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Interparental Boundary Problems, Parent-Adolescent Hostility, and Adolescent-Parent Hostility: A Family Process Model for Adolescent Aggression Problems

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Abstract

This study tests interparental boundary problems (IBPs), parent hostility with adolescents, and adolescent hostility with parents within a reciprocal influence model and tests each as risk factors for adolescent aggression problems. Prospective, longitudinal analyses were conducted with multi-informant data from 768 adolescents and their families, from 6th to 9th grade. Guided by spillover and social learning perspectives, our findings suggest that IBPs have a robust, negative influence on both parent and adolescent hostility. In turn, adolescent hostility was the best predictor of global adolescent aggression problems. Two indirect effects were found that link IBPs and adolescent aggression problems; however, findings indicate that adolescent hostile behavior in the family is the key risk indicator for adolescents' later aggression problems. Model invariance tests revealed that this model was not different for boys and girls, or for adolescents in families with two biological parents and youth in families with two caregivers (e.g. stepparent families).

Introduction

Poorly regulated conflict in the interparental relationship is a long-recognized risk factor for child and adolescent aggression problems (e.g., Buehler et al., 1997). Several mechanisms have been identified to explain this association; among the most prominent are those identifying family processes that account for the transmission of risk from interparental functioning to adolescent aggression problems. A *spillover perspective* (Erel & Burman, 1995) argues that mood or affect is transferred from one relationship to another. From this perspective, parents in distressed interparental relationships are more likely to be angry and hostile with their adolescents, which places adolescents at risk for adjustment problems. A *social interaction learning perspective* (Patterson, Reid, & Dishion, 1992) emphasizes the role of contingencies in family interactions that reinforce hostile or aversive adolescent behavior. Within the family, adolescents' hostile or angry behavior toward parents may be reinforced if such behavior serves to disrupt parental disagreements (Minuchin, 1974). To date, these two processes have only been studied separately, obscuring the relative impact of

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each for adolescent development. The current study aims to fill this gap by examining the inter-relations among interparental boundary problems, parent hostility towards their adolescent, and adolescent hostility towards their parents, and the unique implications of these three processes for adolescent aggression problems.

Adolescence is a particularly important time for the study of family dynamics that underlie parent-adolescent conflict and their relations to adolescent aggression problems. This developmental period is characterized by the reorganization of parent-adolescent relationships; families of adolescents are faced with the challenge of adapting to adolescents' growing needs for privacy and autonomy while maintaining appropriate supervision, structure, and guidance (Dishion, Nelson, & Bullock, 2004; Hawk et al., 2008; Laursen & Collins, 2009; Laursen, Coy, & Collins, 1998). Increases in the frequency of parent-adolescent conflict are common during this period (Collins & Laursen, 2006, Laursen et al., 1998); however, adolescents who experience particularly intense and hostile conflicts with their parents are at greater risk for adjustment problems, particularly aggression problems (Laursen & Hafen, 2010). To identify ways of differentiating normative changes in parent-adolescent conflict from problematic risk processes in the family, we look beyond the parent-adolescent dyad to consider the broader family context in which parent-adolescent interactions occur.

From a family systems framework, parent-adolescent relationships are nested within a broader system of interdependent family relationships and these relationships affect and are affected by the quality of other relationships in the family (Minuchin, 1985). The interparental relationship plays an important leadership function in the family, helping guide effective parenting practices and helping maintain appropriate boundaries around the interparental relationship (Feinberg, 2002; Minuchin, 1974). Further, the management of interparental boundaries plays a critical role in setting the tone for the quality of other family relationships; a failure to do so can reverberate throughout the family system (Cowan et al., 2002; Fosco & Grych, 2013). In this study, we focus on *interparental boundary problems*, characterized by family dynamics in which interparental conflict frequently occurs in front of the adolescent, and/or results in triangulating the adolescent into the parents' conflicts, as a key risk factor for disrupted parent-adolescent relationships, and ultimately for adolescent aggression problems.

Interparental boundary problems (IBPs) typically arise in the context of a distressed marital relationship and are marked by parents having difficulty managing their disagreements and keeping their marital problems compartmentalized, or separate, from their children (Bell, Bell, & Nakata, 2001). IBPs are problematic for adolescent development in at least two important ways. Poor boundaries that involve frequent arguments in front of youth, expose them to hostility between parents, which is a well-documented risk factor for child and adolescent aggression or externalizing problems (Gerard & Buehler 1997; Grych & Fincham, 1990; Grych, Oxtoby, & Lynn, 2013). Youth may also become involved in parental conflicts by taking sides (e.g., alliance formation), attempting to solve disagreements (i.e., acting as mediators), or disrupting parental conflicts through misbehavior (e.g., scapegoating; Buchanan & Waizenhofer, 2001), which also poses risk for youth aggression and emotional distress (Fosco & Grych, 2008; Gerard, Buehler, Franck, &

Anderson, 2005; Grych et al., 2004; except see Buehler & Welsh, 2009). Although both of these dimensions of IBPs have considerable evidence implicating risk for adolescent aggression problems, the mechanism by which this occurs is less clear. Two perspectives have emerged that offer explanation as to why IBPs are a risk factor for aggression problems: a spillover mechanism and a social-interactional learning mechanism.

A Parent Hostility Spillover Mechanism

Broadly, spillover refers to the transfer of mood, affect, or behavior across settings (Engfer, 1988), or more narrowly, across family subsystems (Cox, Paley, & Harter, 2001). This spillover process is widely supported across cross-sectional and longitudinal studies and across studies using global assessments and daily diary designs (Almeida, Wethington, & Chandler, 1999; Benson, Buehler, & Gerard, 2008; Bradford, Vaughn, & Barber, 2008; Fosco & Grych, 2010; Gerard, Krishnakumar, & Buehler, 2006; Krishnakumar & Buehler, 2000). In particular, IBP's represent a potent risk process for spillover. At a basic level, adolescents' presence during interparental conflicts may make them a convenient target for hostility. When couples have difficulty managing their own disagreements, turning their attention to other family members may be a welcome reprieve from disagreements they struggle to resolve (Minuchin, 1974). Triangulation also seems to promote spillover. Adolescents who are drawn into parental conflicts to help mediate the dispute are more likely to experience hostility from their parents, simply because they are involved in the argument (Emery, 1999). Similarly, parents who ask their adolescent to side with them against their partner often create conflict in the adolescents' relationship with the other parent (Buchanan & Waizenhofer, 2001). A recent short-term longitudinal study of high school students found that adolescents who felt triangulated into parental conflicts reported increased parent hostility toward adolescents over time, even when accounting for overall parent-adolescent relationship quality (Fosco & Grych, 2010).

These spillover processes represent a significant risk factor for adolescent aggression problems. Harsh parenting and parental hostility are key mediators that may link interparental conflict and IBP's to adolescent aggression problems (Benson et al., 2008; Bradford et al. 2004; Erel & Burman, 1995; Gerard et al., 2006; Harold & Conger, 1997; Harold, Fincham, Osborne & Conger, 1997). This body of research supports a pathway by which IBPs increase parent hostility towards their adolescents, and increases the risk of adolescent aggression problems.

An Adolescent Hostility Social Interaction Learning Mechanism

An important limitation to family process research aimed at predicting adolescent aggression problems is that the vast majority of studies overlook the role of the adolescent as an active participant in the family (Fincham, 1994). Adolescents' strategies for influencing their social environment are shaped by the contingencies experienced in the social interactive context of the family (Dishion & Patterson, 2006). Primary examples of social interaction learning include coercive processes in parent-child and sibling relationships (e.g., Patterson, 1982). In coercive interactions, escalations in hostile behavior may result in parent acquiescence to children's demands (e.g., giving in to children's tantrums), which reinforces the negative

behavior. However, contingencies also exist in other, triadic family dynamics. In families with poor boundaries around interparental conflicts, adolescents may become hostile toward their parents in an attempt to interrupt or distract attention from interparental conflicts. If effective, adolescent hostile behavior toward parents may actually serve an important function for the family system by terminating parental conflicts that may pose a threat to the integrity of the family (Minuchin & Fishman, 1981). Moreover, the diffusion of tension between parents may also reinforce adolescents' hostile behavior in the family, even if it increases parent-child conflict (Charles, 2001). Ultimately, this family dynamic where parents reinforce adolescents' hostile interactions within the family may generalize to adolescent aggression problems, because these hostile tactics may be applied outside of the family as well (e.g., Natsuaki, Ge, Reiss, & Neiderhiser, 2009; Patterson et al., 1989).

One longitudinal study of families of adolescents used observational methods to identify adolescent responses to interparental conflicts, and the implications for adolescent adjustment one year later (Davis et al., 1998). Adolescents' most frequent response to interparental conflict was hostility toward their parents (e.g., yelling). Observed adolescent hostility during parental conflicts was an important predictor of adolescents' self-reported aggression problems one year later. A second study, by Schermerhorn and her colleagues (2007), examined the implications of child-directed involvement in parental disputes. Relevant to the current study, Schermerhorn and her colleagues found that children are more likely to become involved in interparental conflicts when they experience negative arousal and feel threatened by them. When children used hostile behavior to become involved in parental conflicts (e.g., yelling, disruptive behavior), they were more likely to develop externalizing problems. These two studies provide compelling evidence for the role of child and adolescent hostile behavior in the family as a mechanism linking adolescent involvement in parental conflict and global aggression problems. However, it is noteworthy that they have evaluated youth hostility toward parents without simultaneously considering the role of parent hostility toward youth.

The Present Study

Family processes, such as IBPs, parent hostility toward adolescents, and adolescent hostility toward parents, are interrelated, co-occurring, and mutually influential (Minuchin, 1985). This study seeks to test an integrated model of these three family processes, and the developmental consequences they hold for adolescent aggression problems. In doing so, this study extends current knowledge in several ways. First, we evaluated these processes within a transactional framework, making it possible to test the predominant assumption of unidirectional influence in which IBPs undermine parenting, which in turn impacts child outcomes. This approach is consistent with growing evidence that adolescent behavior problems and marital functioning are bidirectional processes (Cui, Donnellan, & Conger, 2007; Gerard et al., 2006), and extends findings by Gerard and colleagues (2006) in which both couple functioning and adolescent aggression problems accounted for variance in parent hostility. Second, we considered both spillover and social-interaction learning mechanisms simultaneously within the family context. By considering both hypothesized pathways simultaneously, it was possible to determine whether they were unique risk mechanisms, or even a sequential process. This is an important next step in this research

because it makes it possible to examine the family context in which IBPs, parent hostility, and adolescent hostility are all co-occurring. Third, we examined these family dynamics over the course of early to middle adolescence, when IBPs are particularly salient. Early adolescents are more likely to be aware of and to become involved in parental conflicts than younger children (Davies & Forman, 2002) and parental conflicts may have negative consequences for the parent-adolescent relationship (Fosco & Grych, 2010). Adolescents may become resentful of their parents for involving them in distressing conflicts, which may lead to angry exchanges and increases in hostility between youth and their parents (Davis, Hops, Alpert, & Sheeber, 1998; Fosco & Grych, 2010).

We examined reciprocal associations among IBPs, parent hostility towards adolescents and adolescent hostility towards parents in a three-wave, cross-lagged, autoregressive model, and the relative prediction of these three factors for later adolescent aggression problems. One benefit of a cross-lagged model is that it avoids assumptions of directionality (Selig & Little, 2012), allowing for tests of multiple hypotheses in an integrated model. The *spillover mechanism hypothesis* would be supported if IBP's were directly associated with changes in parent hostility over time, and if parent hostility was then related to aggression problems. A *social learning mechanism hypothesis* would be supported if IBPs were associated with increases in adolescent hostility over time, controlling for parent hostility, and if adolescent hostility was a direct predictor of aggression problems. Finally, drawing on the strengths of this analytic approach, it was possible to consider combinations of these two proposed mechanisms, including sequential (e.g., IBPs→parent hostility→adolescent hostility→aggression problems) and additive (i.e., both parent and adolescent hostility predicting aggression problems) processes of risk.

Method

Procedure

Participants were a randomly-selected subset of 6th graders participating in the PROSPER project (Promoting School-Community-University Partnerships to Enhance Resilience), a large-scale effectiveness trial of preventive interventions aimed at reducing substance use initiation among rural adolescents (Spoth, Greenberg, Bierman, & Redmond, 2004). Participants resided in 28 rural communities and small towns in Iowa and Pennsylvania. Initial eligibility requirements for communities considered for the studies were: (a) school district enrollment from 1,300 to 5,200, and (b) at least 15% of the student population eligible for free or reduced-cost lunches (for more information, see Spoth, Guyll, Lillehoj, Redmond, & Greenberg, 2007).

Schools in intervention communities implemented two evidence-based programs designed to reduce adolescent substance use: a school-based curriculum (delivered in the 7th grade to all students) and a family-based program (offered to all families of 6th graders). Schools selected programs from a menu of evidence-based interventions. In addition, districts were supported by community-based prevention teams (see Spoth et al. [2004] for more information on the PROSPER project and the sample).

On average 88% of all eligible students completed in-school assessments at each data collection point for the larger study. A random sample of 2,267 families from the in-school assessment sample were invited to participate in the in-home family assessments and 979 (43%) completed the in-home assessments. The in-home assessments included a family composition interview and written questionnaires completed independently by the adolescent, mother, and if present, father.

We conducted comparisons of the in-home group with the larger sample from which they were drawn. Variables used in the current study were not assessed in the larger sample so comparisons were made for other risk factors, such as substance use and problem behavior. Comparisons of those who participated in the in-home family assessments revealed no differences between groups in substance use initiation. However, youth who received in-home assessments were less likely to engage in delinquent behavior than youth in the general population of cases (M = .58, SE = .06 vs. M = .82, SE = .04): F (1, 27) = 18.32, p < .01. Youth in the in-home sample also perceived fewer benefits from using substances (M = 4.77, SE = .01 vs. M = 4.71, SE = .02): F (1, 27) = 18.32, p < .01). These differences suggest that the low response rate for the in-home sample may have influenced our ability to obtain a truly random sample. Although similar in most dimensions to the general population of cases, the in-home subsample may be at slightly lower risk for problem behavior.

Participants

Because the focus of this study was interparental boundaries in families, only two-parent families were used, resulting in 768 families at time 1, with a retention rate of 75% (N = 575) at the final time point. We analyzed data from 4 time points: the Fall of 6th grade (T1), Spring of 6th grade (T2), 7th grade (T3), and 9th grade (T4). The mean participant ages at Time 1 were: adolescents (M = 11.3 years, SD = .49); mothers (M = 38.7, SD = 6.05); and fathers (M = 41.2, SD = 7.14). At subsequent time points, average youth ages were 11.9 (T2), 13.0 (T3), and 15.1 (T4) years old. There was some variability among caregivers' relationships to those caregivers referred to as mothers for this study. Female caregivers identified their relationship to the target adolescent as “mother” (94.9%), “stepmother” (1.3%), and other parental figures (3.8%; e.g., parents' significant other, foster parent). Male caregivers identified their relationship to the target adolescent as “father” (75.3%), “stepfather” (16.9%), and other parental figures (7.8%). Sixty-one percent of families resided in Iowa and 39% lived in Pennsylvania; 47% were male. The median household income was $52,000 (in 2003) and 64% of adolescents had parents with some post-secondary education. Adolescents identified their race as White (89%), Hispanic (6%), African American (1%), Asian (1%), or Other (3%).

Measures

Measures were drawn from the PROSPER in-home surveys administered to caregivers and adolescents as indicated below.

Interparental Boundary Problems—As discussed earlier, interparental boundary problems were characterized by parents' tendency to have arguments in front of their

adolescent and/or triangulating adolescents into parental disagreements. Caregivers completed a four-item scale that included two items that assessed how frequently parents argue with their partner in front of their child on issues that related to their child, and those that do not relate to their child. Parents responded on a 7-point scale—*absolutely never (1), very rarely (2), once every month or two (3), once a week (4), a few times per week (5), pretty much every day (6), and several times a day (7)*. Two additional items assessed the degree to which parents involved adolescents in parental conflicts either by belittling the other parent in front of the child, or trying to get the adolescent to side with them in arguments. These two items were rated on a 7-point scale from *Strongly disagree (1)* to *Strongly agree (7)*. These four items were standardized and then averaged to create a composite for triangulation. Internal consistency for this 4-item scale ranged from .64–.71 across waves 1–3, for mothers and fathers. Mother and father scales were then averaged together to form a single indicator of triangulation at each wave (correlations for mother and father report ranged from .38 to .46, $p < .01$).

Parent-Adolescent Hostility—Mother, father, and youth perceptions of parental hostility towards their child were measured using four items. An example item is: “When this youth does something wrong, how often do you lose your temper and yell at him or her.” These items were rated on a scale from 1 (*always*) to 5 (*never*). Youth were asked similar items about interactions with their mother and father. Cronbach's alphas ranged from .82–.84 for mothers, .80–84 for fathers, and .77–.91 for youth reports. Correlations between mother and adolescent report ranged from .44 to .50 (p's < .01) and correlations between father and adolescent report ranged from .39 to .53 (p's < .01). Indicators of mother-adolescent hostility and father-adolescent hostility were formed by averaging parent and youth report. Mother- and father-adolescent hostility were correlated .51 to .61 (p's < .01). Thus, a single indicator of parent-adolescent hostility was created by averaging mother and father hostility.

Adolescent-Parent Hostility—Adolescents and their parents also reported on their hostile behavior toward parents. They were asked to rate how often they engaged in different behaviors toward each parent over the last month, including “get angry with her”, “criticize her or her ideas” and more severe items such as “swear or curse at her” and “hit, push, grab, or shove her”. These items were rated on a scale from 1 (*always*) to 5 (*never*). Cronbach's alphas ranged from .71–84 for adolescent reports of hostility toward mothers, and .71–91 for adolescent reports of hostility toward fathers; mothers reports ranged from .81–.85, and those of fathers ranged from .82–.83. Mother and adolescent correlations ranged from .41 to .49 (p's < .01) and father and adolescent correlations ranged from .34 to .46 (p's < .01). After averaging parent and adolescent reports, adolescent-mother and adolescent-father hostility scores were highly correlated, ranging from .58 to .69 (p's < .01). A final, parent-adolescent hostility score was created by averaging adolescent hostile behavior with mothers and fathers.

Adolescent Aggressive Behavior Problems—Parent and adolescent perceptions of aggressive behavior problems were measured using the 16-item aggressive behavior subscale from the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) and the

Youth Self Report (YSR; Achenbach & Rescorla, 2001). Items were rated to indicate how true each item was for the adolescents' behavior “now or within the past six months” on a 0 (not true) to 2 (very true or often true). Examples of youth items include: “I get in fights”, “I disobey my teachers”, and “I destroy things”. Scales indicated good internal consistency for adolescent report (.86, .86), mother report (.88, .91), and father report (.89, .90) for T1 and T4, respectively. Correlations for mother and father reports ranged from .58 to .67 (*p*'s < .01), and correlations for youth and parent reports ranged from .25 to .45 (*p*'s < .01). At first glance, the aggressive behavior scale may seem similar to adolescent hostility with parents. However, only two out of 16 items in the CBCL scales refer to interactions with at home (i.e., “disobedient at home” and “destroys things belonging to his/her family or others”), and the rest refer to general tendencies to exhibit aggressive behavior across several settings (e.g., with peers, at school). To ensure that these items did not drive the findings, the structural model was estimated a second time, using aggression scales that excluded family items. The pattern of results remained the same. Therefore, we present findings with the complete aggression scales to facilitate the most direct comparisons to other studies of adolescent aggressive behavior problems.

Results

Table 1 presents correlations and descriptive statistics for the variables. All constructs evidenced moderate to strong stability over time. As expected, families with higher levels of interparental boundary problems also were more likely to more parent hostility and adolescent hostility. IBPs, parent hostility, and adolescent hostility all were correlated with higher risk for aggressive behavior at T1 and T4. Building on these preliminary descriptive analyses, we then estimated the hypothesized structural equation model.

Analysis Plan

To test the study hypotheses, structural equation models were estimated to capture the bidirectional influences of boundary problems, parent hostility, and adolescent hostility in an autoregressive, cross-lag model to examine the direction of effects among these variables. This analytic approach allowed for a simultaneous test of the spillover and social interactional learning mechanisms, while avoiding assumptions about the direction of effects (Selig & Little, 2012). In turn, testing the unique effects of each of these three family dynamics were tested for unique or additive effects on later adolescent aggression problems. The goal of this test was to identify the key explanatory mechanism predicting risk for aggression problems.

A structural equation model was computed using full information maximum likelihood (FIML) estimation with Mplus 6.1 (Muthén & Muthén, 2008). A benefit of using FIML estimation is that it reduces bias incurred by dropping individuals with missing data points (Widaman, 2006). Models were estimated using a combination of manifest and latent variables. Variables in the cross-lag analyses (interparental boundary problems, parent-adolescent negativity and adolescent hostility each were represented as manifest variables, to give equal treatment of each construct in the cross-lag analyses and to avoid model fit problems that arise with latent variables derived of two indicators. Correlations were

estimated among all three variables within each wave. Stability paths were estimated for variables from T1 to T2 and T3. Adolescent aggression problems were estimated as a latent variable in which mother, father, and adolescent indicators were allowed to load freely on the latent variable; this latent variable was regressed on T1 family variables and T1 aggression problems.

For each model, standard measures of fit are reported, including the chi-square (χ^2), comparative fit index (CFI), nonnormed or Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA). CFI/TLI values greater than .95, RMSEA values less than 0.05, and a nonsignificant χ^2 (or a ratio of $\chi^2/df < 3.0$) indicate good fit (Hu & Bentler, 1999). Then, multiple group invariance tests were conducted to determine whether the model fit the full sample. Invariance tests were conducted to evaluate whether the pattern of associations in the model differed for intervention and control groups and whether the model parameters differed as a function of adolescent gender. Group comparisons were conducted by comparing model fit for a model in which path coefficients were freely estimated for each group to a model in which substantive paths (stability paths were excluded) were constrained to be equal across groups. Changes in model fit (CFI) of .01 or more indicated group differences. This approach is superior to tests of change in chi-square values, because changes in CFI are not affected by sample size (Cheung & Rensvold, 2002).

A Structural Model Testing Spillover and Social-Interactional Learning Mechanisms of Interparental Boundary Problems and Aggression Problems

The structural model, shown in Figure 1, yielded a good fit with the data, $\chi^2(56) = 99.88$, $p < .01$; CFI = .99; TLI = .98; RMSEA = .032 (90% C.I.: .021-.042). Over time, interparental boundary problems, mother-adolescent hostility, and adolescent-mother hostility demonstrated moderate stability over time (T1 to T3 paths are not presented in Figure 1 for ease of presentation)

As hypothesized, IBPs were consistently related to increases in parent hostility and adolescent hostility, evidenced by significant paths from T1 to T2 and from T2 to T3, above and beyond previous levels of hostility. However, parent and adolescent hostility influences on IBPs were less evident. Only one of two parent hostility paths significantly predicted IBPs. Specifically, parent hostility at T2 was related to increases in IBPs at T3; that is, parents who were more hostile with their adolescents at T2 were more likely to report increases in IBPs at T3. However the path from T1 to T2 was not statistically significant. Adolescent-parent hostility was not predictive of IBPs at either time point. Thus, these findings support a predominantly unidirectional pattern of influence for IBPs on parent-adolescent relationship hostility.

We also examined the links between parent hostility and adolescent hostility. Across both spans of time, parent hostility was related to increases in adolescent hostility but not vice versa. No evidence for the reciprocal effects was found; that is, adolescent-parent hostility did not predict later parent hostility. Therefore, these findings suggest that adolescent-parent hostility was multiply determined by both IBPs and parent hostility. However, parent hostility was only shaped by IBPs, and was not shaped by their adolescents' hostile behavior. It is important to note that higher levels of global adolescent aggression problems at T1 was

related to more IBPs, parent hostility and adolescent hostility at T2, indicating that adolescents aggression problems may place a general strain on all dimensions of family dynamics measured.

Examining Mechanisms of Risk for Aggression Problems

We then turned our attention to examining the unique implications of IBPs, parent hostility and adolescent hostility in relation to 9th grade aggression problems, above and beyond earlier levels. Of these three family processes, only adolescent hostility was directly associated with adolescents' aggression problems two years later. As a result, this model did not provide support for a direct spillover mechanism in which parent-adolescent hostility explains the association between IBPs and adolescent aggression problems. However, the findings did support two other pathways. Support for the social learning pathway was found in linkages between T2 IBP, T3 adolescent hostility, and T4 adolescent global aggression problems. The standardized indirect effect for this association was .02 and was statistically significant ($p < .05$). In addition, a second pathway that reflects a combination of spillover and social-interactional processes was found. Specifically, T1 IBPs was related to increased T2 parent hostility, which in turn was associated with T3 adolescent hostility, and ultimately was associated with T4 global aggression problems. The indirect effect for this pathway was statistically significant ($p < .05$), albeit understandably small in magnitude (.003). These findings support two unique pathways by which IBPs impact adolescent aggression problems within this family systems framework.

Multiple group invariance tests for homogeneity of results

We then conducted three sets of multiple group invariance tests. First, we tested whether these findings were moderated by random assignment to intervention or control groups in the PROSPER intervention trial. We tested a multigroup structural equation model in which paths were freely estimated across groups and one where paths were constrained to be equal across groups, and examined the change in CFI that resulted in placing these constraints on the model estimation. The unconstrained model CFI was .983, and this changed to .975 with constraints. This change in CFI of .008 did not meet criteria for a meaningful change in model fit (Chung & Rensvold, 2002). Therefore, the null hypothesis of invariance in models for intervention and control groups was not rejected, suggesting that this model was a good representation of both intervention and control groups.

Second, we tested whether these findings were different for boys and girls. The freely estimated model CFI was .981, and this changed to .978 with constraints. This change in CFI of .003 did not meet criteria for a meaningful change in model fit and thus the null hypothesis of invariance for boys and girls was not rejected. Therefore, this model held for boys and girls.

Third, we tested whether the structural model was different for youth in families with both biological parent and youth in families with other caregiver combinations (e.g., one stepparent). The freely estimated model CFI was .986 and this changed to .984 when constrained to be the same across groups. This change in CFI of .002 did not meet criteria

for meaningful change in model fit, supporting the view that this model was representative of families with two biological parents and families with two caregivers.

Discussion

This is the first study to examine both spillover and social learning processes simultaneously as mechanisms linking IBPs and adolescent aggression problems. The spillover mechanism hypothesis predicted that hostility would transfer from interparental conflict to parents' behaviors with adolescents because of overly diffuse boundaries (e.g., Erel & Burman, 1995; Fosco & Grych, 2010), ultimately placing adolescents at increased risk for aggressive behavior problems. The social learning mechanism hypothesis focused on how family processes may shape adolescents' hostile behavior toward parents, which in turn would generalize to more global aggression problems in other contexts. From this view, families with IBPs would reinforce adolescents' hostile behavior because it serves to terminate parental conflicts (Davis et al., 1998). Both spillover and social interaction learning mechanisms highlight IBPs as a process that can undermine the leadership role the parent subsystem has role in the family and transmit hostility into other family relationships (Minuchin, 1974). By testing both of these processes simultaneously, this study investigated which (parent or adolescent hostility) theoretical mechanism had stronger implications for youth aggressive behavior outcomes.

Evaluating the Two Hypothesized Mechanisms: From Comparison to Integration

In comparing spillover and social interaction learning mechanisms, it is important to turn to the findings testing the unique predictive roles of adolescent and parent hostility. In our analyses, adolescent-parent hostility was the key mechanism linking these family dynamics with adolescent aggression problems. Adolescents who were more argumentative, critical, and insulting toward parents were at significantly higher risk for later aggression problems, even when accounting for parent-adolescent hostility and previous levels of aggression problems at baseline. These findings provide compelling evidence that adolescent hostile behavior in the family is a key risk factor for aggression problems, and holds important implications for family and prevention science. Our findings indicate that adolescent hostile behavior in the family is the most proximal risk factor for aggression problems of those included in this study, which underscores the importance of examining adolescents' contributions to family interactions as a means of understanding family risk processes (Fincham, 1994). In addition, family interventions may also benefit from monitoring changes in adolescent-parent hostility as a more proximal outcome that has lasting implications for aggressive behavior.

Given the importance of adolescent hostility to parents for their long-term adjustment, it is critical to examine the underlying family processes that promote or maintain adolescent hostile behavior. Our analyses tested reciprocal associations among IBPs, parent hostility, and adolescent hostility. Several patterns of results emerged. First, IBPs were consistently and uniquely associated with both parent and adolescent hostility. Poorly regulated interparental boundaries predicted increases in parent hostility with adolescents and increases in adolescent hostility with parents over time. Reciprocal effects were less well

supported with the data. Adolescent hostility did not predict changes in IBPs. However, parent hostility was associated with increases in IBPs for one of two estimated paths. Thus, there was some support for reciprocal influences between IBPs and parent hostility; however, the most consistent pattern of results supported the view of IBPs as a disruptive influence on other family relationships. These findings highlight the leadership role the interparental subsystem serves in the family, and the implications of interparental functioning for parent-adolescent conflict. Our results converge with other studies linking dysregulated interparental conflict (e.g., Buehler et al., 2006; Fosco & Grych, 2013) or triangulation (Fosco & Grych, 2010) with a spread of hostility into other relationships in the family. The entirely unidirectional association for IBPs on adolescent hostility provides support for the view that poorly regulated boundaries around parental discord may reinforce adolescent hostile behavior with parents, consistent with previous work (Davis et al., 1998). As a whole, these findings indicate that IBPs are disruptive to multiple family processes.

Second, consistent support for the social interaction learning mechanism hypothesis was found. IBPs were consistently associated with increases in adolescent hostility over time; and a statistically significant indirect effect was found linking IBPs to adolescent hostility, to aggression problems. These findings add to the existing literature documenting social information learning processes in parent-child and sibling relationships by demonstrating a direct link between IBPs and adolescent hostility, accounting for the influence of parent hostility. Families with poorly defined boundaries can blur distinctions between parent and child roles, undermining the family hierarchy (Kerig, 2005). With parental authority diminished, adolescents' hostile behavior may be more tolerated in the family, and adolescents may seek to shape their family environment through hostile behavior, such as using hostile behavior to disrupt interparental conflicts. As such, adolescents' hostile behavior may assume an important function of disrupting or re-routing conflict in families with marital distress (Davis et al., 1998; Minuchin, 1974). These processes may reinforce adolescent hostile behavior toward parents if it effectively reduces exposure to interparental conflict that can be distressing to adolescents (Davies & Cummings, 1994; Schermerhorn et al., 2007).

Beyond the direct links between IBPs and adolescent hostility, support was found for another mechanism of change. Our findings suggested a three-step sequence, starting with interparental boundary problems leading to increases in parent hostility. Then, parent hostility was related to increases in adolescent hostility. Finally, adolescent hostility was the sole pathway to aggression problems, two years later. Support for this finding was bolstered by a statistically significant indirect effect across all three model parameters. Thus, although there was no support for a spillover mechanism directly impacting adolescent aggression problems, our findings do support the role of spillover of hostility from interparental relationships to parents' behavior with their adolescents. However, it was through the influence on adolescents' behavior with parents that parent hostility was a risk factor for aggression problems. This finding extends previous studies that document harsh parenting and parental hostility as directly associated with adolescent outcomes (Benson et al., 2008; Bradford et al., 2008; Buehler et al., 2006; Gerard et al., 2006; Harold et al., 1997). Moreover, it provides support for multiple channels by which family dynamics

(interparental boundaries and parent hostility with adolescents) impact adolescent behavior in the family.

Limitations and Future Directions

This study's findings should be interpreted within the context of its limitations. First, it is important to acknowledge that interparental boundary problems were measured using a brief assessment. More comprehensive measurement of this construct might facilitate a more complete understanding of family processes. Also, this study did not assess child-initiated involvement in parental discord, which may reflect another pathway of risk or protection for adolescents (e.g., Schermerhorn et al., 2005, 2007). Second, the conceptualization of boundary problems in this study refers specifically to the boundary separating adolescents from interparental disagreements. It is worth noting that other research has focused on other boundary problems, often in the parent-youth relationship (e.g., enmeshment) that are different from those examined in the current study. Third, it is important to acknowledge methodological issues related to evaluating family dynamics. This study employed a prospective, longitudinal design over several years to test mechanisms of change. Despite advantages that come with this design, it is also limited by self-reports of similar constructs, such as parent-adolescent or adolescent-parent hostility, that may inflate associations due to method variance. Replication of these findings using other research designs, such as ecological momentary assessment or real-time observational methods, would bolster confidence in the current findings. Fourth, our sample was composed of primarily European-American, rural families. Although the findings are consistent with other studies drawing from more diverse, urban samples (e.g., Fosco & Grych, 2010), replication is warranted before the results can be generalized to other populations with confidence. Fifth, the findings are drawn from a community sample; translation to clinical populations is less clear. However, interventions that reduce triangulation (e.g., Szapoznic et al., 1989) and parent hostility (e.g., Spoth, Redmond, & Shin, 1998) have demonstrated ameliorative effects on aggressive behavior outcomes with adolescents. Finally, it was not possible to rule out possible third-variable factors, such as genetic influences on hostility, which might also account for these associations.

Conclusion

This study examined parent and adolescent hostility mechanisms that link IBPs with adolescent aggression problems. By utilizing prospective, longitudinal methodology, we found support for IPBs as an important family dynamic that undermines parent-adolescent relations and ultimately promotes risk for aggression problems. Our findings indicate several recommendations are warranted for future research. First, interparental functioning plays an important role in the quality of parent-adolescent relationships. Developmental models and family interventions that focus solely on dyadic processes may be overlooking important systemic processes that contribute to coercive interactions between parents and adolescents, ultimately impacting the quality and maintenance of parent-adolescent relationships. Our findings demonstrate that the quality of interparental boundaries plays an important role in dysfunctional patterns of parent-adolescent interactions. Often, parental discord generally, and interparental boundaries specifically, are overlooked in family-centered interventions

and prevention programs that seek to prevent aggressive behavior, delinquency, and substance use. This oversight may be to the detriment of long-term intervention effect sizes. Intervention components that enhance coparenting support and boundaries (e.g., Cowan et al., 2009; Feinberg, 2003; Feinberg, Jones, Kan, & Goslin, 2010) may enhance family-centered interventions for adolescents aimed at promoting lasting change. Second, our findings emphasize the importance of adolescents' behavior toward their parents as a core mechanism accounting for their maladjustment. Often ignored, adolescent behavior within the family is an important direction to consider as research in this area progresses (Fincham, 1994). This pattern of results may be relevant to understanding other outcomes, such as withdrawal from family interactions as a potential risk mechanism for depression, or positive engagement in the family as a protective factor for youth well-being. Understanding how adolescents' behavior with family members translates to broader indices of maladjustment can offer intervention and prevention programs important targets and proximal outcomes.

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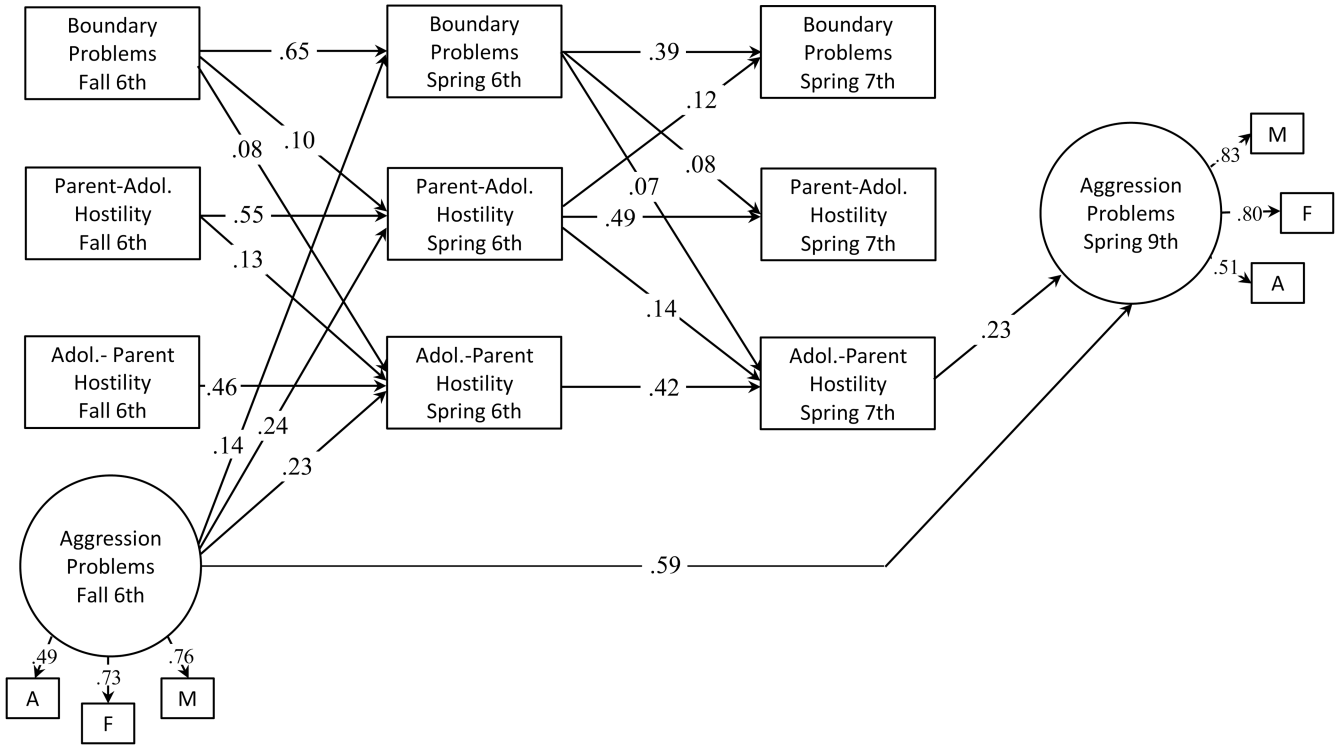

Figure 1.

The Structural Model.

Note.

Standardized path coefficients presented in model, only statistically significant paths are depicted ($p<.05$) for ease of presentation.

Model Fit: $\chi^2(56) = 99.88$, $p < .01$; CFI = .99; TLI = .98; RMSEA = .032 (90% C.I.: .021-.042)

Stability Paths: Boundary 1 -> Boundary 3 (.28); Parent-Adol. -> Parent-Adol. 3 (.30); Adol.-Parent1 -> Adol.-Parent3 (.23)

Boundary → P-A Neg →A-P Neg → Aggression (std. indirect effect = .003, p<.05); Boundary2 →A-P neg3 → Aggr4 (.02, p<.05)

Table 1

Correlations, Means, and Standard Deviations

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Boundary Prob. T1	--														
2. Boundary Prob. T2	.62	--													
3. Boundary Prob. T3	.56	.60	--												
4. Parent-Adol. Host. T1	.33	.26	.32	--											
5. Parent-Adol. Host. T2	.32	.36	.39	.73	--										
6. Parent-Adol. Host. T3	.32	.33	.39	.67	.72	--									
7. Adol.-Parent Host. T1	.29	.22	.29	.73	.59	.51	--								
8. Adol.-Parent Host. T2	.26	.25	.29	.54	.71	.52	.68	--							
9. Adol.-Parent Host. T3	.29	.28	.36	.52	.59	.76	.61	.67	--						
10. Aggr. T1 (Y)	.13	.12	.15	.36	.32	.29	.38	.33	.29	--					
11. Aggr. T1 (M)	.18	.19	.24	.49	.48	.44	.54	.47	.46	.37	--				
12. Aggr. T1 (F)	.23	.19	.24	.47	.44	.43	.56	.44	.44	.29	.57	--			
13. Aggr. T4 (Y)	.14	.13	.10	.26	.33	.26	.29	.35	.30	.44	.29	.26	--		
14. Aggr. T4 (M)	.19	.17	.22	.40	.46	.43	.45	.43	.47	.34	.62	.52	.46	--	
15. Aggr. T4 (F)	.28	.27	.23	.39	.46	.43	.46	.46	.46	.33	.42	.66	.42	.69	--
Mean	2.15	2.06	2.09	2.49	2.30	2.38	1.87	1.79	1.84	.22	.30	.31	.27	.23	.22
Standard Deviation	.84	.77	.81	.76	.74	.82	.53	.54	.60	.23	.28	.30	.28	.28	.26

All correlations were statistically significant ($p < .05$)