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ORIGINAL PAPER

Investigating the Influence of Parenting Stress on Child Behavior Problems in Children with Developmental Delay: The Role of Parent-Child Relational Factors

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Abstract Parents of children affected by developmental delays (DD) have been shown to experience elevated levels of parenting stress compared to parents of typically developing children. Recent studies suggest that higher levels of parenting stress can adversely impact child behavior, such that higher levels of parenting stress are often associated with higher levels of both internalizing and externalizing behavior problems. However, the specific mechanisms through which parenting stress influences child behavioral outcomes remain unclear. The parent-child relationship may be one potential medium through which parenting stress impacts child behavioral outcomes. The current study involved data from the Mindful Awareness for Parenting Stress Project, a randomized controlled trial examining the efficacy of mindfulness-based stress reduction in reducing parental stress and subsequent child behavior problems. Participants included 102 parents of children, ages 2.5 to 5 years old, with DD. Results of a multiple mediation analysis indicted that one component of the parent-child relationship, parent-child relational frustration, significantly mediated the relationship between parenting stress and child outcomes, such that higher levels of parental stress at baseline were associated with increased relational frustration, which in turn was associated with more total child behavior problems. Recognizing that dyadic parent-child factors such as relational frustration impact the association between heightened parenting stress and adverse behavioral outcomes among children with DD may allow interventions to be developed that not only reduce parenting stress, but also specifically target improving the parent-child relationship, with the ultimate goal of decreasing child behavior problems among children with DD.

Keywords Parenting stress · Child behavior problems · Developmental delay · Parent-child relationship

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It has been well documented that parents of children affected by developmental delays (DD) report considerably more parenting stress than parents of typically developing (TD) children (Baker et al. 2003; Emerson 2003; Estes et al. 2009; Gerstein et al. 2009; Hauser-Cram et al. 2001; Oelofsen and Richardson 2006). The elevated levels of stress experienced by these parents may often be in the clinical range and show a chronic, persistent trajectory (Crnic et al. 2005; Gerstein et al. 2009; Oelofsen and Richardson 2006; Tervo 2012; Webster et al. 2008), which in turn has been linked to adverse outcomes, such as higher levels of maternal distress and depression, poor physical health status, marital difficulties, and reduced overall family wellbeing (Eisenhower et al. 2009; Hastings et al. 2006; Herring et al. 2006; Kersh et al. 2006). Parents of young children with DD who experience persistent stress may show less effective coping mechanisms, increased emotional problems, decreased maternal self-efficacy, more authoritarian parenting styles, and both negative interactions and decreased involvement with their children, which can have a particularly adverse impact on their children during early development (Crnic et al. 2005; Crnic and Low 2002; Hauser-Cram et al. 2001).

Studies examining stress outcomes for parents and children have adopted different conceptualizations of stress that vary according to form, origin, and chronicity, including the daily hassle model (Crnic and Greenberg 1990), major life stressors

(Crnic et al. 2005), stress resulting from financial hardship (Gershoff et al. 2007), and stress related to child developmental outcomes (Gerstein et al. 2009). When investigating parenting stress as it directly relates to the challenges presented by being a parent in general, the theoretical model often utilized is the parenting distress scale outlined by the Parenting Stress Index-Short Form (PSI-SF; Abidin 1995). The PSI model of parental distress focuses on the experience of stress within parenting roles independent of child behavior problems, which is an important consideration in studies investigating the relationship between parenting stress and child behavior problems because it allows reported distress and behavioral outcomes to be examined as separate constructs and reduces potential issues with high degrees of interrelatedness among predictor and outcome variables.

Substantial literature suggests that children with DD display clinically significant levels of behavior problems across early childhood and the preschool period (Baker et al. 2002, 2003; Crnic et al. 2004; Emerson and Einfeld 2010; Merrell and Holland 1997; Tervo 2010). Research has also demonstrated that relative to TD children, the presence of both externalizing and internalizing behavior problems is more prevalent among children with DD (Anthony et al. 2005; Baker et al. 2002, 2010; Emerson and Einfeld 2010; Merrell and Holland 1997; Neece et al. 2011, 2013). Given the prevalence of both externalizing and internalizing behavior problems in children with DD and the link between these types of challenges and future comorbid psychiatric difficulties as well as heightened parenting stress, early global problem behaviors are an important indicator of risk (Baker et al. 2010; Cormack et al. 2000; Dekker and Koot 2003).

Parenting stress is a significant risk factor for exacerbating child behavior problems among children with DD. Children with DD whose parents experience elevations in parenting stress are at risk for a host of unfavorable outcomes including increased internalizing and externalizing behavior problems and decreased social competence (Anthony et al. 2005; Donenberg and Baker 1993; Neece et al. 2012). Research has indicated a strong, mutually escalating, and reciprocal relationship between parenting stress and overall levels of child behavior problems, such that increases in parenting stress predict increases in child behavior problems, and increases in child behavior problems subsequently predict increases in parenting stress (Baker et al. 2003; Neece et al. 2012). Therefore, improved understanding of the association between parenting stress reduction and child behavioral functioning is critical in identifying and, ultimately, disseminating targeted family supports.

The mechanisms underlying the association between parenting stress and child challenging behaviors in families of children with DD remain unclear and understudied (Anthony et al. 2005; Crnic et al. 2005; Hastings 2002). However, findings from the broader developmental literature suggest the important role that parent-child interaction may play in understanding the cascading effects of parenting stress upon child functioning (Anthony et al. 2005; Crnic et al. 2005; Deater-Deckard et al. 1998; Deater-Deckard and Scarr 1996; Jackson and Huang 1998; Östberg and Hagekull 2000). For example, a longitudinal study investigating risk factors related to parenting stress and child adjustment among a socioeconomic and ethnically diverse sample of families recruited during the kindergarten period revealed associations between stress, poor parenting behaviors (e.g., harsh discipline, positive attitudes toward aggression, lack of father involvement, exposure to violence, lack of positive/proactive strategies), and child maladjustment (Deater-Deckard et al. 1998). Negative parenting behaviors, including harsh discipline, hostility, and rejecting behavior, have consistently been linked to increased child behavior problems in families of children with typical development, both concurrently and over time (Campbell et al. 1996; Lansford et al. 2010; Luoma et al. 2004; Sellers et al. 2014). In contrast, positive parenting behaviors, including warmth and sensitivity, emotional availability, and provision of clear structure and rules, have been found to predict positive child emotional and behavioral functioning (Alegre 2010; Anthony et al. 2005; Crnic and Neece 2015; Deater-Deckard et al. 1998; Sellers et al. 2014; Smith and Prinz 2001). Of note, low-income, single, ethnic minority mothers have been shown to be particularly vulnerable to negative parenting outcomes (Jackson 2000).

Parenting is a complex process that can be drastically impacted by having a child affected by DD. Dyadic parent-child relationships can be altered by a multitude of both child- and parent-related factors including the mere presence of a delay, co-occurring disruptive behaviors, a heightened need for guidance and support (e.g., providing more directives and a greater number of commands), increased irritation and decreased tolerance related to child functioning and behavior, greater demands placed on caregivers, and higher levels of stress and poor mental health status among parents (Blacher et al. 2013; Costigan et al. 1997; Crnic et al. 2005; Floyd et al. 2004; Hanson and Hanline 1990; Hastings and Brown 2002). Of these, parental factors have been shown to have the greatest impact on children with developmental risk, especially in the context of externalizing behavior problems and heightened parenting stress (Denham et al. 2000). Previous research suggests that over time, the increased demands placed on parents of children with DD can lead to feelings of ineffectiveness as a parent, increased strain in parent-child relationships, decreased coping mechanisms and self-efficacy, and interactions characterized by lack of pleasure and positivity. Ultimately, this pattern of diminished parenting resources can result in coercive dyadic interactions between the parent and child, as well as less positive, consistent, and effective parenting behaviors overall (Brown et al. 2011; Crnic et al. 2005; Garner et al. 2013; Hastings 2002; Williford et al. 2007). Evidence

also suggests that parents of children with DD exhibit an overall higher level of negative parenting behaviors in dyadic interactions compared to parents of TD children (Blacher et al. 2013; Fenning et al. 2007).

While studies have not yet examined whether parenting stress and child behavior problems are indirectly related through parent-child relational factors, specific aspects of the parent-child relationship have been linked to both parenting stress and child outcomes. For example, discipline styles and practices have been implicated in various psychosocial outcomes such that authoritarian and permissive parents tend to have children who are at risk for lower cognitive performance, isolation from peers, decreased ability to self-regulate, and increased risk of conduct problems, which have been shown to stem from parental psychological distress (Aunola and Nurmi 2005; Heller et al. 1996; Howard et al. 2004; Wolfradt et al. 2003). Research has also linked factors indicative of frustration in the dyadic relationship (e.g., intrusiveness, hostility) with problematic child outcomes such as greater emotion dysregulation and increased externalizing behavior problems (Brown et al. 2011; NICHD Early Child Care Research Network 2004). In addition, formation of adaptive dyadic attachment can be negatively impacted by parental mental health status, and compromised attachment in parent-child relationships has been associated with lower levels of maternal sensitivity, responsiveness, and ability to discriminate between various types of behavioral indicators, as well as higher rates of insecure attachment among children (Cerezo et al. 2008; Korja et al. 2010). Parenting confidence has also been shown to be compromised by parental mental health status. A study by Oyserman et al. (2005) provided evidence that parenting confidence mediated the relationship between maternal psychopathology and poor child outcomes in a sample of mothers with serious mental illness. Finally, research examining positive aspects of the parent-child relationship has noted that parents who report a positive impact of having a child with DD report lower levels of stress, less restrictiveness in their roles as parents, and a higher sense of competence about and confidence in their parenting (Hanson and Hanline 1990).

Despite a general lack of research investigating components of the parent-child relationship as mechanistic factors through which parenting stress and behavior problems specifically relate to one another, parent-child relational variables have been implicated as playing a mediating role between larger scale family stressors and development of child psychopathology. A meta-analysis by Grant et al. (2006) noted support for parent-child relationships and parenting behaviors as mediators to the relationship between cumulative stressors (e.g., negative affect, self-esteem, delinquency, family cohesion/conflict) and psychological symptoms in children and adolescents. On the other hand, the findings of Brown et al. (2011) suggest a plausible additive, rather than meditational, relationship between child risk status, negative parenting, and child demandingness. In either case, given the prominence of comorbid psychopathology among children with DD and elevated levels of behavior problems, the findings of previous studies underscore the importance of understanding the role of parent-child relational factors given potential implications for developing targeted interventions to reduce child behavior problems in this population (Baker et al. 2010; Cormack et al. 2000; Dekker and Koot 2003). Although parent-child interactions are inherently bidirectional in nature, the majority of research has focused on the direction of effect from parent to child, especially in light of the potential for negative parenting to adversely impact child outcomes.

Although parenting stress is a substantial problem among parents of children with DD and has been consistently linked to poor parental as well as child outcomes, very few interventions aimed at treating child developmental problems actually target improvement of parental stress. Rather, most programs focus on parent training or direct child intervention. Moreover, studies have specifically highlighted an ever-mounting need to establish consistent, evidence-based, parenting-mediated interventions for families affected by DD (Bearss et al. 2015; Oono et al. 2013). Mindfulness-based stress reduction (MBSR) is one particular intervention that has been well-established with over two decades of extensive research as an evidence-based stress reduction practice (Chiesa and Serretti 2009), and a growing number of studies support its effectiveness in reducing stress among parents of children with DD (Baer et al. 2012; Bazzano et al. 2015; Dykens et al. 2014; Evans et al. 2011; Neece 2013). These studies indicate that MBSR is not only effective in reducing stress but also anxiety and depression while promoting overall parental wellbeing (Baer et al. 2012; Bazzano et al. 2015; Dykens et al. 2014; Evans et al. 2011; Neece 2013). Furthermore, a recent study examining the feasibility of implementing an MBSR intervention with parents of young children with DD suggests that this intervention technique can not only be effectively implemented with such populations, but also is associated with significant reductions in both parenting stress and child behavior problems (Neece 2013).

Despite substantial evidence that parenting stress and child behavioral outcomes are linked to one another, the specific mechanisms through which parenting stress exerts its impact have yet to be elucidated. Recent studies have pointed to an ever-growing need to increase understanding of parenting variables such as parent-child relational factors as possible mediators to the relationship between parenting stress and child behavior among families of children with DD specifically (Anthony et al. 2005; Crnic et al. 2005; Deater-Deckard et al. 1998; Hastings 2002). Due to the fact that parenting stress is extremely prevalent among parents of children with

DD and can lead to more negative mental health consequences, it has also been suggested that interventions should go beyond simply teaching parenting skills and should instead target methods of reducing parenting stress (Anthony et al. 2005; Crnic and Neece 2015).

The aim of the current study was to further examine the mechanisms through which parenting stress impacts the parent-child relationship and in turn influences behavior in children affected by DD. We hypothesized that parent-child relational factors would serve as mediators to the relationship between parenting stress and child behavior problems such that lower levels of parental involvement, confidence, attachment, and negative/harsh discipline practices, and higher levels of relational frustration would be related to higher levels of stress and behavior problems. Parenting stress and characteristics of the parent-child relationship as predictors of change in child behavioral outcomes were examined at baseline following implementation of the MBSR intervention.

Method

Participants

The current study employed data from the MAPS study at Loma Linda University, which included two cohorts of parents and their children 2.5 to 5 years old with DD. Phase 1 was conducted in 2012 and included 46 parents and their children. Phase 2 was initiated in 2013 and included 45 parents and their children. Families who participated in the MAPS Project were primarily recruited through Inland Regional Center (IRC) in Southern California, a government agency that provides services to individuals with disabilities. Additional participants were recruited through local elementary schools, the local newspaper, and community-based disability groups. Families who met study criteria were identified from IRC's computerized databases and were sent a letter and brochure detailing the study. Interested parents either contacted the MAPS Project by phone, returned a postcard requesting us to contact them, or submitted their contact information on the MAPS website.

Inclusion criteria for participation in the study were: (1) having a child 2.5 to 5 years old, (2) the child was determined to have a developmental delay by IRC or an independent assessment, (3) parent reported more than ten child behavior problems (the recommended cutoff score for screening children for treatment of conduct problems) on the Eyberg Child Behavior Inventory (ECBI; Eyberg and Ross 1978), (4) parent was not receiving any form of psychological or behavioral treatment at the time of referral (e.g., counseling, parent training, parent support group, etc.), and (5) parent agreed to participate in the intervention. For Phase 1 of the study, parent ability to speak and understand English was also an inclusionary criterion due to limitations in study resources; however, for Phase 2, monolingual Spanish-speaking families were eligible for participation.

In order to be included, parents must also have completed all initial measures and attended the initial assessment before the beginning of the first intervention session. Of the 192 families that were screened, 143 were determined to be eligible, and 130 parents enrolled in the study. Twenty parents completed the initial assessments but dropped out of the study before the intervention began, leaving a total of 110 parents in the combined study sample. The demographic characteristics of the participants in the combined sample are presented in Table 1. Of particular note, the current sample was relatively diverse in terms of ethnicity and socioeconomic status, with approximately half of the participants identifying as Hispanic and more than 50% earning less than $50,000 per year. The final sample utilized in the current analyses was determined by the number of parents who had complete data on all relevant measures of interest, resulting in a total of 102 parent-child pairs. Participants were excluded from the analyses if they were missing data on any of the relevant measures utilized in the analyses. Little's MCAR test evidenced that data was missing at random, rather than systematically ($\chi^2 = 101.631$, $df = 306$, $p > .05$). There were no demographic differences between participants who completed the intervention and those who dropped out.

Procedure

Once parents communicated interest in participating, study personnel conducted a phone screen to determine the eligibility of the parent(s). If the parent(s) met inclusion criteria, a baseline laboratory assessment with the parent(s) and child was scheduled. Prior to the initial assessment, parents were mailed a packet of questionnaires that was to be completed before arrival at the assessment. Although participation of only one parent was required, both parents were allowed to participate if they chose to do so. In this case, one parent was chosen as the primary participating parent (i.e., they were responsible for the majority of the child's caregiving, had more interaction with the child, and/or had more relevant knowledge of the child's functioning) who completed all of the assessment measures. For the purposes of the current study, only data from the primary caregiver were examined. The initial assessment took place in a laboratory setting. At this assessment, parents were given an informed consent document that was reviewed by the study personnel. After completing the informed consent and an interview to collect demographic information, parents were randomly assigned to either the immediate treatment or waitlist control intervention group.

The MBSR intervention followed the manual outlined by Dr. Jon Kabat-Zinn at the University of Massachusetts

Table 1 Demographic characteristics of participants from phase 1 and phase 2 of the MAPS study

	$n = 102$
Children	
Gender (% boys)	70.90
Mean age in years (SD)	4.27 (1.41)
Ethnicity	
Hispanic (%)	50.00
Caucasian (%)	27.30
African American (%)	2.70
Asian (%)	2.70
Other (%)	17.30
Participating parent	
Mean age in years (SD)	36.42 (7.60)
Marital status (% married)	68.20
Mean grade in school (SD)	14.37 (2.89)
Monolingual Spanish speaker (%)	17.50%
Family income (% > $50 k)	40.60

Medical Center (Kabat-Zinn et al. 1992). The MBSR program included eight weekly 2-h sessions, a daylong 6-h meditation retreat after class 6, and daily home practice for 35–45 min using audio CDs with instruction. Formal mindfulness exercises included the body scan, sitting meditation with awareness of breath, and mindful movement. The instructor for the group had over 20 years' experience practicing mindfulness and teaching MBSR, completed the Advanced MBSR Teacher Training at the University of Massachusetts Medical Center, and had received supervision with senior MBSR teachers through the Center for Mindfulness at the University of Massachusetts Medical Center.

After the immediate treatment group completed the intervention, parents participated in a post-treatment assessment and completed the measures again. At the same time, the parents assigned to the delayed treatment group also returned to the laboratory to participate in the same assessment in order to execute the waitlist control design. Each group also returned at their respective 6-month follow-up time points to complete an abbreviated laboratory assessment and packet of questionnaires. After the completion of the project (all assessments were conducted), parents received a short summary of their child's behavioral functioning in order to reinforce parents' efforts to improve their parenting skills as well as raise awareness of remaining concerns.

Measures

Parenting Stress Index-Short Form (PSI-SF, Abidin 1995) The PSI was used to assess parenting stress. The PSI-SF contains 36 items that are rated on a 5-point Likert scale ranging from "Strongly Agree" (1) to "Strongly Disagree" (5) and contains three subscales, parental distress, parent-child dysfunctional interaction, and difficult child, which are combined into a total stress score (Abidin 1995). The PSI also includes a validity index, which measures the extent to which the parent is answering in a way that he or she thinks will make them look best. A score of 10 or less on this index suggests that the reporter is responding in a defensive manner and indicates that caution should be used in interpreting any of the scores. There were no participants in the current sample who had a defensive responding score less than or equal to 10 at the baseline or post-treatment assessments. PSI data were collected at both the baseline and post-treatment assessments.

In terms of the individual subscales, we used the parental distress subscale, which measures the extent to which the parent is experiencing stress in his or her role as a parent. This subscale was utilized because it assesses parental stress independent of child behavior problems, which is also a key outcome variable of the current investigation. Previous studies have supported sound reliability and validity of the PSI-SF (Abidin 1995), and the internal consistency for the parental distress subscale in our sample was high ($\alpha = .89$).

Parenting Relationship Questionnaire (PRQ, Kamphaus and Reynolds 2006) The Parenting Relationship Questionnaire is a 45-item scale designed to assess the relationship between the primary caregiver and his or her child. The scale measures this construct through five subscales including attachment, discipline practices, involvement, parenting confidence, and relational frustration. The attachment subscale measures the affective, cognitive, and behavioral relationship between a parent and child that results in feelings of closeness, empathy, and understanding on the part of the parent for the child. Discipline practices are a measure of parent tendency to consistently apply consequences or punishment in response to a child's misbehavior, along with a corresponding belief that rule establishment and adherence to rules is desirable. The involvement subscale looks at the extent to which the parent and child participate together in a variety of common activities, in addition to the parent's knowledge of the child's activities. The parenting confidence subscale measures level of parent comfort, control, and confidence in relation to the parenting process and parental decision-making. Finally, the relational frustration subscale is a measure of the parent's level of stress in relating to or controlling the behavior and affect of the child, along with the tendency to be over reactive and frustrated in parenting situations.

Parents responded to the questions on the PRQ on a 4-point Likert scale ranging from "Never" (1) to "Almost Always" (4). The PRQ is supported as having sound reliability and validity (Kamphaus and Reynolds 2006). In the current sample, Cronbach's alpha coefficients for five subscales were moderately high and were as follows: Attachment ($\alpha = .75$), Discipline Practices ($\alpha = .87$), Involvement, ($\alpha = .84$), Parenting Confidence ($\alpha = .71$), and Relational Frustration

($\alpha = .80$). PRQ data were collected at both the baseline and post-treatment assessments.

Child Behavior Checklist for Ages 1.5–5 (CBCL, Achenbach 2000) The CBCL 1.5 to 5 was used to assess child behavior problems. The CBCL contains 99 items that are rated as "not true" (0), "somewhat or sometimes true" (1), or "very true or often true" (2). Each item represents a problem behavior, such as "acts too young for age" and "cries a lot." The current study analyzed the individual items through the total problem score on the CBCL. The internal reliability for the total problem score for our sample was high ($\alpha = .93$) and previous research indicates that this instrument has strong convergent validity (Achenbach 2000). CBCL data were collected at both the baseline and post-treatment assessments.

Data Analyses

The aim of the current study was to further examine the mechanisms through which parenting stress impacts the parent-child relationship and in turn influences behavior and development in children affected by developmental delay. Each measured component of the parent-child relationship was examined in a meditational framework given the potential for differential contributions. We hypothesized that the parent-child relational factors would mediate the relationship between parenting stress and child behavioral outcomes. For the purposes of the current study, relationships in the mediation models were examined at baseline to first test if the proposed variables of interest were indeed associated. Initial analyses examined concurrent associations between parenting stress, parent-child relational factors, and child externalizing behavior problems, in the direction of parenting stress to child behavior. We did a preliminary test of the bidirectional model (e.g., child behavior to parenting stress) to ensure proper directionality of proposed model; however, it was not significant. Follow-up analyses then tested the extent to which baseline levels of parenting stress and parent-child relational factors were predictive of child behavior change following parent treatment.

Given that we proposed each of the components of the parent-child relationship would have a mediating effect on the relationship between parenting stress and child behavior problems, we employed a statistical technique known as multiple mediation. Multiple mediation is currently the most appropriate mediation analysis method for testing the relationship between a predictor variable and outcome variable when the model consists of more than one mediating variable (Preacher and Hayes 2008). A multiple mediation analysis using the bootstrapping method was conducted for phase 1 and phase 2 combined in order to determine whether the five measured components of the parent-child relationship mediate the relationship between parenting stress and child outcomes while maximizing statistical power. These analyses were conducted using "Indirect," a multiple mediation macro developed by Preacher and Hayes (2008) for SPSS. The bootstrapping method takes a sample of size n with replacement from the original sample in order to calculate the indirect (mediation) effect and the program repeats this process 5000 times. This procedure provides the total indirect effect, specific indirect effects for each mediating variable, and tests of all pairwise comparisons among specific indirect effects, providing both standard errors and 95% confidence intervals (CIs). Results are reported and interpreted with respect to bias-corrected and accelerated (BCa) bootstrap CIs, because they are generally considered to be most accurate (Briggs 2006; Preacher and Hayes 2008; Williams and MacKinnon 2008).

Results

Demographic characteristics of the sample and variables utilized in the analyses were assessed using standard descriptive statistic frequency analyses (see Tables 1 and 2, respectively). In order to evaluate the theoretical model proposed in the current study, a multiple mediation analysis using the bootstrapping method was conducted at baseline to test whether the components of the parent-child relationship mediated concurrent relationships between parenting stress and child behavior problems. Results of the multiple mediation analysis, presented in Table 3, indicated that Relational Frustration significantly mediated the relationship between parenting stress and child behavior problems at baseline (see Fig. 1). Specifically, as parenting stress increased by one-point on the Parental Distress subscale of the PSI, child behavior problems increased on the total problem scale of the CBCL by .176 points, via the effect of Relational Frustration, BCa 95% CI [.012, .501]. Attachment, Discipline Practices, Involvement, and Parenting Confidence on the other hand did not significantly mediate the relationship between parenting stress and child behavior problems (p's $> .05$). Pairwise comparisons of the specific indirect effects showed that the relative strengths of the five mediators were significantly different from each other, with relationship frustration better predicting child behavior problems compared to the Attachment ($ab = .207$, BCa 95% CI [.011, .547]), Discipline ($ab = .175$, BCa 95% CI [.003, .510]), and Involvement ($ab = .185$, BCa 95% CI [.002, .529]), but not Parenting Confidence ($p > .05$); see Table 3.

Given that relationship frustration was a significant mediator to the relationship between parenting stress and child behavior problems at baseline, a follow-up analysis was conducted to examine these effects longitudinally at post-treatment, controlling for baseline levels of each respective variable. Due to current problems with multiple mediation's ability to investigate change over time using change or difference

Table 2 Descriptive statistics for variables utilized in the analyses

	Baseline		Post-treatment	
	M (SD)	Percent or percentile	*M* (SD)	Percent or percentile
	Predictor			
PSI parental distress subscale score	91.18 (11.53)	73.91% (C)	31.62 (8.55)	39.29% (C)
	Mediators			
PRQ attachment	20.78 (4.51)	15th (NS)	22.65 (4.67)	34th (NS)
PRQ discipline practices	14.73 (5.74)	30th (NS)	15.27 (5.61)	30th (NS)
PRQ involvement	12.98 (4.49)	29th (NS)	14.67 (4.50)	37th (NS)
PRQ parenting confidence	11.18 (3.19)	9th (NS)	13.01 (3.29)	22nd (NS)
PRQ relationship frustration	11.44 (3.90)	95th (NS)	9.13 (3.50)	77th (NS)
	Outcome			
CBCL total problem score	71.08 (23.79)	76.47% (C)	60.52 (26.03)	60.71% (C)

% (C) percentage of sample in the clinical range, *(NS)* percentile rank for corresponding mean score based on the normative sample

scores, regression's ability to better handle missing data, and no longer needing to test multiple mediators at the post-treatment time point, regression was utilized for the follow-up analyses (Cohen et al. 2003; Selig and Preacher 2009). Specifically, hierarchical multiple linear regressions were employed to examine change in parenting stress as a predictor of change in parent-child relational frustration, and change in parent-child relational frustration as a predictor of change in child behavior problems. Results indicated that parenting stress at post-treatment significantly predicted relational frustration at post-treatment above and beyond baseline levels of these variables ($t = 3.810$, 95% CI [.085, .272], $\beta = .430$, $p < .001$). Specifically, every 1-point decrease in parenting stress was associated with a .179-point decrease in relational frustration. Additionally, relational frustration at post-treatment significantly predicted child behavior problems at post-treatment above and beyond baseline levels of these variables ($t = 2.464$, 95% CI [.321, 3.038], $\beta = .226$, $p < .05$). Specifically, for every 1-point decrease in relational frustration, there was a 1.680-point decrease in behavior problems. Proportions of variance explained by each regression model were 29.1 and 47.2%, respectively. Regression results are presented in Table 4.

Discussion

The aim of the current study was to further examine the mechanisms through which parenting stress impacts the parent-child relationship and in turn influences behavior problems in children with DD. We derived a quantitative model that assessed whether parent-child relational factors mediated the relationship between parenting stress and child behavior problems.

Interestingly, parent-child relational frustration emerged as the only feature of reported parent-child interaction that significantly accounted for the association between parenting

Table 3 Results of mediation analyses testing the components of the parent-child relationship as mediators of the concurrent relationship between parental distress and child behavior problems

Independent variable	Mediated effect	Point estimate	SE	BCa 95% CI
Parental distress	PRQ subscale			
	Attachment	−.032	.053	[−.215, .031]
	Discipline practices	.001	.023	[−.034, .075]
	Involvement	−.008	.041	[−.130, .049]
	Parenting confidence	.048	.070	[−.045, .262]
	Relational frustration	.176*	.120	[.017, .501]
	Total indirect effect	.186	.131	[−.014, .519]
	Attachment vs. relational frustration	.208*	.131	[.011, .546]
	Discipline practices vs. relational frustration	.175*	.124	[.003, .510]
	Involvement vs. relational frustration	.185*	.130	[.001, .529]

BCa 95% CI 95% bias-corrected and accelerated confidence interval

*Significant mediation effect or pairwise comparison

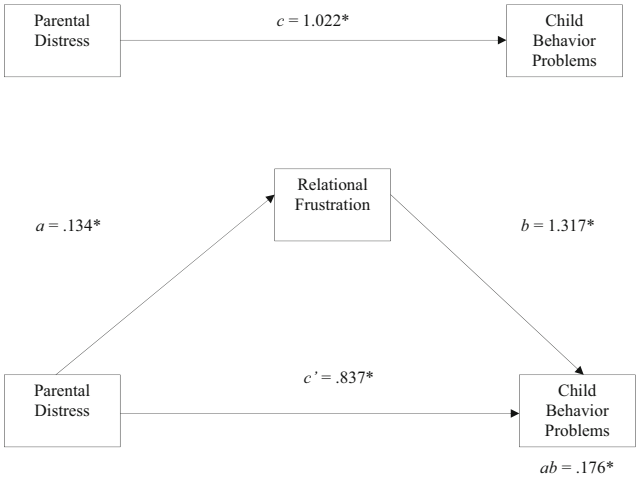

Fig. 1 Mediation model predicting child behavior problems from parental distress through the effect of parent-child relational frustration. *Significant path

stress and child behavior problems in the present sample. Parent-child relational frustration was found to be a mechanism through which parenting stress impacts child behavior problems in the current sample at baseline, such that higher levels of parental distress were associated with increased relational frustration, which in turn were associated with more child behavior problems. The relationship between parenting stress, relational frustration, and behavior problems was also evidenced at immediate post-treatment using hierarchical multiple linear regression, demonstrating evidence of this relationship in the present sample following the MBSR intervention. Direct effects in this model are consistent with those of previous studies demonstrating that both heighted parenting stress and increased parental demands placed on parents of children with DD are related to increased strain in parent-child relationships and may subsequently lead to coercive dyadic

Table 4 Results of hierarchical multiple linear regression analyses predicting post-treatment PRQ relational frustration and CBCL total problems from baseline PSI parental distress and PRQ relational frustration

	b	SE	β	*t*	*p*
PRQ relational frustration (post)					
PRQ relational frustration (BL)	.275	.098	.314	2.804	.007
PSI parental distress (BL)	−.079	.046	−.199	−1.717	.090
PSI parental distress (PT)	.179	.047	.430	3.810	.000*
CBCL total problems (post)					
CBCL total problems (BL)	.679	.096	.638	7.069	.000
PRQ relational frustration (BL)	−.062	.619	−.010	−.100	.921
PRQ relational frustration (PT)	1.680	.682	.226	2.464	.016*

PSI Parenting Stress Index, *PRQ* Parenting Relationship Questionnaire, *CBCL* Child Behavior Checklist, *BL* baseline score, *PT* post-treatment score.

*Significant prediction

interactions between the parent and child (Anthony et al. 2005; Crnic et al. 2004). Furthermore, research has demonstrated that parents of children with DD often show increased levels of irritation and decreased levels of tolerance related to their child's functioning and behavior to the extent that they tend to experience an inability to effectively cope with disruptive behaviors (Crnic et al. 2005). As such, parenting can become more coercive, intrusive, and less positive overall, which may ultimately lead to increased incidence of behavior problems in children (Blacher et al. 2013; Crnic et al. 2005; Deater-Deckard and Scarr 1996; Garner et al. 2013; Hastings 2002; Jackson 2000).

The findings evidenced herein support the mechanistic effect parent-child relational frustration plays in the association between parental distress and child behavior problems. Parents who are highly distressed appear to experience heighted levels of frustration and stress in their interactions with their children, which appears to result in increased incidence of child behavior problems. Specifically, these parents may feel that they are unable to relate to their children in appropriate ways and are ineffective in controlling or regulating their children's behavior and affect, leading to tendencies to overreact and become frustrated even in common parenting situations (Kamphaus and Reynolds 2006). Implications of these findings are especially salient for families of children with DD, and suggest that when parents experience stress in their roles as parents, they may be particularly susceptible to increased frustration when interacting with their child and perhaps also to associate negative attributions regarding parenting challenges. Difficulty regulating internal states during parent-child exchanges may heighten parental negativity, even in conventional, everyday interactions, and may also complicate co-regulatory efforts, which may ultimately contribute to greater child behavioral problems. Thus, interventions aimed at reducing frustration in the parent-child relationship may be especially beneficial for parents of children with DD.

Evidence that parents' internal emotional experience during interactions with their children plays an important role in the unfolding of dynamic interpersonal processes consistent with a host of literature suggesting the centrality of emotional experiences and affective quality of parent-child interaction to child and family wellbeing in populations with and without DD (Landry et al. 2001; Lovejoy et al. 2000; NICHD 2004; Rueger et al. 2011; Wiggins et al. 2009). Additionally, increased negative affective experiences among parents of children with disabilities may be predictive of lower parenting satisfaction and decreased social competence among children over time (Carson and Parke 1996; Hanson and Hanline 1990). Results suggesting that relational frustration was more strongly associated with parenting stress and child behavior problems than parent-reported attachment quality, confidence, discipline practices, or involvement, also underscore the particular significance of parental negativity and dyadic conflict

to the processes under examination. This is consistent with existing studies demonstrating robust associations between parent negativity and criticism and problematic outcomes for children with DD (Carson and Parke 1996; Lovejoy et al. 2000; Luoma et al. 2004; Rueger et al. 2011). Although this is the first known study to evidence parent-child relational frustration as a mechanism through which parenting stress influences child behavior, it is worth noting the context of our findings within a framework of parental role or relational satisfaction as well. Greater levels of positive parenting and parenting satisfaction specifically have been evidenced when parenting stress is low and parenting competence is high among parents of children with DD (Hanson and Hanline 1990). Research has also shown that having a child with DD can be an overall positive, rewarding experience, sometimes leading to levels of satisfaction with the parent-child relationship that extend above and beyond parenting a typically developing child (Blacher and Baker 2007; Green 2007; Heiman 2002; McKeever and Miller 2004).

Surprisingly, parent-reported attachment, discipline practices, involvement, and parenting confidence were not identified as significant mediators of the association between parenting stress and child behavior problems. Although research has linked dyadic attachment to parental mental health status and ability to recognize behavioral cues in children, attachment quality in empirical studies is often tied to broader factors including maternal sensitivity and responsiveness, and is generally assessed in children rather than parents, which may explain why attachment was not implicated here (Cerezo et al. 2008; Korja et al. 2010). Despite the fact that studies have evidenced harsh and negative discipline practices to be predictive of maladaptive behavior in children with DD, especially under conditions of parental psychological distress (Aunola and Nurmi 2005; Baumrind 1991; Guralnick 1999; Steinberg 2001; Howard et al. 2004), discipline practices were not found to mediate the relationship between parenting stress and child behavior problems in the current study. Even though it might be expected that high levels of parenting stress may be associated with increased application of negative discipline strategies and less consistency, and higher behavior problems as a result, lack of findings in this area may be attributable to the nature of the individual items on the discipline practices subscale of the PRQ. These items appear to assess application of global punishment by parents in situations related to general misbehavior and adherence to rules (e.g., I punish my child when he or she misbehaves), and low scores may reflect permissive, rather than authoritarian or harsh parenting, which have more consistently been implicated in poor child outcomes (Baumrind 1991). Regarding parental involvement, the lack of observed meditational effects may be explained by relatively average scores at baseline, indicating overall adaptive levels of parental involvement with their children and in their activities. In addition, the majority of literature in this area has specifically linked parental involvement in school-related activities to outcomes such a child literacy, rather than behavior problems (Dearing et al. 2004). Finally, although parenting confidence was relatively low at baseline (e.g., mean score at approximately the 9th percentile), and past research has provided evidence for the meditational role of parenting confidence in the relationship between parental mental health status (e.g., severe mental illness) and poor child outcomes (e.g., school grades and teacher-rated behavior problems; Oyserman et al. 2005) the predictor (e.g., parenting stress) and outcome (e.g., parent-reported behavior problems) variables utilized in the current study may not capture the true nature of this relationship. It was reasonable to anticipate parenting stress to be associated with or predictive of parent-child relational constructs aside from relational frustration, and in turn child behavior problems; however, contrary to our expectations, these relationships were not evidenced in the current study. Overall, differences in measurement of the various constructs investigated in previous studies compared to those used herein may account in part for such inconsistencies.

Limitations and Future Directions

Although the current study yielded meaningful findings for families affected by DD, several limitations should be considered. First, mediation effects for each of the five parent-child relational factors were only examined at baseline initially, whereas the mediating effect of relational frustration was subsequently examined assessed post-intervention. The rationale for evaluating the mediation model at baseline only was twofold: (1) to evaluate if the proposed relationships accurately fit the data at baseline in the MAPS sample and (2) to reduce the probability of statistical error (e.g., type I error) associated with running multiple analyses with the same data. As such, it may be the case that additional components of the parent-child relationship serve as mechanisms though which change occurs following the intervention. Future analyses should examine change scores for all of the dyadic relationship factors in order to assess how changes in the variables of interest relate to one another at post-treatment and whether they change as a function of the MBSR intervention.

In the present sample, a unidirectional mediation relationship with parenting stress predicting child behavior problems was supported by the data. Research has evidenced, however, a bidirectional relationship between parenting stress and child behavior problems such that increases in parenting stress not only lead to increases in child behavior problems, but increases in child behavior problems also lead to increases in parenting stress (Baker et al. 2003; Neece et al. 2012). As such, it is possible that these relationships are bidirectional in nature and testing reciprocal effects using longitudinal, multi-wave data is an important endeavor for future research. Ultimately, we chose to test the proposed direction of effect

based on a large body of literature supporting parenting stress being predictive of child behavior problems and a preliminary test of the bidirectional model; however, it is possible that parent-child relational factors or other proposed mechanisms of effect operate in the opposite direction of effect, and should be investigated accordingly.

In addition, research has indicated that although reductions in parenting stress are evident immediately following the intervention and are maintained at follow-up, positive changes in child behavior may not be apparent initially, but continue to develop over time (Neece 2013). Thus, future studies should examine the proposed model within a more extended longitudinal framework in order to obtain the most accurate picture of child behavior outcomes. A follow-up model was not examined in the present investigation due to high rates of attrition at the 6-month follow-up time point, and our primary interest was in maximizing power for our pilot data. It will also be important to replicate effects with a larger sample, which would provide an opportunity for more complex statistical analyses, including latent modeling of change variables.

A range of additional child outcomes including adaptive behavior, emotion regulation, social skills and competence, and overall developmental progress may be important outcomes responsive to changes in parenting stress and parent-child relational frustration, and as such should be given appropriate attention in future investigations (Blacher et al. 2013; Crnic et al. 2005; Feng et al. 2008; Garner et al. 2013; Hastings 2002; Lewallen and Neece 2015; Trentacosta et al. 2008). Finally, the current study relied upon parent report given our study emphasis on parents' subjective experiences and evidence that modification in parent perceptions may be sufficiently powerful to incite clinically meaningful change in parent-child interaction (Korja et al. 2010). Although there was a strong rationale for use of parent report methodology in the present investigation, this may contribute to shared method variance and it would be beneficial to incorporate additional measurement techniques such as observational data to further examine patterns of association.

Despite these limitations, the implications of this study are significant. The current study is unique in that specific components of the dyadic parent-child relationship were examined collectively as mechanisms by which parenting stress impacts child behavior. Findings underscore the central role that parent-child relational frustration in particular may play in understanding associations between parenting stress and child behavioral functioning, and suggest the potential for targeted intervention efforts in this area.

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References

Abidin, R. R. (1995). *Parenting stress index manual* (3rd ed.). Charlottesville: Pediatric Psychology Press.

Achenbach, T. M. (2000). *Manual for the child behavior checklist 1 ½-5*. Burlington: University of Vermont, Department of Psychiatry.

Alegre, A., & Benson, M. J. (2010). Parental behaviors and adolescent adjustment: Mediation via adolescent trait emotional intelligence. *Individual Differences Research, 8*(2), 83–96.

Anthony, L., Anthony, B., Glanville, D., Naiman, D., Waanders, C., & Shaffer, S. (2005). The relationships between parenting stress, parenting behaviour and preschoolers' social competence and behaviour problems in the classroom. *Infant and Child Development, 154*, 133–154. https://doi.org/10.1002/icd.

Aunola, K., & Nurmi, J. E. (2005). The role of parenting styles in children's problem behavior. *Child Development, 76*(6), 1144–1159.

Baer, R. A., Carmody, J., & Hunsinger, M. (2012). Weekly change in mindfulness and perceived stress in a mindfulness-based stress reduction program. *Journal of Clinical Psychology, 68*(7), 755–765. https://doi.org/10.1002/jclp.21865.

Baker, B., Blacher, J., Crnic, K., & Edelbrock, C. (2002). Behavior problems and parenting stress in families of three-year-old children with and without developmental delays. *American Journal of Mental Retardation: AJMR, 107*(6), 433–444. https://doi.org/10.1352/0895-8017(2002)107<0433:BPAPSI>2.0.CO;2.

Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Pre-school children with and without developmental delay: behaviour problems and parenting stress over time. *Journal of Intellectual Disability Research: JIDR, 47*(Pt 4–5), 217–230 Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12787154.

Baker, B. L., Neece, C. L., Fenning, R. M., Crnic, K. A, & Blacher, J. (2010). Mental disorders in five-year-old children with or without developmental delay: focus on ADHD. *Journal of Clinical Child and Adolescent Psychology, 39*(4), 492–505. https://doi.org/10.1080/15374416.2010.486321.

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. *The Journal of Early Adolescence, 11*(1), 56–95.

Bazzano, A., Wolfe, C., Zylowska, L., Wang, S., Schuster, E., Barrett, C., & Lehrer, D. (2015). Mindfulness based stress reduction (MBSR) for parents and caregivers of individuals with developmental disabilities: a community-based approach. *Journal of Child and Family Studies, 24*(2), 298–308.

Bearss, K., Burrell, T. L., Stewart, L., & Scahill, L. (2015). Parent training in autism spectrum disorder: what's in a name? *Clinical Child and Family Psychology Review, 18*(2), 170–182.

Blacher, J., Baker, B. L., & Kaladjian, A. (2013). Syndrome specificity and mother-child interactions: examining positive and negative parenting across contexts and time. *Journal of Autism and Developmental Disorders, 43*(4), 761–774. https://doi.org/10.1007/s10803-012-1605-x.

Blacher, J., & Baker, B. L. (2007). Positive impact of intellectual disability on families. *American Journal on Mental Retardation, 112*(5), 330–348.

Briggs, N. (2006). Estimation of the standard error and confidence interval of the indirect effect in multiple mediator models. *Dissertation Abstracts International, 37*, 4755B.

Brown, M. A., McIntyre, L. L., Crnic, K. A., Baker, B. L., & Blacher, J. (2011). Preschool children with and without developmental delay: risk, parenting, and child demandingness. *Journal of Mental Health Research in Intellectual Disabilities, 4*(3), 206–226.

Campbell, S. B., Pierce, E. W., Moore, G., Marakovitz, S., & Newby, K. (1996). Boys' externalizing problems at elementary school age:

pathways from early behavior problems, maternal control, and family stress. *Development and Psychopathology, 8*(4), 701–719.

Carson, J. L., & Parke, R. D. (1996). Reciprocal negative affect in parent-child interactions and children's peer competency. *Child Development, 67*(5), 2217–2226.

Cerezo, M. A., Pons-Salvador, G., & Trenado, R. M. (2008). Mother–infant interaction and children's socio-emotional development with high-and low-risk mothers. *Infant Behavior and Development, 31*(4), 578–589.

Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: a review and meta-analysis. *The Journal of Alternative and Complimentary Medicine, 15*(5), 593–600.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences (3rd ed.)*. Mahwah: Lawrence Erlbaum Associates.

Cormack, K., Brown, A., & Hastings, R. (2000). Behavioural and emotional difficulties in students attending schools for children and adolescents with severe intellectual disability. *Journal of Intellectual Disability Research, 44*, 124–129.

Costigan, C. L., Floyd, F. J., Harter, K. S., & McClintock, J. C. (1997). Family process and adaptation to children with mental retardation: disruption and resilience in family problem-solving interactions. *Journal of Family Psychology, 11*(4), 515.

Crnic, K., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: relations to maternal parenting and child behaviour at age 5. *Infant and Child Development, 132*, 117–132. https://doi.org/10.1002/icd.

Crnic, K., & Greenberg, M. (1990). Minor parenting stresses with young children. *Child Development, 61*, 1628–1637.

Crnic, K., Hoffman, C., Gaze, C., & Edelbrock, C. (2004). Understanding the emergence of behavior problems in young children with developmental delays. *Infants and Young Children, 17*, 223–235.

Crnic, K., & Low, C. (2002). Everyday stresses in parenting. In *Handbook of parenting volume 5 practical issues in parenting* (Vol. 5, pp. 243–267).

Crnic, K., & Neece, C. L. (2015). Illness and disability. In R. M. Lerner (Ed.), *Handbook of child psychology and developmental science-7th edition*. Hoboken: Wiley Publishers.

Dearing, E., McCartney, K., Weiss, H., Kreider, H., & Simpkins, S. (2004). The promotive effects of family educational involvment for low-income chilren's literacy. *Journal of School Psychology, 42*(6), 445–460.

Deater-Deckard, K., Dodge, K. A., Bates, J. E., & Pettit, G. S. (1998). Multiple risk factors in the development of externalizing behavior problems: group and individual differences. *Development and Psychopathology, 10*(3), 469–493.

Deater-Deckard, K., & Scarr, S. (1996). Parenting stress among dual-earner mothers and fathers: are there gender differences? *Journal of Family Psychology, 10*(1), 45–59. https://doi.org/10.1037//0893-3200.10.1.45.

Dekker, M. C., & Koot, H. M. (2003). DSM-IV disorders in children with borderline to moderate intellectual disability. I: prevalence and impact. *Journal of the American Academy of Child and Adolescent Psychiatry, 42*(8), 915–922. https://doi.org/10.1097/01.CHI.0000046892.27264.1A.

Denham, S. A., Workman, E., Cole, P. M., Weissbrod, C., Kendziora, K. T., & Zahn-Waxler, C. (2000). Prediction of externalizing behavior problems from early to middle childhood: the role of parental socialization and emotion expression. *Development and Psychopathology, 12*(1), 23–45.

Donenberg, G., & Baker, B. L. (1993). The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology, 21*(2), 179–198.

Dykens, E. M., Fisher, M. H., Taylor, J. L., Lambert, W., & Miodrag, N. (2014). Reducing distress in mothers of children with autism and other disabilities: a randomized trial. *Pediatrics, 134*(2), e454–e463.

Eisenhower, A. S., Baker, B. L., & Blacher, J. (2009). Children's delayed development and behavior problems: impact on mothers' perceived physical health across early childhood. *Social Science & Medicine, 68*(1), 89–99.

Emerson, E. (2003). Mothers of children and adolescents with intellectual disability: social and economic situation, mental health status, and the self-assessed social and psychological impact of the child's difficulties. *Journal of Intellectual Disability Research, 47*(4–5), 385–399. https://doi.org/10.1046/j.1365-2788.2003.00498.x.

Emerson, E., & Einfeld, S. (2010). Emotional and behavioural difficulties in young children with and without developmental delay: a bi-national perspective. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 51*(5), 583–593. https://doi.org/10.1111/j.1469-7610.2009.02179.x.

Estes, A., Munson, J., Dawson, G., Koehler, E., Zhou, X.-H., & Abbott, R. (2009). Parenting stress and psychological functioning among mothers of preschool children with autism and developmental delay. *Autism : The International Journal of Research and Practice, 13*(4), 375–387. https://doi.org/10.1177/1362361309105658.

Evans, S., Ferrando, S., Carr, C., & Haglin, D. (2011). Mindfulness-based stress reduction (MBSR) and distress in a community-based sample. *Clinical Psychology and Psychotherapy, 558*, 553–558.

Eyberg, S. M., & Ross, A. W. (1978). Assessment of child behavior problems: the validation of a new inventory. *Journal of Clinical Child & Adolescent Psychology, 7*(2), 113–116.

Feng, X., Shaw, D. S., Kovacs, M., Lane, T., O'rourke, F. E., & Alarcon, J. H. (2008). Emotion regulation in preschoolers: the roles of behavioral inhibition, maternal affective behavior, and maternal depression. *Journal of Child Psychology and Psychiatry, 49*(2), 132–141.

Fenning, R. M., Baker, J. K., Baker, B. L., & Crnic, K. A. (2007). Parenting children with borderline intellectual functioning: a unique risk population. *American Journal on Mental Retardation, 112*, 107–121.

Floyd, F. J., Harter, K. S., & Costigan, C. L. (2004). Family problem-solving with children who have mental retardation. *American Journal on Mental Retardation, 109*(6), 507–524.

Garner, R. E., Arim, R. G., Kohen, D. E., Lach, L. M., Mackenzie, M. J., Brehaut, J. C., & Rosenbaum, P. L. (2013). Parenting children with neurodevelopmental disorders and/or behaviour problems. *Child: Care, Health and Development, 39*(3), 412–421. https://doi.org/10.1111/j.1365-2214.2011.01347.x.

Gerstein, E. D., Crnic, K. A., Blacher, J., & Baker, B. L. (2009). Resilience and the course of daily parenting stress in families of young children with intellectual disabilities. *Journal of Intellectual Disability Research, 53*(12), 981–997. https://doi.org/10.1111/j.1365-2788.2009.01220.x.

Gershoff, E. T., Aber, J. L., Raver, C. C., & Lennon, M. C. (2007). Income is not enough: incorporating material hardship into models of income associations with parenting and child development. *Child Development, 78*(1), 70–95. https://doi.org/10.1111/j.1467-8624.2007.00986.x.

Grant, K. E., Compas, B. E., Thurm, A. E., McMahon, S. D., & Gipson, P. Y. (2006). Stressors and child and adolescent psychopathology: measurement issues and prospective effects. *Journal of Clinical Child and Adolescent Psychology, 33*(2), 412–425.

Green, S. E. (2007). "We're tired, not sad": benefits and burdens of mothering a child with a disability. *Social Science & Medicine, 64*(1), 150–163.

Guralnick, M. J. (1999). Family and child influences on the peer-related social competence of young children with developmental delays. *Developmental Disabilities Research Reviews, 5*(1), 21–29.

Hanson, M. J., & Hanline, M. F. (1990). Parenting a child with a disability: a longitudinal study of parental stress and adaptation. *Journal of Early Intervention, 14*(3), 234–248.

Hastings, R. (2002). Parental stress and behaviour problems of children with developmental disability. *Journal of Intellectual and Developmental Disability, 27*(3), 615–625. https://doi.org/10.1080/1366825021000008865.

Hastings, R. P., & Brown, T. (2002). Behavior problems of children with autism, parental self-efficacy, and mental health. *American Journal on Mental Retardation, 107*(3), 222–232.

Hastings, R. P., Daley, D., Burns, C., & Beck, A. (2006). Maternal distress and expressed emotion: cross-sectional and longitudinal relationships with behavior problems of children with intellectual disabilities. *American Journal on Mental Retardation, 111*(1), 48–61.

Hauser-Cram, P., Warfield, M. E., Shonkoff, J. P., Krauss, M. W., Sayer, A., Upshur, C. C., & Hodapp, R. M. (2001). Children with disabilities: a longitudinal study of child development and parent well-being. *Monographs of the Society for Research in Child Development*, i-126.

Heiman, T. (2002). Parents of children with disabilities: resilience, coping, and future expectations. *Journal of Developmental and Physical Disabilities, 14*(2), 159–171.

Heller, T. L., Baker, B. L., Henker, B., & Hinshaw, S. P. (1996). Externalizing behavior and cognitive functioning from preschool to first grade: stability and predictors. *Journal of Clinical Child Psychology, 25*(4), 376–387.

Herring, S., Gray, K., Taffe, J., Tonge, B., Sweeney, D., & Einfeld, S. (2006). Behaviour and emotional problems in toddlers with pervasive developmental disorders and developmental delay: associations with parental mental health and family functioning. *Journal of Intellectual Disability Research, 50*(12), 874–882.

Howard, L. M., Thornicroft, G., Salmon, M., & Appleby, L. (2004). Predictors of parenting outcome in women with psychotic disorders discharged from mother and baby units. *Acta Psychiatrica Scandinavica, 110*(5), 347–355.

Jackson, A. P. (2000). Maternal self-dfficacy and children's influence on stress and parenting among single black mothers in poverty. *Journal of Family Issues, 21*(1), 3–16. https://doi.org/10.1177/019251300021001001.

Jackson, A. P., & Huang, C. C. (1998). Concerns about children's development: implications for single, employed black mothers' well-being. *Social Work Research, 22*(4), 233–240. https://doi.org/10.1093/swr/22.4.233.

Kabat-Zinn, J., Massion, A. O., Kristeller, J., & Peterson, L. G. (1992). Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *The American Journal of Psychiatry, 149*, 936–943.

Kamphaus, R. W., & Reynolds, C. R. (2006). *PRQ: Parenting relationship questionnaire manual*. New York: Pearson.

Kersh, J., Hedvat, T. T., Hauser-Cram, P., & Warfield, M. E. (2006). The contribution of marital quality to the well-being of parents of children with developmental disabilities. *Journal of Intellectual Disability Research, 50*(12), 883–893.

Korja, R., Ahlqvist-Björkroth, S., Savonlahti, E., Stolt, S., Haataja, L., Lapinleimu, H., et al. (2010). Relations between maternal attachment representations and the quality of mother–infant interaction in preterm and full-term infants. *Infant Behavior and Development, 33*(3), 330–336.

Landry, S. H., Smith, K. E., Swank, P. R., Assel, M. A., & Vellet, S. (2001). Does early responsive parenting have a special importance for children's development or is consistency across early childhood necessary? *Developmental Psychology, 37*(3), 387.

Lansford, J. E., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2010). Does physical abuse in early childhood predict substance use in adolescence and early adulthood? *Child Maltreatment, 15*(2), 190–194.

Lewallen, A. C., & Neece, C. L. (2015). Improved social skills in children with developmental delays after parent participation in MBSR: the role of parent–child relational factors. *Journal of Child and Family Studies, 24*(10), 3117–3129.

Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: a meta-analytic review. *Clinical Psychology Review, 20*(5), 561–592.

Luoma, I., Kaukonen, P., Mäntymaa, M., Puura, K., Tamminen, T., & Salmelin, R. (2004). A longitudinal study of maternal depressive symptoms, negative expectations and perceptions of child problems. *Child Psychiatry and Human Development, 35*(1), 37–53.

Merrell, K. W., & Holland, M. L. (1997). Social-emotional behavior of preschool-age children with and without developmental delays. *Research in Developmental Disabilities, 18*(6), 393–405.

McKeever, P., & Miller, K. L. (2004). Mothering children who have disabilities: a Bourdieusian interpretation of maternal practices. *Social Science & Medicine, 59*(6), 1177–1191.

Neece, C. L. (2013). Mindfulness-based stress reduction for parents of young children with developmental delays: implications for parenting stress and child behavior problems. *Journal of Applied Research in Intellectual Disabilities, 27*(2), 174–186. https://doi.org/10.1111/jar.12064.

Neece, C. L., Baker, B. L., Blacher, J., & Crnic, K. a. (2011). Attention-deficit/hyperactivity disorder among children with and without intellectual disability: an examination across time. *Journal of Intellectual Disability Research, 55*(7), 623–635. https://doi.org/10.1111/j.1365-2788.2011.01416.x.

Neece, C. L., Baker, B. L., Crnic, K., & Blacher, J. (2013). Examining the validity of ADHD as a diagnosis for adolescents with intellectual disabilities: clinical presentation. *Journal of Abnormal Child Psychology, 41*(4), 597–612. https://doi.org/10.1007/s10802-012-9698-4.

Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behavior problems: a transactional relationship across time. *American Journal on Intellectual and Developmental Disabilities, 117*(1), 48–66. https://doi.org/10.1352/1944-7558-117.1.48.

NICHD Early Child Care Research Network. (2004). Affect dysregulation in the mother-child relationship in the toddler years: antecedents and consequences. *Development and Psychopathology, 16*, 43–68.

Oelofsen, N., & Richardson, P. (2006). Sense of coherence and parenting stress in mothers and fathers of preschool children with developmental disability. *Journal of Intellectual & Developmental Disability, 31*(1), 1–12. https://doi.org/10.1080/13668250500349367.

Oono, I. P., Honey, E. J., & McConachie, H. (2013). Parent-mediated early intervention for young children with autism spectrum disorders (ASD). *Evidence-Based Child Health: A Cochrane Review Journal, 8*(6), 2380–2479.

Östberg, M., & Hagekull, B. (2000). A structural modeling approach to understanding parenting stress. *Journal of Clinical Child Psychology, 29*, 615–625.

Oyserman, D., Bybee, C., Mowbray, C., & Hart-Johnson, T. (2005). When mothers have serious mental health problems: parenting as a proximal mediator. *Journal of Adolescence, 28*(4), 443–463.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891.

Rueger, S. Y., Katz, R. L., Risser, H. J., & Lovejoy, M. C. (2011). Relations between parental affect and parenting behaviors: a meta-analytic review. *Parenting: Science and Practice, 11*(1), 1–33.

Selig, J. P., & Preacher, K. J. (2009). Mediation models for longitudinal data in developmental research. *Research in Human Development, 6*(2–3), 144–164.

Sellers, R., Harold, G. T., Elam, K., Rhoades, K. A., Potter, R., Mars, B., et al. (2014). Maternal depression and co-occurring antisocial behaviour: testing maternal hostility and warmth as mediators of risk

for offspring psychopathology. *Journal of Child Psychology and Psychiatry, 55*(2), 112–120.

Smith, E., & Prinz, R. (2001). Latent models of family processes in African American families: relationships to child competence, achievement, and problem behaviour. *Journal of Marriage and Family, 63*, 967–980. https://doi.org/10.1111/j.1741-3737.2001.00967.x/full.

Steinberg, L. (2001). We know some things: parent–adolescent relationships in retrospect and prospect. *Journal of Research on Adolescence, 11*(1), 1–19.

Tervo, R. C. (2010). Attention problems and parent-rated behavior and stress in young children at risk for developmental delay. *Journal of Child Neurology, 25*(11), 1325–1330. https://doi.org/10.1177/0883073810362760.

Tervo, R. C. (2012). Developmental and behavior problems predict parenting stress in young children with global delay. *Journal of Child Neurology, 27*(3), 291–296. https://doi.org/10.1177/0883073811418230.

Trentacosta, C. J., Hyde, L. W., Shaw, D. S., Dishion, T. J., Gardner, F., & Wilson, M. (2008). The relations among cumulative risk, parenting, and behavior problems during early childhood. *Journal of Child Psychology and Psychiatry, 49*(11), 1211–1219.

Webster, R. I., Majnemer, A., Platt, R. W., & Shevell, M. I. (2008). Child health and parental stress in school-age children with a preschool diagnosis of developmental delay. *Journal of Child Neurology, 23*(1), 32–38. https://doi.org/10.1177/0883073807307977.

Williams, J., & MacKinnon, D. P. (2008). Resampling and distribution of the product methods for testing indirect effects in complex models. *Structural Equation Modeling, 15*, 23–51.

Williford, A. P., Calkins, S. D., & Keane, S. P. (2007). Predicting change in parenting stress across early childhood: child and maternal factors. *Journal of Abnormal Child Psychology, 35*(2), 251–263.

Wiggins, T. L., Sofronoff, K., & Sanders, M. R. (2009). Pathways triple P-positive parenting program: effects on parent-child relationships and child behavior problems. *Family Process, 48*(4), 517–530.

Wolfradt, U., Hempel, S., & Miles, J. N. (2003). Perceived parenting styles, depersonalisation, anxiety and coping behaviour in adolescents. *Personality and Individual Differences, 34*(3), 521–532.