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Mechanisms Underlying the Influence of Disruptive Child Behavior on Interparental Communication

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Abstract

Prospective and experimental manipulations of child behavior have demonstrated that disruptive child behavior causes interparental discord. However, research has yet to test for mechanisms underlying this causal pathway. There is reason to suspect parent affect and parenting behavior explain child effects on interparental relations. To investigate this hypothesis, parent couples of 9- to 12-year-old boys and girls with attention-deficit/hyperactivity disorder (ADHD; $n=51$) and without ADHD ($n=39$) were randomly assigned to interact with a confederate child exhibiting “disruptive” or “typical” behavior. Parents rated their own affect as well as the quality of their partner's parenting and communication immediately following the interaction. Observers also coded the quality of parenting and communication behaviors parents exhibited during the interaction. Parents who interacted with disruptive confederates reported lower positive affect and higher negative affect than those who interacted with typical confederates. Parents were also noted by their partners and observers to parent disruptive confederates more negatively than typical confederates. Multilevel mediation models with observational coding and partner ratings both found that negative parenting explained the causal pathway between disruptive child behavior and negative communication. Exploratory analyses revealed that the strength of this pathway did not differ between parents of children with and without ADHD. Parent affect was not found to explain child effects on interparental communication. Though methodological issues limit the generalizability of these findings, results indicate that negative parenting may be one mechanism through which disruptive children cause interparental discord.

Keywords

child effects; interparental conflict; parenting; parent distress; ADHD

Children's influence on adult behavior is a well-documented phenomenon. Following Bell's (1968) seminal review, which called into question the widely-held notion that parent-child interactions were solely unidirectional (sp. parents influence children, not vice versa), science has repeatedly shown that children play a significant role in shaping the behavior of their parents (e.g., Bell & Chapman, 1986; Lytton, 1990). Indeed, child effects on parent affect and parenting behavior are a well-established phenomena (e.g., Lang, Pelham, Atkeson, & Murphy, 1999; Pelham et al., 1997, 1998). Recent studies have also shown that disruptive child behavior increases the risk of interparental discord (e.g., Jenkins, Simpson, Dunn, Rasbash, & O'Connor, 2005; Wymbs & Pelham, 2010). However, researchers have yet to identify mechanisms explaining how child misbehavior disturbs marital relations. This study was conducted to elucidate the results of Wymbs and Pelham (2010), which demonstrated that disruptive child behavior causes discordant interparental communication,

by testing whether parent affect and parenting behavior mediate child effects on interparental communication.

Child Effects on Interparental Relationships

Substantial research has demonstrated that marital discord exacerbates child maladjustment (for a review, see Cummings & Davies, 2010). At the same time, it is also common for child misbehavior to spark marital distress. Studies of adults “transitioning to parenthood” have suggested that marital quality suffers once a child is introduced into the family (for a review, see Mitnick, Heyman, & Smith-Slep, 2009). Recently, prospective tests have identified child externalizing behavior as a risk factor for marital conflict in community samples (e.g., Jenkins et al., 2005; Schermerhorn, Cummings, DeCarlo, & Davies, 2007) and in clinic-referred samples (Wymbs et al., 2008). Still, results of prospective studies are limited by the possibility that untested time-varying covariates (e.g., parent distress) better explain purported child effects on interparental conflict (Jenkins et al., 2005). For this reason, more rigorous tests were necessary to demonstrate that disruptive child behavior indeed causes interparental discord.

To this end, Wymbs and Pelham (2010) conducted a study to examine the degree to which experimentally-manipulated child behavior impacted interparental communication. An experimental design was selected because carefully-controlled experiments are uniquely capable of clarifying causal relations between variables (e.g., Cummings, 1995). Ninety parent couples of 9–12 year-old children, including 51 with attention-deficit hyperactivity disorder (ADHD), were each randomly assigned to interact with a child actor trained to reliably enact “disruptive,” ADHD-like behavior or “typical,” developmentally-appropriate behavior. As expected, Wymbs and Pelham (2010) found that parent couples communicated less positively and more negatively during interactions with disruptive confederates than those interacting with typical confederates. This was the first experiment to clearly demonstrate that disruptive child behavior elicits interparental discord. Combined with results from prospective testing, evidence definitively supports the existence of child effects on marital relations. Less well understood, however, are mechanisms underlying these causal pathways. As such, the present study sought to investigate variables that may explain how disruptive child behavior sparks interparental conflict.

Potential Mechanisms

Family systems theory suggests that disruptive child behavior sparks interparental discord, and vice versa, via overlapping subsystems (Minuchin, 1985). Studies exploring mechanisms by which marital conflict exacerbates child maladjustment have focused their attention on aspects of the parent-child relationship, including parenting behavior (e.g., Fauber, Forehand, Thomas, & Wierson, 1990) and the attachment of children to their parents (e.g., Cummings, Schermerhorn, Davies, Goeke-Morey, & Cummings, 2006). Similarly, preliminary evidence suggests that parent affect and parenting behavior may play a role in how children misbehavior causes interparental conflict.

Research indicates that parent affect is both sensitive to child behavior and predictive of relationship difficulties. Pelham and colleagues found that parents interacting with disruptive, “ADHD-like” child confederates reported greater levels of anxiety, depression, and hostility than parents who interacted with nondisruptive child confederates (Pelham et al. 1997, 1998). A recent study by the same group found that mothers of children with ADHD reported lower positive affect (i.e. engagement) and higher negative affect (i.e. distress) after interactions with disruptive confederates than after interactions with nondisruptive confederates (Pelham et al., 2011). Moreover, Gottman and colleagues demonstrated that married adults exhibiting low levels of positive affect and high levels of

negative affect during brief dyadic interactions were at greater risk of divorcing years later than those exhibiting higher levels of engagement and lower levels of distress (Gottman, Coan, Carrere, & Swanson, 1998; Gottman & Levenson, 2000). Taken together, while untested at this time, there is reason to suspect that positive and negative affect may mediate the causal pathway between child behavior and interparental communication.

Parenting has also been studied as an outcome of disruptive child behavior and as a risk factor for marital discord. Studies utilizing experimental manipulations of child behavior have shown that parents rely on fewer positive (praise, affection) and greater negative (punitive, inconsistent) parenting behaviors with misbehaving children than with well-behaved children (e.g., Brunk & Henggeler, 1984; Lang et al., 1999). A number of studies have also shown that parents whose parenting skills improve during a course of behavioral parent training report short- and long-term gains in marital quality (e.g., Dadds, Schwartz, & Sanders, 1987). Yet, research is still needed to examine whether positive and negative parenting behavior explains causal relations between disruptive child behavior and discordant marital relationships.

Not surprisingly, parent affect and parenting behavior are interrelated (for a meta-analytic review, see Rueger, Katz, Risser, & Lovejoy, 2011). Studies have shown that improvement in child behavior management skills is associated with lower distress and higher self-esteem (e.g., Pisterman et al., 1992). Evidence also indicates that child-induced negative affect results in higher negative and lower positive parenting behavior (Healey, Flory, Miller, & Halperin, 2010). Acknowledging the link between affect and parenting, studies seeking to examine whether either variable mediates the influence of child behavior on interparental relations should include both in the same model. This would allow for analyses to examine whether one uniquely mediates the causal pathway over and above the effect of the other. The current investigation was designed, in part, to disentangle whether positive or negative affect, positive or negative parenting, or some combination explained how disruptive child behavior sparked interparental conflict.

Child Effects on Parents of Youth with and without ADHD

Parents of children with ADHD tend to have more marital difficulties than parents of children without ADHD (for a review, see Johnston & Mash, 2001). The level of conflict between parents of youth with ADHD is not surprising given the numerous parental (e.g., maternal depression, paternal antisociality) and environmental risk factors (e.g., financial difficulties) commonly found in these families. Particularly interesting, given the focus of this paper, are data suggesting that disruptive child behavior is also a risk factor for marital strife in families of youth with ADHD. Relative to well-known risk factors of divorce (e.g., maternal depression, level of education), Wymbs, Pelham, Molina and colleagues (2008) found that the severity of conduct problems exhibited by their children uniquely increased the propensity of divorce among parents of children with ADHD. Wymbs and Pelham (2010) also showed that parents of children with ADHD, compared to those of children without ADHD, were more likely to communicate negatively with each other during interactions with disruptive confederate children than those interacting with typical confederates. Though preliminary, the latter finding suggests that mechanisms explaining child effects on interparental relations may differ between parents of children with and without ADHD. For this reason, the present study sought to explore whether mechanisms explaining how disruptive child behavior causes discordant interparental communication differ between parents of children with and without ADHD.

Specific Aims and Hypotheses

In summary, this study was conducted to investigate whether child effects on interparental relations demonstrated by Wymbs and Pelham (2010) occurred through parent affect and/or parenting behavior, and to explore whether these pathways differed for parents of youth with and without ADHD. It was hypothesized that parents interacting with disruptive, “ADHD-like,” confederate children would self-report lower positive affect and higher negative affect than parents who interacted with confederate exhibiting typical, developmentally-appropriate behavior. It was also expected that partner ratings and observational coding would indicate that parents exhibited less positive and more negative parenting behavior during interactions with disruptive confederates than those with typical confederates. As depicted in Figure 1, it was anticipated that lower positive affect/parenting as well as higher negative affect/parenting would mediate causal relations between disruptive child behavior and discordant interparental communication. Finally, given the limited evidence suggesting that parents of children with ADHD may respond differently to child misbehavior than parents of non-ADHD children, we tested whether mediational processes varied between parents of children with and without ADHD on an exploratory basis.

Method

Participants

Ninety parent couples who had children with ADHD ($n = 51$) or without ADHD ($n = 39$) were recruited “to participate in a collaborative parenting study.” Interested couples completed a phone screening, during which the following inclusion criteria were confirmed: (a) Parents agreed to participate in the study session together; (b) Parents had lived together for at least two years; (c) Mothers and fathers were both active parents with their children at home; (d) Target children were 9–12 years of age; and (e) Target children did not meet diagnostic criteria for a developmental disorder, schizophrenia, or any other psychotic disorder.

Presence of child ADHD was assessed using evidence-based strategies (Pelham, Fabiano, & Massetti, 2005), including standardized parent and teacher symptom rating scales (Disruptive Behavior Disorder Rating Scale; Pelham, Gnagy, Greenslade, & Milich, 1992) and measures of functional impairment (Impairment Rating Scale; Fabiano et al., 2006). Children were diagnosed with ADHD provided they presently met Diagnostic and Statistical Manual of Mental Disorders (4th ed.) criteria (American Psychiatric Association, 1994).

After most of the parents of youth with ADHD had been recruited, parents of children without ADHD were sought to participate. Couples received an invitation if (a) Their child did not meet present or historical diagnostic criteria for ADHD; (b) They had no other children meeting current or historical criteria for ADHD; and (c) Demographic characteristics of both parents and their child matched that of parent couples of youth with ADHD who participated in the study. As it turned out, the demographics of families with and without ADHD children were matched quite well (Wymbs & Pelham, 2010). Child age (approximately 11 years-old for both groups), gender (> 82% male for both groups), and race (> 94% Caucasian for both groups) did not differ statistically between groups. Maternal and paternal age (40 and 42, respectively for both groups), race (> 90% Caucasian for both groups), marital status (> 92% married for both groups), and household income (69–80 K for both groups) also did not differ between groups. The only demographic variable found to significantly differ between groups was the ‘length of the parents’ relationship with children’ (i.e., how long they were parents of their own children together). In brief, couples of children without ADHD reported being parents longer ($M=13.1$ years, $SD=4.18$) than did parents of children with ADHD ($M=10.2$ years, $SD=4.37$, $p < .01$). A statistical trend also

indicated that parents of youth with ADHD were somewhat less educated than parents of youth without ADHD. To control for these possible confounds, parent education level and length of the parents' relationship with children were covaried in all analyses.

Procedures

Study procedures were approved by the University at Buffalo Children and Youth Institutional Review Board. After providing informed consent, parent couples were given an overview of the child interaction sequence. Parents were told that they would interact with an unfamiliar child selected at random from a local elementary school who was the same gender and race and approximately the same age as their own child. Couples were encouraged to act naturally with the child during the interaction. Parent couples were also reminded that the goal of this study was to learn more about collaborative parenting (i.e. co-parenting).

All child interactions began with a *cooperative task* (8 min), which required that both parents engage the child in helping them to build the tallest *Jenga* block tower in the shortest amount of time. Next, in the *parallel task* (7 min), while parents completed a checkbook-balancing task individually, they were responsible for ensuring the child completed a simple math worksheet. Then, during the *free-play task* (7 min), parent couples were instructed to play with the child using toys available in the room and to allow the child to direct the play. Finally, during the *clean-up task* (3 min), couples were asked to have the child clean up all of the toys without their help. Structured interactions such as these are evidence-based (Roberts, 2001) and are often used to examine parent-child relationship quality in families of youth with ADHD (e.g., Arnold, O'Leary, & Edwards, 1997; Johnston, Murray, Hinshaw, Pelham, & Hoza, 2002).

Unbeknownst to the parents, the child with whom they interacted was a confederate. Seven 9- to 12-year-old children were trained extensively to enact two scripted behavioral roles: one dictating they behave like "disruptive" children with ADHD and another requiring they behave like "typical" children without externalizing behavior problems. Scripts for both roles were adapted from an experimental paradigm devised and validated in a series of studies with individual parents (Lang et al., 1999; Pelham et al. 1997, 1998) to allow for interactions with parent couples. Every confederate was trained to enact both disruptive and typical roles, but they were randomly assigned to enact only one role with each parent couple for the duration of the child interaction. Trained observers used checklists to track the behavior of the confederates during every interaction, recording whether or not specific behaviors were exhibited or omitted correctly according to the scripts for each role. Behavior tracking confirmed the reliability of the "typical" ($M=93\%$, $SD=5$, $\text{Range}=82\text{--}99\%$) and "disruptive" ($M=88\%$, $SD=4$, $\text{Range}=78\text{--}98\%$) confederate roles. Further, parents were asked to rate the level of inattention/overactivity (IO) and oppositional-defiance (OD) exhibited by the confederates after the interaction on the IOWA Connors Rating Scale (Pelham, Milich, Murphy, Murphy, 1989). As expected, parents interacting with disruptive confederates reported greater IO ($M=8.70$, $SD=3.12$), $F(1, 169)=379.58$, $p<.01$, and OD ($M=5.29$, $SD=3.47$), $F(1, 169)=124.52$, $p<.01$, than did parents interacting with typical confederates (for IO, $M=1.15$, $SD=1.45$; for OD, $M=0.65$, $SD=1.19$). Effect sizes calculated using Cohen's d (i.e., $M1-M2/\alpha$ pooled; Cohen, 1988) revealed very large effects for both comparisons ($d=3.10$ and 1.79 , respectively).

Dependent Measures

Parent affect—Parents reported on their affect immediately after the child interaction on the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The positive affect subscale consists of 10 positive mood adjectives (active, alert, attentive,

determined, enthusiastic, excited, inspired, interested, proud, and strong). The negative affect subscale consists of 10 negative mood adjectives (afraid, ashamed, distressed, guilty, hostile, irritable, jittery, nervous, scared, and upset). Respondents were asked to rate how much they were experiencing each adjective at that moment: 1 = *Very slightly or not at all*, 2 = *A little*, 3 = *Moderately*, 4 = *Quite a bit*, or 5 = *Extremely*. Positive and negative affect scores were obtained by adding together the ratings for each relevant adjective. The PANAS has demonstrated high internal consistency, test-retest reliability and external validity for both positive (sp. engagement) and negative scales (sp. distress; Watson et al., 1988) and has been shown to be sensitive to differences in adult mood before and after social interactions occurring over brief intervals of time (McIntyre, Watson, Clark, & Cross, 1991; Pelham et al., 2011). In the present study, Cronbach's alphas for positive and negative affect were .90 and .82, respectively.

Observer-coded parenting and communication—Parenting and interparental communication was coded using the Family Observation Schedule (FOS; Dadds & Sanders, 1992; see also Dadds, Sanders, Behrens, & James, 1987). The FOS is a simplified version of the Family Interaction Coding System (for a review, see Patterson, 1982), which has been shown to be sensitive to the child behavior manipulation paradigm used in this study (Lang et al., 1999). The FOS is particularly well-suited for studies seeking to capture parenting and communication behaviors exhibited by parents during interactions with disruptive children (Dadds, Schwartz et al., 1987; Dadds, Sanders et al., 1987). Coders evaluate parents' use of positive or aversive feedback, questions, or instructions directed towards the child, and also evaluate parents' positive (e.g., listening, questions, positive feedback) and aversive (e.g., negative feedback, contradiction, ignoring) communication with each other. Total frequencies of positive and negative parenting and communication behaviors were dependent measures. Interactions were coded by pairs of observers in order to calculate interobserver agreement. Intraclass correlations for positive (.98) and negative (.99) parenting as well as positive (.98) and negative (.81) communication were acceptable.

Partner-reported parenting and communication—Immediately following the child interaction, each parent independently answered two questions regarding how their partner parented the confederate child: 1) Ignoring their negative parenting, how *positively* did your partner parent the child (1 = *Not at all positive* to 10 = *Completely positive*)? and 2) Ignoring their positive parenting, how *negatively* did your partner parent the child (1 = *Not at all negative* to 10 = *Completely negative*)? Similarly, parents also independently rated how their partner communicated with them during the interaction: 1) Ignoring their negative communication, how positively did your partner communicate with you (1 = *Not at all positive* to 10 = *Completely positive*)? and 2) Ignoring their positive communication, how negatively did your partner communicate with you (1 = *Not at all negative* to 10 = *Completely negative*)? The format and scale of the partner ratings was adapted from Fincham and Linfield's (1997) *Positive and Negative Quality in Marriage Scale*, an empirically-validated measure of positivity and negativity in romantic relationships. Observer and partner ratings of positive parenting were not significantly associated ($r = .14$, $p = .06$). However, coding and partner ratings of negative parenting ($r = .26$, $p < .01$) as well as positive ($r = .21$, $p < .01$) and negative ($r = .42$, $p < .01$) communication were directly related. The strength of the significant associations is consistent with cross-informant correlations ($r_s = .20$ – $.40$) for measures of parenting (e.g., Coffman, Guerin & Gottfried, 2006) and interpersonal behavior (e.g., Foltz, Morse & Barber, 1999).

Analytical Plan

Given the hierarchical nature of the data (i.e. individual parents nested within couples), procedures for conducting mediation analyses with multilevel data were required for this

study. Per MacKinnon (2008), mediation with a couple-level predictor variable (confederate child behavior), individual-level mediators (positive/negative affect, positive/negative parenting), and an individual-level outcome variable (positive/negative interparental communication) was estimated using the following equations:

$$\begin{aligned}\text{Interparental communication}_{ij} = & \gamma_{00} + \gamma_c (\text{Confederate child behavior})_j \\ & + \beta_{b1} (\text{Positive affect})_{ij} \\ & + \beta_{b2} (\text{Negative affect})_{ij} \\ & + \beta_{b3} (\text{Positive parenting})_{ij} \\ & + \beta_{b4} (\text{Negative parenting})_{ij} \\ & + U_{0j} + R_{ij}\end{aligned}$$

$$\text{Positive affect}_{ij} = \gamma_{00} + \gamma_{a1} (\text{Confederate Child Behavior})_j + U_{0j} + R_{ij}$$

$$\text{Negative affect}_{ij} = \gamma_{00} + \gamma_{a2} (\text{Confederate Child Behavior})_j + U_{0j} + R_{ij}$$

$$\text{Positive parenting}_{ij} = \gamma_{00} + \gamma_{a3} (\text{Confederate Child Behavior})_j + U_{0j} + R_{ij}$$

$$\text{Negative parenting}_{ij} = \gamma_{00} + \gamma_{a4} (\text{Confederate Child Behavior})_j + U_{0j} + R_{ij}$$

In the first equation, positive or negative interparental communication was regressed on an overall intercept term (γ_{00}), confederate child behavior, positive and negative affect, positive and negative parenting, as well as individual- and couple-level error terms. Estimating this equation is equivalent to determining “path b” when assessing for mediation among single-level data (Baron & Kenny, 1986). In the remaining equations, each of the individual-level mediators were regressed upon by an overall intercept term (γ_{00}), confederate child behavior, as well as individual- and couple-level error terms. Estimating these equations is equivalent to determining “path a” when assessing for mediated effects with simple regression (Baron & Kenny, 1986). Figure 1 depicts the base model tested in these analyses. Models were tested separately with positive or negative communication as the outcome as well as with observer or partner ratings of parenting and communication.

Using Mplus 6.0 (Muthen & Muthen, 2010), maximum likelihood estimation robust to data non-normality was used to test the multilevel path models. Model fit indices used in this study were χ^2 , root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean square residual (SRMR). A model is considered a good fit for the data when χ^2 is nonsignificant, RMSEA $\leq .06$, CFI $\geq .95$, and SRMR $\leq .08$ (Hu & Bentler, 1999). In order to estimate the magnitude of any mediated effect, the beta coefficient of the mediator was multiplied by the beta coefficient of the predictor variable (i.e. $\gamma_{a1}\beta_{b1}$; Krull & MacKinnon, 2001). The standard error of the mediated effect was then estimated (i.e. $SE_{\gamma_{a1}\beta_{b1}} = \sqrt{S^2_{\gamma_{a1}\beta_{b1}} + S^2_{\beta_{b1}\gamma_{a1}}}$) to determine whether the mediated effect was significant (Z-score $> \pm 1.96$). Then, the proportion of the total effect that is mediated was included for each analysis ($\gamma_{a1}\beta_{b1} / c$; where “c” = unmediated effect of child behavior on outcome; Mackinnon 2008).

After testing for mediation with the full sample, multiple group analyses were used to explore whether mechanisms differed for parents of children with and without ADHD. The equivalence of the mediation processes across diagnostic groups was tested using χ^2 difference tests comparing models with and without constraint. First, models were tested with paths freely estimated in both groups. Next, models were tested with a single path constrained to be equal across groups. Afterwards, χ^2 statistics were compared to see if model fit changed significantly with the additional constraint. Moderation by diagnostic status was supported by a statistically significant worsening in the χ^2 statistic ($\Delta \chi^2(1) = 3.84$).

Results

Prior to conducting the mediation analyses, descriptive statistics and correlations were computed for variables in the models with observer-coded (Table 1A) and partner-reported (Table 1B) parenting and interparental communication. Disruptive child behavior was associated with parents reporting lower positive affect and higher negative affect immediately following the interaction. Observer coding indicated that parents exhibited more positive and negative parenting behaviors with disruptive confederate children than with confederates behaving like typical children. Parents reported that their partners parented disruptive confederates more negatively and less positively than typical confederates. Regarding associations between mediators and outcomes, negative affect and parenting were significantly associated with observer-coded negative communication. No affect or parenting variables were associated with observer-coded positive communication. Partner-reported parenting variables were both strongly correlated with partner-reported positive and negative communication. Negative affect was correlated with partner-rated positive, but not negative, communication. Positive affect was not significantly associated with observer- or parent-reported communication.

The first pair of path models examined whether affect and parenting variables mediated the relationship between child behavior and *positive* interparental communication. The proposed mediation model fit the observer-coded data very well $\chi^2(8) = 6.81, p = .56$, RMSEA=.00, CFI=1.00, and SRMR=.03. Though all of the proposed mediators were associated with confederate child behavior, none were associated with observer-coded positive communication (Figure 2A). The specified model with positive communication also fit the partner-reported data well, $\chi^2(8) = 12.41, p = .13$, RMSEA=.06, CFI=.99, and SRMR=.04. The effect of confederate child behavior on positive communication was shown to be fully-mediated by positive parenting (Figure 2B). The mediated effect was significant ($\gamma_{a3}\beta_{b3} = -1.09$, $SE_{\gamma_{a3}\beta_{b3}} = .25$, $z\text{-score} = -4.43, p < .01$) and this path accounted for 66% of the total effect that is mediated. The same model was tested in a multiple group framework and fit the data well $\chi^2(16) = 18.04, p = .32$, RMSEA=.04, CFI=1.00, and SRMR=.04. Partner-reported positive parenting mediated the relationship between child behavior and positive communication for parents of children with ADHD ($\gamma_{a3}\beta_{b3} = -1.59$, $SE_{\gamma_{a3}\beta_{b3}} = .37$, $z\text{-score} = -4.34, p < .01$; 73% of total effect mediated), but not for parents of children without ADHD ($\gamma_{a3}\beta_{b3} = -.26$, $SE_{\gamma_{a3}\beta_{b3}} = .24$, $z\text{-score} = -1.09, p = .28$; 28% of total effect mediated). When the mediation path was constrained to be equal across groups, the χ^2 difference test was significant, $\Delta \chi^2(1) = +12.82, p < .01$. This indicated that the strength of partner-reported positive parenting as a mediator of child effects on partner-reported positive communication differed between parents of children with and without ADHD.

The next set of path models examined whether affect and parenting variables mediated the relationship between child behavior and *negative* interparental communication. The proposed mediation model fit the observer-coded data adequately, $\chi^2(8) = 14.43, p = .07$, RMSEA=.07, CFI=.97, and SRMR=.04. As displayed in Figure 3A, negative parenting

partially-mediated the causal relationship between child behavior and observer-coded negative communication. Though the mediated effect was significant ($\gamma_{a4}\beta_{b4} = .15$, $SE_{\gamma_{a4}\beta_{b4}} = .05$, $z\text{-score} = 2.75$, $p < .01$) and accounted for 31% of the total effect that is mediated, disruptive child behavior continued to have a direct effect on negative communication. When tested in a multiple group framework, this model fit the data fairly well, $\chi^2(16) = 23.22$, $p = .11$, $RMSEA = .07$, $CFI = .97$, and $SRMR = .05$. Negative parenting mediated the association between child behavior and observer-coded negative communication between parents of children with ADHD ($\gamma_{a3}\beta_{b3} = .16$, $SE_{\gamma_{a3}\beta_{b3}} = .07$, $z\text{-score} = 2.14$, $p < .05$), but not between parents of children without ADHD ($\gamma_{a3}\beta_{b3} = .04$, $SE_{\gamma_{a3}\beta_{b3}} = .07$, $z\text{-score} = .54$, $p = .28$). However, because the χ^2 difference test comparing models was not significant, $\Delta\chi^2 = +0.27$, the strength of observer-coded negative parenting as a mediator of did not appear to differ for parents of children with or without ADHD.

Similarly, the negative communication mediation model also fit the partner-reported data well, $\chi^2(8) = 10.51$, $p = .23$, $RMSEA = .04$, $CFI = .99$, and $SRMR = .03$, and revealed that negative parenting partially-mediated the link between child behavior and negative interparental communication (Figure 3B). Again, disruptive child behavior continued to have a direct effect on partner-reported negative communication even though the mediated effect was significant ($\gamma_{a4}\beta_{b4} = .57$, $SE_{\gamma_{a4}\beta_{b4}} = .20$, $z\text{-score} = 2.90$, $p < .01$) and accounted for 49% of total effect mediated. When tested in a multiple group framework, the model fit the data well $\chi^2(16) = 15.74$, $p = .49$, $RMSEA = .00$, $CFI = 1.00$, and $SRMR = .04$. Negative parenting as rated by partners explained the association between child behavior and negative communication for parents of children without ADHD ($\gamma_{a4}\beta_{b4} = .51$, $SE_{\gamma_{a4}\beta_{b4}} = .17$, $z\text{-score} = 2.99$, $p < .01$) and with ADHD ($\gamma_{a4}\beta_{b4} = .63$, $SE_{\gamma_{a4}\beta_{b4}} = .34$, $z\text{-score} = 1.83$, $p < .10$). Not surprisingly, the chi-square difference test was non-significant, $\Delta\chi^2 = +.30$. Consistent with findings of models run with observer-coded negative parenting, partner-rated negative parenting was shown to not operate differently in the mediation process among parents of children with and without ADHD.

Since mediator and outcome variables were assessed at the same time, “reverse models” (with interparental communication mediating effect of child behavior on positive/negative parenting) were also tested. All reverse models tested fit the data adequately. [In the interest of space, fit indices, weights of the prediction paths, and their significance for these analyses are omitted from the manuscript. The author will provide these upon request.] Reverse models with observer-coded data revealed that communication failed to mediate links between child behavior and positive or negative parenting. These null findings increase confidence in the specified model suggesting that observer-coded negative parenting mediated the effect of child behavior on observer-coded negative communication. On the other hand, models with partner-reported data found that interparental communication significantly mediated the path from child behavior to parenting. Specifically, positive communication rated by partners facilitated the link between child behavior and positive parenting while partner-reported positive and negative communication mediated the association between child behavior and negative parenting. As such, the reliability of results suggesting that partner-reported parenting, especially positive parenting (since negative parenting results were corroborated by observational coding), mediated child effects on interparental communication is questionable given the lack of model specificity.

Discussion

The current study sought to extend the findings of Wymbs and Pelham (2010) by determining whether parent affect and parenting behavior facilitated causal relations between disruptive child behavior and discordant interparental communication. Bivariate correlations indicated that disruptive child behavior was associated with lower positive and

higher negative affect reported by parents. Consistent with Lang and colleagues (1999), disruptive child behavior was found to be positively associated with observer-coded positive and negative parenting behavior. Disruptive child behavior was also linked with parents exhibiting less positive and more negative parenting behavior, as rated by their partners. Multilevel mediation analyses indicated that partner-reported positive parenting facilitated causal relations between disruptive child behavior and positive interparental communication, particularly among parents of children with ADHD. However, these results were not corroborated by models with observational coding, which found no mediation of child effects on positive communication. In contrast, analyses with observer-coded and partner-rated data demonstrated that negative parenting explained the causal pathway between disruptive child behavior and negative interparental communication. The strength of this mediated effect did not differ between parents of youth with or without ADHD.

Not unexpectedly, parents were distressed by interactions with disruptive child confederates. Numerous studies have already shown that experimentally-produced child misbehavior disturbs the affect and parenting of individual parents (e.g., Lang et al., 1999; Pelham et al., 1997, 1998). Unique to this study, however, was demonstrating child effects on affect and parenting in a *co-parenting context* as well as finding that *partner reports* of parenting quality depended on child behavior. As such, findings from this study may have somewhat broader implications than prior studies. For example, study results appear to suggest that parenting alongside ones' partner does not necessarily protect against stress induced by managing disruptive children. Moreover, sharing parenting responsibilities make actually introduce additional distress for parents whose partners believe they respond inappropriately to disruptive child behavior. Studies are warranted to replicate these results in co-parenting contexts and to assess for potential predictors of how parents rate the parenting ability of their partners (e.g., parent attributions for child misbehavior).

Contrary to our hypotheses, parent affect was not found to mediate causal pathways between disruptive child behavior and interparental communication. These null findings were unexpected given how affect is influenced adversely by child misbehavior (e.g., Pelham et al., 1997, 1998, 2011) and how it contributes to long-term marital stability (e.g., Gottman et al., 1998; Gottman & Levenson, 2002). Affect may not have facilitated child effects on interparental relations in this study for several reasons. Measurement variance (e.g., *self-reported* affect vs. *observer/partner-reported* communication) could have reduced the opportunity to detect associations between affect and communication. Reporter bias and/or structural similarity of the partner-reported parenting and communication questions likely contributed the strong associations among these variables (see Table 1B), thereby leaving little variance in communication for affect to predict. Finally, even though observational coding was shown to be done reliably in this study, observers may have missed subtle clues indicating how distressed parents were by interactions with disruptive confederates. For all of these reasons, future studies examining the role of affect in processes underlying child effects on interparental communication should consider using multiple strategies to effectively assess affective distress (e.g., self-report and physiological measures).

While it is intriguing to find that partner-reported positive parenting fully-mediated child effects on positive communication, particularly among parents of children with ADHD, there are several caveats that appear to limit the conclusiveness of these results. First, the correlation between partner-reported positive parenting and communication was rather large ($r = .73$). Regardless of whether this association was a product of response bias or the similarity of the questions asked, the possibility that methodological factors artificially strengthened the association between partner-reported positive parenting and communication cannot be ruled out. Second, reverse models highlighted that partner-reported positive communication significantly mediated the pathway between child behavior

and partner-rated positive parenting. This suggests that it may not be appropriate to test the hypothesized mediation model with the partner-reported data collected in this study. Third, positive parenting was not shown to explain child effects on positive communication with observational coding data. Failing to replicate with the same sample suggests the possibility that the partner-reported finding may have been spurious.

On the other hand, negative parenting was shown to partially-mediate the influence of disruptive child behavior on negative interparental communication. Particularly impressive was finding that this pathway was significant across observational coding and partner ratings. Punitive or inconsistent parenting has long been known to be a mechanism underlying the effect of marital conflict on children (e.g., Fauber et al., 1990). Thus, finding that it appears to explain child effects on interparental communication was not unexpected. At the same time, because negative parenting failed to fully mediate the causal pathway, untested variables (e.g., parental ADHD symptoms) may have also played a role in facilitating child effects on negative interparental communication. Furthermore, the degree to which negative parenting mediated the causal pathway was not different for parents of children with or without ADHD. This suggests that, regardless of the behavioral severity of their children—and the parenting experience they gained while managing them, parents who reacted negatively to disruptive child behavior were also at-risk of communicating negatively with their partner. Though convincing, more studies are needed to establish whether negative parenting indeed facilitates child effects on interparental relations and to investigate whether additional variables expedite this process.

Results of the multilevel mediation analyses have clinical implications for parent couples exposed frequently to disruptive child behavior, such as those who have children with ADHD. One of the evidence-based psychosocial treatments for children with ADHD is behavioral parent training (BPT), which seeks to improve the efficacy and consistency of managing disruptive child behavior (for review, see Pelham & Fabiano, 2008). Not surprisingly, interparental discord is a predictor of poor parent and child response to BPT (e.g., Reid, Webster-Stratton, & Hammond, 2003). Our findings suggest that BPT may achieve better outcomes in households with discordant parents if they are encouraged to manage disruptive child behavior less negatively *in co-parenting contexts*. To this end, reviewing skills to effectively support each other's parenting efforts when managing child misbehavior and to problem-solve persistent childrearing issues may help (e.g., Dadds, Schwartz et al., 1987). Highlighting strategies to maintain behavior management consistency across parents (when appropriate) may also reduce interparental discord in these families (Harvey, 2000).

More generally, results of this study provide evidence in support of transactional family dynamics (Schermerhorn & Cummings, 2008). As illustrated above, children are capable of influencing interparental communication through negative parenting. Synthesizing these findings with those from studies highlighting that harsh/inconsistent parenting is a mechanism underlying the effect of marital conflict on child maladjustment (e.g., Fauber et al., 1990), it appears that negative parenting advances *reciprocal* relations between disruptive child behavior and interparental discord. This prompts the need for future research to test whether the reciprocity between child externalizing behavior and interparental conflict is indeed exacerbated by negative parenting. Vector autoregressive models examining dynamic relations between child behavior, parenting, and interparental communication during the course of family interactions appear well-suited to accomplish this task (e.g., Schermerhorn, Chow, & Cummings, 2010). Studies of this sort would likely provide insight into processes accelerating dysfunction in many families, particularly those with discordant parents and children with externalizing behavior problems.

As discussed previously (Wymbs & Pelham, 2010), the generalizability of our findings is limited by our use of an experimental child behavior manipulation paradigm. Because we staged interactions in a university laboratory instead of a more naturalistic location (e.g., homes of participating families), had parent couples interact with an unfamiliar child enacting scripted behaviors instead of having parents interact with their own child, and informed parents they would be observed and taped throughout the interactions, the external validity of this work is questionable. At the same time, these experimental controls were necessary to clearly demonstrate that disruptive child behavior causes interparental discord. Similar rigid experimental procedures were also used in early studies examining the effect of interadult conflict on child adjustment, which ultimately set the stage for research weaving together experimental and nonexperimental methods to highlight the impact of marital conflict on children (for a review, see Cummings & Davies, 2010). In an analogous fashion, we hope the present study will stimulate researchers to use experimental methods in addition to nonexperimental methods in future studies exploring how disruptive child behavior influences interparental relations. Studies relying on more naturalistic manipulations of child behavior would be especially useful (e.g., stimulant medication manipulations with ADHD children; for examples and a review of the rationale, see Barkley, 1981).

Conclusions drawn from this study are limited in other ways as well. First, because observer and partner reports of parenting and communication were collected at the same time, the lack of temporal precedence prohibits causation from being inferred for these variables. Second, it is difficult to trust the measurement of positive parenting in this study owing to the nonsignificant correlation between observer- and parent-reported measures of this construct. Third, participants were mostly Caucasian, middle- to upper-class parents with 9- to 12-year-old male children. Future research in this area should consider examining for child effects on interparental discord using samples with more racial and ethnic minorities, socioeconomically disadvantaged families, parents of girls, and/or parents of toddlers or adolescents. Fourth, all parents of children with ADHD in this study were married beyond the point when the risk of divorce is greatest for this population (sp. when child is younger than 8 years-old; Wymbs et al., 2008). As such, results of this study may not generalize to parents in less stable or more stressful relationships. Finally, because we did not assess the current treatment status or treatment history of parent couples (or their children), we cannot rule out the possibility that our results may have differed between parents with and without treatment histories.

In closing, it should be said that child effects research essentially quantifies what is common knowledge for all parents—managing disruptive child behavior is difficult. It is hardly a surprise to learn that externalizing children make it harder to be an effective parent or that childrearing difficulties spark marital distress. At the same time, relative to the amount of research focusing on the harmful effects of marital conflict for children, too little attention has been paid to level of stress children can introduce into families. Mindful of this gap in the literature, it is hoped that this study will stimulate researchers to continue studying the role that children play in shaping interparental relations and to investigate ways to disrupt mechanisms exacerbating dysfunctional cycles among discordant parents with disruptive children.

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References

- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th Ed.. Author; Washington, DC: 1994.
- Arnold EH, O'Leary SG, Edwards GH. Father involvement and self-report parenting of children with attention-deficit hyperactivity disorder. *Journal of Consulting and Clinical Psychology*. 1997; 65:337–342. DOI: 10.1037/0022-006X.65.2.337. [PubMed: 9086700]
- Barkley RA. The use of psychopharmacology to study reciprocal influences in parent-child interaction. *Journal of Abnormal Child Psychology*. 1981; 9:303–310. DOI: 10.1007/BF00916834. [PubMed: 7320347]
- Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*. 1986; 51:1173–1182. DOI: 10.1037/0022-3514.51.6.1173. [PubMed: 3806354]
- Bell RQ. A reinterpretation of the direction of effects in studies of socialization. *Psychological Review*. 1968; 75:81–95. DOI: 10.1037/h0025583. [PubMed: 4870552]
- Bell RQ, Chapman M. Child effects in studies using experimental or brief longitudinal approaches to socialization. *Developmental Psychology*. 1986; 22:595–603. DOI: 10.1037/0012-1649.22.5.595.
- Brunk MA, Henggeler SW. Child influences on adult controls: An experimental investigation. *Developmental Psychology*. 1984; 20:1074–1081. DOI: 10.1037/0012-1649.20.6.1074.
- Coffman JK, Guerin DW, Gottfried AW. Reliability and validity of the parent-child relationship inventory (PCRI): Evidence from a longitudinal cross-informant investigation. *Psychological Assessment*. 2006; 18:209–214. DOI: 10.1037/1040-3590.18.2.209. [PubMed: 16768597]
- Cohen, J. Statistical Power Analyses for the Behavioral Sciences. 2nd ed.. Lawrence Erlbaum Associates; Hillsdale, NJ: 1988.
- Cummings EM. Usefulness of experiments for the study of the family. *Journal of Family Psychology*. 1995; 9:175–185. DOI: 10.1037/0893-3200.9.2.175.
- Cummings, EM.; Davies, PT. Marital Conflict and Children: An Emotional Security Perspective. Guilford Press; New York, NY: 2010.
- Cummings EM, Schermerhorn AC, Davies PT, Goeke-Morey MC, Cummings JS. Interparental discord and child adjustment: Prospective investigations of emotional security as an explanatory mechanism. *Child Development*. 2006; 77:132–152. DOI: 10.1111/j.1467-8624.2006.00861.x. [PubMed: 16460530]
- Dadds MR, Sanders MR. Behavioural Observation Coding System: FOS-V. 1992 Unpublished manual.
- Dadds MR, Sanders MR, Behrens BC, James JE. Marital discord and child behavior problems: A description of family interactions during treatment. *Journal of Clinical Child Psychology*. 1987; 16:192–203. DOI: 10.1207/s15374424jccp1603_3.
- Dadds MR, Schwartz S, Sanders MR. Marital discord and treatment outcome in behavioral treatment of child behavior problems. *Journal of Consulting and Clinical Psychology*. 1987; 55:396–403. DOI: 10.1037/0022-006X.55.3.396. [PubMed: 3597955]
- Fabiano GA, Pelham WE, Waschbusch DA, Gnagy EM, Lahey BB, Chronis AM, Onyango AN, Kipp H, Lopez-Williams A, Burrows-MacLean L. A practical measure of impairment: Psychometric properties of the Impairment Rating Scale in samples of children with attention deficit hyperactivity disorder and two school-based samples. *Journal of Clinical Child and Adolescent Psychology*. 2006; 35:369–385. DOI: 10.1207/s15374424jccp3503_3. [PubMed: 16836475]
- Fauber R, Forehand R, Thomas AM, Wierson M. A mediational model of the impact of marital conflict on adolescent adjustment in intact and divorced families: The role of disrupted parenting. *Child Development*. 1990; 61:1112–1123. DOI: 10.2307/1130879. [PubMed: 2209181]
- Fincham FD, Linfield KJ. A new look at marital quality: Can spouses feel positive and negative about their marriage? *Journal of Family Psychology*. 1997; 11:489–502. DOI: 10.1037/0893-3200.11.4.489-502.

- Foltz C, Morse JQ, Barber JP. Self and observer reports of interpersonal problems in couples. *Journal of Clinical Psychology*. 1999; 55:27–37. DOI: 10.1002/(SICI)1097-4679(199901)55:1<27::AID-JCLP3>3.0.CO;2-2. [PubMed: 10100829]
- Gottman JM, Coan J, Carrere S, Swanson C. Predicting marital happiness and stability from newlywed interactions. *Journal of Marriage and the Family*. 1998; 60:5–22. DOI: 10.2307/353438.
- Gottman JM, Levenson RW. The timing of divorce: Predicting when a couple will divorce over a 14-year period. *Journal of Marriage and the Family*. 2000; 62:737–745. DOI: 10.1111/j.1545-5300.2002.40102000083.x.
- Harvey EA. Parenting similarity and children with attention-deficit/hyperactivity disorder. *Child & Family Behavior Therapy*. 2000; 22:39–54. DOI: 10.1300/J019v22n03_02.
- Healey DM, Flory JD, Miller CJ, Halperin JM. Maternal positive parenting style is associated with better functioning in hyperactive/inattentive preschool children. *Infant and Child Development*. 2010 DOI: 10.1002/icd.682.
- Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*. 1999; 6:1–55. DOI: 10.1080/10705519909540118.
- Jenkins J, Simpson A, Dunn J, Rasbash J, O'Connor TG. Mutual influence of marital conflict and children's behavior problems: Shared and nonshared family risks. *Child Development*. 2005; 76:24–39. DOI: 10.1111/j.1467-8624.2005.00827.x. [PubMed: 15693755]
- Johnston C, Mash EJ. Families of children with attention-deficit/hyperactivity disorder: Review and recommendations for future research. *Clinical Child and Family Psychology Review*. 2001; 4:183–207. DOI: 10.1023/A:1017592030434. [PubMed: 11783738]
- Johnston C, Murray C, Hinshaw S, Pelham WE, Hoza B. Responsiveness in interactions of mothers and sons with ADHD: Relations to maternal and child characteristics. *Journal of Abnormal Child Psychology*. 2002; 30:77–88. DOI: 10.1023/A:1014235200174. [PubMed: 11930974]
- Krull JL, MacKinnon DP. Multilevel modeling of individual and group level mediated effects. *Multivariate Behavioral Research*. 2001; 36:249–277. DOI: 10.1207/S15327906MBR3602_06.
- Lang AR, Pelham WE, Atkeson BM, Murphy DA. Effects of alcohol intoxication on parenting behavior interactions with child confederates exhibiting normal or deviant behaviors. *Journal of Abnormal Child Psychology*. 1999; 27:177–189. DOI: 10.1023/A:1021996122095. [PubMed: 10438184]
- Lytton H. Child and parent effects in boys' conduct disorder: A reinterpretation. *Developmental Psychology*. 1990; 26:683–697. DOI: 10.1037/0012-1649.26.5.683.
- MacKinnon, DP. *Introduction to Statistical Mediation Analysis*. Taylor & Francis Group/Lawrence Erlbaum Associates; New York, NY: 2008.
- McIntyre CW, Watson D, Clark LA, Cross SA. The effect of induced social interaction on positive and negative affect. *Psychonomic Society Bulletin*. 1991; 29:67–70.
- Minuchin P. Families and individual development: Provocations from the field of family therapy. *Child Development*. 1985; 56:289–302. DOI: 10.2307/1129720. [PubMed: 3886321]
- Mitnick DM, Heyman RE, Smith Slep AM. Changes in relationship satisfaction across the transition to parenthood: A meta-analysis. *Journal of Family Psychology*. 2009; 23:848–852. DOI: 10.1037/a0017004. [PubMed: 20001143]
- Muthen, L.; Muthen, B. *Mplus User's Guide*. 6th ed.. Muthen & Muthen; Los Angeles: 2010.
- Patterson, GR. *Coercive Family Process*. Castalia Publishing Co; Eugene, OR: 1982.
- Pelham WE, Fabiano GA. Evidence-based psychosocial treatments for ADHD. *Journal of Clinical Child and Adolescent Psychology*. 2008; 37:184–214. DOI: 10.1080/15374410701818681. [PubMed: 18444058]
- Pelham WE, Fabiano GA, Massetti GM. Evidence-based assessment of attention deficit hyperactivity disorder in children and adolescents. *Journal of Clinical Child and Adolescent Psychology*. 2005; 34:449–476. DOI: 10.1207/s15374424jccp3403_5. [PubMed: 16026214]
- Pelham WE, Gnagy EM, Greenslade KE, Milich R. Teacher ratings of DSM-III-R symptoms of the disruptive behavior disorders. *Journal of American Academy of Child and Adolescent Psychiatry*. 1992; 31:210–218. DOI:10.1097/00004583-199203000-00006.

- Pelham WE, Lang AR, Atkeson B, Murphy DA, Gnagy EM, Greiner AR, Vodde-Hamilton M, Greenslade KE. Effects of deviant child behavior on parental distress and alcohol consumption in laboratory interactions. *Journal of Abnormal Child Psychology*. 1997; 25:413–424. DOI: 10.1023/A:1025789108958. [PubMed: 9421749]
- Pelham WE, Lang AR, Atkeson B, Murphy DA, Gnagy EM, Greiner AR, Vodde-Hamilton M, Greenslade KE. Effects of deviant child behavior on parental alcohol consumption: Stress-induced drinking in parents of ADHD children. *The American Journal on Addictions*. 1998; 7:103–114. DOI: 10.1111/j.1521-0391.1998.tb00325.x. [PubMed: 9598214]
- Pelham WE, Lang AR, Jacob RG, Blumenthal JD, Baumann BL, Gnagy EM, Kashdan TB. A laboratory study of the effects of deviant child behavior on subjective and physiological distress and alcohol consumption in mothers with positive and negative family histories of alcoholism. 2011 Manuscript in preparation.
- Pelham WE, Milich R, Murphy DA, Murphy HA. Normative data on the IOWA Conners Teacher Rating Scale. *Journal of Clinical Child Psychology*. 1989; 18:259–262. DOI: 10.1207/s15374424jccp1803_9.
- Pisterman S, Firestone P, McGrath P, Goodman JT, Webster I, Mallory R, Coffin B. The effects of parent training on parenting stress and sense of competence. *Canadian Journal of Behavioural Science*. 1992; 24:41–58. DOI: 10.1037/h0078699.
- Reid MJ, Webster-Stratton C, Hammond M. Follow-up of children who received the *Incredible Years* intervention for oppositional-defiant disorder: Maintenance and prediction of 2-year outcome. *Behavior Therapy*. 2003; 34:471–491. DOI:10.1016/S0005-7894(03)80031-X.
- Roberts MW. Clinic observations of structured parent-child interactions designed to evaluate externalizing disorders. *Psychological Assessment*. 2001; 13:46–58. DOI: 10.1037/1040-3590.13.1.46. [PubMed: 11281038]
- Rueger SY, Katz RL, Risser HJ, Lovejoy MC. Relations between parental affect and parenting behaviors: A meta-analytic review. *Parenting: Science and Practice*. 2011; 11:1–33. DOI: 10.1080/15295192.2011.539503.
- Schermerhorn, AC.; Cummings, EM. Transactional family dynamics: A new framework for conceptualizing family influence processes. In: Kail, RV., editor. *Advances in Child Development and Behavior*. Vol. 36. Elsevier Press; San Diego: 2008. p. 187-250.
- Schermerhorn AC, Chow S-M, Cummings EM. Developmental family processes and interparental conflict: Patterns of microlevel influences. *Developmental Psychology*. 2010; 46:869–885. DOI: 10.1037/a0019662. [PubMed: 20604608]
- Schermerhorn AC, Cummings EM, DeCarlo CA, Davies PT. Children's influence in the marital relationship. *Journal of Family Psychology*. 2007; 21:259–269. DOI: 10.1037/0893-3200.21.2.259. [PubMed: 17605548]
- Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*. 1988; 54:1063–1070. DOI: 10.1037/0022-3514.54.6.1063. [PubMed: 3397865]
- Wymbs BT, Pelham WE. Child effects on communication between parents of youth with and without attention-deficit/hyperactivity disorder. *Journal of Abnormal Psychology*. 2010; 119:366–375. DOI: 10.1037/a0019034. [PubMed: 20455609]
- Wymbs BT, Pelham WE, Molina BSG, Gnagy EM, Wilson T, Greenhouse JB. Rate and predictors of divorce among parents of youth with attention-deficit hyperactivity disorder. *Journal of Consulting and Clinical Psychology*. 2008; 76:735–744. DOI: 10.1037/a0012719. [PubMed: 18837591]

Figure 1. Path model tested to evaluate parent affect and parenting behavior as mechanisms underlying child effects on interparental communication. Covariances among the mediators were included in the model, but omitted from this figure to enhance clarity.

Figure 2.

Results of multilevel path models investigating mechanisms that underlie child effects on positive interparental communication with a) observational coding and b) partner ratings. Only significant ($p > .05$) paths are shown. Unstandardized betas with standard errors in parentheses are provided.

Figure 3. Results of multilevel path models investigating mechanisms that underlie child effects on negative interparental communication with a) observational coding and b) partner ratings. Only significant ($p > .05$) paths are shown. Unstandardized betas with standard errors in parentheses are provided.

Table 1

Descriptives and intercorrelations among variables in the multilevel mediation models

<i>A. Models with observer coding</i>	<i>M (SD)</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
1. Confederate Child Behavior	-					
2. Positive Affect (P)	31.23 (7.88)	-.25**				
3. Negative Affect (P)	12.26 (3.66)	.31**	-.19*			
4. Positive Parenting (O)	98.16 (47.88)	.31**	.07	.10		
5. Negative Parenting (O)	1.46 (3.84)	.36**	.03	.19**	.25**	
6. Positive Communication (O)	26.53 (12.31)	-.23**	-.01	-.06	-.14	-.11
7. Negative Communication (O)	.38 (.85)	.29**	-.12	.22**	.11	.32**
<i>B. Models with only partner ratings</i>	<i>M (SD)</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
1. Confederate Child Behavior	-					
2. Positive Affect (P)	31.23 (7.88)	-.25**				
3. Negative Affect (P)	12.26 (3.66)	.31**	-.19*			
4. Positive Parenting (P)	8.69 (1.53)	-.48**	.21**	-.22**		
5. Negative Parenting (P)	1.78 (1.30)	.42**	-.06	.22**	-.72**	
6. Positive Communication (P)	8.49 (2.04)	-.40**	.14	-.18*	.73**	-.62**
7. Negative Communication (P)	1.81 (1.56)	.38**	-.09	.14	-.47**	.58**

Note: "P" indicates that data were gathered from parent ratings. "O" indicates that data were gathered from observational coding. Affect summary scores range from 10–50, with higher scores indicating stronger emotional valence. Frequencies of positive parenting ranged from 5–250 and negative parenting ranged from 0–31. Frequencies of positive communication ranged from 3–70 and negative communication ranged from 0–7. Partner ratings of parenting and communication range from 0 (Not at all positive/negative) to 10 (Very much positive/negative).

* $p < .05$,

** $p < .01$