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A Prospective Investigation of the Impact of the Timing of Exposure to

Interparental Conflict on Young Children's Emotional and Behavioral Adjustment

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By

Amy Ransom Kincheloe
B.S., The University of North Carolina at Chapel Hill, 2003
M.A., Emory University, 2007

Advisor: Stephen Nowicki, Ph.D.

An abstract of
A dissertation submitted to the Faculty of the
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Abstract

A Prospective Investigation of the Impact of the Timing of Exposure to Interparental Conflict on Young Children's Emotional and Behavioral Adjustment

By Amy Ransom Kincheloe, M.A.

The present prospective investigation examined the effect of exposure, and particularly the timing of exposure, to verbal and physical interparental conflict on children's subsequent adjustment. For 4264 children (males = 2168, females = 2096), mothers reported on interparental conflict during their child's toddlerhood and early childhood. Mothers completed a parent-report checklist of their child's emotional and behavioral functioning and children completed measures of locus of control orientation and nonverbal receptive skill during middle childhood. Analyses revealed that children's emotional and behavioral difficulties were more severe among those exposed to either verbal or physical conflict, and these effects were additive across developmental periods. No significant interaction effects were found for those exposed to both verbal and physical conflict, indicating that verbal conflict and physical conflict appear to have independent effects on children's well-being. Analyses showed significant sequencing effects such that children exposed to both types of adversities, but at different time-points, functioned more poorly in the future in terms of overall difficulties, and specifically with regard to conduct and peer problems, as compared to children exposed to both adversities during a same time-point. It was also found that children experiencing parental conflict earlier in their lives tended to show poorer emotional functioning and to have more externally-oriented locus of control scores when compared to those exposed to conflict later in childhood. Although there was support for more parental verbal conflict being associated with greater externality in children, there was no support for a relationship between conflict exposure and nonverbal receptive skill. There were also no gender differences. Results are further discussed in terms of limitations of the present study and directions for future research are outlined.

Keywords: Interparental conflict; child mental health; locus of control

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Tables and Figures

A Prospective Investigation of the Impact of the Timing of Exposure to Interparental Conflict on Young Children's Emotional and Behavioral Adjustment

Exposing children to violent interparental conflict is a form of emotional abuse that is far too common. The First National Family Violence Survey advised that at least 3.3 million children in the United States are exposed to marital violence annually (Straus, Gelles, & Steinmetz, 1980). Since that seminal investigation, estimates have been revised upward to projections that between 10 and 17.8 million American children are exposed to marital violence each year (Holden, 1998; Straus, 1992). Furthermore, it is likely that more children are exposed to interparental conflict than indicated by either estimate, and that inclusion of non-violent forms of conflict would dramatically increase the projections of exposure (Silvern, et al., 1995).

Research has established that children exposed to interparental conflict are at increased risk for a wide variety of emotional and behavioral problems. Interparental conflict has been associated with numerous adjustment difficulties, including (a) internalizing disorders such as depression and anxiety (Cummings & Davies, 1994; Gordis, Margolin, & John, 1997; Rossman & Rosenberg, 1992); (b) externalizing problems such as poor conduct, aggression, and delinquency (Grych & Fincham, 1990; Holden & Ritchie, 1991; Jenkins & Smith, 1991; Jouriles, Barling, & O'Leary, 1987); (c) dysfunctional parent-child relationships (Camara & Resnick, 1989; Forehand et al., 1991; Klein, Johnston, & Tschann, 1991); and (d) poor interpersonal skills, peer relationships, and social competence (Emery & O'Leary, 1984; Grych & Fincham, 1990; Long, Forehand, Fauber, & Brody, 1987). However, it is also clear from the literature that children exposed to interparental conflict differ widely in the type and severity of their

responses, with some children showing few, if any, symptoms of maladjustment (e.g., Grych, Jouriles, Swank, McDonald, & Norwood, 2000; see reviews by Cummings & Davies, 2002; Grych & Fincham, 1990). Having established the association between interparental conflict and children's adjustment difficulties, researchers are shifting focus to investigating the underlying mechanisms that result in diverse developmental outcomes.

Although there is strong evidence to support the association between interparental conflict and children's maladjustment in a number of areas, little is known about the role timing of the exposure may have for children's subsequent adjustment. Investigating the effects of timing appears critical to gaining a more thorough understanding of differences in children's emotional and behavioral adjustment in the face of parent conflict. In a review of the impact of marital discord on children, Emery (1982) called for further exploration of the effect of child age. While the importance of such an investigation appears clear, and although several theories hypothesize the existence of developmental differences in response to interparental conflict, in the subsequent 29 years few studies have heeded that demand, and those that have done so have produced inconsistent and contradictory findings.

Purpose

The purpose of this research study was to investigate the impact of the timing of exposure to interparental conflict on children's adjustment. Unlike the majority of previous researchers, we sought to determine whether exposure at, and across, different time-points during toddlerhood and early childhood resulted in differential outcomes in children's subsequent emotional and behavioral adjustment. We used a prospective

framework in which study participants and their families, as part of a larger study, were tracked over the course of their infancy, toddlerhood, and early and middle childhood. Knowledge of how timing of exposure relates to children's emotional and behavioral adjustment may help to clarify the ambiguity in the extant literature regarding differences in children's adjustment to conflict and may, in turn, inform and enhance existing policy and practice.

We present next a review of what has been empirically and theoretically established concerning the role children's age may play in their adjustment to interparental conflict. Due to the limited number of existing prospective studies in this area, the majority of time will be spent reviewing the results of concurrent research. We will use this review to provide information pertinent for forming this study's predictions.

Examining the Effects of Child Age

The existing literature that considers developmental differences in adjustment for children exposed to interparental conflict is muddled with conflicting and contradictory findings. More specifically, some research studies have found that particular age groups may be especially susceptible to developing adjustment difficulties, but others have shown no differences in adjustment among children of different ages. For example, in a study of children 4 to 9 years of age, Mahoney, Jouriles, and Scavone (1997) found that child age moderated the association between marital adjustment and children's internalizing and externalizing behavior problems such that the association was stronger among younger (i.e., 4 to 5 year olds) as compared to older (i.e., 6 to 7 and 8 to 9 year olds) children. In contrast, other studies suggest that older children (i.e., approximately 11 years of age; Cummings, Schermerhorn, Davies, Goeke-Morey, & Cummings, 2006)

and adolescents (Sim & Vuchinich, 1996) are more vulnerable than their younger peers to developing adjustment difficulties when exposed to interparental conflict. Finally, a number of studies (e.g., Buehler, Anthony, Krishnakumar, & Stone, 1997; Nicolotti, El-Sheikh, & Whitson, 2003; O'Brien & Bahadur, 1998) have failed to find any age differences in adjustment to interparental conflict at all, suggesting that no particular age group is more likely than another to be affected by parent conflict.

The current literature is characterized by a number of methodological difficulties that likely contribute both to the immaturity of age effects findings to date and the lack of research focused on timing and sequencing of exposure. The majority of extant research in this area has relied solely on concurrent data and is characterized by small sample sizes with relatively restricted age ranges. Moreover, the handful of existing longitudinal studies has tended to evaluate data at two time-points and usually from a limited age range of children. The focus on narrow age groups limits the ability to generalize these findings to the larger population and, unfortunately, may contribute to the lack of age differences found when such differences may actually exist. To address these limitations, it is necessary to conduct a prospective investigation with data collected on a large and representative sample of children and their families across multiple points of development.

Prospective Investigations

Although only a limited number of prospective studies have been completed, they have shed some light on the impact of timing of exposure to interparental conflict on children's adjustment. In one of the few studies to focus on younger children, Essex, Klein, Cho, and Kraemer (2003) investigated the effects of timing of initial exposure to

marital conflict on kindergarteners' mental health symptoms. Marital conflict data were collected by maternal report during the child's infancy and toddler years and mental health symptoms were assessed in the spring of the child's kindergarten year. Results indicated that both boys and girls exposed to marital conflict had more severe co-occurring symptoms when compared to children that were reportedly not exposed to parent conflict at all. Additionally, girls initially exposed to marital conflict during the toddler period showed more severe mental health symptoms overall and a greater preponderance of internalizing symptoms than girls exposed to parent conflict in infancy. The effect for the timing of exposure to parent conflict was not supported for boys. These findings suggest that while both boys and girls are negatively affected by exposure to parent conflict, when girls are exposed to conflict as toddlers they may be especially vulnerable to developing later adjustment difficulties.

Whereas Essex and colleagues (2003) emphasize the negative effects of exposure to parent conflict during the early years, Gordis et al. (1997) highlight the potential cumulative negative effects of conflict for children in late childhood and early adolescence. In that study, 90 mother-father-child triads were observed participating in a meal-time discussion task regarding behavior problems of the child about which the parents disagreed. Specifically, the study sought to examine how reported physical marital aggression during the previous year interacts with both observed interparental hostility and hostility directed from parent to child during the triadic interaction to account for variance in children's withdrawal, anxiety, and distraction during the meal-time discussion task. Results supported a sensitization effect of parent conflict. Specifically, prior exposure to interparental physical aggression was related to children's

level of anxiety, distraction, and withdrawal during the family discussion task. The pattern was present even for mild, nonphysical conflict. Gordis and colleagues discuss these findings within the framework presented by Gottman and Katz (1989), who argue that interparental conflict may alter children's physiology leading them to show higher levels of distress, hypervigilance, and difficulty self-regulating.

Cummings and colleagues (2006) suggest that late childhood may be a developmental period where children are particularly vulnerable to the negative effects of exposure to parent conflict. In their study, Cummings et al. found a stronger association between interparental conflict and externalizing problems for children older rather than younger than the average age of study participants (M = 11.12 years). That is, the relationship between interparental discord, measured at Time 1, and externalizing problems, measured two years later, was stronger for children older than 11.12 years of age when compared to children who were younger than that age. Child age did not moderate the association between interparental conflict and later internalizing problems. This finding suggests that older children exposed to parent conflict may have more adjustment difficulties than their younger counterparts.

Although the authors do not provide possible explanations for the findings, it is possible that children around 11 years of age are particularly vulnerable to the effects of parent conflict (i.e., timing). This age marks the transitional period from childhood to adolescence, which is critically important for healthy versus problematic adjustment (Mash & Wolfe, 2002). Adolescents are especially vulnerable to developing problems with substance use, dangerous sexual behavior, violence, and mental health problems (Kilpatrick et al., 2000). The risk of suicide also begins to increase around this age and

continues to rise throughout adolescence (Centers for Disease Control and Prevention, 2009). Alternatively, the difference in externalizing adjustment between older and younger children could evidence a cumulative effect of parent conflict over time. More specifically, the negative effects of chronic exposure to parent conflict may compound over time, resulting in higher rates of maladjustment among children with longer histories of witnessing interparental conflict. While speculative, these possible explanations underscore the need for future research to investigate these relationships in more detail.

In another study of children in late childhood and early adolescence, Forehand, Neighbors, Devine, and Armistead (1994) investigated the relationship between and effects of interparental conflict and divorce on adjustment across the first four years following the divorce. The study sample consisted of over 200 adolescents between 11 and 15 years of age. The four outcomes of interest – externalizing problems, internalizing problems, social competence, and cognitive competence – were assessed with established standardized scales completed by teachers. Mothers were asked to report on current level of interparental conflict in each of the four years.

Results of the study by Forehand and colleagues (1994) indicated that the interparental conflict predicted concurrent adolescent functioning in all four domains in the first year following divorce. Moreover, level of conflict continued to predict adolescents' internalizing problems and social competence in both the second and third years following divorce. Similarly, interparental conflict predicted adolescents' cognitive competence in the second year and externalizing problems in the third year following divorce. However, somewhat surprisingly interparental conflict measured at year four did not predict concurrent adolescent functioning in any domain. A main strength of this

study is that it provides further evidence of the sustained relationship between interparental discord and difficulties in adolescent behavioral, cognitive, and social functioning over time. Unfortunately, the authors do not note whether mothers' *prior* reports of interparental conflict were related to adolescents' *subsequent* adjustment and competence.

To summarize, the prospective investigations of the effect of interparental conflict on child and adolescent adjustment by Essex and colleagues (2003), Gordis et al. (1997), Cummings et al. (2006), and Forehand and colleagues (1994) demonstrate a number of strengths. For example, each study utilized sample sizes of at least 200 families to investigate the effect of interparental conflict on child adjustment over time. Additionally, Forehand and colleagues and Cummings et al. both utilized different informants for the assessment of parent conflict and adolescent adjustment, therefore addressing same-informant bias. Campbell and Fiske (1959) warn that a considerable amount of variance is contributed by the informant and this variance may distort the observed correlations between measures provided by the same informant. A final strength of the Forehand et al. study is that it evaluated child outcomes across multiple time-points. Unfortunately, the study failed to examine – as was done in the Essex et al. study – whether the earlier assessments of interparental conflict predicted later child adjustment, choosing, instead, to examine these factors concurrently. Together, the strengths of these three studies represent characteristics that an optimally-designed study would comprise – including a large sample size, a sample that is developmentally-diverse and spans early childhood through adolescence, the use of multiple informants for the

assessment of parent conflict and child adjustment, and an evaluation of how prior reports of interparental conflict affect later adjustment in children.

Retrospective Investigations

In addition to utilizing single time-point and prospective designs to investigate further the relationship between parent conflict and child maladjustment, researchers have also attempted to retrospectively explore the impact of certain characteristics of interparental conflict (e.g., individual differences, frequency of conflict, etc.) on adjustment difficulties in college-aged populations.

In one such study, David and Murphy (2004) asked 189 undergraduates between 18 and 19 years of age to complete a series of questionnaires about prior exposure to parent conflict while growing up and respond to two simulated laboratory conflicts, which were either constructive or destructive in nature. Participants were asked to listen to taped interactions of couples disagreeing and imagine that they were in the same room with the couple, witnessing the conflict. Results indicated that the effects of prior exposure to interparental conflict were moderated by level of emotional functioning and by gender. Specifically, for late adolescents/young adults with low to moderate emotional functioning, higher levels of perceived conflict were associated with more intense negative emotional reactions (i.e., increased distress and sadness) to the taped interactions. However, this association did not exist for participants higher in emotional functioning. Additionally, for males but not females, the level of prior exposure to interparental conflict was positively associated with their distress in reaction to the simulated laboratory conflict. In contrast, for females but not males, level of interparental conflict was associated with more negative expectations regarding the

implications of the simulated laboratory conflict. Both the two-way interaction for parent conflict and emotional functioning as well as for parent conflict and gender were present for both constructive and destructive conflict situations, suggesting that late adolescents/young adults can become sensitized to even mild forms of interparental conflict.

In another retrospective survey of undergraduate students, Henning, Leitenberg, Coffey, Bennett, and Jankowski (1997) found that men and women who reported witnessing interparental physical aggression during their childhood scored higher on an index of global distress and reported higher levels of internalizing and externalizing problems than a comparison group who reported never having observed interparental physical aggression. However, there was no support for the authors' hypothesis that reports of more *frequent* interparental conflict would be associated with more negative outcomes.

Henning and colleagues suggest that unreliable measurement may have contributed to the lack of significance. Frequency of interparental conflict was measured by totaling the reported frequency anchors (i.e., one time only, 2 – 5 times, or 3 – 6 or more times) of each of the seven items of the Physical Aggression Subscale of the Conflict Tactics Scale (CTS; Straus, 1979). Adult participants may have had difficulty in accurately recalling reliably the number of incidents. Due to its retrospective nature, another limitation of this study is that it was not able to examine the effect of timing (i.e., whether exposure to parent conflict at one particular age versus another was associated with worse adjustment difficulties) or whether exposure to conflict over a longer period of time had worse outcomes. Reports of frequency could be construed as a proxy for

chronicity, but a high frequency of parent conflict does not necessarily mean that the conflict was chronic throughout childhood. It may be the case that reports of the frequency, timing, and chronicity of interparental conflict are best collected and investigated concurrently or prospectively, rather than retrospectively.

Together, these studies suggest that retrospective accounts of undergraduates' exposure to parent conflict during childhood provide some additional support for long-term negative effects of parent conflict on adjustment. However, as was shown in Henning and colleagues' (1997) study, the use of retrospective reports may not be ideal for collecting data on the individual characteristics of that conflict (e.g., frequency). It appears that the impact of conflict characteristics, like the frequency of exposure to conflict, may be studied best using a prospective framework where the features of interparental conflict and child adjustment can be measured and investigated over the course of children's development.

Meta-analyses

Given the challenges inherent to conducting a prospective study of the effects of timing, researchers have turned to meta-analytic techniques to understand better how the association between interparental conflict and children's adjustment problems varies over time. Meta-analytic techniques serve as an organizational tool used to statistically aggregate the findings of multiple empirical studies, thereby increasing the statistical power of the analysis above that of individual studies while maintaining the direction and magnitude of all statistical relationships (Lipsey & Wilson, 2001). Meta-analysis is particularly useful for trying to decipher age effects because it allows you to combine the

effect sizes from studies examining all different age groups and then test statistically whether those effects vary systematically based on participant age.

To date, three meta-analytic reviews have considered age-related effects in the association between parent conflict and youth maladjustment and, again, have produced conflicting findings. The first meta-analysis (Buehler et al., 1997) failed to find a moderating effect of age, whereas the second (Reid & Crisafulli, 1990) and third (Ransom, 2008) did. Reid and Crisafulli's meta-analysis supported a relationship between marital discord and externalizing problems for boys (r = .16), but not for girls (r = .05). Although the authors offer no explanation for this gender difference, it could reflect the tendency for girls to be less likely than boys to externalize. It is noted that Reid and Crisafulli used measures of marital satisfaction and interparental conflict interchangeably, which may limit the generalizability of their findings. Many researchers have found marital dissatisfaction to be a less powerful correlate with child adjustment than is interparental conflict (Cummings, Davies, & Simpson, 1994; Katz & Gottman, 1993), even when controlling for the level of marital dissatisfaction (Jenkins & Smith, 1991; Jouriles, Murphy, & O'Leary, 1989). Consequently, utilizing such measures may underestimate the association between exposure to parent conflict and youth maladjustment. The more recent review by Ransom found that average child age moderated the relationship between children's perceptions of conflict and both internalizing and externalizing problems. In that study, Ransom found that the associations increased as the mean age of sample increased. Paradoxically, average child age also moderated the association between parents' report of conflict and externalizing problems. However, in this instance, the association decreased as the mean age of

sample increased. The author cautions that only tentative inferences should be drawn from these findings until they can be replicated.

Despite its apparent strengths, existing meta-analyses have failed to answer all the questions regarding the association between interparental conflict and children's adjustment. Although three meta-analytic reviews have considered age-related effects, child age was not a central focus of any of these reviews and was only examined in one of many moderator analyses. This leaves open the possibility that other factors may interact with child age. For example, as will be discussed in more detail later in this review, boys and girls may differ in the types of behavior problems they show as they age. Future studies should seek to investigate further the potential interaction between child age and other factors in the relationship between parent conflict and child adjustment.

Understanding Developmental Differences

To date, research regarding the implications of the timing of exposure to interparental conflict for children's subsequent adjustment has been lacking. A number of theoretical frameworks highlight certain developmental periods when children should be particularly vulnerable to adversity, like interparental conflict. The general premise upon which these perspectives are based centers on the idea that exposure to adversity (e.g., interparental conflict) "may interfere with mastery of developmental tasks and leave children vulnerable to later problems associated with the resulting deficits" (Essex et al., 2003 p. 729).

Developmental psychopathology emphasizes the importance of developmental processes, environmental context, and the influence of multiple and interacting events in

shaping development. A central tenet is that a thorough understanding of maladaptive behavior necessitates that it be viewed in the context of what is 'normal' or typical for that developmental period (Cicchetti & Sroufe, 2000). We present below a selection of theories for consideration that address the possibility of age differences in adjustment to interparental conflict.

Many believe that the negative effects of exposure to discordant interactions accumulate over time, thereby *sensitizing* individuals to negative interpersonal interactions (David & Murphy, 2004). Grych and Fincham (2001) argue that chronic exposure to intense marital conflict may classify under Terr's (1991) definition of Type II trauma, which is characterized by long-standing or repeated exposure to extreme events. Terr describes that children respond with surprise to the first occurrence of such an event; however, over time these children tend to show higher levels of reactivity and distress as they begin to anticipate repeated episodes of conflict and violence. Similarly, the sensitization hypothesis proposes that children's prior history with interparental conflict impacts their later adjustment (Cummings, 1994). According to the sensitization hypothesis, children repeatedly exposed to discordant interparental interactions become sensitized to that conflict over time, resulting in an increased level of vulnerability to maladjustment.

Although the sensitization hypothesis and trauma theory emphasize the cumulative negative effects of exposure to parent conflict, other theories highlight certain age groups that may be especially vulnerable to the effects of parent conflict. According to Davies and Cummings' (1994) emotional security hypothesis, infants and toddlers are seen as most vulnerable to adverse and stressful conditions. The emotional security

hypothesis stresses the importance of children's subjective evaluation of negative events in their later adjustment and affirms that children will evaluate interparental conflict in terms of the implications it has for their own emotional security. Emotional security is theorized to regulate and be regulated by three processes: emotional reactivity, regulation of exposure to parental affect, and internal representations of interparental relations (Davies, Harold, Goeke-Morey, and Cummings, 2002).

Children's reactions and adjustment to parent conflict reflect the meaning that conflict has for family relations from the child's perspective. A child's level of emotional security plays an organizing and directing function in their reaction to marital conflict (Cummings & Davies, 1994). For example, according to the emotional security hypothesis, a child high in emotional security will view interparental conflict in the context of a stable and predictable parental relationship. They will expect that the conflict will eventually ameliorate and perceive no significant threat to the physical and psychological well-being of the parental relationship and surrounding family. In contrast, a child low in emotional security will have more difficulty regulating emotions, show an excessive regulation of exposure to parental affect (e.g., the child may attempt to both avoid and become involved in the conflict), and display hostile internal representations of the negative implications of interparental conflict for the self, parents, or family's existence.

Not surprisingly, emotionally insecure children are more prone to negative emotional arousal, distress, and psychological problems (Cummings & Davies, 1996; Davies & Cummings, 1994). The threat of frequent, intense and child-related interparental conflict makes it difficult for children to preserve emotional security.

Children may devote considerable physical and psychological resources to deal with perceived conflict which leaves them with fewer resources to devote to other developmental tasks, thereby increasing their vulnerability to developing adjustment problems (Saarni, Campos, Camras, & Witherington, 2006; Thompson & Calkins, 1996).

Although the importance of infancy and the toddler years is highlighted in the emotional security hypothesis, Davies and Cummings' model also emphasizes the negative effects of exposure to parent conflict over time. As noted earlier, children from high-conflict homes have been shown to become more sensitized to violent interparental conflict and show increased levels of fear, distress, and vigilance in response to conflict situations (e.g., Ballard, Cummings, & Larkin, 1993; Davies & Cummings, 1998; Gordis et al., 1997). Sensitization has even been shown to affect infants exposed to domestic violence (DeJonghe, Bogat, Levendosky, von Eye, & Davidson, 2005). Children become primed for – or sensitized to – increased negative reactions to interparental conflict by their past exposure to such conflict (Cummings, Iannotti, & Zahn-Waxler, 1985). In explaining the impact of interparental conflict exposure over time, Davies and Cummings (1994) argue that children's internal representations of the parent relationship develop over time. Children's emotional security is conceptualized as a product of previous experiences with and internal representations of the interparental subsystem, which, in turn, influences heavily children's future responding and adjustment.

As previously reviewed, Davies and Cummings (1994) suggest that the early developmental periods of infancy, toddlerhood, and early childhood are particularly important for the formation of emotional security. Interparental conflict can threaten the development of children's emotional security which, in turn, may produce emotional

dysregulation and psychological maladjustment. In contrast, Grych and Fincham (1990) emphasize the negative impact parent conflict has on the functioning of older children and adolescents.

Grych and Fincham's (1990) cognitive-contextual framework emphasizes the central role of children's cognitive appraisals of the meaning of conflict in their subsequent social and emotional functioning. This framework underscores the importance of the *context* of the interparental conflict, which includes children's previous exposure to conflict as well as other important factors such as the levels of positive and negative affect in the child and the parents, the parent-child relationship, and the child's gender and age. Conflict that is perceived by the child to be frequent, hostile, aggressive, poorly resolved, and child-centered has been shown to be associated with various types of maladjustment, including internalizing and externalizing behavior problems (Cummings & Davies, 1994; Grych, Seid, & Fincham, 1992).

In addition to contextual factors, the model emphasizes a thorough understanding of children's cognitive appraisals of perceived threat, self-blame, and coping efficacy. Perceived threat reflects the degree to which children believe that the conflict poses a threat to oneself, one's family members, or the family's existence. Self-blame is the degree to which children hold themselves personally responsible for the conflict. Children may feel responsible because they believe that that they are the cause of the conflict or because they feel that they should intervene to prevent the fight from escalating. Finally, coping efficacy reflects children's beliefs about their ability to effectively deal, or cope, with their parents' discordant interactions.

Grych and Fincham (1990) maintain that there are developmental differences in each perceptional domain – perceived threat, self-blame, and coping efficacy. Younger children may perceive disagreements between parents differently than older children due to developmental differences in cognitive skill. All children are theorized to make a *primary appraisal* of perceived threat – evaluating the degree to which the child feels that the conflict poses a threat to self of family. However, due to developmental limitations in cognitive processing, younger children may not be able to engage in the secondary appraisals of attributions of self-blame and evaluations of their coping efficacy (McDonald & Grych, 2006). If younger and older children process parental disagreements in different ways, it suggests that there also may be differential effects on adjustment between the age groups.

Notably, preliminary evidence shows that children from the middle childhood years may be able to process interparental conflict similarly to older children. The original cognitive-contextual framework pinpointed older children and adolescents as particularly vulnerable to developing maladaptive perceptions and attributions when witnessing interparental disagreements. Based on this premise, most investigations have targeted children between the ages of 10 and 14. However, McDonald and Grych (2006) provided preliminary evidence that younger children (i.e., 7 to 9 year olds) are able to make the same cognitive distinctions as older children and adolescents. Moreover, consistent with the cognitive-contextual framework, children's appraisals of threat and self-blame mediated the link between interparental conflict and children's internalizing, but not externalizing, problems.

Taken together, there is theoretical and empirical evidence to suggest that the negative effects of interparental conflict may accumulate over time, sensitizing children to increased arousal, reactivity, and distress. Additionally, Grych and Fincham's (1990) model also suggests that developmental differences may exist between younger and older children in their cognitive abilities to appraise and process discordant interparental interactions that could lead to differences in children's emotional and behavioral adjustment. Unfortunately, little attention has been given to long-term prospective investigations focused on examining developmental differences in adjustment and the cumulative effects of parent conflict over time.

Summary

The review of existing research provides only limited information concerning the role child age may play on the association between interparental conflict and children's adjustment problems. We do know that interparental conflict is associated with children's adjustment difficulties. We also know that there is some empirical evidence to suggest that the adjustment of young (i.e., between 2 and 4 years of age) children (Essex et al., 2003), older (M = 11.12 years) children (Cummings et al., 2006) and adolescents (i.e., between the ages of 11 and 15; Forehand et al., 1994) is associated with exposure to interparental conflict. We do not know, however, whether the association between interparental conflict and emotional and behavioral adjustment varies with child age. Existing theoretical perspectives (i.e., the emotional security hypothesis and the cognitive contextual framework) identify specific age groups or developmental levels where exposure to interparental conflict should be particularly harmful for children. Other theoretical frameworks (i.e., sensitization hypothesis and trauma theory) speculate that

the important factor is not necessarily the child's age at exposure, but rather the chronicity of exposure to parent conflict that can lead to maladjustment. However, no study has investigated within a prospective longitudinal framework whether children's adjustment in the context of exposure to interparental conflict varies systematically with the age of conflict exposure or the type of conflict to which the child is exposed.

Consideration of Additional Factors

The main focus of this study was to identify whether the timing of exposure to interparental conflict influences children's subsequent emotional and behavioral adjustment. In addition, this study also considered the role of children's gender as well as the impact exposure to interparental conflict may have on children's locus of control expectancies and nonverbal identification skill. We will now discuss each of these additional factors in more detail.

Gender

It is difficult to draw firm conclusions regarding the role of child gender in the relationship between interparental conflict and child adjustment. The majority of studies show no evidence of differences in adjustment between boys and girls (e.g., Cummings, Davies, & Simpson, 1994; McDonald & Grych, 2006; Unger, Brown, Tressell, & McLeod, 2000). Of those that do, the pattern of differences is generally inconsistent and contradictory. For example, Davies and Lindsay (2004) and Jaycox and Repetti (1993) found that girls who reported higher levels of interparental conflict were more likely than boys to have increased levels of internalizing problems. Harold and Conger (1997) found a significant association between reports of parent conflict and externalizing problems

and depression for boys, but not for girls, as well as ratings of aggression for girls, but not for boys.

The results of meta-analytic reviews also are equivocal for gender differences. Buehler, et al. (1997) did not find gender differences but Reid and Crisafulli's (1990) meta-analysis did find gender differences between parental discord and externalizing problems for boys, but not for girls. Although the authors offer no explanation for the gender difference they found, it could reflect the tendency for girls to be less likely than boys to externalize. In a more recent meta-analysis, Ransom (2008) concluded that the association between interparental conflict and children's internalizing problems was stronger for girls than for boys. This finding is consistent with that of a number of studies showing that girls are more likely than boys to show symptoms of internalizing problems when exposed to parent conflict (e.g., Cummings, Vogel, Cummings, & El-Sheikh, 1989; Jouriles & Norwood, 1995). However, other studies have shown the opposite relationship (e.g., Gottman & Katz, 1989; Kerig, Fedorowicz, Brown, Patenaude, & Warren, 1998) or have failed to find evidence of gender differences altogether (e.g., Katz & Gottman, 1993).

As outlined above, a review of studies shows modest support for gender differences in children's adjustment to interparental conflict. Given this divergent evidence, any gender differences in response to interparental conflict are likely to be complex and influenced by factors beyond being exposed to conflict situations. It is hoped that results of the present investigation may shed some light on whether or not gender is an important moderator of the parent conflict-child adjustment association.

Locus of Control

The construct of locus of control (LOC) was pioneered primarily through the work of Julian Rotter. Rotter (1966) proposed that an internally-controlled individual was likely to perceive that an "event is contingent upon his own relatively permanent characteristics," while an externally-controlled person would be more likely to perceive an event not to be entirely contingent upon his actions, but rather "as a result of luck, chance, fate, or unpredictable because of the forces surrounding him" (p. 1).

Drawing upon Rotter's (1954, 1966) social learning theory, it is generally accepted that control expectancies are influenced largely by children's early experiences with their parents and other caregivers. In their review, Carton and Nowicki (1994) concluded that four parental factors contributed to the development of a child's locus of control orientation. Specifically, children were more likely to have an external locus of control if they had a high degree of life stress and had parents who (1) made most of their choices for them, (2) expressed less warmth to them, and (3) inconsistently and non-contingently reinforced or punished their behaviors. In contrast, children with internal control orientations tended to have lower levels of life stress and had parents who displayed high levels of warmth, allowed their children to make more decisions on their own, and enforced clear reinforcements and punishments based on their behavior. Of these factors, the construct of life stress is particularly relevant to the present study of adjustment to interparental conflict.

Exposure to interparental conflict is one of a number of stressful life events that has been hypothesized to play an important role in the development of control expectancies. Slater and Haber (1984) investigated the impact of parental conflict and

divorce on the development of generalized control expectancies in a sample of 217 adolescents. Analyses indicated children from high conflict homes had lower self-esteem, higher levels of anxiety, and were more externally-oriented than their counterparts from low conflict homes. Marital status was not a significant predictor of adjustment or locus of control orientation. Similar studies have also linked parental divorce and/or exposure to interparental conflict to external control orientations (e.g., Kurdek & Blisk, 1983; Sun & Li, 2002). Additionally, studies have also linked exposure to more general forms of violence to children's locus of control orientation. For example, Nesbit-Greene (2001) found that the frequency of witnessing, but not hearing about, violent events was associated with a more external locus of control in adolescents.

In contrast, some studies have failed to establish the association between exposure to stressful life events and locus of control orientation. For example, in a study of adolescents' adjustment to child abuse and/or interparental conflict, Shillinglaw (1999) concluded that locus of control did not serve as a protective factor for these children. In another study, Kim, Sandler, and Tein (1997) found that the level of "unknown control" – and not the level of internal control – mediated the association between interparental conflict and children's adjustment. According to Connell (1985), the concept of *unknown control* reflects children's less well-developed understanding of the concepts of chance and randomness; instead, reflecting children's report of not knowing the cause of events. In their study, the levels of unknown control for both positive and negative events mediated the association between parent conflict and child adjustment, suggesting that children's ability to understand why an event occurs, rather than the degree to which they

believe that they are the cause, may explain their adjustment in the face of parental divorce and conflict (Kim et al., 1997).

In summary, research suggests that children exposed to interparental conflict may be more externally oriented than children who are not exposed to parental discord. The current study examined the impact of interparental conflict on children's subsequent locus of control orientation in an effort to help clarify how children's control expectancies are influenced when exposed to the stress of parental conflict.

Emotion Identification Skill

Children's subjective evaluation and interpretation of their worlds may help explain why they react differently to interparental conflict and may provide insight into how to help children cope more effectively with this kind of stressor. One potential skill to use in dealing effectively with others is the ability to identify emotions in others' nonverbal cues. Examples of nonverbal cues include facial expression, tone of voice, and body posture. In the current study, we will focus on children's emotional identification skill in the facial expressions of others.

Interpersonal styles of communication are assumed to be learned in children's early interactions with their parents (Meltzoff, 1995; Snow, 1977, 1999). We know that human infants begin to respond to face-to-face contact by three to five months of age. Infants' focus on the faces and eyes of their caregivers intensifies over time and is one of the foundations for developing attachment with the primary caregiver, usually the mother (Simpson, 1999). As children develop, the relationship with the caregiver changes as the child begins to relate to other adults and, eventually, peers. Children who lack the ability to master social skills early in life increase their risk of developing psychological, social,

and academic difficulties later in life (Asher, Oden, & Gottman, 1977; Nowicki & Duke, 1992; Nowicki & Oxenford, 1989; Parker & Asher, 1987).

To date, only a limited number of studies have considered the role of children's nonverbal skill in the context of exposure to maltreatment. Denham, Zoller, and Couchoud (1994) found that mothers who displayed full-faced expressions of anger in a laboratory task had children who scored lower on a measure of emotion knowledge. The findings suggest that if anger is particularly salient or frequently expressed in their environment, children may experience less than optimal learning of emotional expressions and general emotional knowledge. In a separate study examining spontaneous facial expressions produced by mothers during a mother-child interaction, Camras et al. (1990) found that mothers who produced more intense and negative affect had children with poorer emotional identification skill. Interestingly, it was also found that moms who expressed concentration, determination, frustration, or mild anger had children who were better at identifying emotional expressions. Camras and colleagues concluded that the modeling of low-intensity emotional expressions may be beneficial to the development of better emotion recognition skills in children.

Investigations of nonverbal skill among physically abused children also help to further the understanding of how children's nonverbal skill may affect their adjustment to parent conflict. Pollak, Cicchetti, Hornung, and Reed (2000) examined emotion recognition skill in a sample of 16 physically neglected, 17 physically abused, and 15 non-maltreated children between 3 and 5 years of age. Results indicated that physically abused children showed a response bias for anger, suggesting that when they were uncertain about the emotion being displayed, the children showed a bias for selecting

anger. Additionally, Pollak and colleagues found that physically abused children were less adept at recognizing sad facial expressions than children who were not physically abused. Control subjects and physically neglected children did not display these responses. In a follow-up study, Pollak and Sinha (2002) again found that physically abused children were worse at recognizing anger than controls. However, they failed to replicate the finding that physically abused children had a misattribution bias to select anger. Instead, Pollak and Sinha found that physically abused children were able to accurately identify angry facial expressions with less information about the faces and in less time than were controls.

In sum, the findings above suggest that children who witness anger expressions in their parents tend to have poorer nonverbal skill and general emotional knowledge than those children who aren't exposed to such expressions. Additionally, and more importantly, the work of Pollak and colleagues suggests that young, physically abused children may display differential abilities for processing emotion – specifically sadness and, possibly, anger – as compared to their physically neglected and non-maltreated counterparts. However, other studies have failed to replicate these findings. Given the lack of prospective studies to date, it is unclear whether and how children's nonverbal receptive skill is influenced by exposure to parent conflict. Consequently, the present study will examine the nonverbal receptive skill as a dependent variable in an effort to clarify further its relationship to interparental conflict.

Study Approach and Hypotheses

In this study, we sought to investigate the influences of initial exposure to verbal and physical interparental conflict in toddlerhood and early childhood on children's

subsequent adjustment in middle childhood, and, specifically, how that relationship varies based on the timing and sequencing of exposure. Theoretical and empirical evidence suggests that different age groups of children may be especially vulnerable to the negative effects of interparental conflict, yet, to our knowledge, no researcher has investigated whether the adjustment of these different age groups of children varies systematically with the age of initial exposure to that conflict. On the basis of a large-scale (4000+) sample of children and families, this study attempted to begin to disentangle the role that timing of exposure may play in the relationship between interparental conflict and maladjustment. We did so by examining prospectively the relationship between interparental conflict exposure in toddlerhood and early childhood and children's subsequent emotional and behavioral well-being between ages eight and nine. Although the scale of our sample and the complexity of our analysis required us to limit our current examination to the developmental periods of toddlerhood through middle childhood, we would like to expressly acknowledge the importance of future research examining the potential cumulative effects of interparental conflict exposure on adjustment through late childhood, early adolescence, and young adulthood.

Hypotheses

Exposure effects. The association between interparental conflict and children's adjustment problems is well-established. There is substantial theoretical and empirical support for this relationship which has been summarized and integrated in a number of qualitative reviews (e.g., Cummings & Davies, 1994, 2002; Emery, 1982; Grych & Fincham, 1990) and meta-analyses (i.e., Buehler et al., 1997; Ransom, 2008; Reid & Crisafulli, 1990). Consequently, our first hypothesis was that *children exposed to higher*

levels of interparental conflict would have worse emotional and behavioral problems than those exposed to lower levels of interparental conflict or none at all.

Timing effects. Although there is general acceptance that an association exists between parent conflict and child maladjustment, what is less clear is what exactly is the role played by the timing of initial exposure to that conflict. Empirical studies completed to date have tended to focus on such restricted age ranges of participants that it precluded analyses of age differences in adjustment. Moreover, the findings from the few existing prospective studies only hint at the potential for age differences in adjustment but the paucity of data prevents establishing any coherent pattern. Meta-analyses have also failed to highlight any single age group as more vulnerable than another to the negative effects of interparental conflict.

Yet despite the sometimes conflicting and ambiguous empirical findings, there is a theoretical foundation for suggesting that a particular age or developmental period may be more important in children's adjustment to interparental conflict. Taking a developmental psychopathology approach, the general premise, as outlined by Essex and colleagues (2003), is that interparental conflict may interfere with children's ability to master key developmental tasks which, in turn, may lead to an increased vulnerability for maladjustment. The emotional security hypothesis (Davies & Cummings, 1994) highlights infancy and toddlerhood as particularly important developmental periods for children. It is during these stages of development that children's emotional security with the primary caregivers and within the larger family system are established and strengthened. Exposure to stressors, like interparental conflict, during this time can threaten the development of an adequate level of emotional security which, in turn, may

result in emotional dysregulation and maladjustment. Based on this theoretical framework, we hypothesized that *children initially exposed to parent conflict in toddlerhood (i.e., age 2¾) would have worse emotional and behavioral outcomes in middle childhood than children exposed to conflict in early childhood (i.e., age 6).*

Sequencing effects. There is theoretical and empirical support suggesting that the negative effects of interparental conflict exposure accumulate over time and that greater chronicity of exposure can result in greater difficulties in children's well-being. Cummings (1994) proposes that interparental conflict has a sensitization effect on children, such that children's prior history of conflict exposure impacts their subsequent adjustment. Grych and Fincham (2001) extend this idea by positing that chronic interparental conflict exposure may, in fact, classify as a Type II trauma – trauma characterized by repeated exposure to effects over time. Based on this theoretical framework and consistent with the idea of a sensitization effect, we hypothesized that *children exposed to interparental conflict across the developmental periods of toddlerhood and early childhood would have worse emotional and behavioral problems as compared children exposed to conflict at only one development period or none at all.*

Gender. As discussed in the review above, there are divergent and inconsistent findings regarding the role of child gender in the relationship between interparental conflict and child adjustment. The majority of studies show no evidence of gender differences and, among those that do, the patterns of differences are inconsistent and contradictory. Based on this evidence, there is not enough empirical support to justify a hypothesis regarding the role of child gender in the present study. However, based on the finding of the most recent meta-analytic review by Ransom (2008) and the work of Essex

et al. (2003), we predicted *that gender would moderate the relationship between interparental conflict and children's adjustment*. And, more specifically, we predicted *that girls exposed to higher levels of interparental conflict would have more severe emotional problems than girls exposed to lower levels or not exposed at all.* No other specific gender differences were predicted.

Locus of control. Consistent with previous research (e.g., Nesbit-Greene, 2001; Slater and Haber, 1984; Sun & Li, 2002) establishing a relationship between higher levels of interparental conflict and a more externally-oriented locus of control, we hypothesized *that children exposed to higher levels of interparental conflict would have more external control orientations than children exposed to lower levels of conflict or no conflict at all.*

Nonverbal receptive skill. Based on previous research, and particularly that of Pollak and colleagues (2000), we predicted *that children exposed to higher levels of interparental conflict would have poorer nonverbal receptive skill when compared to children exposed to lower levels of conflict or no conflict at all.* No predictions were made pertaining to the specific emotional subscales of the DANVA.

Method

Participants

Participating families were drawn from a larger sample of the Avon Longitudinal Study of Parents and Children (ALSPAC; Golding & the ALSPAC Study Team, 2004). ALSPAC is a longitudinal study, began in 1992, of a number of environmental and genetic factors associated with the health and development of children from the Avon region of England. Avon includes the cities of Bristol and Bath in addition to a number of other surrounding villages and towns. Avon is culturally and socioeconomically

diverse and has a population of approximately one million. Analyses by Golding and the ALSPAC Team showed that study participants were representative of children and families living throughout Great Britain across a number of demographic and health variables (see Golding, Pembrey, Jones, & the ALPSAC Study Team, 2001).

Pregnant mothers were deemed eligible for ALSPAC if they lived in Avon and had a due date between April 1, 1992 and December 31, 1992. Using those parameters, the overall dataset included 14,663 participating families. For the current study, participants from the overall dataset (N = 14,663) were excluded from the present study if they did not have complete data for the key measures outlined below. This left a subset of 4264 participating families (n = 2168 male children, 2096 female children). Children in the present study ranged in age from 32 to 49 months (for males, M = 33.54 months, SD = 1.25 months; for females, M = 33.60 months, SD = 1.33 months) when parental conflict was assessed at Time 1, and from 73 to 98 months (for males, M = 73.34 months, SD = .94 months; for females, M = 73.36 months, SD = 1.27 months) when parental conflict was assessed at Time 2. For the purposes of consistency and clarity in the present study, Time 1 (i.e., 33 months) will be referred to as age 2¾ or toddlerhood, and Time 2 (i.e., 73 months) will be referred to as age 6 or early childhood.

Data on maternal social class were also available for 1875 male children and 1828 female children. Maternal social class at 32 weeks gestation for the entire ALSPAC sample was categorized using the Office of Population Censuses and Surveys (1991) classification system (I = professional occupations; II intermediate occupations; III NM = skilled occupations: nonmanual; III M = skilled occupations: manual; IV = partly skilled occupations; V = unskilled occupations), which generates an ordinal measure of social

standing (Brewer, 1986), with lower roman numerals indicating higher social class. The social class of most mothers of both male (I = 7.3%; II = 35.6%; III NM = 42.9%; III M = 6.5%; IV = 6.7%; V = 1.0%; Armed Forces = .1%) and female (I = 7.7%; II = 34.3%; III NM = 42.1%; III M = 6.7%; IV = 7.8%; V = 1.4%; Armed Forces = .1%) children was rated as falling into category III NM (i.e., skilled occupations, nonmanual).

Maternal ethnic background data were available for 2120 male children ("White" = 98.9%; "Non-White" = 1.1%) and 2051 female children ("White" = 98.9%; "Non-White" = 1.1%). Study children's ethnic background data were available for 2049 male children ("White" = 97.1%; "Non-White" = 2.9%) and 1975 female children ("White" = 94.1%; "Non-White" = 3.2%). Taken together, demographic data suggest that participants in the present study were predominantly Caucasian and middle class.

Measures

The following sections outline how the constructs of interest were operationalized and assessed in the current study.

Interparental conflict. Interparental conflict was assessed by maternal self-report when ALSPAC children were approximately 2¾ (i.e., toddlerhood) and 6 (i.e., early childhood) years of age. The interparental conflict measure consisted of eight items assessing various dimensions of how the mother and her partner interacted during a disagreement (see Appendix A). The first two questions asked each mom to report how frequently she has become irritable with her partner recently and how frequently her partner has become irritable with her recently. Both of these items had 5-point Likert scales, with response options including (1) not at all, (2) less than once a week, (3) 1-2 times per week, (4) 3-6 times per week, and (5) every day. Mothers were then asked to

report how many arguments or disagreements they had with their partners in the preceding three months. Respondents were asked to choose one of five response choices (none, 1-3, 4-7, 8-13, 14 or more). The last five questions – which served as the basis for categorization of the presence or absence of interparental conflict in the present study – asked each mother to report whether she and/or her partner had engaged in each of the following behaviors in the past three months, including (1) *"Not speaking to partner for more than half an hour,"* (2) *"One of you walking out of the house,"* (3) *"Shouting or calling partner names,"* (4) *"Hitting or slapping partner,"* and (5) *"Throwing or breaking things."* Respondents were asked to choose one of four response options, which included: *"Yes, I did this; Yes my partner did this; Yes, we both did this; not at all"*. These five items formed the basis for the categorization of exposure to interparental conflict.

Categorization of the presence or absence of interparental conflict was based on the methodology outlined by Essex and colleagues (2003). Two scores were derived based on the last five questions outlined above. The first – verbal/non-physical conflict – represented scores on Items 1 (*"Not speaking to partner for more than half an hour")*, 2 *("One of you walking out of the house")*, and 3 *("Shouting or calling partner names")*. The endorsement of at least two of the three items was rated as the presence of verbal/non-physical conflict. The second – physical conflict – represented scores on Items 4 *("Hitting or slapping partner")* and 5 *("Throwing or breaking things")*. The endorsement of at least one of these two items was rated as the presence of physical conflict. Two indices (0, 1) were derived for each of the following four domains: (1) Initial Exposure to Verbal/Non-Physical Interparental Conflict in Toddlerhood; (2) Initial

Exposure to Physical Conflict in Toddlerhood; (3) Initial Exposure to Verbal/Non-Physical Interparental Conflict in Early Childhood; and (4) Initial Exposure to Physical Interparental Conflict in Early Childhood.

No specific information regarding the reliability and validity of this measure was provided by the ALPSAC study team. Therefore, we completed internal consistency and cross validation analyses. The 5-item Interparental Conflict measure demonstrated acceptable internal consistency. Cronbach's alpha and the Spearman-Brown coefficient were .65 and .66, respectively, at age 2¾, and .74 and .84 at age 6. It is noted that the reliability of the scale was lower at the toddlerhood time-point. Hair, Black, Babin, Anderson, and Tatham (2006) suggest, however, that the alpha level may be decreased to a threshold of .60 for exploratory research. The complete 5-item measure served as the scale for validation analyses that follow.

In separate regression analyses, maternal-report of partner warmth (i.e., care), F (5, 3803) = 86.50, $p < .000$, $R = .32$, $R^2 = .10$, and authority (i.e., control), F (5, 3778) = 69.41, $p < .000$, $R = .29$, $R^2 = .08$ at age 2¾ were both related to interparental conflict as measured by the five-item interparental conflict scale. Likewise, at age 6, care, F (5, 3818) = 76.99, $p < .000$, $R = .30$, $R^2 = .09$, and control, F (5, 3818) = 32.89, $p < .000$, $R = .20$, $R^2 = .04$, were related to the five-item interparental conflict scale. Specifically, lower levels of partner warmth and higher levels of partner control were associated with increased reported incidence of interparental conflict. These results demonstrate the expected relationship between known predictors of marital dissatisfaction and the interparental conflict scale, providing evidence for the measure's concurrent validity.

Child adjustment. ALPSAC utilized multiple measures of child adjustment, including measures of psychological health as well as assessments of physical health and well-being. Given that the present study focused on the psychological health of children, a measure was selected that assessed the social, emotional and behavioral adjustment of children.

Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).

The SDQ is an observer-rated report completed by mothers in ALSPAC for their children's 115 month time-point assessment. Children ranged in age from 9.50 to 10.75 years (for males, *M* = 9.64 years, *SD* = .12 years; for females, *M* = 9.64 years, *SD* = .11 years) of age when the SDQ was completed. The measure consisted of 25 items describing children's social, emotional, and behavioral functioning. Respondents were asked to indicate on a 3-point Likert scale (not true, somewhat true, and certainly true) how accurately each statement characterizes the child's functioning over the preceding six months.

The SDQ yields a total problems score and five subscale scores, which include emotional symptoms, conduct problems, hyperactivity-inattention, peer problems, and prosocial behavior (Goodman, 2001). Example items are as follows: *"Often fights with other children or bullies them"* (Conduct Problems); *Has many worries, often seems worried"* (Emotional Symptoms); *"Has been restless, overactive, cannot stay still for long"* (Hyperactivity-Inattention); *"Is rather solitary, tends to play alone"* (Peer Problems); and *"Has been considerate of other people's feelings"* (Prosocial Behavior).

The SDQ has demonstrated satisfactory reliability and validity overall. Internal consistency is generally satisfactory with Cronbach's alpha typically above .70 (see

Goodman, 1997; Hawes & Dadds, 2004; Smedje, Broman, Hetta, & von Knorring, 1999). In a nationwide epidemiological study of over 10,000 British children with an age range of 5 to 15 years, Cronbach's alpha for the overall SDQ was above .80 for the self-, parent-, and teacher-report versions (Goodman, 2001). Internal consistency ratings were also satisfactory for all subscales, except the peer problems scale. Whereas Cronbach's alpha for the parent-report peer problems scale was bordering on acceptable (.57), the internal consistency ratings for the self-report version was low (.41), indicating a potential weakness of this subscale. Test-retest reliabilities have been reported to be as high as .96 after two weeks (Smedje et al., 1999), .85 after three to four weeks (Goodman, 2001), and .62 after four to six months (Goodman, 2001).

Inter-measure correlations are high between the SDQ and the Rutter Parent (r = .88) and Teacher Scales (r = .92; Goodman, 1997) as well as Achenbach's Child Behavior Checklist (r = .87; Goodman & Scott, 1999). Receiver Operative Characteristic (ROC) curves from both studies showed that the SDQ was equally good at discriminating between psychiatric and nonpsychiatric populations as were the Rutter scales and the CBCL, respectively. Comparatively, Klasen et al. (2000) found that the SDQ Total Difficulties score was significantly better than the CBCL total score at discriminating between community and clinical samples. One study has shown that, when compared to findings from a clinical interview with parents, the SDQ was equally good at detecting internalizing and externalizing and was significantly better at detecting inattention and hyperactivity than was the CBCL (Goodman & Scott, 1999). The ability to better detect inattention and hyperactivity is supported by Klasen and colleagues (2000), who found

that the SDQ was significantly better than the CBCL in predicting a clinical diagnosis of a hyperactivity disorder.

Locus of control. Children's locus of control was measured when they were approximately 8½ years of age (for males, *M* = 8.59 years, *SD* = .25 years; for females, *M* = 8.59 years, *SD* = .23 years), with a shortened version of the Children's Nowicki-Strickland Internal-External Control Scale (CNSIE; Nowicki & Strickland, 1973). Locus of control data were available for a total of 1488 males and 1491 females. The CNSIE, shortened in collaboration with the first author Stephen Nowicki, Ph.D., consists of 12 yes/no items. Items were scored 0 or 1 and summed together to create a composite score with higher scores indicating greater external locus of control. Items were coded as "missing" if the child responded "don't know" to a question. Children with at least one missing response do not have an overall score.

In their critique of locus of control scales, Furnham and Steele (1993) described the CNSIE as one of the most widely used and well-validated measures of locus of control in children. Although reliability and validity data are not yet available for the shortened version utilized by ALSPAC, the CNSIE has been used in over 1400 studies to date and has satisfactory reliability and validity (Nowicki, 2008). In the present study, the shortened version of the CNSIE demonstrated acceptable internal consistency, with a Cronbach's alpha of .68 and a Spearman-Brown coefficient of .69.

According to the ALSPAC Investigator Documentation (Heron, and the ALSPAC Study Team, 2009), the measure was administered orally to children by a research assistant, who maintained as much eye contact as possible and emphasized the portion of the questions shown in italics (see Appendix B). If the child did not appear to understand

fully the question, the examiner provided a more thorough explanation of the question without using leading prompts or examples. The examiner made a notation of any confusion with the task and when additional assistance was provided.

Children's emotion identification skill. Children's receptive nonverbal skill was assessed when study children were approximately 8½ years of age (for males, *M* = 8.59 years, *SD* = .25 years; for females, *M* = 8.59 years, *SD* = .23 years) with the child facial expressions subtest of the Diagnostic Analysis of Nonverbal Accuracy (DANVA2-CF; Nowicki & Carton, 2001). The Diagnostic Analysis of Nonverbal Accuracy (DANVA2; Nowicki, 2009; Nowicki & Duke, 1994), which has been used in over 300 studies to date, is designed to evaluate an individual's ability to accurately process nonverbal information. The DANVA2-CF consists of 24 photographs of male and female facial expressions of happy, sad, angry, and fearful emotions (Nowicki & Carton, 2001). Each emotion category has three high intensity photographs and three low intensity photographs. When administering the DANVA2 photographs are presented for no more than 2 seconds. The child is then asked to identify whether the person is happy, sad, angry, or fearful. Scores are determined for the total number of errors made by a participant overall as well as the number of errors made within each of the four emotions.

As outlined by Nowicki (2009), the validity and reliability of the DANVA2 and its subtests were established in several ways. Construct validity data have been presented by Nowicki and Carton (2001) and in several other studies (Bailey, 1996; Baum, 1997; Bailey, Nowicki, & Cole, 1998; Nowicki, 1995). Scores have been found to be internally consistent as measured by coefficient alphas of 0.70 or higher in children as young as four years (Goonan, 1995) and as old as fifteen years (Baum, Logan, Walker, Tomlinson

& Schiffman, 1996). Moreover, lower accuracy scores on the DANVA2-CF have been correlated with poorer social competence and lower academic achievement in preschool (Goonan, 1995; Nowicki & Mitchell, 1998) and elementary school-aged children (Collins & Nowicki, 2001; Davis, 2001; Maxim & Nowicki, 1996). Test-retest reliability has been measured at r = .74 among 8 year olds (Nowicki & Carton, 1993) and slightly lower among preschoolers (Verbeek, 1996).

Additional covariates considered. Although the focus of the present study is the relationship between exposure to interparental conflict and children's subsequent adjustment, locus of control, and nonverbal receptive skill, we felt that it was important to take into consideration other constructs that may affect this relationship. To that end, we controlled for three factors in all regression analyses – child temperament, maternal relationship status, and maternal relationship quality. We have provided an explanation of each of these factors below.

Temperament. The Toddler Temperament Scale (TTS; Fullard, McDevitt, & Carey, 1984) was administered to ALSPAC mothers when study children were approximately 2 years of age (for males, M = 2.02 years, SD = .08 years; for females, M = 2.02 years, SD = .06 years). The TTS consist of 97 items across nine domains: activity level; rhythmicity; approach/withdrawal; adaptability; intensity of reactions; mood; persistence; distractibility; and frustration threshold. For purposes of the present study, we included children's scores on the rhythmicity, approach/withdrawal, adaptability, intensity, and mood scales in the analyses as covariates, because as Fullard and colleagues suggest, these scales relate to overall child difficulty. The TTS was standardized on a sample of 309 children from white, middle-class families. The

measure has high test-retest reliability (0.71 to 0.89) and interrater reliability (0.81), as well as acceptable internal consistency (.62 to .86) and concurrent validity (see Fullard et al., 1984).

Relationship status. Relationship status was assessed by asking mothers *"What is your present marital status?"* There were six possible response choices including: (1) never married; (2) widowed; (3) divorced; (4) separated; (5) married (once only); or (6) married for second or third time. In the present study, we utilized relationship status as reported by mothers when their toddlerhood assessment was completed. Based on the distribution of participants within each of these groups, we recoded maternal relationship status to reflect whether participating mothers were: (1) never married; (2) widowed, divorced, or separated; (3) married (only once); or (4) married for second or third time. This variable recode indicated that 11.8% (n = 505) of mothers were never married, 5.2% (n = 223) were divorced, separated, or widowed, 76.3% (n = 3253) were married for the first time, and 6.6% (n = 283) were in their second or third marriage.

Relationship quality. Relationship quality between ALSPAC mothers and their partners was assessed at the toddlerhood time-point with the *Intimate Bond Measure* (IBM; Wilhelm & Parker, 1988). The IBM is an observer-rated report measure consisting of 24 items which assess the dimensions of care and control between partners in an intimate relationship. Respondents were asked to rate their partner's recent attitudes and behaviors toward the respondent on a 4-point Likert scale (very true, moderately true, somewhat true, not true at all). Higher scores on the dimensions indicate higher perceived care and control. On the care dimension, example items

include *"Understands my problems and worries"* and *"Shows his/her appreciation of everything I do"*. Example items on the control dimension include *"Insists that I do exactly as I'm told"* and *"Wants to know exactly what I'm doing and where I am"*. The IBM has high test-retest reliability and internal consistency, and is reported to have minimal sensitivity to state depression (Boyce, Hickie, & Parker, 1991; Furukawa et al., 2002; Wilhelm and Parker, 1988). In the present study, we included maternal score on care and control as covariates in all core regression analyses.

Procedure

ALSPAC participants were recruited from the Avon community using a variety of methods. As described by Golding and colleagues (2004), pregnant women were recruited through television and radio ads as well as posters and brochures placed around the community and in hospitals. ALSPAC staff and community midwives also approached pregnant mothers in hospitals to directly recruit them for participation in the study. Approximately 85% of expectant mothers interested in participating in ALSPAC were included in the study and filled out at least one questionnaire. The measures that are the focus of the present study represent only a small portion of what was assessed by ALSPAC.

As discussed previously, interparental conflict was assessed across two time-points when the study children were approximately 2¾ (i.e., toddlerhood) and 6 (i.e., early childhood) years of age. Children's locus of control orientation and their ability to identify emotions in the facial expressions of children were assessed when ALSPAC children were approximately 8½ years of age. Finally, children's emotional and behavioral adjustment was assessed when study children were approximately 9½ years

old. All questionnaires were mailed to participants' homes, whereas the DANVA2 and Children's Nowicki-Strickland Internal-External Control Scale were administered to children at an ALSPAC clinic.

Results

Descriptive Statistics and Exploration of Child Gender Differences

Mothers endorsed at least two of the three items tapping verbal conflict at a rate of 28.8% (n = 1229) in toddlerhood and 23.9% (n = 1019) in early childhood; whereas 9.2% (n = 392) of mothers endorsed at least one of two physical conflict items in toddlerhood and 6.3% (n = 269) in early childhood. Gender differences were found in the amount of verbal conflict exposure reported in early childhood (t_{4262} = -2.49, p < .05), with mothers of female children (M = .41, SD = .49) reporting higher levels of verbal conflict exposure than mothers of male children (M = .37, SD = .48). No other gender differences were found in the level of verbal or physical conflict exposure or the timing and sequencing of exposure across toddlerhood or early childhood.

Gender differences were found in each of the dependent variables of interest. Specifically, male children had significantly higher scores on the SDQ scales for Total Difficulties (males, M = 6.67, SD = 4.83; females, M = 5.95, SD = 4.27; t_{4262} = 5.18, p < .000), Conduct Problems (males, M = 1.22, SD = 1.37; females, M = 1.09, SD = 1.22; t_{4262} = 3.28, p < .01), Hyperactivity-Inattention (males, M = 3.12, SD = 2.27; females, M = 2.41, SD = 1.98; t_{4262} = 10.87, p < .000), and Peer Problems (males, M =1.07, SD = 1.47; females, M = .93, SD = 1.29; t_{4262} = 3.16, p < .01). As compared to males, female children had significantly higher scores on the Emotional Problems scale of the SDQ (males, M = 1.27, SD = 1.61; females, M = 1.52, SD = 1.68; t_{4262} = -4.97, p < .000), but

significantly higher functioning scores on the Prosocial Behavior scale (males, $M = 8.10$, $SD = 1.69$; females, $M = 8.68$, $SD = 1.46$; $t_{4262} = -12.08$, $p < .000$). Finally, analyses indicated that female children had more external locus of control orientations (males, $M = 5.80$, $SD = 2.12$; females, $M = 5.96$, $SD = 2.04$; $t_{2977} = -2.09$, $p < .05$), and to have poorer nonverbal receptive skill across the nonverbal subscales than their male counterparts (Total Errors: males, $M = 12.77$, $SD = 7.98$; females, $M = 13.39$ $SD = 7.68$; $t_{4262} = -2.59$, $p < .05$; Happy Errors: males, $M = 3.14$, $SD = 2.07$; females, $M = 3.24$ $SD = 1.92$; $t_{4262} = -1.87$, $p < .06$; Anger Errors: males, $M = 3.74$, $SD = 2.38$; females, $M = 3.89$ $SD = 2.26$; $t_{4262} = -2.19$, $p < .05$; Sad Errors: males, $M = 2.27$, $SD = 1.54$; females, $M = 2.45$ $SD = 1.54$; $t_{4262} = -3.99$, $p < .01$; Fear Errors: males, $M = 3.63$, $SD = 2.28$; females, $M = 3.79$, $SD = 2.19$; $t_{4262} = -2.43$, $p < .05$).

To examine the potential interaction between gender and exposure to interparental conflict, we first grouped children into nine risk profiles defined by the possible combinations of the four timing indices (see Table 1). We then conducted eight separate 9 x 2 analyses of covariance (ANCOVA) to examine potential gender differences in the outcomes of interest. These analyses included risk profile, gender, and their interaction as independent variables, and children's locus of control, nonverbal receptive skill, and maternal report scores on the six subscales of the SDQ (emotional symptoms, conduct problems, hyperactivity-inattention, peer problems, prosocial behavior, and total behavior problems) as dependent variables. Analyses revealed no significant interactions between risk profile and gender (see Table 2); therefore, all subsequent analyses were collapsed across gender.

Data Exploration and Transformations

SDQ scales. We first conducted multiple linear regression analyses without transformations to examine the residuals for violations of assumptions. Our analyses revealed significant heteroscedasticity and non-normality of residuals for each of the SDQ dependent variables. In an attempt to correct for these violations of assumptions, we transformed the SDQ variables. First, we ran all analyses with the SDQ variables transformed with the square root function. This addressed violations of assumptions for the *Total Difficulties, Conduct Problems, Emotional Problems,* and *Hyperactivity-Inattention* scales, but not the *Peer Problems* or *Prosocial Behavior* scales. Consequently, we then examined the *Peer Problems* and *Prosocial* scales transformed with the natural logarithmic function, which imposed a more severe effect on the data than did the square root function. This addressed violations of assumptions for *Peer Problems,* but not *Prosocial Behavior*. We substantially reduced violations of assumptions for the *Prosocial Behavior* analysis with the squared function.

Visual inspection of the scatterplots of SDQ residuals regressed against the predicted value (Y') revealed relatively equal scatter both above and below the perfect predictability line (the 0-line) and across the range of the x-axis. There was a bit of scatter outside the 95% confidence interval in each of the plots, but this scatter seemed to be comparatively equal. Similarly, we created P-P plots where the standardized regression residual was plotted against the cumulative proportion expected if the sample were a normal distribution. With the exception of the Prosocial Behavior scale, the points clustered nicely around the straight line, indicating that the samples were from normal distributions. The P-P plot for the SDQ Prosocial Behavior scale continued to

indicate mild to moderate positive skew following the transformation. The squared transformation, however, substantially reduced the deviation of the residuals from the line thereby reducing the non-normality of residuals.

Locus of control. Our exploration of the locus of control variable revealed that no transformation was necessary. Visual inspection of the scatterplot of the locus of control residuals regressed against the predicted value revealed equal scatter above and below the perfect predictability line. Likewise, the P-P plot showed that the standardized regression residuals from the locus of control analysis clustered nicely around the cumulative probability of a normal distribution. Consequently, locus of control raw scores were used in the regression analysis for that variable.

DANVA. Due to significant heteroscedasticity and non-normality of residuals, we could not successfully transform the DANVA error scores to conform to the assumptions underlying multiple linear regression. Closer inspection of the data revealed that the likely cause of this was that the majority of participants had zero errors. Consequently, we recoded participants' DANVA scores into categorical variables to allow for logistic regression. Consistent with a recommendation from the DANVA's first author, S. Nowicki (personal communication, August 1, 2010) participants' error scores were dichotomized and dummy coded as 0 or 1 depending on whether the number of errors made by a given participant exceeded one standard deviation from the mean number of errors across all participants for each subscale; a coding of 1 indicated that the score exceeded the 1 standard deviation cutoff.

Timing of Exposure to Interparental Conflict and Children's Later Adjustment

We next created eight covariates to correspond to specific group contrasts for exposure effects (C1-C3), timing effects (C4, C5), and – when both adversities were present – sequencing effects (C6-C8), see Table 3. For example, we created the timing effects contrast code C4 such that children initially exposed to verbal interparental conflict in toddlerhood (i.e., age 2¾) were scored with a -1 and those exposed to verbal conflict in early childhood (i.e., age 6) were scored with a +1. A frequency table of males and females by covariate is provided in Table 4. We then included the eight categorical contrast codes in separate regression analyses predicting scores on the six subscales of the SDQ and children's locus of control orientation. Child temperament, maternal report of relationship status, and maternal report of relationship satisfaction with her partner were controlled for in all regression analyses.

The eight covariates explained a significant amount of variance – above that which was explained by the control variables – in four of the six SDQ subscales analyses, namely *Total Difficulties, Conduct Problems, Emotional Problems,* and *Peer Problems* (see Tables 5 through 8). We found no significant changes in variance for the *Hyperactivity-Inattention* (Table 9) or *Prosocial Behavior* (Table 10) subscales. Additionally, the eight covariates accounted for significantly more variance in the children's locus of control orientation, as shown in Table 11.

Exposure Effects

As shown in Table 5, children exposed to verbal conflict (C1) or physical conflict (C2), evinced significantly higher scores on the SDQ Total Difficulties scale than those not exposed, and the nonsignificant interaction of the adversities (C3) shows that these

effects were additive. Similarly, those exposed to verbal conflict or physical conflict also had more peer problems than children who were not exposed, see Table 8, and the effects were also additive. Children exposed to verbal conflict (C1) in either developmental period showed significantly more conduct problems (Table 6) and more external locus of control orientations (Table 11) than those who were not exposed. In addition, exposure to physical conflict (C2) in either period was associated with significantly higher emotional problems scores (Table 7).

We also found a number of nonsignificant trends (i.e., $p < .10$), indicating that children exposed to verbal conflict (C1) tended to have more emotional problems, see Table 7, and those exposed to physical conflict (C2) tended to have more problems in conduct and hyperactivity-inattention, see Tables 6 and 8, than their non-exposed counterparts. Exposure effects for all SDQ subscales and the CNSIE locus of control scale are depicted in Figures 1 through 7.

Timing Effects

The results of the Timing Effects analyses are summarized in Tables 5 through 11. With the exception of one nonsignificant trend for the peer problems scale, no timing effects were found indicating no difference in symptom level on the remaining SDQ scales or locus of control orientation between those initially exposed to physical conflict (C5) in toddlerhood and those initially exposed in early childhood. Our analyses revealed no timing effects across dependent variables for initial exposure to verbal conflict (C4). As shown in Table 8, the nonsignificant trend toward a timing effect showed that children initially exposed to physical conflict in early childhood tended to have more peer problems than those initially exposed in toddlerhood.

Sequencing Effects

The sequencing effects analyses focused on the subset of children exposed to both verbal and physical conflict. In terms of sequencing effects (C6) findings, consistent with our hypothesis, analyses indicated significantly higher levels of total difficulties, conduct problems, and peer problems among children exposed to both verbal and physical conflict in different time periods as compared to children exposed to both adversities during the same time period (see Tables 5, 6, and 8).

Of the subset of children exposed to both adversities, but at different time-points (C7), analyses found no difference across dependent variables based on whether children were exposed to verbal or physical conflict first. It is noted, however, that while the overall equation for hyperactivity-inattention was not significant, there was a trend toward a sequencing effect (C7) for those exposed to both verbal and physical conflict at different time periods. Specifically, as shown in Table 9, among children exposed to conflict sequentially, those exposed first to physical conflict tended to have more severe hyperactivity-inattention symptoms than children exposed to the reverse sequence.

Finally, among children exposed to both verbal and physical conflict in the same period (C8), our analyses revealed two nonsignificant trends, see Tables 7 and 11. The trends indicated that those exposed to verbal and physical conflict in toddlerhood tended to have more emotional problems and also more externally-oriented locus of control scores than children exposed to both adversities in early childhood. No other sequencing effects were found.

Logistic Regression for Nonverbal Receptive Skill

We conducted logistic regression analyses to predict errors in nonverbal receptive skill (0 = no errors or errors less than one standard deviation from the mean, 1 = errors at or exceeding one standard deviation from the mean). Separate analyses were completed for the following indices of nonverbal receptive skill: total nonverbal errors and errors on the four emotion subscales (Happy, Sad, Angry, and Fear), for a total of five sets of analyses. We entered the eight interparental conflict covariates as predictors (at Block 2) while controlling for child temperament, maternal report of relationship quality, and mother's relationship status (at Block 1).

All five chi-square tests comparing a full model (including the interparental conflict covariates) to a model with only the control variables were not statistically significant, indicating that the interparental conflict predictors were not reliably distinguishing the participants with error rates exceeding one standard deviation from their counterparts (Total χ^2= 2.22, p = .97; Happy χ^2 = 12.23, p = .14; Sad χ^2= 10.84; p = .21; Angry = χ^2= 6.82, p = .67; Fear χ^2= 8.26, p = .41).

Cox and Snell R^2 values (Total = .004; Happy = .004; Sad = .007; Angry = .004; Fear = .003) indicated that, even when taking into account control variables and interparental conflict as predictors (i.e., the full model), less than 1% of the variance was accounted for in nonverbal receptive skill. Together, these findings do not support an association between interparental conflict exposure and children's nonverbal receptive skill at age eight.

Discussion

The present study investigated the longitudinal association between exposure to interparental conflict in toddlerhood and early childhood – and the specific timing and sequencing of that exposure – and emotional and behavioral adjustment in middle childhood. We first asked whether exposure to verbal and/or physical conflict was associated with subsequent child maladjustment. Consistent with our hypothesis, the findings supported a relationship between exposure to parental discord and subsequent adjustment difficulties across a number of outcomes, including overall difficulties, conduct problems, emotional problems, peer problems, and possibly hyperactivity-inattention as well. These findings are consistent with the well-established literature linking interparental conflict to children's concurrent and subsequent adjustment difficulties (see reviews by Buehler et al., 1997; Cummings & Davies, 2002; Grych & Fincham, 1990; Ransom, 2008; and Reid & Crisafulli, 1990).

Furthermore, our findings indicated the existence of a cumulative negative effect of exposure to both adversities on children's overall emotional and behavioral difficulties, and specifically in terms of problems in their conduct, emotional functioning, peer relationship skills, and possibly hyperactivity-inattention symptoms. That is, the effects of verbal and physical conflict exposure were shown to be additive, rather than interactional. Therefore, we can suggest that verbal conflict alone and physical conflict alone have unique effects on child functioning, rather than that the effects of one depend on the presence, absence, or level of the other. Additionally, given the additive nature, we can infer that being exposed to both verbal and physical conflict has a more negative impact on children's personal social adjustment than being exposed to just one or the

other form of interparental conflict. Our findings extended the work of Essex and colleagues (2003) on exposure effects, by showing that exposure to interparental conflict, not only in infancy and the preschool years, but also in toddlerhood and early childhood, is associated with subsequent adjustment difficulties, not only in kindergarten, but in middle childhood as well.

In addition to the evidence supporting an overall additive effect of verbal and physical conflict exposure, our analyses indicated that – of those children exposed to both verbal and physical conflict – those exposed across different time-points had more negative outcomes than children exposed to both forms of conflict at the same time-point. This finding was supported irrespective of whether these children were first exposed to verbal conflict or to physical conflict. Therefore, it appears that the relationship is a function of timing rather than a priming effect of one specific type of conflict exposure. Moreover, the overall lack of findings pertaining to the importance of the period of initial exposure to conflict further reinforces the idea that more chronic and continual exposure to interparental conflict over time is related to more negative emotional and behavioral outcomes in children.

Although there are likely multiple mediators that jointly account for the longitudinal association between interparental conflict exposure and subsequent child maladjustment, the present study highlights that more chronic and continual exposure across critical early developmental periods may set the stage for increased maladjustment later in life. These findings are consistent with a developmental psychopathology perspective, which stresses the importance of understanding the impact of early pathways of development on functioning over time. This perspective provides support for the idea

that interparental conflict interferes with children's mastery of key developmental tasks which, in turn, may lead to an increased vulnerability for maladjustment. It follows that increased emotional and behavioral problems in middle childhood among children previously exposed to parental discord could lead to difficulties in other domains of functioning in preadolescence and adolescence, but this proposition is speculative and additional longitudinal research is necessary to establish whether such a relationship exists.

Consistent with the notions of developmental psychopathology, these findings provide support for a sensitization effect of interparental conflict on children's adjustment. Several research groups contend that the negative effects of exposure to interparental conflict accumulate over time, thereby increasing children's vulnerability to maladjustment (see Cummings, 1994; Grych & Fincham, 2001). Here we have shown that, regardless of the nature of the conflict, exposure to interparental discord predicts subsequent child maladjustment across a number of domains. Furthermore, we contend that chronic exposure, as compared to isolated exposure, appears to lead to greater levels of maladjustment over time. Indeed, it may be the case that chronic exposure to interparental discord should be conceptualized as a Type II trauma, which Terr (1991) asserted can result in higher levels of reactivity and distress in children because they may tend to anticipate repeated episodes of conflict over time.

Interestingly, despite the broad findings relating interparental conflict to child maladjustment, no significant effects were found pertaining to children's prosocial behavior. Numerous studies have linked higher levels of interparental conflict to multiple measures of social functioning, including peer rejection (e.g., MacKinnon-Lewis

& Lofquist, 1996; Vairami & Vorria, 2007), poorer quality friendships (e.g., Lindsey, Colwell, Frabutt, & MacKinnon, 2006; Underwood, Beron, Gentsch, Galperin, & Risser, 2008), and less prosocial behavior (Ladd & Profilet, 1996). While the lack of significant findings in the present study is surprising, given that the association of interparental conflict exposure with impaired social functioning appears repeatedly in the existing literature, it is important to highlight the potential weaknesses of the Prosocial Behavior subscale and its use in this study's analyses. As Goodman (1997) pointed out, the "absence of prosocial behaviors is conceptually different from the presence of psychological difficulties" (p. 582). He goes on to state that the Prosocial Behavior scale may function more as a "positive construal" factor, which he notes can be affected by a rater's readiness to attribute positive qualities to the subject (Goodman, 2001). Nevertheless, it may be the case that there is a more robust relationship between interparental conflict and the development of peer problems or difficulties in peer relationships than there is between conflict exposure and the absence of prosocial skill. Notably, we were unable to fully address the heteroscedasticity and non-normality of residuals observed in the initial data exploration and analysis of the prosocial scale. Consequently, this may have prevented us from accurately measuring the relationship between exposure to interparental conflict and children's prosocial behavior.

In contrast to the strong support for a cumulative negative effect of interparental conflict exposure on children's emotional and behavioral well-being, our analyses also provided relatively limited support for our hypothesis pertaining to earlier exposure being associated with poorer adjustment. Specifically, among children exposed to both verbal and physical conflict in the same developmental period, those exposed in toddlerhood

tended to have more emotional problems as compared to children exposed in early childhood. Although this finding is preliminary, it is consistent with the work of Davies and Cummings (1994), who argue that infancy and toddlerhood are key developmental periods for children. It is during this time that children's emotional security with the primary caregivers and within the larger family system is established. Interparental conflict in infancy and toddlerhood is conceptualized as a threat to the development of adequate emotional security, resulting in increased risk for emotional dysregulation and maladjustment. While our study did not address the development of emotional security, and consequently can make no inference about the role it may play in children's adjustment to interparental conflict, our analyses provided preliminary support for the idea that exposure to conflict during toddlerhood may be differentially associated with children's emotionality than is exposure in early childhood.

Interestingly, our analyses on timing of exposure revealed a marginally-significant trend highlighting the potential negative impact of physical conflict exposure in early childhood on later problems in peer relationships. Specifically, we found that the subset of children initially exposed to physical conflict in early childhood tended to have more peer problems than those initially exposed to physical conflict in toddlerhood. We know that early childhood marks the beginning of an important developmental period for the formation of peer relationships and development of social competence (Howes, 2009; Rose-Krasnor & Denham, 2009), and, it may be that physical conflict exposure during that time disrupts the development of a strong foundation in social competence and peer relationship skills. A recent study by Kouros, Cummings, and Davies (2010) found that interparental conflict in early childhood positively predicted change in externalizing

problems in childhood, which in turn predicted decreased prosocial behavior and increased social difficulties five years later during preadolescence. The authors highlight their findings within a developmental cascade model, which theorizes that early levels and changes in functioning in one area impact subsequent functioning in another area, and so on. They concluded that "interparental conflict sets in motion a chain of processes whereby impairment in one domain of functioning (externalizing problems) can contribute to impairment in other domains of functioning (social competence) across time" (p. 534). A developmental cascade model may be appropriate for understanding the results of the present study, with interparental conflict leading to increased adjustment difficulties in middle childhood which, in turn, may result in greater difficulties later on. However, our study served to support only the first pathway in that model, and it will be important for future research to consider adjustment in preadolescence and/or adolescence to capture more completely the relationships among these factors.

In addition to timing, our study also examined the possible role of child gender in the association between exposure to interparental conflict and child maladjustment. As previously described, the extant literature on gender differences in this area is inconsistent and contradictory. In his review of the effects of interparental conflict, Emery (1982) hypothesized that girls may have higher internalizing problems when exposed to parent conflict than boys, whereas boys may have higher externalizing problems than girls. Emery's hypothesis was partially supported by a recent meta-analytic review by Ransom (2008), which found that the association between parent conflict and internalizing problems was stronger for girls than it was for boys. That finding served as the basis for this study's prediction of the effects of gender: we

predicted that gender differences would be found and, more specifically, that girls exposed to higher levels of interparental conflict would have greater emotional problems as compared to girls exposed to lower levels or not at all. We did not find this to be the case.

Although we found significant gender differences in rates across the dependent variables of interest (e.g., total difficulties, conduct problems, emotional problems, locus of control orientation, nonverbal receptive skill, etc.), our analyses revealed no significant interactions between gender and exposure to interparental conflict. This finding supports the conclusions drawn by Buehler and colleagues' (1997) meta-analytic review as well as numerous other research groups (e.g., Davies & Lindsay, 2001, 2004; Katz & Gottman, 1993). While speculative, it may be that additional factors place boys or girls at a greater risk for developing adjustment difficulties in the context of interparental conflict exposure. For example, research has shown that adolescent males often cope with stress by externalizing their behavior as compared to females who tend to cope by internalizing (Eschenbeck, Kohlman, & Lohaus; 2007; Hoffman & Su, 1997). Gender differences also may not be fully realized until later on in adolescence, a developmental period in which we know males are more likely to develop externalizing problems and females are more likely to develop internalizing problems than their respective counterparts (see Kessler et al., 2005; Rosenfield, Vertefuille, & McAlphine, 2000). To that end, in a study of gender differences in the development of depression and anxiety symptoms in adolescents exposed to marital discord, Crawford, Cohen, Midlarsky, and Brook (2001) found that gender differences were not present in early adolescence (i.e., around age 11), but did emerge two years later in mid-adolescence. Consistent with their hypothesis, parental

discord was associated with the development of internalizing symptoms among adolescent females, but not adolescent males. Clarifying this relationship, as well as identifying the relevant underlying mediators (e.g., developmental phase), remains a goal of future research.

The fourth and fifth research questions addressed the impact of exposure to interparental conflict on children's locus of control orientation and nonverbal receptive ability. Statistical analysis provided partial support for our locus of control hypothesis. Specifically, children exposed to higher levels of verbal conflict had a higher external control orientation than those exposed to lower levels or no conflict at all. Interestingly, there was no association between locus of control orientation and exposure to physical conflict. There was also a nonsignificant trend for greater externality being associated with exposure to both verbal and physical conflict in toddlerhood, as compared to early childhood.

The divergent findings with regard to verbal versus physical conflict are interesting; as one would assume that exposure to physical conflict would also increase children's life stress. Locus of control is theorized to be influenced by children's early experiences with their parents and other caregivers (Rotter, 1954, 1966). Increased life stress, like that which comes from exposure to interparental conflict, has been shown to be strongly associated with an external control orientation (see Carton & Nowicki, 1994), and external locus of control has also been associated with numerous other forms of life stress including parental conflict and/or parental divorce (see Kurdek & Blisk, 1983; Nesbit-Greene, 2001; Sun & Li, 2002). Perhaps verbal conflict generally occurs more continuously than does physical conflict, and that bouts of physical conflict are briefer

and potentially less frequent. It is important to note that ALSPAC used a shortened version of the CNSIE and that the restricted range of items may have played a role in results pertaining to locus of control orientation. Future prospective studies should consider collecting data on the frequency and duration of interparental conflict and examine how those variables relate to children's locus of control orientations. Additionally, it is recommended that future studies utilize the complete 40-item CNSIE until the shortened measure is fully validated.

Our prediction with regard to nonverbal receptive skill was not supported in the present study. Consistent with the conclusions drawn by Pollak and colleagues (2000), we predicted that children exposed to higher levels of parent conflict would have poorer nonverbal receptive ability than those exposed to lower levels of conflict, or none at all. Unfortunately, due to non-normality, we were not able to use multiple linear regression to address this research question. Logistic regression revealed no differences in the relationship between interparental conflict exposure and children's nonverbal decoding errors. Overall, there has been relatively little empirical research to consider the possible role interparental conflict may play in children's nonverbal ability. We drew inferences that formed the basis of our predictions based on laboratory-based studies of mothers' facial expressions, and studies of physically abused and neglected children. It may be the case, however, that children's nonverbal skill is not differentially affected by exposure to interparental conflict. Nevertheless, we must caution against drawing firm conclusions based on these findings. The low base rate of the participants with error scores exceeding one standard deviation from the mean may have prevented us from adequately addressing the question of interest. Alternatively, advanced statistical modeling techniques like

hierarchical linear modeling would have precluded the need to dichotomize the nonverbal receptive skill variable, and may have provided a more thorough understanding of the effects of parent conflict. Moreover, future researchers of nonverbal receptive skill should consider utilizing advance modeling techniques given the statistical challenges inherent to analyzing these types of data.

Conclusion

Consistent with a developmental psychopathology approach, our findings suggest that exposure to interparental conflict that is chronic appears to lead to greater levels of maladjustment in young children's subsequent emotional and behavioral well-being. Here we have extended a limited body of literature and underscored the importance of considering the timing and sequencing of exposure to interparental conflict for understanding children's emotional and behavioral adjustment. The results of this study hopefully can be used to better understand the possible mechanisms involved in the association between exposure to interparental conflict and children's subsequent well-being, as well as to provide support for the idea that verbal and physical interparental conflict have unique effects on children's adjustment. Moreover, as outlined below, the limitations of our study have highlighted a number of additional areas of investigation that may shed further light on the impact of timing of exposure to interparental conflict.

Limitations and Future Directions

The present findings suggest that exposure to interparental conflict in toddlerhood and early childhood may make children especially vulnerable to adjustment difficulties in middle childhood, and that more chronic exposure appears to be associated with worse

emotional and behavioral functioning. However, there are several limitations to the study and its findings that merit mention.

Foremost, improvements could have been made in the manner in which interparental conflict was assessed. The ALPSAC Study Group provided limited information regarding the design of the interparental conflict measure, but no information on its reliability or validity. It is not clear why ALSPAC did not choose to utilize an established scale, such as the Conflict Tactics Scale (CTS; Staus, 1979), in lieu of designing their own. It is noted, however, that there is considerable similarity between the ALSPAC interparental conflict measure and the original version of the CTS as well as the updated Revised Conflict Tactics Scales (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996), which have been used to assess interparental conflict in over 7000 studies to date. Specifically, each style of conflict assessed by the interparental conflict measure used in our study (i.e., not speaking to partner, walking out of house, yelling at partner, hitting or slapping partner, throwing and/or breaking things) is also assessed by the CTS. However, the CTS and CTS2 are more comprehensive in that they examine numerous other examples of conflict (e.g., "threatened with gun/knife," "pushed or shoved"), assess reasoning abilities (e.g., "Discussed an issue calmly," "I explained my side of the disagreement," "I showed my partner I cared even though we disagreed"), and obtain ratings of the frequency that the respondent and the frequency of his/her partner engaged in each form of conflict.

It this additional information were to have been available, we would have been able to explore the impact the frequency of various forms of interparental conflict have on children's subsequent well-being. Additionally, we could have been better able to

assess the role played by parental reasoning abilities as well as the possibility of differential relationships between verbal aggression, minor violence (e.g., throwing something, pushing, or shoving), and severe violence (e.g., hitting, threatening the use of a weapon, and actual use of a weapon) on children's subsequent adjustment. Numerous research groups (e.g., Goeke-Morey, Cummings, & Papp, 2007; Schermerhorn, Chow, & Cummings, 2010; Schudlich & Cummings, 2007) have highlighted the importance of examining reasoning abilities and parents' conflict resolution styles, as these factors appear to be important contributors to understanding more fully children's adjustment in the context of interparental conflict exposure.

Furthermore, it may be that findings from our community sample do not generalize to families experiencing more severe forms of interparental conflict. Obtaining data on the clinical significance of adjustment problems, preferably through clinical diagnostic interviews such as the K-SADS-PL (see Kaufman et al., 1997) would enhance the generalizability of the findings to both community and clinical samples and inform existing policy and practice. In addition, our study utilized questionnaire data where mothers were the sole informant of interparental conflict and children's adjustment on the SDQ, which increases the study's likelihood of being vulnerable to statistical problems associated with single informant bias (see Campbell & Fiske, 1959). The Strengths and Difficulties Questionnaire was administered to teachers at the early childhood (i.e., age 6) assessment point, but not in middle childhood. It would be beneficial in future research endeavors to obtain multiple informants' ratings of children's adjustment and functioning, including teachers and, ideally, fathers/other caregivers. Including fathers, romantic partners, or caregivers would afford the

opportunity to obtain multiple informants' ratings of parental discord as well. Moreover, whenever possible, future studies should assess children's perceptions of interparental conflict, which have been shown to be a key factor in the pathway from interparental conflict to children's adjustment (see reviews by Cummings & Davies, 2002; Grych & Fincham, 2001).

In spite of the limitations described above, the findings of this study contribute to the understanding of how interparental conflict may relate to children's emotional and behavioral well-being in middle childhood and the role that more chronic exposure over early developmental periods plays in more negative personal and social adjustment later on. Future studies could examine the impact of continued interparental conflict exposure on adjustment of the ALSPAC children through later developmental periods, including late childhood, preadolescence and adolescence. Our study provided a foundation from which to continue to explore the potential cumulative negative effect of conflict exposure, as well as the moderating effects of gender as these children age and the potential mediating effects of factors such as parent-child relationship, parents' mental health, and children's social support and relationships.

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Appendix A

Interparental Conflict Scale

F11.a) How often recently have you been irritable with your partner?

not at all [1] less than once a week [2] 1-2 times a week [3] 3-6 times a week [4] every day [5]

F11. b) How often has he been irritable with you?

not at all [1] less than once a week [2] 1-2 times a week [3] 3-6 times a week [4] every day [5]

F12. a) How many arguments or disagreements have you had in the past three months?

None [1] 1-3 [2] 4-7 [3] 8-13 [4] 14 or more [5]

b) In the past 3 months, have any of these happened?

		Yes, I did this	**Yes, he did this**	**Yes, we both did this**	**No, not at all**
i)	not speaking to partner for more than half an hour	[1]	[2]	[3]	[4]
ii)	one of you walking out of the house	[1]	[2]	[3]	[4]
iii)	shouting or calling partner names	[1]	[2]	[3]	[4]
iv)	hitting or slapping partner	[1]	[2]	[3]	[4]
v)	throwing or breaking things	[1]	[2]	[3]	[4]

Appendix B

Locus of Control Scale

(Modified from the Children's Nowicki-Strickland Internal-External Control Scale (CNSIE; Nowicki & Strickland, 1973).

1. Do you feel that wishing can make good things happen?
2. Are people nice to you *no matter what you do*?
3. Do you *usually* do badly in your school work even when you try hard?
4. When a friend is angry with you is it hard to make that friend like you again?
5. Are you surprised when your teacher praises you for your work?
6. When bad things happen to you is it *usually* someone else's fault?
7. Is doing well in your class-work just a matter of 'luck' to you?
8. Are you *often* blamed for things that just aren't your fault?
9. When you get into an argument or fist fight is it *usually* the other person's fault?
10. Do you think that preparing for tests is a waste of time?
11. When nice things happen to you is it usually because of 'luck'?
12. Does planning ahead make good things happen?

Table 1

Risk Profiles for Timing of Exposure to Interparental Conflict

	Verbal/Non-Physical Conflict: Age 2¾	Verbal/Non-Physical Conflict: Age 6	Physical Conflict: Age 2¾	Physical Conflict: Age 6
Profile 1 (boys = 1295; girls = 1167)	0	0	0	0
Profile 2 (boys = 425; girls = 437)	1	0	0	0
Profile 3 (boys = 173; girls = 202)	0	0	1	0
Profile 4 (boys = 36; girls = 32)	0	1	0	0
Profile 5 (boys = 19; girls = 28)	0	0	0	1
Profile 6 (boys = 148; girls = 151)	1	1	0	0
Profile 7 (boys = 27; girls = 41)	1	0	0	1
Profile 8 (boys = 14; girls = 11)	0	1	1	0
Profile 9 (boys = 31; girls = 27)	0	0	1	1

Note: $N = 4264$. 1 = present, 0 = absent

Table 2

Analysis of Covariance (ANCOVA) Sex x Risk Profile Interaction

	$F_{(8, 4246)}$	p
Strengths and Difficulties Questionnaire		
Total Difficulties	1.11	0.35
Conduct Problems	0.47	0.88
Emotional Problems	1.20	0.30
Hyperactivity-Inattention	1.30	0.24
Peer Problems	0.74	0.66
Prosocial Behavior	1.06	0.39
Locus of Control[a]	0.58	0.79
Diagnostic Analysis of Nonverbal Accuracy		
Total Errors	0.56	0.81
Happy Errors	0.67	0.72
Angry Errors	0.44	0.90
Sad Errors	0.72	0.67
Fear Errors	0.54	0.82

Note: [a] *df* (8, 2971)

Table 3

Definition of Covariates (C) To Be Used in Regression Analyses

	Exposure to Adversities[a]			Timing of Initial Exposure[b]				
	(C) 1. Verbal/ Non-Physical Conflict	(C) 2. Physical Conflict	(C) 3. Both	(C) 4. Verbal Conflict Only	(C) 5. Physical Conflict Only	(C) 6. If Both, Same or Different Period?	(C) 7. If Different, Verbal or Physical Conflict First?	(C) 8. If Same, Which Period?
Profile 1	0	0	0	0	0	0	0	0
Profile 2	1	0	0	-1	0	0	0	0
Profile 3	1	0	0	+1	0	0	0	0
Profile 4	0	1	0	0	-1	0	0	0
Profile 5	0	1	0	0	+1	0	0	0
Profile 6	1	1	1	0	0	-1	0	-1
Profile 7	1	1	1	0	0	+1	-1	0
Profile 8	1	1	1	0	0	+1	+1	0
Profile 9	1	1	1	0	0	-1	0	+1

[a] For exposure effects, 1 = exposure to conflict in either period, 0 = not exposed

[b] For timing effects, -1 = exposure in toddlerhood, + 1 = exposure in early childhood. If exposed to both, -1 = same period, +1 = different period. If exposed in different periods, -1 = verbal conflict first, +1 = physical conflict first. If exposed in the same period, -1 = toddlerhood period, + 1 = early childhood period.

Table 4

Frequency Table for Interparental Conflict Covariates by Gender

Covariates		
Exposure Effects	Exposed (+)	Not Exposed (-)
(C) 1. Verbal conflict either period	M: 818 F: 869	M: 1350 F: 1227
(C) 2. Physical conflict either period	M: 275 F: 290	M: 1893 F: 1806
(C) 3. Both adversities (Verbal and Physical Conflict)	M: 220 F: 230	M: 1948 F: 1866
Timing Effects	Toddlerhood (-1)	Early Childhood (+1)
(C) 4. Period of initial exposure to Verbal Conflict only	M: 425 F: 437	M: 173 F: 202
(C) 5. Period of initial exposure to Physical Conflict only	M: 36 F: 32	M: 19 F: 28
Sequencing Effects	(–)	(+)
(C) 6. If exposed to both, same (–) or different (+) period	M: 179 F: 178	M: 41 F: 52
(C) 7. If different periods, Verbal Conflict (–) or Physical Conflict (+) first	M: 27 F: 41	M: 14 F: 11
(C) 8. If same period, toddlerhood (–) or early childhood (+)	M: 148 F: 151	M: 38 F: 27

TABLE 5

Multiple Regression Analyses for Exposure, Timing, and Sequencing Effects for Strengths and Difficulties Questionnaire Total Difficulties Scale [b]

	Total Difficulties		
	b	β	*t*
Covariates[a]			
(C) 1. Verbal conflict either period (+)	0.10	0.06	3.44**
(C) 2. Physical conflict either period (+)	0.23	0.10	3.05**
(C) 3. Both adversities (Verbal and Physical Conflict) (+)	-0.11	-0.04	-1.09
(C) 4. Period of initial exposure to Verbal Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.01	0.01	0.31
(C) 5. Period of initial exposure to Physical Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.07	0.02	0.98
(C) 6. If exposed to both, same (–) or different (+) period	0.11	0.05	2.22*
(C) 7. If different periods, Verbal Conflict (–) or Physical Conflict (+) first	0.13	0.02	1.47
(C) 8. If same period, toddlerhood (–) or early childhood (+)	-0.07	-0.02	-1.23
R^2		0.09	
$F_{(8, 4255)}$		55.08***	
ΔR^2		0.008	
$\Delta F_{(8, 4247)}$		4.55***	

Note: [a] Coding of the covariates (C1-C9) is shown in Table 3. [b] Square root transformation used to reduce heteroscedasticity and promote normality of residuals.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE 6

Multiple Regression Analyses for Exposure, Timing, and Sequencing Effects for Strengths and Difficulties Questionnaire Conduct Problems Scale [b]

	Conduct Problems		
	b	β	*t*
Covariates[a]			
(C) 1. Verbal conflict either period (+)	0.06	0.07	4.13***
(C) 2. Physical conflict either period (+)	0.06	0.05	1.64†
(C) 3. Both adversities (Verbal and Physical Conflict) (+)	-0.02	-0.02	-0.51
(C) 4. Period of initial exposure to Verbal Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.01	0.01	0.50
(C) 5. Period of initial exposure to Physical Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.02	0.01	0.61
(C) 6. If exposed to both, same (–) or different (+) period	0.07	0.05	2.43*
(C) 7. If different periods, Verbal Conflict (–) or Physical Conflict (+) first	0.04	0.02	0.89
(C) 8. If same period, toddlerhood (–) or early childhood (+)	-0.04	-0.03	-1.58
R^2		0.08	
$F_{(8, 4255)}$		46.98***	
ΔR^2		0.007	
$\Delta F_{(8, 4247)}$		4.15***	

Note: [a] Coding of the covariates (C1-C9) is shown in Table 3. [b] Square root transformation used to reduce heteroscedasticity and promote normality of residuals.

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

TABLE 7

Multiple Regression Analyses for Exposure, Timing, and Sequencing Effects for Strengths and Difficulties Questionnaire Emotional Problems Scale [b]

	Emotional Problems		
	b	β	*t*
Covariates[a]			
(C) 1. Verbal conflict either period (+)	0.03	0.03	1.69†
(C) 2. Physical conflict either period (+)	0.12	0.08	2.59*
(C) 3. Both adversities (Verbal and Physical Conflict) (+)	-0.07	-0.05	-1.23
(C) 4. Period of initial exposure to Verbal Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.01	0.01	0.49
(C) 5. Period of initial exposure to Physical Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.00	0.00	0.04
(C) 6. If exposed to both, same (–) or different (+) period	0.05	0.03	1.56
(C) 7. If different periods, Verbal Conflict (–) or Physical Conflict (+) first	0.02	0.01	0.43
(C) 8. If same period, toddlerhood (–) or early childhood (+)	-0.06	-0.04	-1.77†
R^2		0.04	
$F_{(8, 4255)}$		20.96***	
ΔR^2		0.004	
$\Delta F_{(8, 4247)}$		2.44*	

Note: [a] Coding of the covariates (C1-C9) is shown in Table 3. [b] Square root transformation used to reduce heteroscedasticity and promote normality of residuals.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE 8
Multiple Regression Analyses for Exposure, Timing, and Sequencing Effects for Strengths and Difficulties Questionnaire Peer Problems Scale [b]

	Peer Problems		
	b	β	*t*
Covariates[a]			
(C) 1. Verbal conflict either period (+)	0.02	0.04	2.16*
(C) 2. Physical conflict either period (+)	0.05	0.07	2.12*
(C) 3. Both adversities (Verbal and Physical Conflict) (+)	-0.01	-0.02	-0.45
(C) 4. Period of initial exposure to Verbal Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.01	0.02	0.93
(C) 5. Period of initial exposure to Physical Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.04	0.03	1.68†
(C) 6. If exposed to both, same (–) or different (+) period	0.04	0.05	2.10*
(C) 7. If different periods, Verbal Conflict (–) or Physical Conflict (+) first	0.03	0.02	1.14
(C) 8. If same period, toddlerhood (–) or early childhood (+)	-0.01	-0.02	-0.73
R^2		0.03	
$F_{(8, 4255)}$		18.21***	
ΔR^2		0.005	
$\Delta F_{(8, 4247)}$		2.59**	

Note: [a] Coding of the covariates (C1-C9) is shown in Table 3. [b] Natural log transformation used to reduce heteroscedasticity and promote normality of residuals.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE 9

Multiple Regression Analyses for Exposure, Timing, and Sequencing Effects for Strengths and Difficulties Questionnaire Hyperactivity-Inattention Scale [b]

	Hyperactivity-Inattention		
	b	β	*t*
Covariates[a]			
(C) 1. Verbal conflict either period (+)	0.03	0.03	1.44
(C) 2. Physical conflict either period (+)	0.09	0.05	1.65†
(C) 3. Both adversities (Verbal and Physical Conflict) (+)	-0.02	-0.01	-0.28
(C) 4. Period of initial exposure to Verbal Conflict only (-1 Toddlerhood, +1, Early Childhood)	-0.01	-0.01	-0.49
(C) 5. Period of initial exposure to Physical Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.02	0.01	0.46
(C) 6. If exposed to both, same (–) or different (+) period	0.03	0.02	0.76
(C) 7. If different periods, Verbal Conflict (–) or Physical Conflict (+) first	0.11	0.03	1.80†
(C) 8. If same period, toddlerhood (–) or early childhood (+)	-0.01	0.00	-0.16
R^2		0.07	
$F_{(8, 4255)}$		40.16***	
ΔR^2		0.003	
$\Delta F_{(8, 4247)}$		1.59	

Note: [a] Coding of the covariates (C1-C9) is shown in Table 3. [b] Square root transformation used to reduce heteroscedasticity and promote normality of residuals.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE 10
Multiple Regression Analyses for Exposure, Timing, and Sequencing Effects for Strengths and Difficulties Questionnaire Prosocial Behavior Scale [b]

	Peer Problems		
	b	β	*t*
Covariates[a]			
(C) 1. Verbal conflict either period (+)	1.11	0.022	1.19
(C) 2. Physical conflict either period (+)	-1.82	-0.03	-0.78
(C) 3. Both adversities (Verbal and Physical Conflict) (+)	2.12	0.03	0.72
(C) 4. Period of initial exposure to Verbal Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.53	0.01	0.72
(C) 5. Period of initial exposure to Physical Conflict only (-1 Toddlerhood, +1, Early Childhood)	-0.39	0.00	-0.17
(C) 6. If exposed to both, same (–) or different (+) period	-2.49	-0.03	-1.51
(C) 7. If different periods, Verbal Conflict (–) or Physical Conflict (+) first	-2.83	-0.02	-1.01
(C) 8. If same period, toddlerhood (–) or early childhood (+)	1.22	0.01	0.70
R^2		0.05	
$F_{(8, 4255)}$		27.10***	
ΔR^2		0.002	
$\Delta F_{(8, 4247)}$		1.01	

Note: [a] Coding of the covariates (C1-C9) is shown in Table 3. [b] Squared transformation used to reduce heteroscedasticity and promote normality of residuals.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE 11

Multiple Regression Analyses for Exposure, Timing, and Sequencing Effects for Children's Nowicki-Strickland Internal-External Control Scale (CNSIE)

	Locus of Control		
	b	β	*t*
Covariates[a]			
(C) 1. Verbal conflict either period (+)	0.31	0.07	3.26**
(C) 2. Physical conflict either period (+)	-0.24	-0.04	-1.07
(C) 3. Both adversities (Verbal and Physical Conflict) (+)	-0.02	0.00	-0.08
(C) 4. Period of initial exposure to Verbal Conflict only (-1 Toddlerhood, +1, Early Childhood)	0.04	0.01	0.54
(C) 5. Period of initial exposure to Physical Conflict only (-1 Toddlerhood, +1, Early Childhood)	-0.16	-0.01	-0.72
(C) 6. If exposed to both, same (–) or different (+) period	0.17	0.03	1.08
(C) 7. If different periods, Verbal Conflict (–) or Physical Conflict (+) first	-0.23	-0.02	-0.84
(C) 8. If same period, toddlerhood (–) or early childhood (+)	-0.34	-0.05	-1.91†
R^2		0.002	
$F_{(8, 2970)}$		1.59	
ΔR^2		0.006	
$\Delta F_{(8, 2962)}$		2.31*	

Note: [a] Coding of the covariates (C1-C9) is shown in Table 3.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

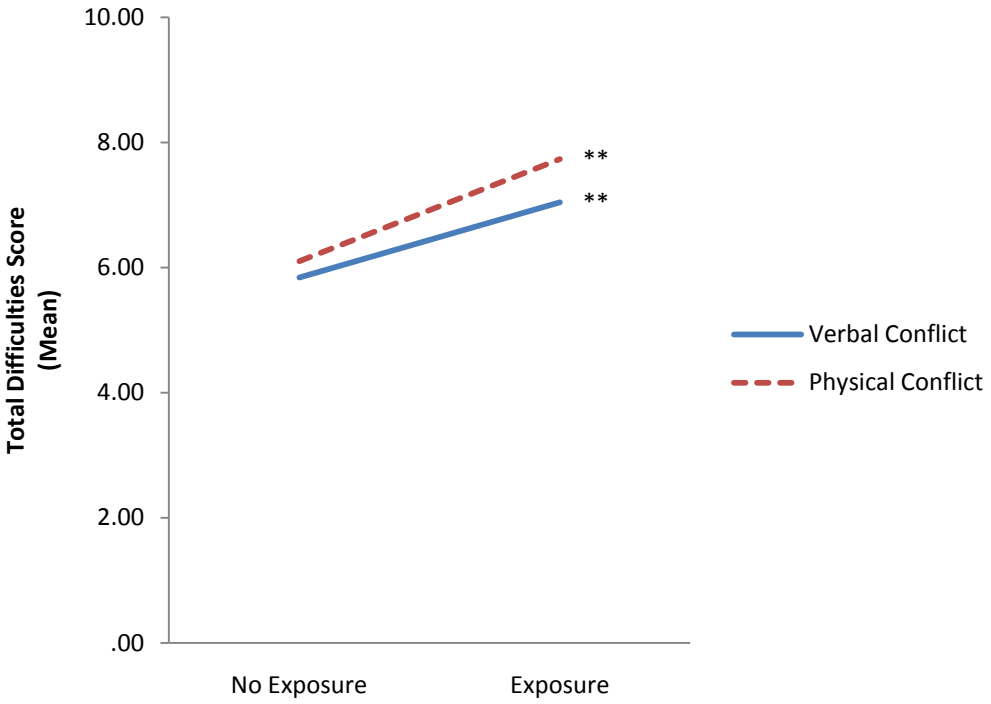

Figure 1. Exposure Effects for Strengths and Difficulties Questionnaire Total Difficulties Scale. Significant mean differences found for both verbal conflict and physical conflict, indicating that children exposed to either verbal or physical conflict evinced more total difficulties than those not exposed. ** $p < .01$

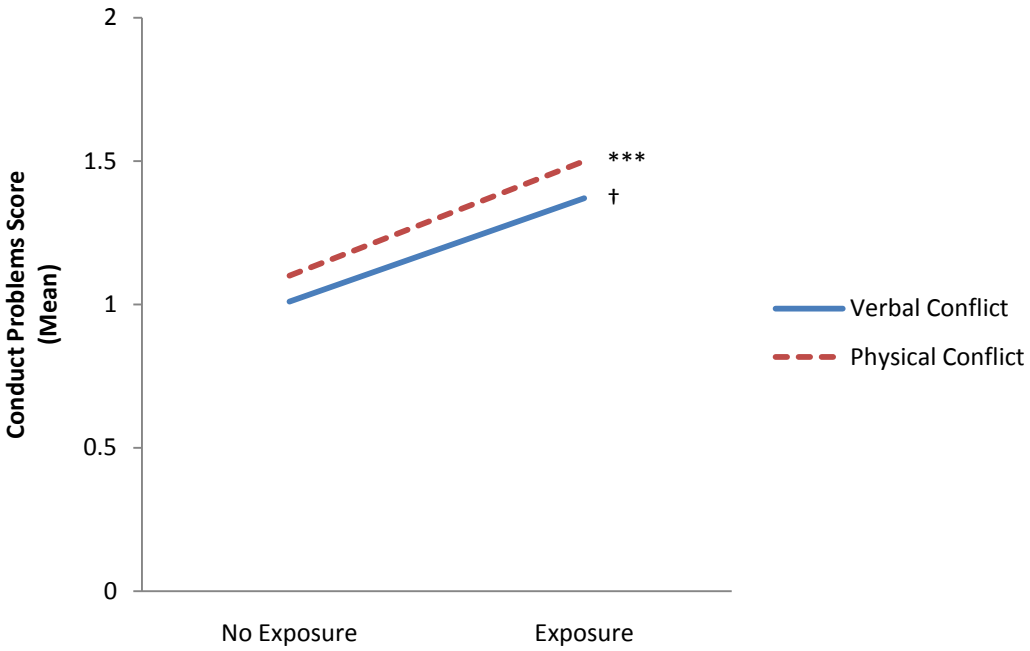

Figure 2. Exposure effects for Strengths and Difficulties Questionnaire Conduct Problems Scale. Significant mean difference was found for physical conflict, with children exposed to physical conflict showing more conduct problems than those not exposed. A marginally-significant mean difference was found for verbal conflict, indicating that children exposed to verbal conflict tended to have more reported conduct problems than those not exposed.

*** $p < .001$;† $p < .10$.

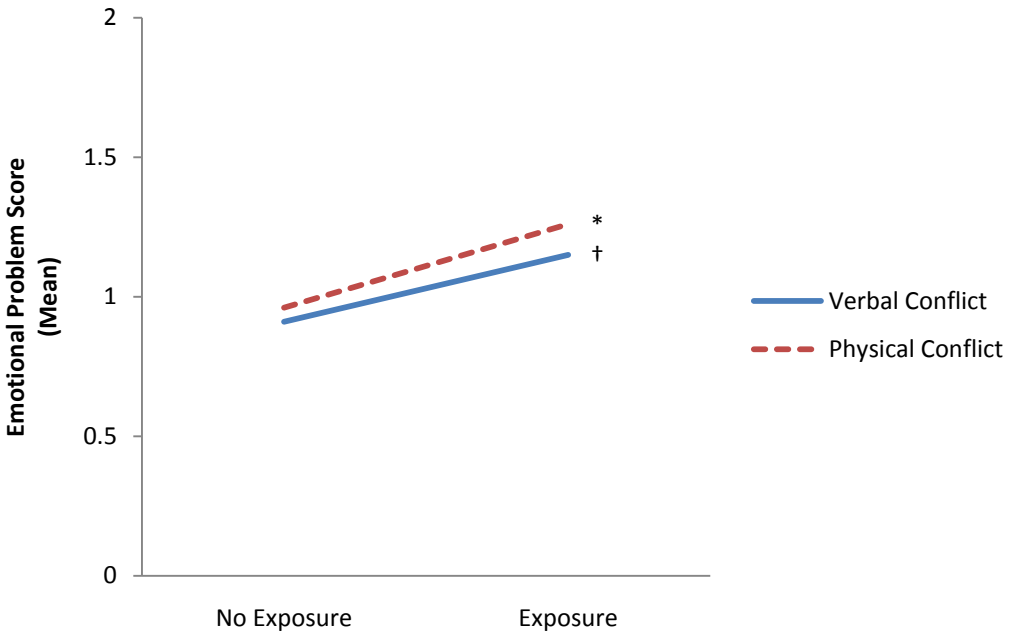

Figure 3. Exposure effects for Strengths and Difficulties Questionnaire Emotional Problems Scale. Significant mean difference found for physical conflict, with children exposed to physical conflict showing more emotional problems than those not exposed. A marginally-significant mean difference was found for verbal conflict, indicating that those exposed to verbal conflict tended to have more emotional problems as compared to those not exposed.

* $p < .05$;† $p < .10$.

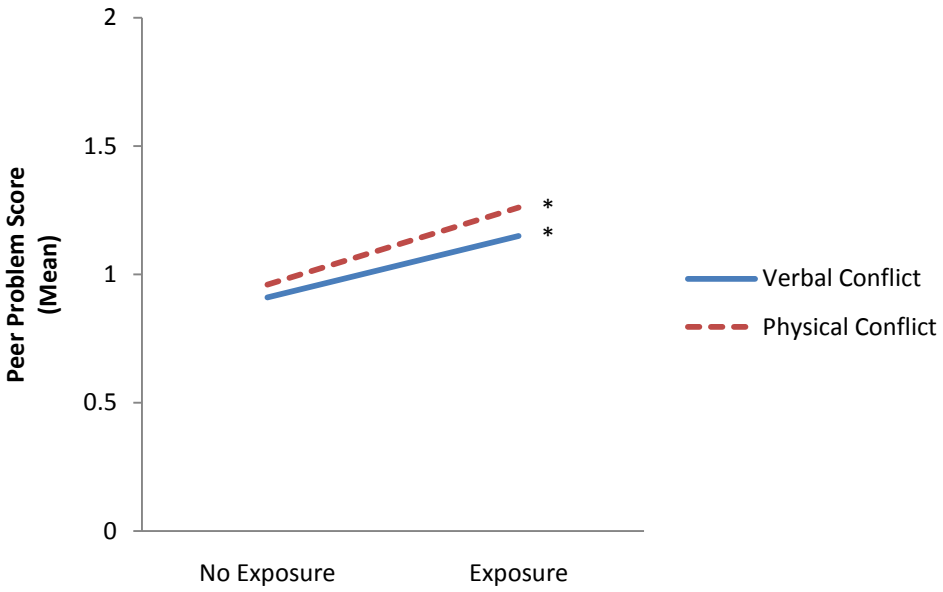

Figure 4. Exposure effects for Strengths and Difficulties Questionnaire Peer Problems Scale. Significant mean differences found for both verbal conflict and physical conflict, with children exposed to conflict evincing more peer problems than those not exposed. * $p < .05$

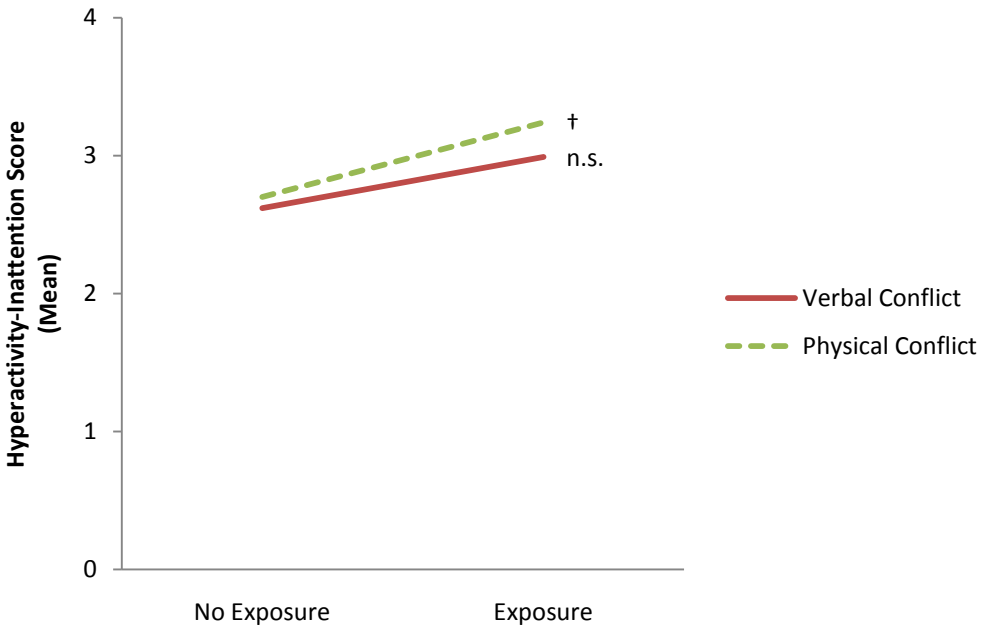

Figure 5. Exposure effects for Strengths and Difficulties Questionnaire Hyperactivity-Inattention Scale. Marginally-significant mean difference found for physical conflict, with children exposed to physical conflict tending to have more hyperactivity-inattention symptoms than those not exposed. Mean difference for verbal conflict was not significant.

† $p < .10$; n.s. Not significant

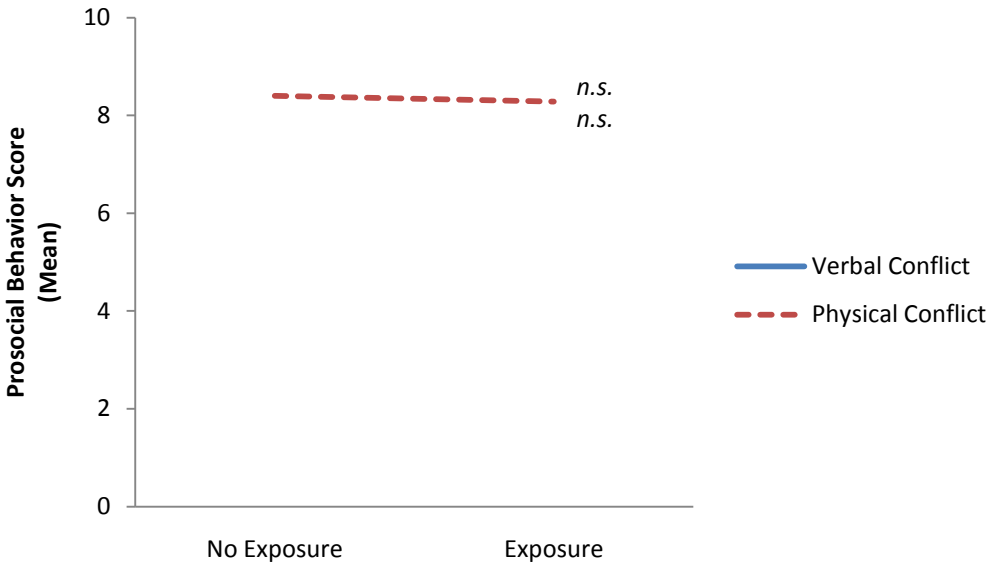

Figure 6. Exposure effects for Strengths and Difficulties Questionnaire Prosocial Behavior Scale. No mean differences found between children exposed to interparental conflict and those not exposed to interparental conflict. *n.s.* Not significant

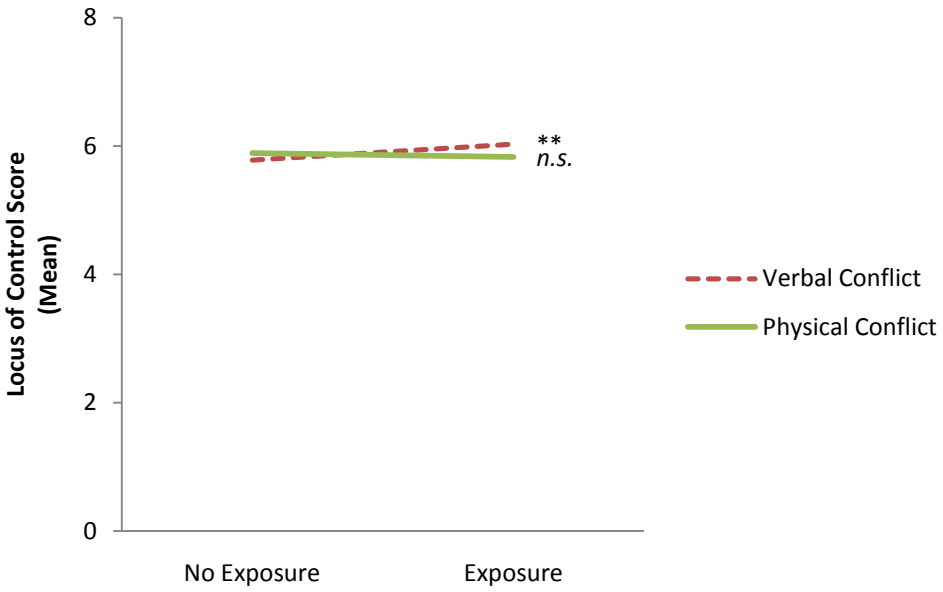

Figure 7. Exposure effects for Children's Nowicki-Strickland Internal-External Locus of Control Scale (CNSIE). Significant mean difference found for verbal conflict exposure, with children exposed being more externally-oriented than those not exposed. No significant difference found in locus of control orientation for physical conflict exposure.

** $p < .01$; *n.s.* Not significant