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Children's Responses to Interparental Conflict:

A Meta-Analysis of Their Associations With Child Adjustment

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Abstract

A meta-analysis examined the relations between children's adjustment and children's cognitive, affective, behavioral, and physiological responses to interparental conflict. Studies included children between 5 and 19 years of age. Moderate effect sizes were found for the associations between cognitions and internalizing and externalizing behavior problems and self-esteem problems, negative affect and behavioral responses and internalizing behavior problems, and behavioral responses and self-esteem problems. Small to moderate effect sizes were found for the associations between cognitions and relational problems, negative affect and behavioral responses and externalizing behavior problems, and physiological reactions and internalizing and externalizing behavior problems. Effect sizes were, with one exception, larger for internalizing than for externalizing behavior problems. Age significantly moderated the majority of effect sizes.

The link between interparental conflict (IPC) and children's behavioral and emotional dysfunction is well established in both intact and divorced families (Amato & Keith, 1991; Buehler et al., 1997; Cummings & Davies, 2002; Cummings & Davies, 1994; Davies and Cummings, 1994; Emery, 1982; Grych & Fincham, 2001; Ingolsby, Shaw, Owens, & Winslow, 1999). However, not all children who witness IPC display behavior problems (Jouriles, Murphy, & O'Leary, 1989). More recent research efforts have focused on identifying the characteristics of children exposed to IPC, their coping responses to conflict, and contextual factors of IPC that may relate to adjustment problems (e.g., Cummings & Davies, 2002).

Ultimately, it is not the conflict itself but rather more proximal processes that must account for the relation between IPC and child behavior problems. Children's responses to IPC are one possible proximal variable. Such responses are indicators of how children process and make meaning of IPC in relation to their own needs, desires, and goals. Of course, children's responses to IPC are not the only variables relevant to the association between IPC and child dysfunction. This meta-analysis focuses on children's responses to conflict because: 1) children's own responses to IPC are most proximal to their own psychosocial and physical adjustment, 2) these responses provide an index of how children interpret and cope with IPC, which should ultimately mediate the relation between IPC and child adjustment, and 3) the literature on children's reactions to IPC is sufficiently large to warrant a systematic, quantitative review and provides an established theoretical background. This meta-analysis focuses on four broad categories of child responses to IPC: cognitions, emotional responses, behavioral responses, and physiological responses. These four categories represent the full spectrum of possible child responses to conflict; when children are exposed to IPC they can think, feel, act, and physiologically respond to the situation. The first three of these

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responses to IPC are included as mediating constructs in three major theoretical frameworks. We first explore empirical research on the relations between cognitive, affective, behavioral, and physiological responses to IPC and child adjustment, drawing on relevant theoretical frameworks when warranted. We then outline what is still unclear in the literature and how a meta-analysis can advance knowledge in the field.

Cognitions

Hostile internal representations of IPC are consistently and strongly related to children's behavior problems (Davies, Forman, Rasi, & Stevens, 2002). The Emotional Security Hypothesis (Davies & Cummings, 1994) posits that children's reactions to IPC are a function of the perceived implications of the conflict on the well-being of the family and have the goal of preserving and promoting the child's own emotional security. Thus, cognitions associated with threatened family security are likely to elicit fear and helplessness. These responses may, over time, become generalized responses to a variety of life events.

Additionally, researchers have found that cognitions of self-blame and threat are associated with internalizing behavior problems (Cummings, Davies, & Simpson, 1994; Grych et al., 2000; Grych et al., 2003; Grych, Seid & Fincham, 1992; Jouriles, Spiller, Stephens, McDonald, & Swank, 2000; Kerig, 1998b; Rogers & Holmbeck, 1997). Consistent with the Cognitive-Contextual Framework (Grych & Fincham, 1990; Grych et al., 2000), if children view their parents' conflicts as threatening to themselves or the family system or feel that they are unable to cope with the conflict they are likely to feel anxious and helpless. Likewise, if children feel that they are to blame for their parents' conflicts they are likely to feel guilt, shame, and sadness (Grych & Fincham, 1990; Grych et al., 2000).

Children's cognitions could also be associated with aspects of development other than internalizing and externalizing behavior problems. For example, if a child feels that they are to blame for their parents' conflict or that they are unable to cope with the conflict, they may be likely to have low self-esteem or self worth (Rogers & Holmbeck, 1997). If children feel threatened by IPC, especially if they feel that the conflict may result in family dissolution or conflict spillover, their social relations within the family may be negatively influenced. Worry associated with threat cognitions or destructive family representations could also influence children's physical health through stress responses. Although we know relatively little about how children's cognitive responses to IPC influence their physical health, we do know that exposure to IPC is related to health problems (Gottman & Katz, 1989). Similarly, if children worry about how IPC may impact their family while they are in school, their academic progress may be influenced by their distraction. It is thus important to go beyond measures of internalizing and externalizing behavior problems when examining the possible impact of children's responses to IPC on child adjustment.

Affect

Child negative affect in response to IPC has also been investigated as a possible mediator of the relation between IPC and child adjustment. In response to IPC, sadness has been shown to be positively correlated with internalizing and externalizing behavior problems (Cummings, Goeke-Morey, & Papp, 2003). Fear has been shown to be positively correlated with internalizing behavior problems (Cummings et al., 2003, Crockenberg & Langrock, 2001). Anger, when coupled with paternal aggression, has been shown to be positively correlated with externalizing behavior problems in boys (Crockenberg & Langrock, 2001).

These findings are consistent with the Cognitive-Contextual Framework (Grych & Fincham, 1990), the Emotional Security Hypothesis (Cummings & Davies, 1994) and the Specific

Emotions Model (Crockenberg & Forgays, 1996; Crockenberg & Langrock, 2001). In the Cognitive-Contextual Framework, emotions are conceptualized as primary responses to IPC which then influence secondary, cognitive, processing of the event. Through its relation to cognitions, affect is thus viewed as a mediator of the relation between IPC and child adjustment. The Emotional Security Hypothesis conceptualizes affect as an additional index of emotional security, which is ultimately related to child adjustment. Lastly, the Specific Emotions Model posits that children's evaluations of IPC lead to affective reactions based on the children's expectations of specific goal attainment. These affective reactions are then theorized to relate child internalizing and externalizing behavior problems.

Relations between affective reactions to IPC and child adjustment, however, have been inconsistent, especially for externalizing behavior problems. Although some authors find strong positive correlations between negative affect and internalizing (Davies & Cummings, 1998; Davies, Forman, et al., 2002), and externalizing (Ablow, 1997; Davies, Harold et al., 2002) behavior problems, other authors have not found significant relations among these variables (Crockenberg & Langrock, 2001; El-Sheikh & Harger, 2001). It should be noted, however, that even non-significant correlations were positive; increased negative affect is certainly not associated with positive adjustment outcomes.

Behavioral Responses

Behavioral reactions to IPC are conceptualized as a final index of emotional security (Cummings & Davies, 1994) and are typically divided into involvement behaviors and avoidance behaviors. Involvement includes behaviors such as trying to break up the conflict or otherwise talking to or physically interacting with parents while they are arguing. Avoidance includes behaviors where children actively attempt to avoid their parents' conflict when they are aware of its occurrence. Behavioral reactions to IPC are not consistently positively related to adjustment problems. Although involvement in IPC is positively correlated with children's depression, low self-worth, anxiety and hostility (O'Brien, Bahadur, Gee, Balto, & Erber, 1997; O'Brien, Margolin, & John, 1995), avoidance of IPC is negatively correlated with internalizing behavior problems in some studies (e.g., O'Brien et al., 1995) and positively correlated with internalizing behavior problems in other studies (e.g., Davies, Forman et al., 2002). If a child avoids IPC and proceeds to ruminate over the conflict and or its implications for the family, he/she may be likely to develop internalizing behavior problems. Conversely, if a child avoids IPC by engaging in adaptive coping responses, such as distracting him/herself with another positive activity, he/she might avoid the negative effects of IPC. Avoidance of IPC and externalizing behavior problems have not been found to be significantly correlated (see Davies, Forman et al., 2002; O'Brien et al., 1995).

Physiological Responses

Physiological responses to IPC have been less frequently examined as possible mediators or moderators in the relation between IPC and child adjustment. Consistent with the Emotional Security Hypothesis (Cummings & Davies, 1994); physiological responses to IPC may be indicators of the meaning placed on the conflict by the child. Thus, children's physiological responses to IPC may be associated with poor adjustment outcomes. Research has indicated that physiological responses to IPC are associated with adjustment outcomes (El-Sheikh, 2005; El-Sheikh, Harger, & Whitson, 2001; El-Sheikh & Whitson, 2006). Less is known, however, about the relative impact of physiological responses to IPC when compared to other child responses to IPC.

Age and Gender Effects

Inconsistent results have been found regarding the effects of gender on the relations between self-blame and threat cognitions and behavior problems. Some researchers find no gender differences (Grych et al., 1992; Jouriles et al., 2000). Others find that threat cognitions are a stronger predictor of dysfunction in boys, and self-blame cognitions are a stronger predictor of dysfunction in girls, even though boys and girls report similar rates of self-blame and threat cognitions (Cummings et al., 1994; Kerig, 1998b). Additionally, overall maladaptive cognitions were, in one study, a stronger predictor of externalizing behavior problems in boys and of internalizing behavior problems in girls (Kerig, 1998a).

Gender differences in the relations between negative affect and child adjustment have also been inconclusive. For example, El-Sheikh (2005) found that relations between self-reported anger and internalizing and externalizing behavior problems and self-reported sadness and externalizing behavior problems are stronger for girls than for boys. Additionally, Davies, Forman, et al., (2002) found gender moderation for links between cognitive and behavioral responses to IPC and maternal (but not child, paternal, or teacher) reports of child behavior problems. Other studies, however, have either failed to find gender differences (Cummings et al., 2006; Davies, Harold et al., 2002), or have not directly examined the role of gender (Dukewich, 2001).

Child age could also be an important moderator of the relation between children's responses to IPC and their adjustment. Unfortunately, the role of child age is even less clear than that of gender. Most empirical studies utilize restricted age ranges, or do not report analyses including child age as a predictor or covariate. Young children's behavior may be more highly influenced by primary processing (i.e., negative affective responses), whereas older children's behavior may be more highly influenced by secondary processing (i.e., cognitions) (Grych & Fincham, 1990). We know that as children age, cognitions become less ego-centric, less catastrophic about negative events and more sophisticated (Harter, 1983; Leitenberg, Yost, & Carroll-Wilson, 1986; Piaget, 1932). Additionally, attributional cognitions become more highly correlated with depression as age increases (Nolen-Hoeksema, Girgus, & Seligman, 1992; Turner & Cole, 1994). Thus, as children age they are less likely to make self-blaming (i.e., egocentric) or threat (i.e., catastrophic) attributions about events (Grych, 1998; Jouriles et al., 2000), while cognitions overall become more highly correlated with dysfunction.

Aims

The literature on children's responses to conflict is well developed and in many ways consistent. However, because no single study has included cognitive, affective, behavioral, and physiological responses to IPC in relation to broad child adjustment, it is difficult to interpret the relative importance or influence of each child response in relation to various adjustment indices. Similarly, no single study has included, or should be expected to include, all possible measures of child adjustment. By aggregating studies that include a variety of adjustment outcomes in relation to children's responses to IPC we are able to make general conclusions about how these responses relate to adjustment as a whole. We are also then able to compare the relations between child responses to IPC and various measures of adjustment. The literature has also been unable to make conclusive statements about the possible moderating role of age or gender in the relations between children's responses to IPC and child adjustment. If the major theories are designed to apply to all children, then we should expect that all relevant responses to IPC are related to child adjustment for each age group and for both boys and girls. If this is not true, we may need to adjust our theories to reflect that processes may differ between older and younger children or boys and girls.

A meta-analysis is important at this time to 1) quantify, in one report, the last 15 or so years of research on the relation between children's responses to IPC and child adjustment, 2) to compare the relative impact of each of these responses to IPC on child adjustment; 3) to reduce uncertainty about gender effects in the relations between children's responses to IPC and adjustment, and 4) to examine age effects in the relations between children's responses to IPC and adjustment. It is important for researchers, clinicians, and policy makers to have consolidated, easily accessible information about responses to IPC that are likely to be more or less deleterious to child development. It is similarly important for them to know if boys or girls or certain age groups are more or less likely to be negatively influenced by various responses to IPC.

Consequently, the first goal of the meta-analysis is to evaluate the research support for the relations between child adjustment and children's cognitive, affective, behavioral, and physiological responses to IPC. In relation to this goal, the relative effect sizes for the four constructs are compared with the goal of more fully understanding which, if any, of the constructs are more or less related to child adjustment. The second goal of the meta-analysis is to examine possible differences in the relations between children's responses to IPC and different types of adjustment difficulties. For instance, are children's responses to IPC more strongly related to internalizing behavior problems or externalizing behavior problems? The final goal is to evaluate the possible moderating effects of child age and gender for all significant relations between children's responses to IPC and child adjustment.

Method

To identify relevant studies for inclusion in the meta-analysis, a computerized search of five electronic databases, PsychInfo, PubMed, Dissertation Abstracts International, ERIC, and Sociological Abstracts was conducted. Keywords used in the computerized search included interparent* conflict*, parent* conflict*, interparent* disagreement*, parent* disagreement*, child rearing disagreement*, child related disagreement*, child rearing conflict, child related conflict, behav* adjustment, coping, appraisal*, cognition*, reaction*, buffering factors, respon*, emotional response, behavioral response, child appraisal, adjustment, externalizing behavior problems, internalizing behavior problems, resilience, moderators, mediators, social development, domestic violence, and intimate partner violence (*s indicate that any permutations of the word stem were retrieved). These keywords were selected based on a desire to include studies assessing a variety of types IPC, child responses to IPC, and adjustment variables in the meta-analysis. Studies including conflict about marital relations, children or child-rearing practices, daily activities, and domestic violence were all included. No study was excluded based on type of IPC, type of child response to IPC, or type of adjustment variable. The search was limited to English language articles.

This initial search yielded a total of 7,422 studies (with expected overlap among the databases). To be included in the meta-analysis, each study met five criteria; 1) the study was published in English 2) the study included at least one measure of child adjustment, and 3) the study included at least one measure of children's cognitive, emotional, behavioral, or physiological responses to IPC. Closer examination of the titles and abstracts of studies resulted in 130 studies that could possibly meet inclusion criteria. These studies were retrieved and more closely inspected. The reference lists of the retrieved articles, as well as all relevant meta-analyses, literature reviews, and books were then examined to identify any additional studies for inclusion. Nine journals likely to publish articles in this area; Journal of Family Psychology, Child Development, Journal of Abnormal Child Psychology, Journal of Marriage and Family, Developmental Psychology, Parenting: Science and Practice, Journal of Divorce and Remarriage, Journal of Clinical Child and Adolescent Psychology, and Journal of Child Psychology and Psychiatry were hand-searched. This process yielded

four additional studies. The above searches were conducted in September 2007. Finally, experts in the field were contacted to identify any relevant in-press or unpublished studies. Experts in the field were identified as those researchers who were first authors on more than one published paper in the area of children's responses to interparental conflict and child adjustment. These eleven researchers were contacted once via e-mail. The combined literature search resulted in a total of 142 possibly relevant studies.

Of the 142 studies initially retrieved for inclusion in the meta-analysis, 17 did not include measures of child adjustment, 19 did not include measures of children's responses to IPC, 18 studies did not include the necessary statistical values, 7 articles included duplicate samples, and 16 articles were purely theoretical or reviews. The authors of the 18 studies that did not report the necessary statistical values were contacted via e-mail. Two authors responded with the necessary information. This resulted in a final group of 71 studies that were included in the current meta-analysis. These 71 studies came from 67 articles, with 4 articles containing two studies or data sets. The majority of included studies (52) were published journal articles; the remaining 19 were dissertations. Of these 71 studies, 50 included measures of cognitions, 18 included measures of negative affect, 23 included measures of behavioral reactions in response to IPC, and 6 studies included measures of physiological responses to IPC. Only four studies separated negative affect into specific emotions (Crockenberg & Langrock, 2001; Cummings et al., 2003; El-Sheikh, 2005; Harold, Shelton, Goeke-Morey, & Cummings, 2004). Because of this, analyses involving negative affect used composite measures of negative affect, averaging effect sizes for fear, anger, and sadness when they were reported separately. Cognitions were analyzed as a unified construct and separately for self-blame and threat cognitions. Behavioral reactions were analyzed both as a unified construct and separately for active avoidance of and involvement in IPC. Because of the heterogeneity of physiological responses in the literature, physiological responses to IPC could only be analyzed as a unified construct. Two of the included studies measured skin conductance, one measured skin conductance and heart rate, one measured cortisol reactivity, and two measured vagal regulation. Attempts were made to include the higher-order construct of emotional security in the analyses. However, only two manuscripts included the necessary zero-order correlations between overall emotional security and child adjustment. All manuscripts that included relations between the cognitive, affective, and behavioral components of emotional security were included in the review. Adjustment variables in the review include: internalizing and externalizing behavior problems, self-esteem problems, relational problems, academic or cognitive problems, physical health problems, emotion dysregulation, and poor self-esteem or self-worth. In most cases, there were not enough studies reporting a particular adjustment variable (the exceptions being internalizing and externalizing behavior problems, poor self-esteem, and relational problems) to separately meta-analyze the results. In these cases, the effect sizes for these adjustment variables were only included in the overall adjustment analyses.

Nine studies that included measures of cognitions reported results separately by gender. Thus, these studies were analyzed with both the entire sample and separately by gender. Because only a small number of studies reported results separately by gender, analyses for negative affect, behavioral reactions, and physiological responses were only run with the whole samples.

A very small number of studies that met inclusion criteria included longitudinal data. For consistency across studies, when the manuscript included both cross-sectional and longitudinal data, the cross-sectional data was aggregated with the other, cross-sectional, studies. Because of the paucity of longitudinal data meeting inclusion criteria, longitudinal

results were not aggregated, but are later described in relation to aggregate cross-sectional findings.

Study Coding

Each of the 71 manuscripts included in the meta-analysis were coded. Coded study characteristics included the type of publication, publication year, first author name, type of data collection method, mean child age, percentage of male children, percent minority and dominant minority group, clinical status of the population, percentage of married or cohabitating parents, and mean family income. Twenty-five percent of the articles were coded by an independent coder to determine reliability. Intraclass correlation coefficients (ICCs) for continuously coded variables ranged from .93 to 1.00. Cohen's kappa for categorically coded variables ranged from .88 to 1.00.

Results

All results are for weighted fixed effects analyses. A fixed effects model assumes that the effect size obtained in a study estimates the population effect sizes, with random error that derives solely from participant sampling (Lipsey & Wilson, 2001). This model is additionally used when one assumes that any heterogeneity in effect sizes is due to systematic differences between studies that can be modeled. Aggregate effect size and moderator analyses were conducted using SPSS Macros for Meta-Analysis Version 2005 (Wilson, 2005). After weighting for sample size, each effect size is given in correlation coefficient metric, ranging from -1 to +1. Effect sizes are positive when a higher degree of negative cognitions, negative affect, behavioral responses to IPC, or physiological responses to IPC was associated with more adjustment problems. Effect sizes are categorized as large, medium, and small if values were about equal to the following values: large = .40, medium = .25, small = .10 (Lipsey & Wilson, 2001). For each significant aggregate effect size, two fixed effects analogue to regression analyses with age and methodological quality as potential moderating variables were conducted. Methodological quality was continuously scored with studies receiving one point each for utilizing: 1) daily diary reports, 2) audio or video vignettes of IPC, and 3) observation of child behavior problems and/or child responses to IPC. Methodological quality ranged from 0-3 points with a mean of 0.18. For each significant effect size, fixed effects analogues to ANOVA with publication status and dichotomous child age (above or below the mean) as the moderating variables were conducted. Additionally, for each significant aggregate effect size, the fail-safe N (Rosenthal, 1979) was computed. The fail-safe N estimates the number of studies reporting null findings needed to reduce the aggregate effect sizes to negligible levels. All fail-safe N analyses were conducted using the formula proposed by Orwin (1983). For this analysis the critical effect size value was set at .01, representing a negligible effect size. Effect sizes were aggregated separately if at least 3 studies included the measure of child response to IPC or adjustment. Composite measures of overall maladaptive cognitions and overall behavioral responses to IPC were created to include all cognitive and behavioral variables, including those that were not reported in at least three studies. Similarly, overall adjustment indices were created to include all adjustment variables, including those that were not reported in at least three studies.

Descriptives

For this sample of 71 studies, the mean child age was 10.61 years ($SD = 2.84$), with a range of 5.0 to 19.3 years. Minority percentage ranged from 0-100% with a mean of 27.72% ($SD = 23.90$) minority participants. Of the studies that included minority participants, the dominant minority group was African American in 59.2% of the studies and Hispanic in 11.3% of the studies. The remaining studies including minority participants listed another minority group

as the largest minority group or did not provide this information. Between 0% and 100% of the adult participants were married or cohabitating, with a mean of 92.46% ($SD = 16.60$). The mean yearly family income was \$39,763.65 ($SD = \$18,781.95$), with a range of \$6,684 - \$88,000. About 74.6% of the studies had about equal numbers of boy and girl children; 11.3% had between 5 and 45% male children, 8.5% of the studies had 55-95% male children, and 1.4% had more than 95% male children. The remaining studies did not report this information. Forty-four percent of the studies utilized questionnaires as the sole data collection method; 7% used interviews as the sole data collection method, and 49% of the studies used a combination of methods.

Cognitions and Adjustment Problems

Fifty studies included information on the relations among cognitions about IPC and children's adjustment problems (Table 1). These studies included 10,364 participants, with a mean of 207.28 participants per study. Results are reported both for overall maladaptive cognitions (including self-blame cognitions, threat cognitions, control cognitions and coping efficacy) and separately by self-blame and threat cognitions. The overall weighted aggregate effect size including all studies for the relation between cognitions and adjustment problems was $r = .18, p < .001$. Each of the more specific effect sizes were significant ($ps < .001$), and most weighted aggregate effect sizes were medium-large (see Table 1 for values). The fail-safe N for these analyses ranged between 52 and 1,485. Each fail-safe N exceeded suggested minimum values (Rosenthal, 1984).

Nine of the 50 studies reported cognition results separately by gender. The nine studies included 1,507 participants, with a mean of 167.44 participants per study. All weighted aggregate effect sizes were significantly ($ps < .001$) different from zero. Most weighted aggregate effect sizes were of medium strength (see Table 1 for values). The fail-safe N indicated that between 152 and 384 unpublished studies with null results would be needed to reduce the aggregate effect sizes to negligible levels. Each fail-safe N exceeded suggested minimum values (Rosenthal, 1984).

Negative Affect and Adjustment Problems

Eighteen studies were included that measured relations between negative affect and adjustment problems (Table 2). These studies contained 3,538 total participants, with a mean of 196.56 participants per study. The overall weighted aggregate effect size including all studies for the relation between negative affect and adjustment problems was $r = .14, p < .001$. Each of the more specific weighted aggregate effect sizes were significantly different ($ps < .001$) from zero. Most weighted aggregate effect sizes were small to medium-large (see Table 2 for values). The fail-safe N indicated that between 224 and 480 unpublished null studies would be needed to reduce the aggregate effect sizes to negligible levels. Each fail-safe N exceeded suggested minimum values (Rosenthal, 1984).

Behavioral Responses to IPC and Adjustment Problems

Twenty-two studies were included that investigated the relations between behavioral responses to IPC and adjustment problems (Table 2). These studies included 5,618 total participants, with a mean of 255.36 participants per study. The overall weighted aggregate effect size including all studies for the relation between behavioral responses and adjustment problems was $r = .19, p < .001$. Each of the more specific weighted aggregate effect sizes, except one, was significantly ($ps < .001$) different from zero. Weighted aggregate effect sizes were in the small — medium range (see Table 2 for values). The fail-safe N for these significant findings indicated that between 63 and 506 unpublished null findings would be required to reduce the aggregate effect sizes to negligible levels. Each fail-safe N exceeded suggested minimum values (Rosenthal, 1984). A non-significant ($p = .07$) weighted

aggregate effect size was found for the relation between avoidance of IPC and externalizing behavior problems.

Physiological Responses to IPC and Behavior Problems

Six studies were included that investigated the relations among physiological responses to IPC and adjustment problems. These studies included 768 participants, with a mean of 128 participants per study. The overall weighted aggregate effect size including all studies for the relation between physiological responses and adjustment problems was $r = .12$, $p < .001$. Each of the more specific weighted aggregate effect sizes were significantly ($ps < .001$) different from zero, and small in strength (see Table 2 for values). The fail-safe N indicated that between 60 and 78 studies with null findings would be required to reduce the aggregate effect sizes to negligible levels. Each fail-safe N exceeded suggested minimum values (Rosenthal, 1984).

Effect Size Comparisons

Using r-to-z transformations, effect sizes for the relations between each of the four constructs and adjustment problems were compared. Aggregate effect sizes for the relations between cognitions and negative affect and internalizing behavior problems were significantly larger ($p < .05$) than those for behavioral and physiological responses to IPC and internalizing behavior problems (with one exception of negative affect and involvement in IPC). Aggregate effect sizes for the relations between cognitions and externalizing behavior problems were significantly larger ($p < .01$) than those for negative affect, behavioral responses, and physiological responses to IPC and externalizing behavior problems. Aggregate effect sizes for the relation between cognitions and self-esteem problems was significantly ($p < .001$) larger than the relation between behavioral responses to IPC and self-esteem problems. For overall adjustment, relations were significantly ($p < .001$) larger for cognitions and behavioral responses to IPC than for physiological responses to IPC.

Differences for Internalizing Compared to Externalizing Behavior Problems

Using r-to-z transformations, effect sizes for the relations between children's responses to IPC and internalizing behavior problems were compared to the effect sizes for the relations between children's responses to IPC and externalizing behavior problems. Other adjustment indices were not examined due to the small number of studies representing each adjustment outcome. With the exception of physiological responses, all effect sizes for the combined samples of boys and girls were larger for relations with internalizing behavior problems than for relations with externalizing behavior problems (all $ps < .001$).

Age and Gender Moderation

For all significant effect sizes, analogue to regression moderation analyses were conducted with child age entered as the moderator. Child age was a significant moderator of 22 of 34 relations between child responses to IPC and adjustment problems (see Tables 1 and 2). In all instances, effect sizes were larger for older children than for younger children. To examine whether any of the effect sizes were non-significant for older children or younger children, analogue to ANOVA analyses were conducted with dichotomous child age as the moderator. Older children were defined as those at or above the mean of 10.61; younger children were defined as those below the mean of 10.61. Overall moderation results were equivalent to the previous regression results. Aggregate effect sizes were non-significant for the relations between overall cognitions and internalizing and externalizing behavior problems for younger girls, self-blame and externalizing behavior problems for younger

boys, threat and internalizing behavior problems for younger girls, and threat and externalizing behavior problems for younger girls and younger boys ($ps > .05$).

For those studies that reported effect sizes separately for boys and girls, effect sizes for the relations between self-blame and threat cognitions and adjustment for boys were compared to those for girls using r-to-z transformations. No significant differences were found (all $ps > .05$).

Publication Status and Quality Moderation

For all significant effect sizes, analogues to ANOVA were conducted with publication status and methodological quality entered as moderators. Publication status moderated the magnitudes of the relations between 14 of 34 significant aggregate effect sizes (all $ps < .05$). In all cases, effect sizes were larger for published studies than for unpublished studies. Study quality moderated the magnitudes of the effect sizes for 11 of 34 significant aggregate effect sizes (all $ps < .05$). Higher quality studies, for these relations, reported smaller effect sizes than lower quality studies.

Additional Analyses

Because the relations among children's reactions to IPC and their adjustment problems might be confounded with the amount of exposure children have to conflict, partial correlations controlling for the amount of IPC were computed for those studies that reported the necessary statistical values. The subsequent analyses are based on between 5 and 22 studies depending on the relation being analyzed. Partial aggregate effect sizes were significant for all relations with two exceptions: avoidance of IPC and internalizing and externalizing behavior problems (see Table 3). Bivariate aggregate effect sizes were significantly larger ($ps < .05$) than partial aggregate effect sizes for all relations with the following exceptions: negative affect and externalizing behavior problems, avoidance and externalizing behavior problems, and involvement and externalizing behavior problems.

Although there were not enough longitudinal studies that met inclusion criteria to aggregate results across studies, bivariate correlations were extracted from these studies for comparison with cross-sectional aggregate results. Due to the small number of studies represented by these results, caution is urged in their interpretation. Two longitudinal studies provided bivariate longitudinal correlations among cognitions and adjustment problems, four studies (two within the same manuscript) provided longitudinal correlations among negative affect and adjustment problems, five studies (two within the same manuscript) provided longitudinal correlations among behavioral responses to IPC and adjustment problems, and three studies provided longitudinal correlations among physiological reactivity and adjustment problems. Longitudinal correlations were significantly lower than cross-sectional correlations for relations among cognitions and negative affect and internalizing behavior problems ($ps < .01$).

Discussion

The first goal of the meta-analysis was to evaluate and compare the research support for the relations among children's cognitions, negative affect, behavioral, and physiological reactions to IPC and their adjustment. Most aggregate effect sizes were significantly different from zero. Overall the pattern of data implies that all four response constructs are related to child adjustment, although the relations appear stronger for cognitions and negative affect than for behavioral and physiological reactions to conflict.

Only one aggregate bivariate effect size was non-significant; that for the relation between avoidance and externalizing behavior problems. Avoidance is exclusively associated with

internalizing behavior problems. If children are ruminating or worrying about the conflict during their avoidance, they may be likely to develop internalizing behavior problems. Alternatively, children who report more internalizing behavior problems may be more likely to avoid interparental conflict in general, whereas children reporting externalizing behavior problems may be less likely to actively avoid interparental conflict.

The second goal of the meta-analysis was to examine differences in the relations among children's responses to IPC and different types of adjustment problems. With the exception of involvement in IPC, relations between children's responses to IPC and internalizing behavior problems were larger than relations with externalizing behavior problems. If children use maladaptive coping strategies in response to IPC they may be particularly vulnerable to using these same or similar maladaptive coping skills whenever they are confronted with difficult life circumstances. Inability to cope with various life stressors may make children particularly at risk for internalizing behavior problems. Because exposure to IPC and externalizing behavior problems are clearly associated, we need to know more about which, if any, child responses to IPC are more strongly or uniquely predictive of externalizing behavior problems. Although aggressive responses to IPC are related to general externalizing behavior problems (Cummings, Goeke-Morey, & Papp, 2004), the direction of this association is unclear.

The final goal of the meta-analysis was to examine the effects of age and gender on the relations between children's responses to IPC and their adjustment problems. Gender differences could only be explored for the relations among cognitions and internalizing and externalizing behavior problems. Interestingly, no significant differences were found between the aggregate effect sizes for girls and those for boys. This is consistent with previous studies that have failed to find gender differences in the relations between self-blame and threat cognitions and behavior problems (Grych et al., 1992; Jouriles et al., 2000). This does not imply that boys and girls are necessarily similarly susceptible to maladaptive cognitions; rather, these results imply that gender does not significantly influence how those cognitions are related to internalizing or externalizing behavior problems.

Age was found to be a significant moderator of the majority significant aggregate effect sizes. In each case, older children showed stronger associations between the two constructs than did younger children. Negative responses to IPC may be more likely to, over repeated experiences, become a characteristic response pattern to a variety of life events, resulting in more generalized internalizing or externalizing behavior problems. Effect sizes were non-significant for younger children for six of the relations between responses to IPC and adjustment. It may be that children younger than about age ten lack the cognitive sophistication necessary for effectively generating and processing maladaptive cognitions about IPC. Younger children may also generate these cognitions while conflict is occurring, but not continue to process them after the conflict resolves. Possibly, extended rumination about IPC increases one's risk of developing more generalized persistent behavior problems. Lastly, younger children have not had as much opportunity to witness IPC as older children. In line with the sensitization hypothesis (Davies, Myers, Cummings, & Heindel, 1999), conflict exposure may influence the relation among children's responses to IPC and their behavior problems. Although IPC exposure certainly influences child adjustment, aggregate partial correlations illustrate that children's responses to IPC (with the exception of avoidance) are significantly related to their adjustment even when exposure to IPC is statistically controlled. Particularly in light of the non-significant effect sizes for the relations among some child responses to IPC and children's behavior problems for children under about ten years, future studies should attempt to explain how and why relations between children's responses to IPC and their adjustment differ for elementary age versus adolescent children.

Result interpretation is limited by uncertainty about the directionality of the effects. Theories of the relations between children's responses to IPC and child adjustment have explained the process as being one in which children's reactions to IPC lead to child behavior problems (Grych & Fincham, 1990; Davies & Cummings, 1994). However, children's behavior problems could also influence their reactions to IPC. Children with internalizing behavior problems may be more likely to blame themselves for the conflict, or feel threatened, anxious, fearful, or sad about the conflict, and be likely to avoid the conflict. Negative affect has been found to predict avoidant coping and be related to avoidance goals (Blackburn, Johnston, Blampied, Popp, & Kallen, 2006; Sideridis, 2005). Avoidance, then, could be the result of generalized internalizing behavior problems that manifest as fear or sadness in the presence of IPC, than an antecedent of internalizing behavior problems.

Externalizing behavior problems could also influence children's reactions to IPC. For example, if children are generally aggressive, they are probably more likely to involve themselves in their parents' conflict than non-aggressive children. Externalizing behavior problems are indeed related to both aggressive responding to IPC in the home, and the endorsement of aggressive responses to IPC in laboratory analogue tasks (Cummings et al., 2004). Additionally, aggressive children are more likely to make hostile attributions (i.e. threat cognitions) than non-aggressive children (Dodge & Somberg, 1987). The relation between children's responses to IPC and their adjustment problems could thus be influenced by children's pre-existing internalizing or externalizing behavior problems.

Longitudinal results, however, indicate that children's responses to IPC predict later behavior problems. For example, Cummings et al., (2006) found that IPC at time one predicts children's responses to IPC at time two, which predicts internalizing and externalizing behavior problems at time three. Additionally, Schermerhorn, Cummings, DeCarlo, & Davies (2007) found that while behavioral dysregulation in response to IPC was positively associated with subsequent internalizing and externalizing behavior problems, internalizing and externalizing behavior problems were not significantly associated with later behavioral dysregulation. In other research (Grych et al., 2003; Schermerhorn, Cummings, & Davies, 2005) bi-directional effects are suggested. Although causality can only be definitively determined through experimental studies, carefully crafted longitudinal studies with multiple time points allow one to make strong inferences about causality and allows for the examination of the development of these processes. Harold et al., (2004), made advantageous use of this type of longitudinal design and were able to make causal assertions about the mediational role of cognitive, affective, and behavioral responses to IPC. In a positive move, longitudinal studies on this topic are becoming increasingly more common. It would be advantageous, however, to see longitudinal studies including all four types of child responses to IPC, and multiple measures of child adjustment, as well as additional analogue experimental studies.

Limitations of the meta-analysis should be noted. First, most of the included studies used questionnaires or structured interviews as the sole method of data collection. The accuracy with which responses on questionnaires or during interviews capture children's responses to IPC is unclear. Self-report methodology may overestimate true effect sizes, as studies using observation, daily diaries, and audio or video vignettes, resulted in smaller aggregate effect sizes than studies using questionnaires. Although a small number of included studies utilized diary methods (see Cummings et al., 2003) or behavioral observations (see Davies & Cummings, 1998; El-Sheikh, 2005) to measure either children's responses to IPC or behavior problems, future studies could be improved by including these methods of data collection more frequently or by devising innovative methods for more accurately assessing children's responses to IPC. An additional limitation related to self-report methodology is that often children's responses to IPC and their behavior problems are reported by the same

informant. This concern has been partially addressed by the nature of the literature. In many included reports, children's responses to IPC were reported by children while their behavior problems were reported by their parents. Because this was not the case for all studies, and it could be argued that children's reports of internalizing behavior problems should always be used in lieu of parents' reports of these problems, the limitation cannot be completely addressed.

Sixteen studies were excluded because the authors did not include the necessary statistical values. The fail-safe N, however, indicates that even if these studies had null effect sizes, the results would remain significant. Higher-order child responses to IPC could not be included in the meta-analysis due to statistical limitations. When higher-order variables were included, relations between the latent variable and child adjustment were typically indexed multivariately. Because these studies controlled for different variables, we were unable to statistically aggregate findings related to higher-order constructs.

A final limitation is that this meta-analysis focused solely on the relations among children's responses to IPC and child adjustment. This focus omitted studies that measured children's responses to IPC but did not include measures of child adjustment. It also omitted studies that focused on the relation between IPC and child adjustment, but that did not include measures of children's responses to IPC. Ultimately, this meta-analysis was not designed to be a comprehensive review of all possible mediators or moderators of the relation between IPC and child adjustment, but rather a more focused review of the relations between one particular type of mediator, children's responses to IPC, and child adjustment.

Overall, the pattern of results indicates that children's cognitive, affective, behavioral, and physiological responses to IPC are moderately related to child adjustment. The results of this meta-analysis are informative in light of current theory about the mechanisms by which IPC influences children's behavior problems. It is clear that most child responses to IPC are significantly related to child adjustment. These results remain significant for all responses except avoidance even after controlling for conflict exposure. Results indicate that the Cognitive-Contextual Framework, the Emotional Security Hypothesis, and the Specific Emotions Model all have something to contribute in explaining the relation between IPC and children's behavior problems. Because the Cognitive-Contextual Framework and the Emotional Security Hypothesis differ primarily by *how* they propose child responses to conflict influence adjustment and both, although to varying degrees, include cognitions, affect, and behavior in their models, it is difficult to evaluate which framework best describes the data. Cognitions and negative affect are more strongly related to adjustment problems than behavioral or physiological responses. However, all three theories include these two responses to IPC making it difficult to argue for the supremacy of one theory over another. Because these theories include very similar constructs it may be advantageous to further investigate the integration of the theories. Future studies should continue to concentrate on how each of these theories can inform one another, and consider how different types of child responses may interact together in predicting child behavior problems.

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Note: * indicates that the article was included in the meta-analysis

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Table 1

Cognitions and Adjustment Problems

| Gender | Constructs | N studies | Effect Size <i>r</i> (SD) | 95% CI | Z-score | Age moderation | |
|----------------|----------------|-------------|------------------------------|---------------|-----------|-------------------|-----|
| Both | Cog and Int | 45 | .34 (.18) *** | .32 - .36 | 35.15 | No | |
| | Cog and Ext | 43 | .21 (.14) *** | .19 - .23 | 19.92 | Yes | |
| | Cog and Adj | 50 | .18 (.10) *** | .16 - .20 | 18.28 | Yes | |
| | SB and Int | 37 | .36 (.13) *** | .34 - .38 | 34.22 | No | |
| | SB and Ext | 34 | .28 (.10) *** | .25 - .30 | 24.15 | Yes | |
| | SB and Adj | 39 | .32 (.09) *** | .29 - .33 | 29.94 | No | |
| | Threat and Int | 34 | .40 (.16) *** | .38 - .42 | 37.44 | Yes | |
| | Threat and Ext | 32 | .21 (.12) *** | .19 - .23 | 18.05 | Yes | |
| | Threat and Adj | 38 | .30 (.12) *** | .28 - .32 | 27.88 | Yes | |
| | Cog and Rel | 4 | .14 (.04) * | .02 - .27 | 2.22 | No | |
| | Cog and Self | 3 | .38 (.03) *** | .25 - .50 | 5.40 | No | |
| | Boys | Cog and Int | 9 | .22 (.10) *** | .16 - .29 | 6.31 | No |
| | | Cog and Ext | 9 | .23 (.10) *** | .16 - .28 | 6.51 | Yes |
| SB and Int | | 9 | .32 (.22) *** | .26 - .39 | 9.36 | No | |
| SB and Ext | | 9 | .21 (.12) *** | .15 - .28 | 6.08 | Yes | |
| Threat and Int | | 7 | .38 (.12) *** | .31 - .44 | 10.45 | No | |
| Threat and Ext | | 7 | .23 (.10) *** | .16 - .30 | 6.22 | Yes | |
| Girls | | Cog and Int | 8 | .22 (.06) *** | .15 - .28 | 6.40 | No |
| | | Cog and Ext | 8 | .22 (.11) *** | .16 - .28 | 6.49 | Yes |
| | | SB and Int | 8 | .31 (.08) *** | .25 - .37 | 9.32 | No |
| | | SB and Ext | 8 | .20 (.08) *** | .14 - .27 | 5.91 | No |
| | Threat and Int | 6 | .36 (.14) *** | .30 - .42 | 10.59 | Yes | |
| | Threat and Ext | 6 | .25 (.21) *** | .18 - .31 | 7.04 | Yes | |

Note. Cog = overall cognitions; SB = self-blame cognitions; Threat = threat cognitions; Adj = overall adjustment problems; Rel = relationship problems; Self = self esteem problems; Int = internalizing behavior problems; Ext = externalizing behavior problems; Effect Size r = weighted aggregate effect size (correlation); SD = standard deviation of the weighted aggregate effect size; 95% CI = 95% confidence interval for the weighted effect size; Age Moderation = Is age a significant moderator of the effect size?

* $p < .05$

*** $p < .001$.

Table 2
Negative Affect, Behavioral Responses, and Physiological Responses and Adjustment Problems

| Constructs | N Studies | Effect Size <i>r</i> (SD) | 95% CI | Z-score | Age Moderation |
|----------------|-----------|------------------------------|-----------|---------|-------------------|
| NA and Int | 16 | .31 (.17)*** | .28 - .34 | 18.12 | Yes |
| NA and Ext | 16 | .15 (.13)*** | .12 - .19 | 7.89 | Yes |
| NA and Adj | 18 | .14 (.07)*** | .11 - .17 | 8.32 | Yes |
| Beh and Int | 22 | .24 (.19)*** | .21 - .26 | 17.55 | Yes |
| Beh and Ext | 22 | .14 (.13)*** | .11 - .17 | 9.07 | Yes |
| Beh and Adj | 22 | .19 (.13)*** | .16 - .22 | 13.74 | Yes |
| Avoid and Int | 10 | .26 (.26)*** | .23 - .30 | 15.31 | Yes |
| Avoid and Ext | 10 | .04 (.11) | .00 - .09 | 1.82 | Yes |
| Inv and Int | 14 | .29 (.17)*** | .26 - .32 | 17.60 | Yes |
| Inv and Ext | 16 | .15 (.12)*** | .12 - .18 | 8.49 | Yes |
| Beh and Self | 3 | .22 (.06)** | .09 - .35 | 3.20 | No |
| Physio and Int | 6 | .14 (.06)*** | .07 - .21 | 3.88 | No |
| Physio and Ext | 6 | .11 (.08)** | .04 - .18 | 3.11 | No |
| Physio and Adj | 6 | .12 (.07)*** | .05 - .19 | 3.43 | No |

Note. NA = child negative affect; Beh = overall behavior response to IPC; Avoid = avoidance of IPC; Inv = involvement in IPC; Physio = physiological response to IPC; Adj = overall adjustment problems; Int = internalizing behavior problems; Ext = externalizing behavior problems; Self = self esteem problems; Effect Size *r* = weighted aggregate effect size (correlation); SD = standard deviation of the weighted aggregate effect size; % CI = 95% confidence interval for the weighted effect size; Age Moderation = Is age a significant moderator of the effect size?

**
 $p < .01$

 $p < .001$.

Table 3

Partial Aggregate Effect Sizes Controlling for Amount of IPC

| Constructs | N Studies | Effect Size <i>r</i> | 95% CI | Bivariate Comparison |
|---------------------|-----------|----------------------|------------|----------------------|
| SB and Int | 20 | .30*** | .28 - .33 | Yes |
| SB and Ext | 21 | .17*** | .15 - .20 | Yes |
| Threat and Int | 21 | .36*** | .34 - .38 | Yes |
| Threat and Ext | 22 | .08*** | .06 - .11 | Yes |
| NA and Int | 9 | .24*** | .18 - .29 | Yes |
| NA and Ext | 9 | .16*** | .10 - .22 | No |
| Avoidance and Int | 5 | -.05 | -.11 - .01 | Yes |
| Avoidance and Ext | 5 | -.05 | -.12 - .00 | No |
| Involvement and Int | 7 | .06* | .01 - .11 | Yes |
| Involvement and Ext | 8 | .10** | .05 - .15 | No |

Note. SB = self-blame cognitions; Threat = threat cognitions; Int = internalizing behavior problems; Ext = externalizing behavior problems; NA = negative affect; Effect Size *r* = weighted aggregate effect size (correlation); 95% CI = 95% confidence interval for the weighted effect size; Bivariate Comparison = Is the corresponding bivariate correlation significantly larger than the partial correlation?

* $p < .05$

** $p < .01$

*** $p < .001$.