American Psychological Association

Journal of Family Psychology


ISSN: 0893-3200

2020, Vol. 34, No. 3, 312–321
http://dx.doi.org/10.1037/fam0000588

# Dynamics of Mother–Adolescent and Father–Adolescent Autonomy and Control During a Conflict Discussion Task

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Adolescence is characterized by increases in autonomy, yet we have limited knowledge about how parents and adolescents may navigate this transition in real time. We assessed dynamic bidirectional associations between parental behavior—specifically, autonomy support and control—and adolescent autonomy in both mother–adolescent and father–adolescent dyads during a 10-min conflict discussion task ($N$ = 86, 32 girls). Observers rated parental autonomy support, parental control, and adolescent autonomy on 4-point scales in 30-s epochs. Residual dynamic structural equation (RDSEM) models revealed that increases in paternal autonomy support in a given 30-s epoch predicted increases in adolescent autonomy in the next epoch, after controlling for stability in father and adolescent behavior from one epoch to the next. Further, increases in adolescent autonomy in a given 30-s epoch predicted increases in maternal control in the next epoch. Findings highlight the importance of investigating bidirectional associations in parent–adolescent interactions as well as considering the divergent roles that mothers and fathers may play in the socialization of adolescent autonomy.

*Keywords:* autonomy support, parenting, conflict discussion, bidirectional associations, fathers

*Supplemental materials:* http://dx.doi.org/10.1037/fam0000588.supp



Early adolescence is marked by increasing needs for autonomy and individuation from parents, and these changes are likely due to cognitive advances and changes in social relationships (e.g., increasing time spent with peers) during this developmental period (Nelson, Jarcho, & Guyer, 2016; Ryan & LaGuardia, 2000; Zimmer-Gembeck & Collins, 2003). Parents and adolescents need to renegotiate and balance adolescents' and parents' needs for autonomy and authority, respectively, and these changes may result in shifts in the nature and frequency of conflict during parent–adolescent interactions (Allison & Schultz, 2004; Collins, Laursen, Mortensen, Luebker, & Ferreira, 1997; Steinberg, 1990). At the same time, conflict has been recognized as an essential and normative feature of the parent–adolescent relationship (Collins & Steinberg, 2006) and could catalyze the development of autonomy (Collins et al., 1997). Given the changing dynamics of the parent–child relationship during early adolescence, especially in the context of adolescents' growing need for autonomy and heightened levels of parent–adolescent conflict, we aimed to assess the dynamics of parenting behaviors (i.e., autonomy support, control) and children's autonomy during this developmental stage.

## Self-Determination Theory and Parental Autonomy Support and Control

According to Self-Determination Theory (SDT), humans have three basic psychological needs: competence, autonomy, and relatedness (Ryan & Deci, 2000). Parents may facilitate these needs in children and adolescents through the use of autonomy supportive parenting and hinder them through the use of controlling behavior (Ryan & Deci, 2000). SDT postulates that parental au-

This article was published Online First September 2, 2019.

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Preliminary findings from this report were presented at the Society for Research on Adolescence in April 2018. This study was supported by funding from the National Science Foundation (Grant 1539651) to Nancy L. McElwain and Eva H. Telzer and the National Institute of Food and Agriculture, U.S. Department of Agriculture (ILLU-793-339) to Nancy L. McElwain. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the funding agencies or the academic institutions that the authors are affiliated with. We are grateful to the families who participated in this research. We also thank Jordan Bodway and Nina Gupta who played a key role in coordinating and supervising the parent–adolescent laboratory visits, and Aashika Anantharaman, Amber Winters, Mariell Demertzis, Morgan Burshtan, and Zhanea James who assisted with observational coding of parent and adolescent behavior.

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tonomy support, which includes behaviors such as provision of choice and valuing adolescents' ideas, fosters adolescents' feelings of agency over their thoughts and actions, and sense of efficacy about being able to cope with problems (Joussemet, Landry, & Koestner, 2008; Ryan & Deci, 2000). In contrast, parental control, which includes behaviors such as directing the adolescent's actions or making decisions without consulting the adolescent, hinders adolescents' feelings of agency, volition, and effectiveness (Joussemet et al., 2008; Ryan & Deci, 2000).

Consistent with SDT, empirical studies demonstrate a strong link between parental autonomy support or control and adolescent adjustment. Specifically, greater parental autonomy support, as reported by adolescents, has been linked with adaptive functioning, including greater adolescent self-esteem and fewer depressive symptoms (e.g., Duineveld, Parker, Ryan, Ciarrochi, & Salmela-Aro, 2017; Soenens et al., 2007), greater social adjustment (e.g., Brenning, Soenens, Van Petegem, & Vansteenkiste, 2015; Missotten, Luyckx, Branje, & Van Petegem, 2018), and higher adolescent-reported autonomy (Fousiani, Van Petegem, Soenens, Vansteenkiste, & Chen, 2014). In contrast, adolescent-reported parental control has been associated with lack of sympathy and social competence (Hasebe, Nucci, & Nucci, 2004), more depressive symptoms (Laible & Carlo, 2004), and reduced decision-making autonomy (Pérez & Cumsille, 2012).

Although prior studies focus on mothers specifically (e.g., Brenning et al., 2015; Missotten et al., 2018) or do not distinguish between mothers and fathers (e.g., Hasebe et al., 2004; Soenens et al., 2007), parent gender is important to consider when examining the associations between parenting and adolescent autonomy. Drawing from attachment theory, Paquette (2004) posited that mothers may play a more important role in comforting the child when distressed, whereas fathers may provide psychological support for autonomous exploration, thereby referring to the father–child relationship as the *activation relationship*. Compared with mothers, fathers may be more likely to encourage children to take risks and challenge themselves by gaining exposure to new situations and experiences, while setting limits to offer protection (Paquette, 2004).

In support of Paquette's theoretical claims, some studies show that fathers are more likely than mothers to encourage independence and assertiveness among adolescents (Power & Shanks, 1989) and are less engaged and have lower intimacy in relationships with adolescents (Shulman & Klein, 1993), suggesting that fathers are more likely to encourage adolescents' individuation compared with mothers. Indeed, adolescents rated their fathers as being higher on autonomy support than mothers (Kenny & Gallagher, 2002), and fathers' but not mothers' observed autonomy-related parenting behaviors were related to adolescents' adjustment (Allen, Hauser, Bell, & O'Connor, 1994). Other studies of autonomy-related parenting practices, however, have found similar patterns across mothers and fathers (Duineveld et al., 2017; Fousiani et al., 2014) or showed that adolescents' reports of socioemotional functioning (e.g., social competence, self-worth) were related to perceptions of mothers' but not fathers' support and control (Laible & Carlo, 2004; Soenens & Vansteenkiste, 2005). In light of the mixed evidence that has emerged among the few studies examining both maternal and paternal autonomy support and control, further investigations are needed. Additionally, past studies have largely relied on parental and/or adolescent reports. Incorporating observational assessments of parent–adolescent interaction may provide more objective measures of parenting behavior in vivo, which may help to clarify mixed results in prior work.

## Dynamic Approaches to Assessing Parent–Adolescent Interactions

In addition to providing a more objective measure of behavior, observational assessments provide an opportunity to investigate dynamics of parent–adolescent interaction. Momentary fluctuations in affect and behavior during conflict discussions between parents and adolescents are proximal mechanisms that may influence parent–adolescent relationships and adolescent development (Branje, 2018). Specifically, parent–adolescent discussion of divergent opinions is theorized to function as "numerous small dry runs for the adolescent to establish him or herself as an independent adult" (p. 190), which may promote adolescents' long-term development of autonomy and relatedness (Allen et al., 1994). Despite theoretical emphasis on real-time dynamics in parent–adolescent conflict-related discussions, we know little about the extent to which momentary fluctuations in parental autonomy support and control predict adolescent autonomy in real time and vice versa (i.e., fluctuations in adolescent autonomy predicting parenting behavior).

Among the few studies that have utilized a dynamic approach to assessing parent–adolescent interactions, the focus has been on affect and physiological regulation. For instance, mothers' and adolescents' affect in a given minute of a dyadic conflict discussion predicted their interaction partner's physiological regulation in the next minute (Crowell et al., 2014; Cui, Morris, Harrist, Larzelere, & Criss, 2015). These studies suggest that parents and adolescents may influence and be influenced by each other's affect in real time. In addition to affect, it may be important to examine momentary fluctuations in behavior during conflict discussions, particularly with respect to parental autonomy support and control.

## The Current Study

Our main objective was to assess dynamic associations between parental autonomy support (and control) and adolescent autonomy in 30-s epochs during a 10-min conflict discussion task. Although the focus of prior work has largely been on parenting behavior as a predictor of adolescent outcomes, theoretical work and qualitative interviews suggest that adolescents' increasing demands for autonomy may be stressful for parents (Branje, 2018; Montemayor, 1983; Silverberg & Steinberg, 1987; Spring, Rosen, & Matheson, 2002; Steinberg & Silk, 2002). Thus, we also aimed to test an alternate direction of effects in which adolescent autonomy predicted parental autonomy support and control. In assessing bidirectional associations in parent–adolescent interactions, we utilized a statistical framework that segregates within-person fluctuations (i.e., person-specific deviations in one's behavior in a given epoch relative to one's own mean levels of that behavior across the task) from stable, between-person differences in behavior (i.e., mean levels of behavior during the task). We assessed within-person *time-lagged* effects (i.e., parents' or adolescents' behavior in a given 30-s epoch predicting the other's behavior in the next 30-s epoch), after controlling for autoregressive effects (i.e., stability in parent and adolescent behavior).

We had two primary hypotheses with respect to within-person associations. First, consistent with the SDT framework (Ryan &

Deci, 2000) and prior research that parental autonomy support is associated with higher levels of adolescent autonomy (e.g., Fousiani et al., 2014), we hypothesized that increases in parental autonomy support in a given 30-s epoch would predict increases in adolescent expressions of autonomy in the next 30-s epoch. Second, consistent with theory and research that parental control may hinder adolescent autonomy (Joussemet et al., 2008; Pérez & Cumsille, 2012), we hypothesized that increases in parental control in a given 30-s epoch would predict decreases in adolescent expressions of autonomy in the next 30-s epoch. Because of the lack of research on the extent to which adolescent autonomy predicts parenting behavior, this direction of effects was exploratory. With regard to between-person associations, we hypothesized that higher mean levels of parental autonomy support would be associated with higher mean levels of adolescent autonomy, whereas higher mean levels of parental control would be associated with lower mean levels of adolescent autonomy.

Finally, given theoretical work indicating that fathers and mothers may play distinct roles in supporting adolescent autonomy (Paquette, 2004), we examined hypothesized associations for both mother–adolescent and father–adolescent dyads. However, in light of mixed evidence regarding differences by parent gender (e.g., Allen et al., 1994; Duineveld et al., 2017; Fousiani et al., 2014; Hasebe et al., 2004; Kenny & Gallagher, 2002) and given the complexity of the models to be tested as well as the limited number of families in which both parents participated, we tested mother–adolescent and father–adolescent bidirectional associations in separate models.

## Method

### Participants

Eighty-six adolescents (32 females) and their parents participated in the current study. Sixty-seven families had participated in earlier phases of a longitudinal study of social development (see McElwain, Holland, Engle, & Wong, 2012) and were recruited to participate in a follow-up study of family relationships and adolescent adjustment. An additional 19 families were recruited to participate in the adolescent phase of the study. Adolescents ranged between 12.3 and 14.8 years of age ($M$ = 13.29 years, $SD$ = .60). Mothers averaged 43.2 ($SD$ = 5.3) years of age and 16.4 years of education ($SD$ = 1.8). Fathers averaged 45.1 ($SD$ = 5.4) years of age and 15.6 years of education ($SD$ = 2.4). Mothers and fathers identified as 1.2 and 3.7% African American, 0.8 and 1.9% Asian American, 89.3 and 92.5% White non-Hispanic, 2.4 and 0% Hispanic, and 2.4 and 1.9% more than one race, respectively. The median family income was $90,000 ($SD$ = $12,000). Data for the conflict discussion task were available for 84 mother–adolescent dyads and 37 father–adolescent dyads. In 35 cases, both mothers and fathers participated in the behavioral session. In 49 cases, only the mother participated in the behavioral session because the father was not living in the home ($n$ = 14) or was not interested or able to participate due to scheduling issues ($n$ = 35). In two cases, only the father participated in the behavioral session because the mother had scheduling issues. This study was approved by the Institutional Review Board at the University of Illinois at Urbana-Champaign.

Comparisons between families who participated in the earlier study phases versus families who participated in the adolescent phase only indicated no significant differences between the two groups on the study measures during the mother–adolescent discussion, although mothers who participated in the adolescent phase only had higher number of years of education than mothers who participated in the earlier phase, $t(82) = -.22$, $p = .03$. Comparisons between families with versus without father participation indicated no significant differences on the main study variables or family demographics (i.e., parental education, family income).

### Study Overview

Adolescents and parents participated in a 90-min behavioral visit in an observational laboratory resembling a home environment (e.g., living room, dining area, and functional kitchen), in which multiple remote-controlled cameras were mounted unobtrusively throughout the space. During the first part of the behavioral visit, parents and adolescents were observed during a series of dyadic and triadic (when both mothers and fathers participated) interactive sessions. During the second half of the behavioral visit, a trained research assistant administered assessments of expressive language ability and family relationships to the adolescent. Data obtained from the dyadic conflict discussion task were utilized for this report.

### Observational Procedure and Measures

After a brief overview of the visit, mother–adolescent and father–adolescent dyads were each observed during a 10-min discussion task. Parent–adolescent dyads were given a set of 15 cards. Each card listed a common area of conflict among teens and their parents (e.g., chores, homework, cellphone use), and dyads were instructed to select three issues of mutual disagreement from the set of cards, talk about each of the three issues and attempt to make progress toward a resolution. The task was designed not to elicit high levels of conflict, but to capture individual differences in how parents and adolescents discuss common issues of conflict. Two sets of 15 cards with different topics were available for families in which both mothers and fathers participated. The set of cards and order of mother/father discussions (when applicable) were counterbalanced across families. For visits in which both the mother and father were present, the father completed questionnaires in a separate room during the mother–adolescent conflict discussion task and vice versa. Across the full sample, parent–adolescent dyads discussed a wide range of the topics provided, with mother–teen and father–teen dyads discussing a total of 29 and 26 of the 30 possible topics, respectively. For teens' discussions with both mothers and fathers, the most frequent topics discussed were sibling conflict (8.2 and 7.2% of all observed epochs, mothers and fathers respectively), chores (5.2 and 4.9%) and cleaning room (5.2 and 4.7%; see online supplemental materials for epoch-level frequencies for all topics).

From digital recordings of the conflict discussion task, independent teams of trained coders (who were "blind" to other study data) assessed adolescent and parent behaviors, respectively. Furthermore, for cases in which both parents participated, different coders within the adolescent team assessed the same adolescent interacting with the mother and father, and different coders within the

parent team assessed the mother and father in the same family. In this report, we examined the following three behavioral codes, which were modified from work by Allen et al. (1994; Allen, Chango, Szwedo, Schad, & Marston, 2012): adolescent autonomy, parental support of autonomy, and parental control. Each behavior was coded in 30-s epochs on 4-point scales, ranging from 0 (*not characteristic*; no instances of behavior observed during the epoch) to 3 (*very characteristic*; multiple and/or high levels of behavior observed during the epoch). Ratings took into account both the frequency and quality of behavior. Epochs were synchronized in time across adolescent and parent behaviors using Datavyu (Datavyu Team, 2014), a computerized video coding tool.

*Adolescent autonomy* captures the degree to which the adolescent asks questions related to the conflict topic or discussion, states reasons clearly for disagreeing with the parent, attempts to be persuasive regarding his or her position in the disagreement, displays confidence in stating his or her thoughts and opinions during the conflict discussion, and initiates the choice of the conflict topic/s to be discussed and/or resolutions to be considered. *Parental autonomy support* reflects the degree to which the parent behaves in ways that recognize and respect the adolescent's individuality. A parent high on autonomy support encourages the adolescent to express his or her thoughts and opinions, validates the teen's thoughts and emotions, engages in a reasoned discussion of the conflict topic at hand, and mutually negotiates solutions with the teen. *Parental control* captures parent-centered behavior, in which the parent focuses on his or her own agenda without considering the teen's perspective. Control includes instances in which the parent makes demands of the teen that allows little or no room for discussion and directs the interaction such that the adolescent has little opportunity to choose the topic to be discussed or make decisions about the resolution. Parental control also includes lecturing and/or telling the adolescent what or how to think. Control is coded on the basis of the demanding quality with which parental recommendations are expressed, even if those recommendations are meant for the well-being or benefit of the teen.

Discussion of conflict during the task was defined as any discussion pertaining to a disagreement or description of a problem (even if the problem or conflict was not between the parent and adolescent, e.g., describing a problem with a friend at school). In some instances, dyads completed the discussion task early or switched to unrelated topics during the conflict discussion. In 30-s epochs when dyads discussed topics unrelated to the conflict task (e.g., comments about objects in the room, making plans for later in the day), both parent and adolescent behavior were coded as missing.

Observers were trained on a subsample of tapes until interobserver agreement was 80% or higher. Interobserver reliability was assessed throughout the coding process, and 20% of all observational protocols (i.e., 16–18 out of 84 protocols for mother–adolescent dyads and 8 out of 37 for father–adolescent dyads) were double coded by pairs of raters on the team. Discrepancies were discussed during weekly meetings and consensus was reached on ratings. Single-measure intraclass correlations (ICCs), utilized to assess interobserver agreement, were .67 and .67 for adolescent autonomy with mothers and fathers, respectively, .69 and .69 for parental autonomy support, and .69 and .52 for parental control. All ICCs were considered "adequate" (see Hallgren, 2012) for all codes except for paternal control, which was considered "fair." We suspect that the lower ICC for paternal control was due to a combination of (a) lower number of participating father–adolescent dyads ($N = 37$ vs. 84 mother–adolescent dyads), resulting in fewer paternal cases that were double-coded ($N = 8$) and (b) the relatively low levels of control displayed in this sample overall.

Conflict discussion tasks, like the one used in the current study, have been shown to elicit a range of positive and negative interactions among parents and adolescents (e.g., Allen et al., 2012; Gaté et al., 2013). Further, parent autonomy support and control and adolescent autonomy assessed during conflict discussion tasks have shown expected associations with adolescent adjustment (e.g., Allen et al., 1994, 2012).

## Data Analytic Strategy

We first conducted preliminary analyses to estimate the proportions of between- and within-person variability in parent and adolescent behaviors by computing intraclass correlations (ICCs) from random intercept models. Next, comparisons were conducted to assess whether mean levels of parent and adolescent behavior during the discussion task varied as a function of (a) the deck of discussion cards used and (b) order of the discussion (first vs. second) for families in which both parents participated. Paired *t* tests were also conducted to examine whether there were significant differences in mean levels of behavior during mother–adolescent versus father–adolescent discussions. Finally, demographic characteristics (e.g., adolescent gender, parent education, family income) were examined as potential covariates.

To assess bidirectional associations between parent and adolescent behavior across the 30-s intervals, four residual dynamic structural equation models (RDSEM) were estimated in Mplus Version 8.1 (Muthén & Muthén, 1998–2018). Dynamic structural equation modeling combines concepts from both structural equation modeling and time-series analyses and is specifically designed to be used with intensive longitudinal assessments (Asparouhov, Hamaker, & Muthén, 2018). RDSEM permits estimating within-person autoregressive and cross-lagged regressions between the residuals (vs. observed variables; see Asparouhov & Muthén, 2018 for more details about this approach). We first tested within-person bidirectional effects between adolescent autonomy and (a) maternal autonomy support (Model 1) and (b) maternal control (Model 2). A parallel set of models assessed within-person bidirectional effects between adolescent autonomy and (a) paternal autonomy support (Model 3) and (b) paternal control (Model 4). For all models, Parameter Scale Reduction (PSR) values were used to evaluate convergence. PSR values equal or close to 1 indicate good convergence (Muthén, 2010).

In each model, Level 1 (within-person) paths were estimated from (a) parental behavior in epoch *t-1* predicting adolescent autonomy in the subsequent epoch *t*, and (b) adolescent autonomy in epoch *t-1* predicting parental behavior in the subsequent 30-s epoch *t*. Additionally, to account for stability in parent and teen behavior across epochs, we estimated autoregressive effects of adolescent autonomy and parental behavior (i.e., regressing one's behavior in epoch *t* on their behavior in epoch *t-1*). RDSEM uses latent centering for all within-person lagged predictors (i.e., adolescent autonomy and parent behavior in epoch *t-1*). Latent centering is superior to observed centering because it accounts for

sampling error in the mean estimates, whereas observed centering uses the cluster sample mean (i.e., person mean; see Asparouhov & Muthén, 2019). Finally, to account for the concurrent association between adolescent autonomy and parental behavior in each model, we estimated a covariance between adolescent autonomy and parental behavior within the same 30-s epoch at Level 1. A covariance between mean levels of parent and adolescent behavior averaged across the conflict discussion was estimated at Level 2 (between-person). Random effects (i.e., between-person variances) of Level 1 paths (i.e., lagged and autoregressive effects) and covariances between random effects were estimated at Level 2.

To examine whether our associations were influenced by broader temporal trends, unconditional models estimating linear and quadratic change in the variables across the conflict discussion task were estimated. These models revealed small but significant changes in growth. To account for these trends, we followed the detrending procedure recommended by Curran and Bauer (2011), and differenced epoch-level estimates from overall trends (both linear and quadratic) for each individual. Results remained the same when models were tested with the detrended data. Because autoregressive or cross-lagged effects were not influenced by broader temporal trends, we present models with the raw epoch-level data for simplicity.

With respect to missing data, mother–adolescent dyads were observed for a total of 1,673 epochs (84 dyads × 19–20 epochs per dyad), out of which 63 epochs were coded as missing due to mother–adolescent interaction that was not relevant to the conflict discussion task (final $n$ = 1,610 epochs). Father-adolescent dyads were observed for a total of 714 epochs (37 dyads × 19–20 epochs per dyad), out of which 52 epochs were coded as missing (final $n$ = 662 epochs). RDSEM uses a Bayesian estimator, in which estimates are based on all data available and unbiased by missingness (Asparouhov & Muthén, 2010).

## Results

### Preliminary Analyses

Descriptive statistics and intercorrelations for the between-person raw scores of parent and adolescent behavior (i.e., ratings averaged across all epochs) are reported in Table 1. Paired $t$ tests revealed that mothers had higher mean levels of autonomy support compared with fathers, $t(34) = 2.34$, $p = .03$, and adolescents displayed higher mean levels of autonomy with mothers than with fathers, $t(34) = 3.03$, $p = .01$. Mothers and fathers did not significantly differ on mean levels of control, $t(34) = 1.34$, $p = .19$; see Table 1 for Means by parent gender. In Table 1, we also report the range of epoch-level means and standard deviations across participants.

To assess the amount of within- and between-person variability in each variable, we tested random intercept models for each behavioral measure. ICCs for maternal autonomy support and control were .08 and .16, respectively, indicating that 8 and 16% of the variation was between mothers (i.e., individual differences in maternal autonomy support and control, respectively) and 92 and 84% of the variation was within mothers (i.e., time-specific deviations from the mother's own mean level of autonomy support and control, respectively). ICCs for paternal autonomy support and control were .06 and .13, respectively, indicating that 94 and 87% of the variation was within fathers. For adolescents, random intercept models indicated that autonomy with mothers and fathers was .14 and .12, respectively, implying that 86 and 88% of the variation was within adolescents. In sum, ICCs for all variables revealed that a considerable proportion of the variance was within person.

Adolescent gender and age and family income were unrelated to any of the study variables and were therefore not included in the model tests. Paternal education was unrelated to father or teen behavior during the father–adolescent discussion, however mothers' education was related to less maternal control during the mother–adolescent discussion, $r = -.25$, $p = .02$. We note that the pattern of results in the model examining maternal control (i.e., Model 2 in Table 2) remained the same after controlling for mothers' education. Maternal autonomy support and control, paternal autonomy support, and adolescent autonomy with mothers and fathers did not differ as a function of the deck of "conflict issue" cards used ($t$s ≤ 1.22, $p$s ≥ .23). However, paternal control did significantly differ as a function of card deck, $t(35) = .2.28$, $p = .032$. We note that the pattern of results in the model exam-

Table 1
*Between-Person Correlations and Descriptive Statistics Among Study Variables*

| Measures | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Maternal autonomy support | — | | | | | |
| 2. Maternal control | −.08 | — | | | | |
| 3. Adolescent autonomy with mother | −.05 | −.15 | — | | | |
| 4. Paternal autonomy support | .31† | .04 | −.04 | — | | |
| 5. Paternal control | .28† | .31† | −.21 | .09 | — | |
| 6. Adolescent autonomy with father | −.07 | .13 | .59*** | −.19 | −.28† | — |
| Average across epochs | | | | | | |
| *N* | 84 | 84 | 84 | 37 | 37 | 37 |
| *M* | .99 | .52 | 1.41 | .79 | .42 | 1.17 |
| *SD* | .38 | .36 | .44 | .33 | .32 | .43 |
| Range | .20–2.11 | 0–1.75 | .37–2.44 | .21–1.56 | 0–1.15 | .54–2.15 |
| Range of epoch ratings | | | | | | |
| *Ms* | .52–1.35 | .17–.68 | 1.05–1.63 | .37–1.09 | .13–.66 | .71–1.46 |
| *SDs* | .72–1.16 | .49–.93 | .91–1.17 | .63–1.10 | .34–.93 | .84–1.20 |

*Note*. The descriptive statistics and correlations provided here were obtained from mean scores (i.e., ratings averaged across the conflict discussion tasks). The range of epoch ratings depict the ranges across 30-sec epochs for all participants.
† $p < .10$. *** $p < .001$.

Table 2
*Cross-Lagged, Bidirectional Effects Between Adolescent Autonomy and Maternal Behavior in Real Time (N = 84 Dyads)*

| Parameters | Model 1 Maternal autonomy support and teen autonomy | | | Model 2 Maternal control and teen autonomy | | |
|---|---|---|---|---|---|---|
| | Est. ($SD_{posterior}$) | *p* | 95% CI | Est. ($SD_{posterior}$) | *p* | 95% CI |
| Level 1 | | | | | | |
| Maternal behavior$_{t-1}$ → maternal behavior$_t$ | .072 (.035) | .04 | [.003, .141] | .141 (.042) | <.001 | [.062, .226] |
| Teen autonomy$_{t-1}$ → Teen autonomy$_t$ | .109 (.033) | <.001 | [.044, .174] | .118 (.033) | <.001 | [.054, .183] |
| Maternal behavior$_{t-1}$ → Teen autonomy$_t$ | .058 (.036) | .10 | [−.011, .128] | .031 (.051) | .55 | [−.070, .130] |
| Teen autonomy$_{t-1}$ → maternal behavior$_t$ | .007 (.036) | .85 | [−.064, .077] | .058 (.023) | .01 | [.012, .104] |
| WP covariance: maternal behavior and teen autonomy | .097 (.025) | <.001 | [.048, .146] | .007 (.018) | .70 | [−.030, .042] |
| Level 2 | | | | | | |
| Intercept (mean): maternal behavior | .985 (.047) | <.001 | [.895, 1.077] | .515 (.043) | <.001 | [.433, .603] |
| Intercept (mean): teen autonomy | 1.401 (.054) | <.001 | [1.295, 1.507] | 1.402 (.053) | <.001 | [1.297, 1.507] |
| BP covariance: maternal behavior and teen autonomy | −.018 (.025) | .46 | [−.068, .032] | −.032 (.023) | .13 | [−.080, .011] |

*Note*. Lagged terms for maternal behavior and teen autonomy (t − 1) were latent-mean centered for the model tests. Variances (i.e., random effects) of the Level 1 parameters and covariances between them were estimated for each model but are not shown. All variances were significant, and all covariances but one (in Model 1) were nonsignificant.



ining paternal control (i.e., Model 4 in Table 3) remained the same after controlling for card deck. For families in which both parents participated, maternal, paternal, and adolescent behaviors during the conflict discussion did not significantly differ as a function of parent order ($ts \leq 1.80$, $ps \geq .09$). We therefore did not control for parent order in our main model tests.

## Main Model Tests

Results from the four RDSEM models assessing bidirectional associations in (a) parental autonomy support and adolescent autonomy, and (b) parental control and adolescent autonomy are summarized below for mother–adolescent and father–adolescent dyads, respectively. Standardized estimates are reported in the text below, and unstandardized estimates are reported in Tables 2 and 3. All four models showed good convergence, with PSR values ranging from 1.002–1.005.

**Maternal autonomy support and adolescent autonomy.** Mothers and adolescents both showed significant stability in their behavior from one epoch to the next (βs = .38 and .76 for mothers and adolescents, respectively; see Model 1 in Table 2). Additionally, the within-level covariance between maternal autonomy support and adolescent autonomy within the same 30-s epoch was significant, such that higher levels of maternal autonomy support in a given epoch (relative to the mother's mean level of autonomy support across the entire task) was associated with higher levels of adolescent autonomy in the same 30-s epoch ($\delta_{standardized} = .10$). However, the cross-lagged effects between maternal autonomy support and adolescent autonomy were nonsignificant (βs = .27 and .03 for mother → adolescent and adolescent → mother paths, respectively). The between-person covariance between maternal autonomy support and adolescent autonomy was also nonsignificant ($\varphi_{standardized} = -.14$).

**Maternal control and adolescent autonomy.** Mothers and adolescents both showed significant stability in their behavior from one epoch to the next (βs = .80 and .71 for mothers and adolescents, respectively; see Model 2 in Table 2). Maternal con-

Table 3
*Cross-Lagged, Bidirectional Effects Between Adolescent Autonomy and Paternal Behavior in Real Time (N = 37 Dyads)*

| Parameters | Model 3 Paternal autonomy support and teen autonomy | | | Model 4 Paternal control and teen autonomy | | |
|---|---|---|---|---|---|---|
| | Est. ($SD_{posterior}$) | *p* | 95% CI | Est. ($SD_{posterior}$) | *p* | 95% CI |
| Level 1 | | | | | | |
| Paternal behavior$_{t-1}$ → paternal behavior$_t$ | .058 (.063) | .34 | [−.065, .185] | .123 (.069) | .07 | [−.009, .262] |
| Teen autonomy$_{t-1}$ → Teen autonomy$_t$ | .044 (.07) | .51 | [−.096, .183] | .070 (.068) | .28 | [−.061, .203] |
| Paternal behavior$_{t-1}$ → Teen autonomy$_t$ | .145 (.062) | .02 | [.024, .265] | .011 (.089) | .89 | [−.166, .190] |
| Teen autonomy$_{t-1}$ → paternal behavior$_t$ | −.074 (.061) | .21 | [−.197, .048] | .051 (.049) | .29 | [−.048, .145] |
| WP covariance: paternal behavior and teen autonomy | .143 (.035) | <.001 | [.076, .21] | .018 (.027) | .50 | [−.033, .072] |
| Level 2 | | | | | | |
| Intercept (mean): paternal behavior | .786 (.069) | <.001 | [.654, .927] | .402 (.068) | <.001 | [.266, .532] |
| Intercept (mean): teen autonomy | 1.163 (.094) | <.001 | [.982, 1.35] | 1.153 (.093) | <.001 | [.966, 1.338] |
| BP covariance: paternal behavior and teen autonomy | −.045 (.052) | .28 | [−.162, .047] | −.065 (.05) | .10 | [−.184, .017] |

*Note*. Lagged terms for paternal behavior and teen autonomy (t − 1) were latent-mean centered for the model tests. Variances (i.e., random effects) of the Level 1 parameters and covariances between them were estimated for each model but are not shown. All variances were significant, and all covariances were nonsignificant.

trol in a given 30-s epoch was unrelated to adolescent autonomy in the same epoch ($\delta_{standardized} = .01$) and did not predict adolescent autonomy in the next epoch ($\beta = .13$). However, increases in adolescent autonomy in a given 30-s epoch (relative to the adolescent's mean level of autonomy) predicted subsequent increases in maternal control in the next epoch ($\beta = .61$). The between-person association between maternal control and adolescent autonomy was nonsignificant ($\varphi_{standardized} = -.25$).

**Paternal autonomy support and adolescent autonomy.** Neither fathers nor adolescents showed stability in behavior from one epoch to the next ($\beta$s = .16 and .24 for fathers and adolescents, respectively; see Model 3 in Table 3). Similar to the model for maternal autonomy support, the within-level covariance between paternal autonomy support and adolescent autonomy within the same epoch was significant, such that higher levels of paternal autonomy support in a given epoch was associated with higher levels of adolescent autonomy in the same 30-s epoch ($\delta_{standardized} = .17$). Additionally, when fathers showed increases in autonomy support in a given 30-s epoch (relative to the father's mean level of autonomy support across the entire task), adolescents showed increases in autonomy in the next 30-s epoch ($\beta = .68$). Adolescent autonomy did not predict subsequent change in paternal autonomy support ($\beta = -.31$), and the between-person covariance between paternal autonomy support and adolescent autonomy was also nonsignificant ($\varphi_{standardized} = -.32$).

**Paternal control and adolescent autonomy.** Fathers and adolescents did not show significant stability in behavior from one epoch to the next ($\beta$s = .48 and .25 for fathers and adolescents, respectively; see Model 4 in Table 3). The within-level contemporaneous covariance between paternal control and adolescent autonomy ($\delta_{standardized} = .03$), the cross-lagged effects ($\beta$s = .04 and .23 for father → adolescent and adolescent → father paths, respectively), and the between-person covariance ($\varphi_{standardized} = -.45$) were all nonsignificant.

## Discussion

Theoretical models postulate that parental autonomy support facilitates autonomous exploration in adolescence and that parental control hinders autonomy (Steinberg, 1990; Ryan & Deci, 2000). Using observational assessments, we tested these theoretical claims by assessing time-lagged effects between parental and adolescent behavior in real time. Our study was unique in that we also assessed the extent to which changes in adolescent autonomy predicted subsequent changes in parenting. Further, we examined these effects in a developmentally relevant context (i.e., a conflict discussion) during early adolescence, a time when the frequency and content of conflict between parents and adolescents may shift because of adolescents' growing need to establish autonomy and parents' desire to maintain control (Allison & Schultz, 2004; Collins et al., 1997; Steinberg, 1990). Finally, we assessed bidirectional effects in both mother–adolescent and father–adolescent dyads. Findings provide partial support for our hypotheses and align with prior work indicating that mothers and fathers may play divergent roles in the socialization of adolescent autonomy (e.g., Paquette, 2004; Kenny & Gallagher, 2002). Specifically, increases in paternal autonomy support was more likely to predict subsequent increases in adolescent autonomy, whereas increases in adolescent autonomy were more likely to predict subsequent increases in maternal control. Below, we first discuss these two key findings, followed by a discussion of null results.

Consistent with Ryan and Deci's (2000) self-determination theory, within-father increases in autonomy support in a given epoch predicted increases in adolescent autonomy in the next epoch. Paternal autonomy support may promote adolescents' autonomous exploration in real time by fulfilling adolescents' sense of efficacy and volition (Joussemet et al., 2008; Ryan & Deci, 2000). However, this finding was specific to fathers, as maternal autonomy support did not predict subsequent changes in adolescent autonomy. Fathers, in particular, are posited to play a facilitative role in the development of children's autonomy (Paquette, 2004). Fathers encourage more independence and assertiveness and foster greater distance in their relationships with their adolescent children compared with mothers (Power & Shanks, 1989; Shulman & Klein, 1993). Fathers (vs. mothers) are also perceived by adolescents to be higher on fostering autonomy (Kenny & Gallagher, 2002). Thus, adolescents may be more encouraged to engage in autonomous exploration following momentary increases in paternal autonomy support. These findings are consistent with a prior study showing that paternal autonomy support, and not maternal autonomy support, predicted adolescent ego development and self-esteem (Allen et al., 1994; but see Duineveld et al., 2017; Fousiani et al., 2014).

An alternative interpretation of this findings centers on the average levels of autonomy support as well as stability (or lack thereof) in behavior observed across mother– and father–adolescent dyads. That is, mothers displayed higher mean levels of autonomy support compared with fathers, and mothers and adolescents showed stability from one epoch to the next in autonomy support and autonomy, respectively. In contrast, adolescents' and fathers' behavior did not show significant stability across epochs (i.e., autoregressive paths were weak and nonsignificant). Because mothers may be more consistently involved in adolescents' everyday lives and have greater intimacy with adolescents than fathers (Shulman & Klein, 1993), adolescents' interactions with mothers versus fathers may be more supportive, stable, and predictable. At the same time, because fathers may engage in less frequent and/or less predictable displays of autonomy support, momentary increases in paternal autonomy support may be especially salient to adolescents when they do occur, resulting in increases in adolescent expressions of autonomy. Empirical studies assessing other aspects of the parent–adolescent relationship and adolescent outcomes provide some support for this idea. For instance, although parental acceptance and adolescent-reported satisfaction of parental support and relationship quality tends to be higher for mothers than for fathers, higher paternal acceptance and greater satisfaction with fathers uniquely predict higher psychological well-being in adolescents (Barrera & Garrison-Jones, 1992; Forehand & Nousiainen, 1993; Videon, 2005). Thus, low overall levels of paternal engagement and intimacy may amplify the impact of paternal supportive behaviors. Our findings extend this prior work by demonstrating the potential influence of paternal behavior on adolescent functioning in real time.

Interestingly, although maternal behavior did not predict subsequent changes in adolescent autonomy, within-person increases in adolescent autonomy predicted subsequent increases in maternal control. This is the first study, to our knowledge, to assess the extent to which momentary fluctuations in adolescent autonomy

predict parenting behavior. Prior empirical and theoretical work indicates that adolescents' increasing demands for autonomy may be challenging for parents because such demands threaten parental authority (Branje, 2018; Montemayor, 1983; Silverberg & Steinberg, 1987; Spring et al., 2002; Steinberg & Silk, 2002). Our finding suggests that mothers may be calibrated to adolescents' average levels of autonomy and experience the need to reestablish authority by responding in a more controlling manner when adolescents show increases in autonomy beyond their average levels. Mother–adolescent (vs. father–adolescent) relationships tend to be characterized by more conflict and intimacy (Shulman & Klein, 1993) and, thus, adolescents may feel more comfortable challenging their mothers than their fathers. At the same time, mothers are more likely to expect adolescent dependence (Collins & Russell, 1991; Shulman & Klein, 1993), suggesting that adolescent individuation from mothers compared with fathers may be more conflictual. Thus, mothers may have more opportunities to observe adolescents' increasing autonomy in early adolescence and may perceive adolescent autonomy to be a greater threat than fathers, and as a result, respond in a more controlling manner to increases in adolescent autonomy.

Counter to our hypotheses, within- and between-person covariances between parental control and adolescent autonomy were nonsignificant. Although past empirical work has demonstrated that adolescents' perceived parental control predicts lower levels of autonomy among adolescents, prior studies differentiating between behavioral and psychological control have yielded mixed findings, such that higher behavioral control and lower psychological control predict less antisocial behaviors (Brauer, 2017). In contrast, studies utilizing observational assessments similar to those used in the current report have reported null or weak associations between parental control and concurrent adolescent outcomes (Allen et al., 1994; Kunz & Grych, 2013). Although observational methods provide rich and nuanced insights into parent–adolescent interactions, controlling behaviors may be suppressed when parents and adolescents are being observed in a laboratory setting, and self-reports may capture behaviors across a wider range of contexts. Some researchers have also argued that subjective perceptions of parental control, as compared with "objective" measures of controlling behavior, may be more central to how adolescents respond to their parents (Plunkett, Henry, Robinson, Behnke, & Falcon, 2007).

Similar to the models examining parental control, we did not find significant between-person associations between parental autonomy support and adolescent autonomy. The sample was relatively homogenous and affluent, which may have resulted in low between-person variability in both autonomy support and control as indicated by our preliminary analyses (i.e., ICCs ranged from .06 to .16). Thus, the null findings for between-person associations in the main model tests may likely be because there was a low level of variability at the between-person level. However, significant within-person associations in the same 30-s epoch emerged between autonomy support and adolescent autonomy for both mothers and fathers. Although we cannot specify the direction of the effects from these contemporaneous associations, these findings suggest a positive coupling of these behaviors in real time for both mother–adolescent and father–adolescent dyads.

This study is not without limitations. First, the sample was predominantly Caucasian, well-educated, and middle-class and the findings cannot be generalized to families of different ethnic, cultural, or socioeconomic backgrounds. Because parental autonomy support and control may be conceptualized and appraised differently in non-Western cultural contexts (Soenens, Vansteenkiste, & Van Petegem, 2015), different patterns of results may emerge in other cultural contexts. Second, the sample size was relatively small, especially for examination of father–adolescent dyads, and power to detect between-person associations was thereby limited. Yet, we obtained approximately 20 time points per dyad, which—when combined with our sample size—provided adequate power to test the within-person associations of interest. Third, although inclusion of both mothers and fathers in this study is a notable strength, we focused here on parent–adolescent dyadic interactions. Different dynamic interaction patterns may emerge when behaviors are examined in the context of mother–father–adolescent triadic interactions. Fourth, we used 30-s epochs for coding parent and adolescent behaviors because this epoch length was sufficient to assess the quality of parental and adolescent behaviors using a continuous rating scale, yet brief enough so that multiple exchanges between dyad members did not take place. However, developmental theory does not pinpoint a specific time lag when assessing dynamics of parent–adolescent interactions, and similar studies have used longer epochs (e.g., 60 s; Crowell et al., 2014; Cui et al., 2015). Finally, although dyads were asked to discuss their top three topics of disagreement, we did not measure parents' or adolescents' perceptions of conflict intensity for the topics selected. It is possible that associations between parental autonomy support (or control) and adolescent autonomy may vary as a function of perceived conflict intensity, and such perceptions should be considered in future research.

Despite these limitations, this study contributes to prior theory and research on autonomy development during adolescence by using a novel approach to assess adolescents' autonomous behavior in real time with both mothers and fathers. Further, comparing parents and adolescents to their own mean levels of behavior and assessing temporal associations between constructs increases confidence in drawing inferences about the "direction of effects" by eliminating the influence of stable, dispositional characteristics (e.g., socioeconomic status, sex; Bolger & Laurenceau, 2013). Findings suggest that mothers may be more likely to engage in behaviors that reestablish authority following momentary increases in adolescent autonomy, and paternal autonomy support may be associated with adolescent exploration of autonomy in real time. Thus, both mothers and fathers may play important but divergent roles in the socialization of adolescent autonomy. An important next step will be to investigate whether such real-time dynamics vary as a function of adolescent, parent, or relationship characteristics (e.g., pubertal status, mental health, frequency and intensity of conflict experienced in the parent–adolescent relationship) and the extent to which these dynamic patterns predict adolescent adjustment longitudinally. Furthering our understanding of parent–adolescent dynamics can ultimately inform interventions to help families successfully navigate normative conflict that may peak during early adolescence.

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Received February 11, 2019
Revision received June 7, 2019
Accepted July 15, 2019 ■