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Permalink

Journal

ISSN

Authors

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Publication Date

DOI

Peer reviewed

Developmental delay and emotion dysregulation: Predicting parent-child conflict across early to middle childhood

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Abstract

Cumulative risk research has increased understanding of how multiple risk factors impact various socioemotional and interpersonal outcomes across the life span. However, little is known about risk factors for parent-child conflict early in development, where identifying predictors of change could be highly salient for intervention. Given their established association with parent-child conflict, child developmental delay (DD) and emotion dysregulation were examined as predictors of change in conflict across early to middle childhood (ages 3 to 7 years). Participants (n=211) were part of a longitudinal study examining the development of psychopathology in children with or without DD. Level of parent-child conflict was derived from naturalistic home observations, while child dysregulation was measured using an adapted CBCL-Emotion Dysregulation Index. PROCESS was used to examine the conditional interactive effects of delay status (typically developing, DD) and dysregulation on change in conflict from child ages 3 to 5 and 5 to 7 years. Across both of these timeframes, parent-child conflict increased only for families of children with both DD and high dysregulation, providing support for an interactive risk model of parent-child conflict. Findings are considered in the context of developmental transitions, and implications for intervention are discussed.

Keywords

parent-child conflict; developmental delay; emotion dysregulation; longitudinal studies; observational methods; cumulative risk

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Cumulative risk research has shed light on how co-occurring risk factors contribute to a range of maladaptive developmental outcomes, beyond what is observed when youth are exposed to a singular risk factor (Evans, Li, & Whipple, 2013). Within this framework, it has been established that exposure to multiple risk factors relates to poorer mental health (Copeland, Shanahan, Costello, & Angold, 2009), diminished academic functioning (Lucio, Rapp-Paglicci, & Rowe, 2011), and heightened behavior problems (Appleyard, Egeland, van Dulmen, & Sroufe, 2005). Researchers have also used cumulative risk models to examine how such constructs as family demographic factors, parental distress, and youth characteristics (e.g., temperament) impact aspects of family functioning, including risk for child maltreatment (Lamela & Figueiredo, 2015) and maternal responsivity and control (Popp, Spinrad, & Smith, 2008).

Though there is a large, and growing, body of research examining parent-child conflict, there are many unanswered questions. Researchers have called for predictors of change in

parent-child conflict, particularly those risk factors that lead to increased parent-child conflict over time (Burt, McGue, Krueger, & Iacono, 2005). With the majority of research on parent-child conflict focusing on adolescence, examining conflict longitudinally earlier in development may allow for identifying targets for early intervention (Smetana, 2008). Furthermore, since existing studies have largely relied on self- and/or parent-report data, which is susceptible to response bias and has limited validity for use with young children, researchers have highlighted the importance of utilizing observational methods (Furr & Funder, 2007). In the present study, two risk factors – youth developmental delay (DD) and emotion dysregulation – were examined within a cumulative risk framework as predictors of change in parent-child conflict, using naturalistic observations of parent-child interactions, from early to middle childhood.

Parent-child conflict and mental health

Parent-child conflict relates to externalizing problems like oppositional defiant disorder and conduct disorder (Burt et al., 2005) and to relational aggression and association with deviant peers (Ostrov & Bishop, 2008). Conflict has also been linked to child anxiety and depression (Marmorstein & Iacono, 2004). Parent-child conflict predicts children's social functioning later in life, including romantic relationships (Overbeek, Stattin, Vermulst, Ha, & Engels, 2007) and their own parenting practices (Friesen, Woodward, Horwood, & Fergusson, 2013).

Mental health and parent-child conflict in children with developmental delays

Researchers have called for greater comprehension of individual differences in the relationship between parent-child conflict and youth mental health (Laursen & Collins, 2004). Understanding this association is particularly important for children with DD because of their increased risk of developing psychopathology. Children with DD are 3 to 4 times as likely to exhibit clinically significant behavior problems than their typically developing (TD) peers (Baker, Neece, Fenning, Crnic, & Blacher, 2010) and have higher rates of depression (Kiddle & Dagnan, 2011) and anxiety (Green, Berkovits, & Baker, 2015). Youth with DD exhibit more difficulty developing and maintaining peer friendships (Guralnick, Hammond, Connor, & Neville, 2006) and struggle in regulating emotion and behavior (Pears, Kim, Healey, Yoerger, & Fisher, 2014).

Furthermore, parents of children with DD have consistently reported higher stress and poorer parental mental health than parents of TD children, and research suggests that this stress is based more on child behavior problems than on the child's delays *per se* (Baker, Blacher, Crnic, & Edelbrock, 2002). Research suggests that DD has a negative impact on parenting behavior, such that parents of children with DD are more likely to display negative affect, negative-controlling behavior, and hostility towards their children (Basten et al., 2013; Brown, McIntyre, Crnic, Baker, & Blacher, 2011; Fenning, Baker, Baker, & Crnic, 2014; Floyd, Harter, & Costigan, 2004). Given the heightened risk of psychopathology for children with DD, understanding how parent-child conflict may arise from these difficulties is important.

Emotion dysregulation and conflict

Emotion dysregulation, like conflict, has been found to predict a host of emotional, social, psychological, and physical outcomes (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Dysregulation has been discussed as both a concurrent correlate and a predictor of child psychopathology. In a prospective study examining dysregulation as a predictor of adolescent psychopathology, deficits in dysregulation predicted increases in anxiety symptoms, aggressive behavior, and eating pathology in adolescents over a seven-month period, controlling for baseline symptoms (McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema, 2011).

A small body of research has explored youth dysregulation as a predictor of parent-child conflict. In one study, youth temperamental negativity and regulation, jointly with affective dimensions of mothers' early and concurrent parenting, were associated with both youths' and mothers' conflict reactions during a lab-based conflict resolution task (Eisenberg et al., 2008). Basten and colleagues' research within the Generation R Study, a population-based cohort pre-birth and onward from the Netherlands, revealed a link between child dysregulation and family hostility in 5- to 7-year-old children (Basten et al., 2013). More research is needed to examine these associations across time and across developmental stages.

During early childhood, individuals experience significant shifts in social and neurological domains that contribute to dysregulation. Children transition from a parent-oriented home environment to a peer-oriented school environment. School provides a rich context for exposure to emotionally charged interactions, along with, ideally, additional support for managing those emotions from peers and teachers. In addition, development in the brain during middle childhood and adolescence happens largely in areas associated with emotions and the regulation of these emotions, including the prefrontal cortex, anterior cingulate cortex, and the amygdala (Blandon, Calkins, Keane, & O'Brien, 2008; Larsen & Prizmic, 2004). While it may be expected that parent-child conflict would decrease during middle childhood in tandem with these improvements in self-regulation, researchers have yet to examine this association directly, much less earlier in development during the transitions into these emotionally charged, increasingly structured settings.

Cumulative risk of DD and dysregulation

Previous research has identified DD (Ellingsen, Baker, Blacher, & Crnic, 2014) and dysregulation (Popp et al., 2008) as risk factors for maladaptive family functioning, and a small body of research has examined the association among DD, dysregulation, and conflict (Basten et al., 2013; Basten et al., 2014; Brown et al., 2011). However, no study, to our knowledge, has explored the cumulative risk of DD and dysregulation for parent-child conflict. Furthermore, while research suggests that the link between youth mental health and parent-child conflict may differ by age (e.g., Gerard, Krishnakumar, & Buehler, 2006), much research in this field is cross-sectional and focuses on parent-child conflict during adolescence. This highlights the importance of utilizing longitudinal design in exploring how these risk factors function differentially – or not – across developmental stages.

In examining cumulative risk, it is important to recognize the complex nature in which risk factors impact youth and family outcomes (Evans et al., 2013). One distinction that has received attention is discerning additive versus interactive risk models (e.g., Trillingsgaard, Baucom, & Heyman, 2014). In an additive risk model, each additional risk factor increases an individual's risk in a linear manner, while an interactive risk model posits that risk factors interact with one another and lead to a multiplicative increase in risk for certain subgroups (Appleyard et al., 2005). This distinction has important implications for intervention design and effective implementation (Trillingsgaard et al., 2014).

Limitations in the assessment of conflict

Finally, most studies examining parent-child conflict have relied on self-report measures of conflict from parents, children, or both (e.g., Burt et al., 2005; Lam, Solmeyer, & McHale, 2012; van Doorn, Branje, & Meeus, 2011). Though self-report measures have the advantage of requiring fewer logistical demands, they are susceptible to response bias (Furr & Funder, 2007), a limitation that may be heightened with a topic as emotionally laden as conflict. Self-report also has limited validity with young children, while behavioral coding may provide a more valid measure of relational patterns (Nelson, Boyer, Sang, & Wilson, 2014).

The present study

In this study, delay status (TD or with DD) and emotion dysregulation were investigated as predictors of change in parent-child conflict across early to middle childhood (ages 3 to 7). Conflict was assessed during naturalistic home observations across 3 representative time points: ages 3, 5, and 7 years. Measures of dysregulation from ages 4 and 6 were used, given their temporal standing between time points of conflict measures. The focus on the mother-child relationship specifically is supported by findings that mothers tend to be responsible for more of the management and discipline of youth behaviors than fathers (Finley, Mira, & Schwartz, 2008) and tend to have higher rates of conflict with youth than fathers do (Laursen & Collins, 2004).

Based on previous findings linking DD, high emotion dysregulation, and high parent-child conflict (e.g., Basten et al., 2013; Basten et al., 2014; Brown et al., 2011; Pears et al., 2014), and adopting a cumulative risk framework (Evans et al., 2013), it was expected that conflict would increase for children with DD and high dysregulation. Given the lack of research in this area, hypotheses were tentative as to whether an additive or interactive risk model would be more representative for change in conflict over time. Thus, analyses included examination of main effects as well as joint and interactive effects of DD and emotion dysregulation.

Little is known about the longitudinal course of parent-child conflict across early through middle childhood. However, cross-sectional associations among DD, dysregulation, and conflict have been established in preschool (Brown et al., 2011) and middle childhood (Basten et al., 2013; Basten et al., 2014) samples. Furthermore, both models represented important transition points for children, specifically into kindergarten in the early childhood model and into more structured academic settings in the middle childhood model. Given the established difficulty youth with DD and their parents experience during transitions (Wikler,

1981), patterns of risk were expected to be consistent across the early childhood and middle childhood models.

Methods

Participants

Participants were 211 families enrolled in the Collaborative Family Study (CFS), a longitudinal study of children and their families with samples drawn from Southern California and central Pennsylvania. The CFS has been based at three universities: Penn State University, University of California, Los Angeles, and University of California, Riverside. The present sample included all families in which participants had completed the naturalistic home visit at age 3 and at least one other home visit at ages 5 or 7. The larger study from which this sample was drawn recruited families at child age 3 years. The DD sample was recruited primarily through regional agencies that provide and purchase diagnostic and intervention services for individuals with developmental disabilities. In California, nearly all families with young children with DD register for services with one of a network of Regional Centers. Selection criteria for children in the DD group at intake were that children be in the moderate to borderline range of cognitive delay on the Bayley Scales of Infant Development-II (BSID-II; Bayley, 1993), ambulatory, able to speak, and not diagnosed with autism. The TD sample was recruited primarily through local preschools and daycare programs. Selection criteria were that the child score in the range of normal cognitive development and not have been born prematurely or have any developmental delay. In recruiting participants, school and agency personnel mailed brochures describing the study to families who met selection criteria, and interested parents contacted one of the research centers. Informed consent was obtained from participating parents and assent from the children.

Based on the Stanford-Binet Intelligence Scale: 4th edition (Thorndike, Hagen, & Sattler, 1986) at age 5 years, children were classified as having developmental delays (IQ < 70, n=56), borderline developmental delay status (IQ = 70–84, n=17), or typical development (IQ > 84, n=138; APA, 2000). Children categorized as having developmental delays or borderline status were combined in the present analyses and referred to as DD. We use the term "developmental delay" rather than the more formal diagnosis of "intellectual disability" for this young sample because it was based upon IQ alone, as opposed to IQ and adaptive behavior (APA, 2000).

Table 1 shows demographic characteristics at child age 3 by delay status (TD, DD). Socioeconomic status was generally high, and because recruitment initially focused on intact families, the majority of participating parents were married (defined here as legally married or living together for at least six months). With respect to delay status group differences, the TD group had significantly higher family income and maternal education, and mothers in the TD group were more likely to be employed outside the home than mothers in the DD group.

Procedures

Data were obtained through mother-completed questionnaires and naturalistic home observations conducted yearly around the child's birthday from ages 3 to 7 years. Child IQ was assessed by research staff in the laboratory at age 5. All procedures were approved by the Institutional Review Boards of the three participating universities.

Measures

Stanford-Binet IV (SB-IV; Thorndike et al., 1986)—Children's IQ was evaluated at age 5 using the Stanford-Binet IV, a widely used measure with high internal consistency (Glutting, 1989) and good evidence of validity (Thorndike et al., 1986). The SB-IV yields an IQ score with a normative mean of 100 and a standard deviation of 15. It is well suited to assessing children with delays because the examiner adapts starting points according to the child's developmental level.

Parent-Child Interaction Rating System (PCIRS; Belsky, Woodworth, & Crnic, 1996)—Conflict was coded from mother-child interactions during the naturalistic home observations using the PCIRS, which has been used extensively to examine family interactions (Baker et al., 2010; Fenning et al., 2014; Marquis & Baker, 2014). Home observations were 90 minutes at age 3, 60 minutes at age 5, and 30 minutes at age 7. Observations occurred in the evening when the entire family was in the home. These visits often took place during dinner preparation and/or during dinner, and they rarely occurred near bedtime. To capture the most naturalistic interactions possible, visits were not structured, and families were asked only to be present in the room (or nearby) and to "act as they normally do." The examiner observed the behavior of the child, either parent towards the target child, and any interactions between the child and parents. The examiner then provided a global code of a specified behavioral index on a 5-point scale, ranging from 1 (not at all characteristic) to 5 (highly or predominately characteristic) of the behavior. These global codes were provided for each 15-minute observation (e.g., 6 global codes of conflict were provided at the 90-minute age 3 assessment). For all codes, examiners were instructed to only include in codes behaviors that were observed and to not incorporate any judgments or interpretations of behavior.

The present study included only the mother-child *dyadic conflict* code, which measured the amount of conflict, tension, or vented hostility between the mother and the child. Conflictual interactions included a verbal or physical disagreement, verbal or physical harshness that was responded to with clear distress by the other family member (e.g., a child pouting in response to her mother yelling at her), a tense tone of voice or tense silence, and short commands or remarks. Conflict had to be evidenced by behaviors from *both* the mother and the child. Thus, if a child yelled at his mother, but his mother did not respond with distress or anger, this would not be coded as dyadic conflict. See Table 2 for a description of the ratings used in assigning codes for each 15-minute segment. Though coders were instructed to take frequency of behaviors into consideration, it is noted that dyadic conflict scores were global in nature and were designed to represent the overall extent of conflict in a given time segment. Furthermore, given the global nature of coding, the coding system remained consistent across visits, with the goal that coding of behaviors would ideally not vary based

on children's developmental level. Dyadic conflict codes were averaged across the observational time segments to create a mean dyadic conflict score for each assessment time point. Given the relative positive skew of this mean value, conflict was log-transformed for analyses.

Coders were trained by watching videos of home observations and attending live home visits with an experienced coder until reliability was established, defined as 70% exact agreement and 95% within 1 point. To maintain cross-site reliability, master coders were designated at each site for reliability checks. Kappa was .60 or higher each year for both within and cross-site reliability; these levels are considered acceptable (Fleiss, Cohen, & Everitt, 1969). Dimensions measured by this rating system are relatively stable over time (Park, Belsky, Putnam, & Crnic, 1997) and are reliable, valid indicators of naturalistic parent-child interaction (Crnic, Gaze, & Hoffman, 2005).

Child Behavior Checklist for ages 1½-5 (CBCL; Achenbach, 2000) and for ages 6–18 (Achenbach & Rescorla, 2001)—The CBCL is a widely used measure on which respondents indicate whether a problem or behavior is "not true" (0), "somewhat or sometimes true" (1), or "very true or often true" (2) for a child, now or within the past 2 months. The CBCL-Emotion Dysregulation Index (CBCL-EDI) utilized in the present study is adapted from the work of Samson and colleagues (2014) and contributes to a relatively recent approach in the literature of assessing child emotion dysregulation. The original CBCL-EDI index score was developed via an expert rating process in a study of emotion dysregulation in youth ages 6 to 16 with or without autism spectrum disorders (see Berkovits, 2015, and Samson et al., 2014, for further description). These experts selected items from different subscales of the CBCL (e.g., aggressive, social problems, withdrawn/depressed subscales) that were highly relevant to emotion dysregulation (e.g., "cries a lot," "sudden changes in mood," "temper tantrums or hot temper," "worries"). The original index was found to have high internal consistency (α=.90).

Two items addressing self-harm and suicidality were endorsed at a very low frequency in our study's young sample and were thus removed. Items that were clearly relationally conflictual in nature (e.g., "threatens people," "argues a lot," "defiant") were also eliminated in the present study to prevent conflation with the measure of parent-child conflict. Ulitmiately, 12 of the original 18 CBCL-EDI items were included in the adapted index score used in this study. This revised CBCL-EDI had comparable internal consistency (α=.84) to the original index score. CBCL-EDI scores were also established using the same 12-item scale from the CBCL 1½-5 version. The CBCL-EDI exhibited high internal consistency within this younger subset of the sample, as well (α=.82). Extending the CBCL-EDI to the younger version of the CBCL allows reseachers to span the gap between the two CBCL versions and is more appropriate for young children, as several items on the 6–18 version assessing rule-breaking and conduct disorder are rare in children across early and middle childhood.

Results

Analytic Plan

PROCESS, an SPSS utility for conditional process modeling (Hayes, 2012), was used to address how DD and dysregulation predicted change in conflict over time. To prevent model overfitting, two separate models were conducted to assess change in conflict from ages 3 to 5 (Model A) and from ages 5 to 7 (Model B). Figure 1 provides a Conceptual Diagram of the two parallel models. In Model A, we tested the three-way interaction between conflict at age 3 (independent variable), child delay status (moderator 1), and dysregulation at age 4 (moderator 2) in predicting conflict at age 5 (dependent variable). Model B was parallel to the first model and included conflict at age 5 (independent variable), child delay status (moderator 1), and dysregulation at age 6 (moderator 2) in predicting conflict at age 7 (dependent variable).

Accounting for the variance attributed to earlier conflict scores in analyses allowed us to determine if the other variables, child delay status and dysregulation, accounted for change (Rausch, Maxwell, & Kelley, 2003). Using PROCESS, bootstrapped (5000 resamples) tests were conducted of each 2-way interaction at all levels of the third variable, and the 3-way interaction was interpreted by examining regions of significance of each of the 2-way interactions (e.g., DD/low dysregulation, DD/moderate dysregluation, etc.). PROCESS has been used previously for similar three-way interactions in social science literature (e.g., Vasey et al., 2013) and has the advantage of providing both model coefficients using OLS regression and bias-corrected bootstrap confidence intervals for conditional effects (Hayes, 2012).

Demographic variables listed in Table 1 that differed between the TD and DD groups and had a significant correlation ($p < .05$) with the dependent variable were covaried in the analyses. These were family income, mother employment, and maternal education for the age 3 to 5 model and only family income for the age 5 to 7 model.

Correlations among delay status, dysregulation, and parent-child conflict

Table 3 displays intercorrelations within and between the variables of interest. Child dysregulation showed high stability from age 4 to 6, while conflict showed weak, though significant, stability. Child delay status had a weak, positive relationship with dysregulation at both ages 4 and 6. Delay status correlated positively with conflict at age 5, but not at ages 3 or 7. Higher dysregulation at ages 4 and 6 each correlated significantly, although weakly, with higher conflict at ages 5 and 7.

Delay status and dysregulation as predictors of change in conflict

To test the hypothesis that delay status and dysregulation predicted change in conflict, "moderated moderation" analyses were conducted (PROCESS Model 3; Hayes, 2012). We constructed two separate models, the first predicting age 5 conflict (Model A) and the second predicting age 7 conflict (Model B).

Table 4a presents regression analyses for Model A. A significant three-way interaction emerged between age 3 conflict, delay status, and age 4 dysregulation. A significant effect was also found for conflict by delay status. No significant main effects emerged. The total model accounted for 19% of the variance in conflict at age 5, $F(10, 193)=4.52$, $p<0.001$.

The significant three-way interaction indicated that change in conflict differed by delay status and dysregulation. To probe this finding, we examined the significance of the interaction by delay status group (TD, DD) at low (-1 SD), moderate (mean), and high ($+1$ SD) levels of dysregulation in our sample. Among all combinations of low, moderate, and high dysregulation in both status groups, significant change in conflict occurred only for children with DD with high dysregulation. Specifically, parent-child conflict increased from ages 3 to 5 for children with DD and high dysregulation at age 4 (effect=.30, $t=2.43$, $p=.02$). No other pairings led to significant change in conflict from age 3 to 5. See Figure 2a for a graphical depiction of expected increase in conflict based on participants' delay status and dysregulation from ages 3 to 5.

Table 4b presents regression analyses for Model B. Similar to Model A, the three-way interaction between age 5 conflict, delay status, and age 6 dysregulation was significant. A significant effect was also found for delay status. The total model accounted for 13% of the variance in conflict at age 7, $F(8, 147)=2.78$, $p=0.007$.

Again, we probed the three-way interaction to assess the levels of the moderators that were driving the effect. Significant increase in conflict occurred only for children with both DD and high dysregulation at age 6 (effect=.64, $t=2.14$, $p=.03$). Once again, no other pairings led to significant change in conflict from age 5 to 7. See Figure 2b for a graphical depiction of expected increase in conflict based on participants' delay status and dysregulation from ages 5 to 7.

Discussion

The cumulative risk of developmental delay and emotion dysregulation for increased parent-child conflict was examined across early to middle childhood. The hypothesis that both DD and high dysregulation would predict increase in conflict across time was supported in both the early childhood and the middle childhood models. The findings were consistent with an interactive, rather than additive, framework of risk, such that the subgroup of children with both DD and high dysregulation were identified as particularly at-risk (Appleyard et al., 2005).

The two models both represent important transition points for young children, specifically the transition into kindergarten and the transition into more structured academic settings. Both of these transitions require the use of emotion regulation as children adjust to new settings and are placed under heightened demands to remain well-regulated. It has been asserted that the experience of parenting a youth with DD is best understood as "chronic stress" across the youth's developmental span that is marked by disruptive transition points, or "crises," that require parents to constantly readjust their expectations and behaviors (Wikler, 1981). It is conceivable that children with DD and high dysregulation may endure

more negative consequences and exhibit more difficulty adjusting to these transitions than their TD peers, including heightened conflict with their parents, who are themselves adjusting to these developmental "crises." Our results suggest that patterns of change in conflict may emerge early, may sustain into middle childhood, and may potentially relate to developmental transitions. More research is needed to clarify mechanisms by which parent-child conflict fluctuates during times of adjustment, predictable or otherwise.

This study provides several insights into our understanding of contributors to conflict in early and middle childhood. While research to-date has linked dysregulation and DD (Noroña & Baker, 2014; Pears et al., 2014), dysregulation and conflict (Eisenberg et al., 2008), and DD to parent-child conflict (Floyd et al., 2004), this study joins a small body of research examining these three constructs together early in development (e.g., Basten et al., 2013; Basten et al., 2014). The findings also expand upon previous research in exploring the joint, interactive effects of DD and dysregulation, rather than examining DD and dysregulation as distinct predictors of parent-child conflict (Brown et al., 2011; Eisenberg et al., 2008). The longitudinal design allowed us to respond to a call in the literature to examine change in conflict across time (Smetana, 2008). Furthermore, few studies of parent-child conflict have incorporated naturalistic observations of parent-child interactions. While the majority of the literature in this area has relied on self-report, our naturalistic behavioral measure of conflict provides the opportunity for valid inclusion of younger children, who would be unable to provide a self-report perspective.

It is useful to consider our findings within methodological limitations and opportunities for future research. First, we acknowledge that recognizing delay status and dysregulation as predictors of change in conflict is one aspect of a complex developmental process. Research suggests that there may be a transactional relationship between mental health problems and parent-child conflict, with conflict, in turn, predicting an increase in youth problem behavior and psychopathology across time (e.g., Burt et al., 2005; Lam et al., 2012). Future studies could build upon this study and explore how parent-child conflict, in turn, relates to changes in emotion dysregulation and children's cognitive abilities across time. Additionally, while our naturalistic data has many benefits, our use of home observations does allow for more variation between families, including involvement of other family members (e.g., siblings) and other interruptions that would not be present in the laboratory setting. Also, due to the limited availability of observational data between children and fathers, only mothers were included in the present study, both in parent-child interactions and as single informants in assessing child dysregulation. While previous research supports the mother-child bond as a primary focus (Finley et al., 2008; Laursen & Collins, 2004), it would be important to include fathers and other primary caregivers in future studies, particularly since findings suggest that patterns of conflict may differ between caregivers (van Doorn et al., 2011).

Finally, this study focused on child contributors to change in conflict over time. Previous findings suggest that parent and family factors, like marital discord and cultural background, may be highly relevant to parent-child conflict (Dixon, Graber, & Brooks-Gunn, 2008; Gerard et al., 2006). Cumulative risk researchers have called for examining the interplay of both risk and protective factors (Flouri, Midouhas, Joshi, & Tzavidis, 2015; Lucio et al., 2011), and early intervention has been found to be most effective when operating within a

framework of both risk and protective factors (Guralnick, 2011). Future research could incorporate parent and family qualities, including both protective and risk factors, that may contribute to change in conflict across time.

In characterizing the chronic stress experienced by families of youth with DD, Wikler (1981) emphasized the importance of parents having the knowledge and resources to anticipate crises in their child's development so that they may be better prepared to cope, logistically and emotionally. The findings of this study provide insight into risk factors for parent-child conflict, specifically for families impacted by DD, and point to potential targets for interventions that may reduce the heightened risk of conflict in these families (Basten et al., 2013; Brown et al., 2011). While cognitive ability exhibits high stability across the lifespan (Deary, Whalley, Lemmon, Crawford, & Starr, 2000), children's regulatory skills are more susceptible to environmental factors (Noroña & Baker, 2014), which certainly include effective early intervention. Interventions that increase youths' regulatory abilities may diminish their risk of parent-child conflict and perhaps increase the likelihood of positive family functioning for these at-risk families.

Acknowledgments

References

Achenbach, TM., Rescorla, LA. Manual for the ASEBA school-age forms & profiles: an integrated system of multinformant assessment. Burlington: University of Vermont, Research Center for Children, Youth & Families; 2001.

Achenbach, TM. Manual for the Child Behavior Checklist 1½-5. Burlington: Department of Psychiatry, University of Vermont; 2000.

Aldao A, Nolen-Hoeksema S, Schweizer S. Emotion-regulation strategies across psychopathology: A meta-analytic review. Clinical Psychology Review. 2010; 30(2):217–237. DOI: 10.1016/j.cpr. 2009.11.004 [PubMed: 20015584]

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. 2000. Intellectual disability. text rev

Appleyard K, Egeland B, Dulmen MH, Alan Sroufe L. When more is not better: The role of cumulative risk in child behavior outcomes. Journal of Child Psychology and Psychiatry. 2005; 46(3):235–245. DOI: 10.1111/j.1469-7610.2004.00351.x [PubMed: 15755300]

Baker BL, Blacher J, Crnic K, Edelbrock C. Behavior problems and parenting stress in families of three-year-old children with and without developmental delays. American Journal on Mental Retardation. 2002; 107:433–444. DOI: 10.1352/0895-8017(2002)107_0433:BPAPSI_2.0.CO;2 [PubMed: 12323068]

Baker BL, Neece CL, Fenning R, Crnic K, Blacher J. Mental disorders in five year old children with or without intellectual disability: Focus on ADHD. Journal of Clinical Child & Adolescent Psychology. 2010; 39:492–505. DOI: 10.1080/15374416.2010.486321 [PubMed: 20589561]

Basten MM, Althoff RR, Tiemeier H, Jaddoe VW, Hofman A, Hudziak JJ, Verhulst FC, van der Ende J. The dysregulation profile in young children: empirically defined classes in the Generation R study. Journal of the American Academy of Child & Adolescent Psychiatry. 2013; 52(8):841–850. DOI: 10.1016/j.jaac.2013.05.007 [PubMed: 23880494]

Basten M, van der Ende J, Tiemeier H, Althoff RR, Rijlaarsdam J, Jaddoe VW, Hofman A, Hudziak JJ, Verhulst FC, White T. Nonverbal intelligence in young children with dysregulation: the Generation

R Study. European Child & Adolescent Psychiatry. 2014; 23(11):1061–1070. DOI: 10.1007/s00787-014-0551-x [PubMed: 24802760]

Bayley, N. Bayley Scales of Infant Development: Manual. 2. San Antonio, TX: Psychological Corporation; 1993.

Belsky J, Woodworth S, Crnic K. Troubled family interactions during childhood. Child Development. 1996; 67:556–578. [PubMed: 8625728]

Berkovits, LD. PhD Dissertation. University of California; Los Angeles: 2015. Emotion regulation in children with autism spectrum disorders: Individual differences and influence of parental emotion scaffolding.

Blandon AY, Calkins SD, Keane SP, O'Brien M. Individual differences in trajectories of emotion regulation processes: the effects of maternal depressive symptomatology and children's physiological regulation. Developmental Psychology. 2008; 44(4):1110.doi: 10.1037/0012-1649.44.4.1110 [PubMed: 18605838]

Brown MA, McIntyre LL, Crnic KA, Baker BL, Blacher J. Preschool children with and without developmental delay: risk, parenting, and child demandingness. Journal of Mental Health Research in Intellectual Disability. 2011; 4:206–226. DOI: 10.1080/19315864.2011.596990

Burt SA, McGue M, Krueger RF, Iacono WG. How are parent-child conflict and childhood externalizing symptoms related over time? Results from a genetically informative cross-lagged study. Development and Psychopathology. 2005; 17(01):145–165. DOI: 10.1017/s095457940505008x [PubMed: 15971764]

Copeland W, Shanahan L, Jane Costello E, Angold A. Configurations of common childhood psychosocial risk factors. Journal of Child Psychology and Psychiatry. 2009; 50(4):451–459. DOI: 10.1111/j.1469-7610.2008.02005.x [PubMed: 19220623]

Crnic KA, Gaze C, Hoffman C. Cumulative parenting stress across the preschool period: Relations to maternal parenting and child behavior at age 5. Infant and Child Development. 2005; 14:117–132. DOI: 10.1002/icd.384

Deary IJ, Whalley LJ, Lemmon H, Crawford JR, Starr JM. The stability of individual differences in mental ability from childhood to old age: Follow-up of the 1932 Scottish mental survey. Intelligence. 2000; 28:49–55. DOI: 10.1016/s0160-2896(99)00031-8

Dixon SV, Graber JA, Brooks-Gunn J. The roles of respect for parental authority and parenting practices in parent-child conflict among African American, Latino, and European American families. Journal of Family Psychology. 2008; 22(1):1.doi: 10.1037/0893-3200.22.1.1 [PubMed: 18266527]

Eisenberg N, Hofer C, Spinrad TL, Gershoff ET, Valiente C, Losoya S, Zhou Q, Cumberland A, Liew J, Reiser M, Maxon E. Introduction and Conceptual Framework. In Understanding Mother-Adolescent Conflict Discussions: Concurrent and Across-Time Prediction from Youths' Dispositions and Parenting. Monographs of the Society for Research in Child Development. 2008; 73(2):1–30.

Ellingsen R, Baker BL, Blacher J, Crnic K. Resilient parenting of preschool children at developmental risk. Journal of Intellectual Disability Research. 2014; 58(7):664–678. DOI: 10.1111/jir.12063 [PubMed: 23834102]

Evans GW, Li D, Whipple SS. Cumulative risk and child development. Psychological Bulletin. 2013; 139(6):1342.doi: 10.1037/a0031808.supp [PubMed: 23566018]

Fenning RM, Baker JK, Baker BL, Crnic KA. Parent-child interaction over time in families of young children with borderline intellectual functioning. Journal of Family Psychology. 2014; 28(3):326.doi: 10.1037/a0036537 [PubMed: 24707801]

Finley GE, Mira SD, Schwartz SJ. Perceived paternal and maternal involvement: Factor structures, mean differences, and parental roles. Fathering: A Journal of Theory, Research, and Practice about Men as Fathers. 2008; 6(1):62–82. DOI: 10.3149/fth.0601.62

Fleiss JL, Cohen J, Everett BS. Large sample errors of Kappa and weighted Kappa. Psychological Bulletin. 1969; 72:323–327. DOI: 10.1037/h0028106

Flouri E, Midouhas E, Joshi H, Tzavidis N. Emotional and behavioural resilience to multiple risk exposure in early life: the role of parenting. European Child & Adolescent Psychiatry. 2015; 24(7):745–755. DOI: 10.1007/s00787-014-0619-7 [PubMed: 25300919]

Floyd FJ, Harter KS, Costigan CL. Family problem-solving with children who have mental retardation. American Journal on Mental Retardation. 2004; 109:507–524. DOI: 10.1352/0895-8017(2004)109<507:fpwcwh>2.0.co;2 [PubMed: 15471516]

Friesen MD, Woodward LJ, Horwood LJ, Fergusson DM. Quality of parent–child relations in adolescence and later adult parenting outcomes. Social Development. 2013; 22(3):539–554. DOI: 10.1111/j.1467-9507.2012.00657.x

Furr, RM., Funder, DC. Handbook of Research Methods in Personality Psychology. 2007. Behavioral observation; p. 273-291.

Gerard JM, Krishnakumar A, Buehler C. Marital Conflict, Parent-Child Relations, and Youth Maladjustment A Longitudinal Investigation of Spillover Effects. Journal of Family Issues. 2006; 27(7):951–975. DOI: 10.1177/0192513x05286020

Glutting JJ. Introduction to the structure and application of the Stanford-Binet Intelligence Scale – Fourth Edition. Journal of School Psychology. 1989; 27(1):69–80. DOI: 10.1016/0022-4405(89)90032-0

Green SA, Berkovits LD, Baker BL. Symptoms and development of anxiety in children with or without intellectual disability. Journal of Clinical Child & Adolescent Psychology. 2015; 44(1): 137–144. DOI: 10.1080/15374416.2013.873979 [PubMed: 24528099]

Guralnick MJ. Why early intervention works: a systems perspective. Infants and Young Children. 2011; 24:6–28. DOI: 10.1097/iyc.0b013e3182002cfe [PubMed: 21532932]

Guralnick MJ, Hammond MA, Connor RT, Neville B. Stability, change, and correlates of the peer relationships of young children with mild developmental delays. Child Development. 2006; 77(2): 312–324. DOI: 10.1111/j.1467-8624.2006.00872.x [PubMed: 16611174]

Hayes AF. PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling. 2012

Kiddle H, Dagnan D. Vulnerability to depression in adolescents with intellectual disabilities. Advances in Mental Health and Intellectual Disabilities. 2011; 5(1):3–8. DOI: 10.5042/amhid.2011.0010

Lam CB, Solmeyer AR, McHale SM. Sibling differences in parent-child conflict and risky behavior: A three-wave longitudinal study. Journal of Family Psychology. 2012; 26(4):523.doi: 10.1037/a0029083 [PubMed: 22775198]

Lamela D, Figueiredo B. A Cumulative Risk Model of Child Physical Maltreatment Potential Findings From a Community-Based Study. Journal of Interpersonal Violence. 2015; doi: 10.1177/0886260515615142

Larsen, RJ., Prizmic, Z. Affect regulation. In: Baumeister, RF., Vohs, KD., editors. Handbook of Self-Regulation: Research, Theory, and Applications. Guilford; New York: 2004. p. 40-61.

Laursen, B., Collins, WA. Parent-child communication during adolescence. In: Vangelisti, AL., editor. Handbook of Family Communication. Mahwah, NJ: Lawrence Erlbaum Associates; 2004. p. 333-348.

Lucio R, Rapp-Paglicci L, Rowe W. Developing an additive risk model for predicting academic index: School factors and academic achievement. Child and Adolescent Social Work Journal. 2011; 28(2):153–173. DOI: 10.1007/s10560-010-0222-9

Marmorstein NR, Iacono WG. Major depression and conduct disorder in youth: Associations with parental psychopathology and parent–child conflict. Journal of Child Psychology and Psychiatry. 2004; 45(2):377–386. DOI: 10.1111/j.1469-7610.2004.00228.x [PubMed: 14982250]

Marquis WA, Baker BL. An examination of Anglo and Latino parenting practices: Relation to behavior problems in children with or without developmental delay. Research in Developmental Disabilities. 2014; 35(2):383–392. DOI: 10.1016/j.ridd.2013.11.010 [PubMed: 24334227]

McLaughlin KA, Hatzenbuehler ML, Mennin DS, Nolen-Hoeksema S. Emotion dysregulation and adolescent psychopathology: A prospective study. Behaviour Research and Therapy. 2011; 49(9): 544–554. DOI: 10.1016/j.brat.2011.06.003 [PubMed: 21718967]

Nelson JA, Boyer BP, Sang SA, Wilson EK. Characteristics of mother-child conflict and child sex predicting resolution. Journal of Family Psychology. 2014; 28(2):160.doi: 10.1037/a0035990 [PubMed: 24588605]

Noroña AN, Baker BL. The transactional relationship between parenting and emotion regulation in children with or without developmental delays. Research in Developmental Disabilities. 2014; 35(12):3209–3216. DOI: 10.1016/j.ridd.2014.07.048 [PubMed: 25178703]

Ostrov JM, Bishop CM. Preschoolers' aggression and parent–child conflict: A multi-informant and multimethod study. Journal of Experimental Child Psychology. 2008; 99(4):309–322. DOI: 10.1016/j.jecp.2008.01.001 [PubMed: 18299136]

Overbeek G, Stattin H, Vermulst A, Ha T, Engels RCME. Parent-child relationships, partner relationships, and emotional adjustment: A birth-to-maturity prospective study. Developmental Psychology. 2007; 43(2):429.doi: 10.1037/0012-1649.43.2.429 [PubMed: 17352550]

Park SY, Belsky J, Putnam S, Crnic K. Infant emotionality, parenting, and 3-year inhibition: Exploring stability and lawful discontinuity in a male sample. Developmental Psychology. 1997; 33:218–227. DOI: 10.1037/0012-1649.33.2.218 [PubMed: 9147831]

Pears KC, Kim HK, Healey CV, Yoerger K, Fisher PA. Improving Child Self-Regulation and Parenting in Families of Pre-kindergarten Children with Developmental Disabilities and Behavioral Difficulties. Prevention Science. 2014; :1–11. DOI: 10.1007/s11121-014-0482-2 [PubMed: 23408285]

Popp TK, Spinrad TL, Smith CL. The relation of cumulative demographic risk to mothers' responsivity and control: Examining the role of toddler temperament. Infancy. 2008; 13(5):496–518. DOI: 10.1080/15250000802329446 [PubMed: 19865607]

Rausch JR, Maxwell SE, Kelley K. Analytic methods for questions pertaining to a randomized pretest, posttest, follow-up design. Journal of Clinical Child and Adolescent Psychology. 2003; 32(3):467–486. DOI: 10.1207/s15374424jccp3203_15 [PubMed: 12881035]

Samson AC, Phillips JM, Parker KJ, Shah S, Gross JJ, Hardan AY. Emotion dysregulation and the core features of Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2014; 44:1766–1772. DOI: 10.1007/s10803-013-2022-5 [PubMed: 24362795]

Smetana JG. Conflicting views of conflict. Monographs of the Society for Research in Child Development. 2008; 73(2):161–168. DOI: 10.1002/9781444307252.oth1 [PubMed: 18702799]

Thorndike, RL., Hagen, EP., Sattler, JM. Stanford-Binet intelligence scale. Riverside Publishing Company; 1986.

Trillingsgaard T, Baucom KJ, Heyman RE. Predictors of change in relationship satisfaction during the transition to parenthood. Family Relations. 2014; 63(5):667–679. DOI: 10.1111/fare.12089

van Doorn MD, Branje SJ, Meeus WH. Developmental changes in conflict resolution styles in parent–adolescent relationships: A four-wave longitudinal study. Journal of Youth and Adolescence. 2011; 40(1):97–107. DOI: 10.1007/s10964-010-9516-7 [PubMed: 20177961]

Vasey MW, Harbaugh CN, Lonigan CJ, Phillips BM, Hankin BL, Willem L, Bijttebier P. Dimensions of temperament and depressive symptoms: Replicating a three-way interaction. Journal of Research in Personality. 2013; 47(6):908–921. DOI: 10.1016/j.jrp.2013.09.001 [PubMed: 24493906]

Wikler L. Chronic stresses of families of mentally retarded children. Family Relations. 1981; :281–288. DOI: 10.2307/584142
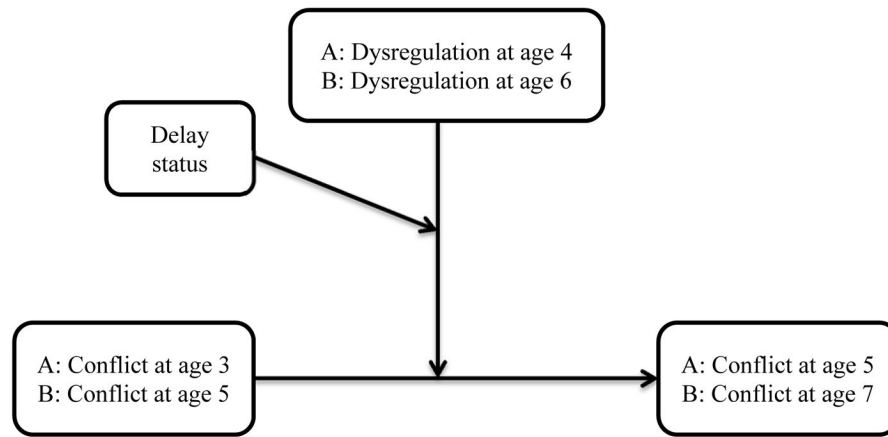
Figure 1.
Conceptual diagram of Models A and B – predictors of change in conflict, ages 3 to 5 (A) and ages 5 to 7 (B)
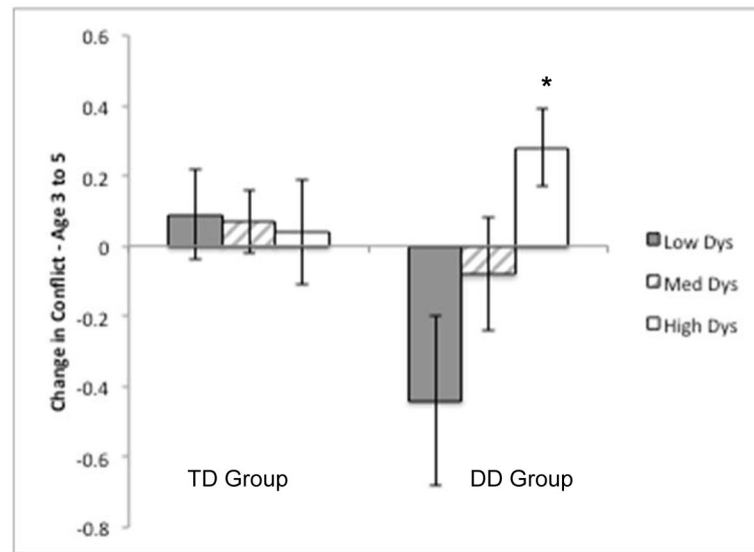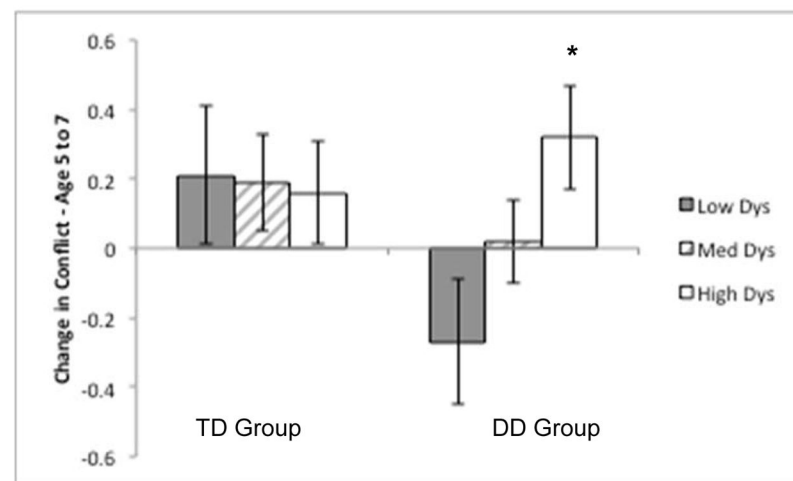
Figure 2a.

Figure 2b.

Figure 2.

Figure 2a. Expected increase in conflict, ages 3 to 5 (Model A)

Notes. Dys = Child Emotion Dysregulation. *p<.05.

Figure 2b. Expected increase in conflict, ages 5 to 7 (Model B)

Notes. Dys = Child Emotion Dysregulation. *p<.05.

Table 1

Sample demographics at age 3 years

	TD (N = 138)	DD (N = 73)	*t or* χ^2
Children			
Sex (% male)	60.0%	57.5%	$\chi^2 < .01$
Race/ethnicity (% White, Non-Latino)	60.1%	57.5%	$\chi^2 = .14$
Mean IQ at 5 (SD)	103.42 (11.43)	60.73 (16.42)	$t = 19.82^{***}$
Parent & Family			
Mother's mean age (SD)	33.98 (5.73)	32.34 (6.06)	$t = 1.94^{\dagger}$
Mother race/ethnicity (% White, Non-Latino)	66.7%	53.4%	$\chi^2 = 3.56^{\dagger}$
Maternal education (highest grade; SD)	15.64 (2.55)	14.32 (2.30)	$t = 3.71^{***}$
Mother marital status (% married)	87.0%	80.8%	$\chi^2 = 1.40$
Mother employment (% employed)	63.0%	43.8%	$\chi^2 = 7.16^{**}$
Family income (% > $50K)	57.7%	41.1%	$\chi^2 = 5.24^*$

[†] $p < .10.$

[**] $p < .01.$

[***] $p < .001.$

Table 2

Description of parent-child conflict ratings

1	No evidence of tension.
2	One instance of slight tension demonstrated by both family members, such as in reciprocal negative tone of voice. Frequency and intensity are low.
3	Tense tone of voice and few brief utterances as responses by both family members on occasion. Frequency of conflict is increased, but intensity is still low to moderate.
4	Dyad is more often conflicted than a code of 3. Conflicted behaviors by both family members are especially frequent.
5	Tension or hostility is characteristic of the dyad, as seen by minimal or no response to initiations, hostile tone of voice, and high intensity and/or frequency by both family members.

Table 3

Intercorrelations among delay status, dysregulation, and conflict

	Status 5	DYS 4	DYS 6	CON 3	CON 5
DYS 4	.189** (n=205)	--			
DYS 6	.238** (n=170)	.682** (n=169)	--		
CON 3	−.094 (n=211)	.048 (n=205)	.022 (n=170)	--	
CON 5	.234** (n=211)	.200** (n=205)	.154* (n=170)	.141* (n=211)	--
CON 7	.128 (n=163)	.157* (n=158)	.161* (n=157)	.315** (n=163)	.167* (n=163)

Notes: Status coded – TD = 0, DD = 1.

*
p<.05.

**
p<.01.

Table 4a

Model A – Predicting conflict at age 5 years

	B (SE)	β
Covariates		
Family income	−.01(.00)	−.15[†]
Mother employment	.02(.01)	.08
Maternal education	.00(.00)	−.02
Main Effects		
Conflict, age 3 (CON3)	.11(.16)	.07
Dysregulation, age 4 (DYS4)	.04(.04)	.11
DD Status (DD)	.05(.03)	.23
Interactions		
CON3 × DYS4	−0.09(.39)	−.03
CON3 × DD	−.63(.31)	−.15[*]
DYS4 × DD	−.02(.01)	.10
CON3 × DYS4 × DD	1.29(.53)	.38[*]

[†]$p < .10$.

[*]$p < 0.05$.

[**]$p < .01$.

Table 4b

Model B – Predicting conflict at age 7 years

	B (SE)	β
Covariate		
Family income	−.01(.00)	−.14[†]
Main Effects		
Conflict, age 5 (CON5)	.22(.22)	.18
Dysregulation, age 6 (DYS6)	.05(.04)	.13
DD Status (DD)	.06(.03)	.17[*]
Interactions		
CON5 × DYS6	−.09(.36)	−.03
CON5 × DD	−.52(.29)	−.14[†]
DYS6 × DD	−.11(.07)	−.13
CON5 × DYS6 × DD	1.06(.51)	.34[*]

[†]
$p < .10$.

[*]
$p < 0.05$.