$).

Short-Term Cascade Cross-Over Effects Between Autonomy and Relatedness Within Friendships and Romantic Relationships

Figure 2 illustrates significant cross-over cascade pathways between autonomy and relatedness with partners and friends. Greater autonomy and relatedness with close friends at age 13 significantly predicted greater autonomy and relatedness with romantic partners 5 years later, at age 18. In addition, age 18 autonomy and relatedness with close friends predicted relative increases (controlling for baseline levels) in autonomy and relatedness with romantic partners between ages 18 and 21. The reverse was also true; age 18 autonomy and relatedness with romantic partners predicted relative increases in positive autonomy and relatedness with close friends between ages 18 and 21. In fact, the relative continuity in autonomy and relatedness with close friends between ages 18 and 21 fell to nonsignificant ($\beta = .15$, $p = .099$) after accounting for the significant link from autonomy and relatedness with romantic partners at age 18.

Long-Term Relational Cascade Effects From Ages 13 to 21 via Age 18 Relational Outcomes

Finally, we tested our hypothesis that experiencing greater parental psychological control at age 13 would have long-term developmental cascade effects on autonomy and relatedness in close relationships at age 21. We expected long-term cascade effects to

be manifest in significant indirect effects from age 13 parental psychological control to age 21 autonomy and relatedness in close relationships as mediated by age 18 relational outcomes. In addition, we tested significant indirect effects from age 13 autonomy and relatedness with close friends to age 21 autonomy and relatedness with close friends and romantic partners as mediated by age 18 relational outcomes. This allowed us to examine whether youth who began adolescence with positive autonomy and relatedness skills in friendships showed increases in autonomy and relatedness within romantic relationships over the transition to adulthood, relative to how well they demonstrated autonomy and relatedness in adolescence. Indirect effects were tested using bootstrapping procedures and bias corrected 95% confidence intervals were examined to determine significance. Results are presented in Table 2, and indirect effects significant at $p < .05$ are bolded.

Age 21 friendship outcomes. Results presented in the first few rows of Table 2 illustrate that psychological control at age 13 predicted significant decreases in autonomy and relatedness with close friends up through age 21, as illustrated by the significant total indirect effect via the combined three age 18 relational outcomes. This indirect effect was

primarily driven by autonomy and relatedness with *romantic partners* at age 18, rather than simple continuity over time in parental psychological control or autonomy and relatedness with friends. That is, Table 2 shows that only age 18 autonomy and relatedness with romantic partners explained a significant portion of the association between age 13 psychological control and age 21 autonomy and relatedness with close friends. Youth who experienced higher levels of parental psychological control at age 13 exhibited less autonomy and relatedness with romantic partners at age 18, and in turn youth who exhibited autonomy and relatedness with romantic partners at age 18 showed relative increases in autonomy and relatedness with friends by age 21. Independently, parental psychological control and autonomy and relatedness with close friends at age 18 did not emerge as significant mediators (see that 95% confidence intervals cross 0).

Next, Table 2 also illustrates a significant total indirect effect from autonomy and relatedness with close friends at age 13 to autonomy and relatedness with close friends at age 21 mediated by age 18 autonomy and relatedness with close friends and partners. This indirect effect was primarily mediated by experiences with romantic partners at age 18. That is, autonomy and relatedness with close

Table 2
Confidence Intervals for Indirect Effects

	Lower 2.5% CI	Estimate	Upper 2.5% CI
<i>Indirect effects on early adulthood (age 21) friend relationships</i>			
Parent psychological control (age 13) → positive autonomy and relatedness with friends (age 21) via			
Parental psychological control (age 18)	-0.080	-0.033	0.015
Positive autonomy and relatedness with friends (age 18)	-0.121	-0.048	0.024
Positive autonomy and relatedness with romantic partner (age 18)	-0.286	-0.188	-0.091
Total indirect effects	-0.042	-0.028	-0.016
Positive autonomy and relatedness with friends (age 13) → positive autonomy and relatedness with friends (age 21) via			
Positive autonomy and relatedness with friends (age 18)	-0.024	0.033	0.090
Positive autonomy and relatedness with romantic partner (age 18)	0.099	0.213	0.327
Total indirect effects	0.075	0.137	0.213
<i>Indirect effects on early adulthood (age 21) romantic relationships</i>			
Parent psychological control (age 13) → positive autonomy and relatedness with romantic partner (age 21) via			
Parental psychological control (age 18)	-0.096	-0.041	0.014
Positive autonomy and relatedness with friends (age 18)	-0.163	-0.080	0.003
Positive autonomy and relatedness with romantic partner (age 18)	-0.207	-0.113	-0.019
Total indirect effects	-0.049	-0.030	-0.015
Positive autonomy and relatedness with friends (age 13) → positive autonomy and relatedness with romantic partner (age 21) via			
Positive autonomy and relatedness with friends (age 18)	-0.010	0.054	0.118
Positive autonomy and relatedness with romantic partner (age 18)	0.035	0.128	0.221
Total indirect effects	0.053	0.124	0.211

Note. Estimates were calculated using bootstrapping with 5,000 resamples. Bias corrected 95% confidence intervals are reported, and estimates significant at $p < .05$ are bolded.

friends at age 13 predicted more positive autonomy and relatedness with romantic partners at age 18; in turn, higher autonomy and relatedness at age 18 with partners was significantly associated with relative increases in autonomy and relatedness with future close friends by age 21.

Age 21 romantic relationship outcomes. The bottom half of Table 2 illustrates indirect effects from age 13 relational outcomes to age 21 autonomy and relatedness in romantic relationships. The pattern of results is consistent with findings on autonomy and relatedness in early adulthood friendships. First, there was a significant total indirect effect from age 13 parental psychological control to age 21 positive autonomy and relatedness with romantic partners mediated by the combination of all three age 18 relational outcomes. Individually, only positive autonomy and relatedness with romantic partners at age 18 accounted for a significant amount of the association between age 13 psychological control and age 21 autonomy and relatedness with romantic partners. That is, youth who experienced psychological control at age 13 showed less autonomy and relatedness with romantic partners at age 18, and in turn continued to show the lowest levels of autonomy and relatedness with partners at age 21.

The last few rows in Table 2 illustrate a significant total indirect effect from autonomy and relatedness with friends at age 13 to positive autonomy and relatedness with romantic partners at age 21 mediated by age 18 autonomy and relatedness with both friends and partners. This indirect effect was driven primarily by experiences with romantic partners at age 18, such that youth who demonstrated better autonomy and relatedness with friends at age 13 grew up to exhibit better autonomy and relatedness with romantic partners at age 18, and in turn continued to demonstrate better autonomy and relatedness with romantic partners at age 21.

Discussion

We sought to identify cascading pathways of relational functioning across adolescence and adulthood. Specifically, we tested whether the developmental origins of autonomy and relatedness within adulthood close friendships and romantic relationships are rooted in early adolescent relationship experiences. Results provided strong support for a developmental cascade model, and revealed three main findings about the pathways by which some youth develop the capacity to form and maintain autonomous, intimate relationships with adult

friends and romantic partners, whereas others struggle with this task.

First, parental attempts to regulate or control decision making through psychological coercion at age 13 placed youth on long-term trajectories at risk for poor functioning in close relationships 8 years later, in early adulthood. As hypothesized based on self-determination theory (Soenens & Vansteenkiste, 2010), parental psychological control appeared to undermine youth's ability to assert autonomy and express relatedness during times of disagreement with close friends concurrently at age 13. Early experiences within the parent-youth relationship then appeared to "cascade" into late adolescent and early adulthood friendships, such that youth who experienced greater psychological control became *increasingly* less skilled than their counterparts at navigating autonomy and relatedness with friends over the transition to adulthood. Similarly, parental undermining of autonomy and relatedness also "cascaded" into future relationships with romantic partners, with links lasting into adulthood. Youth parented with greater psychological control at age 13 were significantly less likely to exhibit autonomy and relatedness during disagreements with romantic partners at age 18, and then remained significantly behind their counterparts in expressing autonomy and relatedness with romantic partners at age 21. Psychological control has long been theorized to undermine the development of autonomy and relatedness, and has been found to predict many markers of poor autonomy and relatedness skills, including hostility and susceptibility to peer pressure (Allen, Chango, Szewedo, Schad, & Marston, 2012; Allen et al., 2002; Barber, 1996; Oudekerk et al., 2013; Schaefer, 1965). Findings herein extend past research by identifying a direct, observable, and longitudinal connection between parent psychological control and decreasing ability over time to establish autonomy and relatedness with friends and romantic partners.

Second, in support of developmental theories, findings suggest that early close friendships present youth with opportunities to develop and practice autonomy and relatedness skills, which then set the course for how well youth can exhibit autonomy and relatedness in future romantic relationships (Karney, Beckett, Collins, & Shaw, 2007; Masten & Cicchetti, 2010; Pepler, 2012). Youth transferred their autonomy and relatedness skills developed in friendships at age 13 into future relationships with romantic partners at age 18. In turn, those who were better at establishing autonomy and relatedness with romantic partners at age 18 continued to

exhibit greater autonomy and relatedness in romantic relationships at age 21. A developmental cascade pathway also emerged such that the degree to which youth exhibited autonomy and relatedness within age 18 friendships predicted an altered course of development, specifically predicting relative increases in autonomy and relatedness exhibited with romantic partners between ages 18 and 21. Findings provide further support to the notion that youth enter into romantic relationships with a set of autonomy and relatedness skills that, in part, were developed within early close friendships (Connolly & McIsaac, 2011; Pepler, 2012; Taradash et al., 2001). Moreover, autonomy and relatedness skills were modifiable over the transition to adulthood, and youth's abilities to interact in healthy ways with romantic partners continued to be shaped by whether they interacted in healthy ways with friends.

Third, romantic relationships at age 18 also appeared to offer opportunities to develop and shape autonomy and relatedness skills. Exhibiting greater skill in managing autonomy and relatedness challenges within romantic relationships at age 18 was the strongest predictor of being able to express autonomy and relatedness with both friends and partners at age 21, and predicted relative increases in autonomy and relatedness with close friends between ages 18 and 21. Moreover, the long-term developmental cascade effects from psychological control and friend autonomy and relatedness at age 13 to future autonomy and relatedness with both close friends and romantic partners at age 21 appeared primarily driven by experiences with romantic partners at age 18.

Future research is needed to understand why experiences with romantic partners have the potential to trump experiences with close friends within late adolescence in predicting the quality of friendships in early adulthood. One potential explanation is that by late adolescence, many youth report spending more time with romantic partners than with friends, during which time youth might form a deeper and more intimate connection with partners than friends (Collins & van Dulmen, 2006; Laursen & Williams, 1997). As such, interactions with romantic partners might afford youth more opportunities than interactions with friends to develop autonomy and relatedness skills. In addition, many youth become involved in long-lasting romantic relationships, dating the same partner for multiple months (Carver, Joyner, & Udry, 2003; Collins, 2003). While dating, adolescents are likely to experience changes in their friend network as it becomes more of a mix of

their own friends and friends they meet through their partners. Changes in the friend network might explain why greater autonomy and relatedness with romantic partners at age 18 was a more robust predictor of increases in autonomy and relatedness with friends between ages 18 and 21 than prior experiences with friends at age 18.

Limitations of this study warrant consideration. First, much research on interaction qualities of youth and their romantic partners is based on small sample sizes (e.g., McIsaac et al., 2008; Shulman et al., 1997; Tuval-Mashiach & Shulman, 2006), and our study is also limited in this regard. Romantic relationship quality can only be observed for adolescents who are in such relationships at the time of assessment, which of necessity limits sample size. The small sample size of participant-partner autonomy and relatedness data is somewhat offset by the quality and richness of the data, in that data were measured via observations of participant-partner interactions during disagreements. In addition, we examined data at ages 13, 18, and 21 to represent early adolescence, late adolescence, and early adulthood, but these ages are somewhat arbitrary and might not capture the full range of experiences within each developmental time point. Next, this study was able to identify predictors of relative changes in autonomy and relatedness over the transition to adulthood across different social domains. However, only randomized, controlled intervention studies could identify whether modifying known risk factors would bring about positive changes in relational functioning. Although this longitudinal design could potentially help reject certain causal hypotheses, it cannot establish them.

There are also a few variables not represented in our model that warrant future research attention. First, there are many positive parenting variables that might promote the development of autonomy and relatedness that were not considered in our analyses, including behavioral control and warmth. Future research is needed to examine whether positive parenting might offset certain forms of negative parenting in predicting the quality of future close relationships. Next, experiences within dyadic relationships are by nature influenced by both members of the dyad, and our model did not account for the fact that participants' autonomy and relatedness competencies were likely to be influenced by their friend's or partner's ability to display healthy autonomy and relatedness. In addition, romantic relationship experiences prior to age 18 were not assessed. Nationally representative data suggest that by age 15, nearly half of youth report at least

some involvement in romantic relationships (Carver et al., 2003). Relatedly, we only assessed romantic relationships lasting at least 3 months, but many early romantic relationships last less than 3 months (Carver et al., 2003). Future research is warranted examining the importance of early to mid-adolescent romantic relationship experiences for later relationships with close friends and romantic partners. Participants' ratings of parental psychological control at age 21 were also not assessed, and although young adults might interact less with their parents than when adolescents, there are likely to still be opportunities for parents to exert psychological control. Future research is also needed to determine whether parental psychological control might continue to relate to friend and romantic autonomy and relatedness processes within early adulthood.

Overall, this study provides evidence that the developmental origins of autonomy and relatedness within adulthood close relationships are embedded within early relationships, as young as age 13. Experiences within early relationships did not simply predict the quality of future relationships, but early competencies (or lack thereof) in expressing autonomy and relatedness predicted an altered course of development of adolescents' abilities to manage autonomy and relatedness challenges in future relationships across different social domains.

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