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Parenting Children with Developmental Delays: The Role of Positive Beliefs

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Abstract

Parents of children with developmental delays consistently report higher levels of child behavior problems and also parenting stress than parents of typically developing children. This study examined how mothers' positive beliefs influence the relation between children's behavior problems and mothers' parenting stress among families of children who are developmentally delayed (DD: $n = 72$) or typically developing (TD: $n = 95$) and assessed at ages 3, 5, and 7 years. Positive beliefs had a main effect on parenting stress at all ages, which was mediated by child behavior problems for mothers in the DD group at every age and across time. In the TD group, mediation was found at age 3 years. Additionally, support was found for a moderation effect of positive beliefs on the relation between child behavior problems and parenting stress, but only in the DD group at age 3. These findings have implications for interventions drawing on Seligman's (1991) work on learned optimism, the positive counterpart of learned helplessness.

Keywords

parenting; self-mastery; optimism; developmental disabilities

Parents of children with intellectual disability are faced not only with cognitive and social skills deficits but also with a heightened likelihood of behavior problems and/or diagnosable mental disorder (Baker, McIntyre, Blacher, Crnic, Edelbrock, & Low, 2003; Emerson, 2003; Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001). Adjustment to parenting can take a variety of forms, with differing consequences for those parents' psychological well-being. One way that parents may maintain motivation to persevere in their parenting efforts is through the acceptance of conflicting cognitions regarding their children's disabilities (Larson, 1998). These parents recognize that they can love and accept the child as he or she is while also preserving positive, and sometimes unrealistic, expectations regarding what may be possible for the child's future and what they can do to improve the child's condition. The sense of optimism and mastery that some parents feel with regard to parenting may offer an explanation for the varying levels of parenting stress reported by mothers when faced with their children's delays and difficult externalizing behaviors.

We refer to these as positive beliefs. There is little known about how such beliefs impact parenting. In this study we examined positive beliefs among parents of young children with developmental delays, for whom such beliefs may be vital in sustaining their parenting efforts (Larson, 1998). We examined the nature of the relations among positive beliefs, child

externalizing behavior problems, and parenting stress in families of children with and without developmental disabilities.

PARENTING STRESS

The heightened stress experienced by parents of children with disabilities is a well-documented finding (Baker, Blacher, Kopp, & Kramer, 1997; Baker et al., 2003; Rodrigue, Morgan, & Geffken, 1990). Baker et al. (1997) discussed both the positive and negative impact that children with developmental delays have on their families. Although parents of children with delays reported levels of positive impact similar to those reported by parents of typically developing children, their reports of negative impact, a measure of parenting stress, were significantly higher. This increased stress was especially evident in areas associated with childrearing (Baker et al., 1997) but also was related to added financial strain, disruption of family plans, and restricted social lives (Gunn & Berry, 1987; Rodrigue et al., 1990). Although parenting stress appears to be higher on average among parents of children with developmental delays, previous analyses in the present sample found that increased stress among parents of 3-year-olds with delays related more strongly to these children's behavior problems than to their delay status (Baker, Blacher, Crnic, & Edelbrock, 2002). The current research focused on behavior problems as the main child-related stressor that parents face and examined the role of positive beliefs.

POSITIVE BELIEFS

In developing strategies to cope with the negative effects of life strains, people employ social and psychological resources (Pearlin & Schooler, 1978). Self-mastery and dispositional optimism represent two such psychological resources. Self-mastery involves a sense of personal responsibility for the events in one's life. Dispositional optimism involves a general positive expectation regarding future events regardless of one's control over the outcome (Scheier, Carver, & Bridges, 1994). Scheier and colleagues (1994) found that although self-mastery is conceptually distinct from optimism, these constructs are positively correlated.

Social psychological studies have provided a useful framework within which to conceptualize the impact of self-mastery and optimism in people's lives (Reed, Kemeny, Taylor, & Visscher, 1999; Taylor & Brown, 1988; Taylor, Lerner, Sherman, Sage, & McDowell, 2003). Although one's perception of control over life events and one's optimism about the future may be accurate reflections of the true degree of control one has, or of the actual likelihood of future positive events, many people display unrealistic beliefs about the degree to which they control events in their environments. Overly positive views of the self, an exaggerated sense of control over life events, and unrealistic optimism make up three cognitive biases that are most often referred to as positive illusions (Taylor & Brown, 1988). Research investigating positive illusions has connected these cognitions to better mental and physical health. One such study found that persons diagnosed with HIV/AIDS progressed less rapidly through the course of the disease when they held unrealistically positive views regarding their medical condition (Reed et al., 1999). The relation between positive beliefs and well-being has been explored extensively among people diagnosed with HIV and cancer, diseases that have clear negative outcomes (Boyd-Wilson, Walkey, & McClure, 2002; Boyd-Wilson, Walkey, McClure, & Green, 2000; Taylor & Brown, 1988; Taylor et al., 2003). In contrast to these types of medical diagnoses, a child's developmental delay does not have an objective negative outcome, and parents' positive beliefs regarding parenting a child with a delay may be realistic rather than illusory.

Considering positive beliefs further, we conceptualize self-mastery and dispositional optimism as traits that people bring with them to challenging situations. Pearlin and Schooler (1978) note that self mastery is a resource that people draw on when confronted with adversity. They note, however, that this resource is separate from the coping behaviors that people employ in such

situations; they found that although it is optimal to have both psychological resources and a coping repertoire, the possession of psychological resources is more likely to be beneficial in situations over which one has little direct control. This finding may have implications for parents dealing with the sometimes uncontrollable problems of raising a child with a developmental delay.

Previous work with the current sample has provided support for the link between self-mastery and parenting, showing that mothers' higher self-mastery at child age 4 years was associated with lower levels of both nonsupportive parenting and child behavior problems (Paczkowski & Baker, 2007). Furthermore, the association between self-mastery and child behavior problems was partially mediated by nonsupportive parenting reactions, suggesting one way in which self-mastery may play a role in the development and/or maintenance of child behavior problems.

Optimism and a sense of control are intimately connected (Tiger, 1979). Although supportive friends or luck may make people more optimistic, people may also derive feelings of optimism from having a sense of control. Scheier and Carver (1985) theorized that optimism, rather than one's sense of self-mastery, is the source of psychological adjustment. This notion is in keeping with the work of Beck and colleagues, who have described pessimistic thinking as creating a psychological vulnerability to experience negative emotions, which leads to symptoms of anxiety and depression (Clarke & Beck, 1999). Moreover, optimism has been shown to have positive effects on health, including fewer illnesses, better physician ratings of well-being, and longer survival after having a heart attack or being diagnosed with AIDS (Peterson, 2000).

The physical and psychological benefits of optimism likely derive from the relation between optimism and coping. Optimists have been found to employ more active, problem-focused coping strategies in the face of threat (Dougall, Hyman, Hayward, McFeeley, & Baum, 2001). When active coping appears impossible, optimists are also more likely to adopt strategies like acceptance and positive reframing of the situation. These strategies may result in what Wrosch and Scheier (2003) describe as goal adjustment. They propose that those who are able to adjust to unattainable goals are more likely to experience a good quality of life.

In addition to optimists' tendency to use more effective coping strategies, the coping strategies employed by optimists in controllable situations were associated with lower levels of subjective stress (Iwanaga, Yokoyama, & Seiwa, 2004). Chang (2002) also found that optimism moderated the relation between appraised stress and psychological symptoms, such that under high stress conditions, participants high in optimism showed far fewer symptoms than did those low in optimism. This finding has been extended into the parenting realm by Baker, Blacher, and Olsson (2005), who found that in the present sample at ages 3 and 4 years, less optimistic mothers, when faced with high levels of child behavior problems, reported lower scores on measures of well-being than did more optimistic mothers.

POSITIVE BELIEFS AND PARENTING

Within the very limited work on positive beliefs and parenting are several studies that address unrealistic beliefs, or positive illusions. Tiger (1979) described the relation between positive illusions and parenting, noting that unrealistic optimism and overly positive views of the self increase parents' willingness to sacrifice for their children. With regard to parenting, positive illusions may take the form of exaggerated beliefs about one's effectiveness as a parent or excessive optimism concerning the likelihood that things will improve during trying times. Larson (1998) addressed many of these issues in a qualitative study of mothers of children with various disabilities. These mothers described how the health professionals' predictions for their children were often contrary to their hopes. Though these predictions often served to temper the mothers' unrealistically positive beliefs for their children's futures, they also felt that

maintaining this hope was vital to their ability to continue in their parenting efforts. Larson conceptualizes these mothers' orientation toward parenting as an embracing of paradox. Although they accept that their children are limited in many ways by their disabilities and are most often acutely aware of this fact due to the great caregiving burden they face on a daily basis, these mothers still cling to a hope that things will improve.

Others have addressed positive beliefs and parenting, without the judgment as to whether or not such beliefs are realistic. Heiman (2002), in her qualitative work exploring resilience among parents of children with disabilities, found that parents' resilience was characterized by an optimistic outlook combined with acceptance of the child's disability. Although such qualitative exploration of the impact of parental cognitions on adjustment to parenting a child with a disability has been informative in shaping this area of research, there is still little well-controlled research in this area (Hassall & Rose, 2005). One study of caregivers of adults with disabilities showed that the relation between the positivity of the parent-child relationship and parents' psychological well-being was mediated by dispositional optimism (Greenberg, Seltzer, Krauss, Chou, & Hong, 2004).

The present research expands on the current body of literature by exploring how positive beliefs influence the relation between child behavior problems and parenting stress across cognitive delay status and early childhood. This bridges the gap between two largely disconnected bodies of literature by exploring positive beliefs, which have been previously examined primarily in the context of health psychology, as they relate to parenting. We explored three hypotheses regarding the ways in which positive beliefs might ultimately influence parenting stress. These are built on two assumptions, based upon prior research, that (a) greater child behavior problems are associated with higher parenting stress, and (b) positive beliefs constitute a stable dispositional factor that mothers bring to parenting. The first, main effect hypothesis, was that positive beliefs would account for additional variance in parenting stress, beyond child behavior problems. Specifically, mothers with higher self-mastery and optimism would report lower stress than mothers lower on these personality attributes. This hypothesis is supported by research that has found an association between high levels of self-mastery and optimism and lower levels of the stress hormone cortisol (Taylor et. al., 2003). The second, moderator effect hypothesis, was that positive beliefs would buffer the degree to which child behavior problems affect mothers' stress level, with mothers higher in positive beliefs displaying less parenting stress than mothers lower in positive beliefs (see Figure 1). The theoretical grounding for this hypothesis lies in early work exploring self-mastery and optimism that conceptualizes such traits as psychological resources that come into play when people are confronted with adverse circumstances (Pearlin & Schooler, 1978). Moreover, previous work with the current sample found that optimism moderated the relation between child behavior problems and parenting stress at age 3 (Baker et al., 2005). The third hypothesis was an extension of the main effect hypothesis. We predicted that the relation between mothers' positive beliefs and parenting stress would be mediated by child behavior problems, such that positive beliefs would lead to lower externalizing problems, which would, in turn, be associated with lower levels of parenting stress (see Figure 1). The potential impact of positive beliefs on child behavior follows from Ryan and Grolnick's (1986) work showing that parents' higher sense of control was associated with better child self-regulation. These hypotheses were explored across groups to determine whether positive beliefs function differently in families of children with and without developmental delays.

METHODS

Participants

Participants were 167 families recruited to take part in a longitudinal study, with samples drawn from central Pennsylvania and southern California. The children were classified as either

developmentally delayed (DD: $n = 72$) or typically developing (TD: $n = 95$). Families in the DD condition were recruited through community agencies serving persons with developmental disabilities. Recruitment was aimed at selecting children with undifferentiated delays in cognitive development. The selection criteria were that the child (a) be between 30 and 39 months of age, (b) receive a score between 40 and 84 on the Mental Development Index of the Bayley Scales of Infant Development II (Bayley, 1993), (c) be ambulatory, and (d) not be diagnosed with autism. Families in the TD condition were recruited primarily through preschools and daycare programs. The selection criteria were that the child (a) be between 30 and 39 months of age, (b) receive a score on the Bayley Scales of 85 or above, and (c) not be born prematurely or have a developmental disability.

The sample was predominantly married (85%) and ethnically diverse. Mothers' education averaged 15.3 years of school, and 50.3% of families had annual incomes above \$50,000. As shown in Table 1, maternal education and family income varied significantly between status groups, with families of children with DD having lower levels of both. These variables were examined as potential covariates. Though maternal education and family income were associated with some of the variables of interest, neither of these variables related to both the independent and dependent variable in any given analysis. Moreover, all analyses were conducted separately for each status group. Thus, these indicators of socioeconomic status were not covaried in subsequent analyses.

Assessments

In the longitudinal study we conducted annual assessments, beginning at child age 3 years; the present analyses involved assessments at child ages 3, 5, and 7 years. The present sample ($n = 167$) included all cases who participated in all three assessments. Measures of the child's developmental level were obtained at the first annual assessment, when the children were 3 years old. Staff visited the family home and administered the Bayley Scales of Infant Development (Bayley, 1993). Demographic information was gathered through an interview with the mother at each time point. Measures of parenting stress and child behavior were part of the packet of measures completed by mothers at each time point. Measures of self-mastery and optimism were completed by mothers only at the age 3 (and 4) assessments. At age 3, self-mastery and optimism were found to be moderately correlated ($r = .43, p < .001$). Mothers' scores on these measures were standardized and summed to create the positive beliefs variable, which yielded an acceptable alpha of .82.

Measures

Self-mastery scale (SMS; Pearlin & Schooler, 1978). The seven-item SMS measures one's perceived level of control over life events. Participants rate the degree to which they agree with each item on a 4-point Likert scale from 1 (strongly disagree) to 4 (strongly agree). Items include statements such as, "What happens to me in the future mostly depends on me." Previous studies employing this measure have reported Cronbach's alphas of .77 (Marshall & Lang, 1990) and .75 (Scheier et al., 1994). Pearlin and Schooler (1978) determined the discriminant validity of the SMS by factor analyzing a number of items measuring various psychological resources, finding that self-mastery is distinct from self-esteem and low levels of self-denigration. In the present sample, mothers' self-mastery scores were stable from child ages 3 to 4, with a correlation of $r = .57, p < .001$. The alpha for mothers in this sample at child age 3 was .75.

Life orientation test-revised (LOT-R; Scheier et al., 1994). The six-item LOT-R measures dispositional optimism, or people's generalized positive expectancies about the future. Participants rate each item (plus four distracter items) on a 5-point Likert scale from 0 (*I disagree a lot*) to 4 (*I agree a lot*). Items include statements such as, "In uncertain times, I

usually expect the best,” and “If something can go wrong for me, it will.” Sheier et al., (1994) reported a Cronbach's alpha of .78 for this measure within a sample of undergraduates and analyzed the association between depression and the LOT-R; controlling for neuroticism, anxiety, self-mastery, and self-esteem, they found that the LOT-R had adequate predictive and discriminant validity. In the present sample, mothers' optimism scores were stable from child ages 3 to 4, $r = .74$, $p < .001$ (Baker et al., 2005). The alpha for mothers in this sample at child age 3 was .80.

Family impact questionnaire (FIQ; Donenberg & Baker, 1993). The 50-item FIQ assesses the “child's impact on the family compared to the impact other children his/her age have on their families” (e.g., Item 1: “My child is more stressful”). Parents rate the degree to which they agree with each item on a 4-point Likert scale from not at all to very much. This instrument has six subscales that measure negative impact on Feelings About Parenting, Social Relationships, Finances, and, if applicable, Siblings and Marriage, as well as Positive Impact. A combined scale (20 items) assessing overall negative impact sums the first two negative impact subscales (Negative Impact on Feelings About Parenting and Social Relationships). The combined negative impact score was the measure of parenting stress in the present study. The FIQ Negative Impact on Social Relationships score has previously been found to correlate positively ($r = .84$) with the Child Domain of the Parenting Stress Index (PSI; Abidin, 1983; Donenberg & Baker, 1993). In the current sample, mothers' FIQ scores were stable across child ages 3, 5, and 7 with correlations ranging from $r = .66$, $p < .001$ to $r = .83$, $p < .001$. The alpha for mothers in this sample at child age 3 was .92.

Child behavior checklist (CBCL) for ages 1.5–5 and child behavior checklist (CBCL) for ages 6–18 (Achenbach & Rescorla, 2001). The version of the CBCL for ages 1.5–5 is designed to assess the competencies and problems of preschool age children. This scale has 99 items that describe childhood problems, listed in alphabetical order. The version of the CBCL for ages 6–18 is designed to assess the competencies and problems of school age children and consists of 118 items that describe childhood problems. On the CBCLs, participants rate how well each item applies to their child now or within the past 2 months, on a scale of 0 (not true), 1 (somewhat or sometimes true), and 2 (very often or often true). The CBCLs yield a Total problem score, broad-band Externalizing and Internalizing scores, and narrow-band scales. The Externalizing scores were used in the present analyses. The raw score is converted to T scores, with a mean of 50 and standard deviation of 10. In the present sample, mothers' CBCL Externalizing scores were stable across child ages 3, 5, and 7 with correlations ranging from $r = .57$, $p < .001$ to $r = .71$, $p < .001$. The alpha for mothers in this sample for the CBCL Externalizing scale at child age 3 was .90.

RESULTS

Overview of Analyses

All analyses were conducted with the DD and TD subsamples separately to allow for the examination of how the relations among the constructs of interest may operate differently among mothers of children with and without developmental delays. We first examined the relation between child behavior problems and parenting stress by examining Pearson correlation coefficients. Also, independent samples *t* tests were employed to determine how means of each variable of interest varied across status groups (DD, TD). Repeated measures analyses of variance were then conducted to determine how levels of externalizing behavior and parenting stress varied across children's age.

Following the preliminary analyses, we conducted three sets of analyses to address the alternative hypotheses regarding the way positive beliefs influence the relation between externalizing behaviors and parenting stress (main, moderator, and mediator effects). To

examine main effects, Pearson correlation coefficients were employed to determine whether positive beliefs were significantly associated with child externalizing behavior and parenting stress, and hierarchical regression was used to determine whether positive beliefs contributed to the predication of parenting stress above and beyond child externalizing behaviors. To examine positive beliefs as a moderator of the relation between child behavior problems and parenting stress, we employed hierarchical regression. To examine mediation, we utilized hierarchical regression analyses and employed the Sobel (1982) test to determine whether the indirect effect of positive beliefs on parenting stress via the externalizing behaviors variable was significantly different from zero, which would indicate a mediating effect of externalizing behaviors.

Correlations between child externalizing behaviors and parenting stress. Bivariate correlations among the variables of interest revealed the same relation between child behavior problems and parenting stress that has previously been established in the literature. Children's externalizing behavior was positively associated with parenting stress at ages 3, 5, and 7 in the TD group ($r = .65, .80, \text{ and } .70$, respectively, $p < .001$) and DD group ($r = .66, .76, \text{ and } .57$, respectively, $p < .001$).

Status group (DD-TD) differences—Table 2 shows mean scores for the key variables by status group. Positive beliefs, assessed only at child age 3, were only slightly, but significantly, higher in mothers of TD versus DD children. Externalizing behavior problems were significantly higher for DD versus TD children at ages 3, 5, and 7. Similarly, mothers' scores for parenting stress were significantly higher for DD versus TD children at ages 3, 5, and 7.

Repeated measures ANOVA—Repeated measures analyses of variance were conducted with age 3 child cognitive status (DD vs. TD) as the independent variable and mothers' reports of externalizing behavior and parenting stress at ages 3, 5, and 7 as the dependent variables. Externalizing behavior varied significantly by children's age ($F(2, 328) = 13.54, p < .001$) with higher levels reported when children were older. Parenting stress did not vary across children's age.

Positive beliefs: main effects—Table 3 shows correlations between mothers' positive beliefs, measured at age 3, and parenting stress at child ages 3, 5, and 7. Among mothers of children in the DD group at all three assessment points, there was a significant relation, such that higher positive beliefs were related to lower parenting stress. However, in the TD group this relation was found only at age 3.

Table 3 also shows correlations between mothers' positive beliefs measured at age 3 and child externalizing behaviors at child ages 3, 5, and 7. There was a significant negative relation within the DD group, with higher positive beliefs related to lower child externalizing behavior at all three assessment points. Among mothers of children in the TD group, a significant relation was found only at child age 3.

Additionally, hierarchical regression was employed to examine whether positive beliefs had an independent effect on parenting stress above and beyond the effect of child externalizing behaviors. Within the TD group, positive beliefs predicted parenting stress at ages 3 ($\beta = -.17, t(94) = -2.16, p < .05$) and 7 ($\beta = -.24, t(94) = -3.37, p = .001$) above and beyond concurrent ratings of child externalizing behaviors at ages 3 and 7. Within the DD group, positive beliefs predicted parenting stress above and beyond child externalizing behaviors at age 3 ($\beta = -.31, t(70) = -3.07, p < .01$). Thus positive beliefs emerged as an independent predictor primarily at child age 3, the assessment point at which positive beliefs were assessed.

Moderation analyses—Using hierarchical regressions, we explored whether mothers' positive beliefs measured at age 3 moderated the relation between children's externalizing behavior and parenting stress across each of the three time points. The positive beliefs and externalizing scores were converted to *z* scores and multiplied to create the interaction term (which would indicate moderation). The dependent variable was parenting stress. The independent variables were the positive beliefs *z* score, the child externalizing *z* score, and the interaction term. Six regressions were conducted, at child ages 3, 5, and 7, for DD and TD groups. The interaction term was significant in only one analysis. At child age 3 there was significant moderation for DD families, ($\beta = -.263, p < .05$). When mothers reported lower levels of externalizing behaviors, parents at all levels of positive beliefs reported similar levels of parenting stress. However, when mothers reported higher levels of externalizing behavior, mothers with higher levels of positive beliefs reported lower levels of parenting stress. This moderation effect was not found at age 3 for TD families ($\beta = -.014, p = .86$). At age 5, the moderation effect was not found for either the DD ($\beta = -.098, p = .32$) or TD groups ($\beta = .020, p = .76$). At age 7, the moderation effect was also not found for the DD group ($\beta = -.065, p = .63$) or the TD group ($\beta = .023, p = .78$). Thus there was limited support for the hypothesis that positive beliefs will have a moderating effect on the relation between child behavior problems and parenting stress, appearing only for the DD group and at age 3 when all measures were taken concurrently.

Mediation analyses—Children's externalizing behaviors were explored as a mediator of the relation between positive beliefs and parenting stress. The prerequisite conditions for using multiple regression to test for mediation were met when the independent variable (positive beliefs), the mediator (externalizing score), and the dependent variable (parenting stress) were significantly related to one another. The correlations shown in Table 3 indicate that these conditions were met for both DD and TD groups at child age 3 and for the DD group at ages 5 and 7. Tables 4 and 5 display the results of these analyses. Within the DD group, there was partial mediation at age 3 and full mediation at ages 5 and 7. Within the TD group, partial mediation was found at age 3. Thus, mothers' positive beliefs affect their stress levels, in part, by influencing the child's extent of challenging behavior, especially among mothers of children with developmental delays.

The mediation effect was also examined longitudinally—Among mothers of DD children, positive beliefs measured at age 3 were found to be significantly associated with child behavior problems at age 5 ($r = -.27, p < .05$) and parenting stress at age 7 ($r = -.34, p < .01$). Age 5 child behavior problems were also found to relate to age 7 parenting stress ($r = .64, p < .001$). Having established the prerequisite relations to test mediation, the Sobel test was employed and significant full mediation was found (Sobel test statistic = $-2.20, p < .05$). The prerequisite correlations among the variables of interest were not found for mothers of TD children.

DISCUSSION

The main, moderating, and mediating effects of mothers' positive beliefs on parenting stress were examined. In preliminary analyses, mothers of children with developmental delays (DD), compared with mothers of children with typical development (TD), reported lower levels of positive beliefs at child age 3, the point at which these were assessed. Also, the mothers of DD group children reported higher levels of child externalizing behaviors and higher levels of parenting stress than mothers of TD group children when examined at child ages 3, 5, and 7 years. These findings suggest that mothers of children with delays are facing greater caregiving challenges (externalizing behavior/stress) yet have fewer cognitive resources to draw on to cope with these challenges (positive beliefs). Subsequent analyses were conducted to explore the pattern of relations among these variables.

The relation between child behavior problems and parenting stress reported in the literature was found at all three assessment points (child ages 3, 5, and 7 years). Children's externalizing behaviors were significantly associated with mothers' reports of parenting stress in both the DD and TD groups, and this relation was stable across time. However, repeated measures analyses of variance revealed that externalizing behavior problems increase slightly over time, whereas parenting stress does not change significantly over time. This increase, though, may be attributable to the change in CBCL versions from ages 3 and 5 (1½–5-year version) to age 7 (6–18 version). An examination of the means for the externalizing *t* scores across ages 3 to 7 reveals that means for this measure actually decrease over ages 3, 4, and 5 and then sharply increase between ages 5 and 6 when the new version of the measure is introduced. Such a discontinuous transition is likely attributable to the change in the composition of the externalizing scale from one version to the next, with Aggressive Behavior and Attention Problems forming this scale in the 1½–5 version and Aggressive Behavior and Rule-Breaking Behavior forming the scale in the 6–18 version.

Three hypotheses concerned the relation between positive beliefs and parenting stress. The first, main effect hypothesis, was supported, with higher levels of positive beliefs significantly associated with lower parenting stress among mothers in the DD group at all ages examined and for the TD group at age 3. This is consistent with findings by Taylor and colleagues that baseline cortisol levels, as an indicator of hypothalamic-pituitary-adrenocortical axis responses to stress, were lower among persons who displayed self-enhancing illusions (Taylor et al., 2003). Moreover, this relation was mediated by participants' higher levels of two psychological resources: self-mastery and optimism.

A closer inspection of the present mean levels of parenting stress also revealed that the extreme group scores were as one would expect: mothers of typically developing children with high levels of positive beliefs whose children were low in externalizing behavior reported the lowest levels of parenting stress, whereas mothers of children with delays who reported low levels of positive beliefs and whose children were high in externalizing behavior reported the highest levels of parenting stress. Consistent with this, positive beliefs were found to have an independent main effect relation to parenting stress above and beyond the effect of child behavior problems for both the TD and DD groups at age 3 and for the TD group at age 7. It is understandable that the relation was strongest at child age 3, when positive beliefs were measured. Even though positive beliefs are viewed as a trait, we would expect some change across time points, so a limitation of this study is that positive beliefs were not assessed at each time point.

Having established that child behavior problems and positive beliefs were both associated with parenting stress, we sought to determine how positive beliefs impacted the relation between externalizing behaviors and parenting stress beyond the main effect found. Two possible mechanisms were assessed. The first, moderation, was that positive beliefs would buffer the relation between child behavior problems and parenting stress, such that mothers with higher positive beliefs would not experience as great an increase in stress as mothers with low positive beliefs would when faced with high child behavior problems. This moderation effect was found only for mothers of children with delays at age 3. Thus there was very little indication of a moderating effect of positive beliefs. Again, given that positive beliefs were measured at age 3, the relations examined could be expected to be strongest at this age. This finding is also in keeping with the work of Baker et al. (2005), who previously employed the combined (DD and TD groups) Collaborative Family Study sample to examine optimism as a moderator of the relation between CBCL total behavior problems and negative impact (parenting stress). The present work builds on this previous study, showing that the moderating effect of positive beliefs, which combines both optimism and self-mastery, is present within the delayed group

at age 3 but not in the typically developing group. The failure to replicate the moderation effect at ages 5 and 7 is likely due to the lack of a concurrent measure of positive beliefs.

The second proposed mechanism, mediation, is that positive beliefs affect parenting stress via their relation to children's externalizing behaviors. There was fairly consistent support for this mechanism from DD group analyses at child ages 3, 5, and 7 and from TD group analysis at child age 3. These findings are consistent with the argument that mothers' positive beliefs aid their children in developing higher levels of self-regulation, which reduces their externalizing behaviors, leading to lower parenting stress. In addition, longitudinal analyses showed that within the DD group, higher positive beliefs at age 3 predicted lower parenting stress at age 7 and that this effect was fully mediated by children's externalizing behavior assessed at age 5. These findings extend the mediation hypothesis, suggesting that the dispositional factors (positive beliefs) that characterize mothers early in parenting are related to their children's behavior two years later and to their own stress as much as four years later. Alternatively, mothers who report more positive beliefs may have more positive views overall, leading to lower reported levels of their children's externalizing behavior and less reported parenting stress.

These findings have implications for intervention, as increasing mothers' positive beliefs during early childhood could aid in reducing their stress, both directly and through the mechanism of reducing their children's externalizing behaviors. Seligman's (1991) work on learned optimism, the positive counterpart of learned helplessness, provides a framework for conceptualizing interventions for parents that focus on increasing optimism and self-mastery as buffers against the adversity inherent in raising challenging children. Gillham, Reivich, Jaycox, and Seligman (1995) developed an intervention program for children that employs aspects of cognitive behavioral therapy to promote the development of optimism. Based on the differing patterns of relations found in the DD versus TD groups, such an intervention would be most beneficial if adapted for mothers of children with developmental delays. Among these mothers, positive beliefs may be especially helpful in coping with high levels of behavior problems. Also, although not explicitly predicted, the more consistent impact of positive beliefs within the DD group is in keeping with previous studies, suggesting that family influences matter more with children at-risk. In their study of preterm and full-term infants, for example, Crnic and Greenberg (1987) found that family functioning had a greater impact on development among the high-risk children.

The present study extended the current literature on positive beliefs by bridging the gap between the study of these traits as they relate to stress and physical well-being and the study of stress within the domain of parenting. The findings must be interpreted with caution, though, due to the modest size of some of the correlations. Additionally, the results are limited by the availability of the positive beliefs variable, which was collected only at age 3. Although positive beliefs are thought to be a stable trait, examining the changes in this variable across time as well as its concurrent relations to other variables of interest would be informative. The assessment of parents' sense of self-mastery and optimism only at age 3 may be particularly problematic because children, especially those with DD, are likely to increase in their need for additional services upon school entry. Previous work has shown that parents' partnerships with service professionals have a significant impact on their sense of control and feelings of empowerment with regard to parenting their children with disabilities (Dunst & Dempsey, 2007). Given these potential changes in mothers' positive beliefs across the time points we examined, stronger associations among the variables of interest may have been found had a measure of positive beliefs been available at ages 5 and 7.

Our findings indicate the beneficial effects of being high on the personality attributes of dispositional optimism and a sense of self-mastery or the detrimental effects of being low on

these attributes. Whether a given mother's high optimism and self-mastery are, to some extent, "positive illusions," or rather a more accurate assessment of how her life will unfold, cannot be determined as well in the parenting domain as in the case of health outcomes. In the latter, many diseases come with actuarial predictions of mortality and these serve as benchmarks against which to assess the operation of personality attributes. Future investigation of these constructs within the realm of parenting children with disabilities would benefit from a more nuanced assessment of the degree to which parents' positive beliefs represent illusions and the degree to which illusory levels of optimism and self-mastery are helpful or harmful in parenting.

Future research could expand on the current work by examining the larger context within which the family is situated, including socioeconomic factors, larger family systems, and cultural values that may contribute to the development of a person's degree of optimism/self-mastery as well as parenting style. Additionally, the exploration of other types of observable parent behavior could add to our understanding of how parents' self-mastery and optimism manifest themselves and come to influence child behavior and whether this influence is carried through specific parenting strategies or by parents' modeling of their own self-regulatory abilities.

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FIGURE 1.
Moderation model and mediation model.

TABLE 1

Demographic Information by Cognitive Status Group

Child variables	DD (<i>n</i> = 72)	TD (<i>n</i> = 95)	<i>t</i> / χ^2
Gender (% boys)	64	53	$\chi^2 = 2.12$
Race (% White)	56	61	$\chi^2 = .51$
Bayley Scales: Mental Development Index	61.1 (<i>SD</i> = 13.3)	104.9 (<i>SD</i> = 11.7)	<i>t</i> = 22.60**
Family variables			
Maternal marital status (% married)	77.8	90.5	$\chi^2 = 5.45$
Maternal education (mean grade completed)	14.4 (<i>SD</i> = 2.2)	15.9 (<i>SD</i> = 2.4)	<i>t</i> = 4.18**
Maternal employment (% employed)	49	63	$\chi^2 = 3.53$
Family income (% \$50K+)	40	58	$\chi^2 = 5.09^*$

Note: DD = Developmentally Delayed;

TD = Typically Developing.

*
p < .01.

**
p < .001.

TABLE 2

Means for Key Variables by Status Group (*n* = 167)

Variable	DD		TD		<i>t</i> score
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
3 year positive beliefs	36.3	7.3	38.7	6.3	-2.32*
3 year externalizing behavior	55.9	10.2	49.7	9.9	3.98***
5 year externalizing behavior	53.9	13.5	46.4	10.7	-3.98***
7 year externalizing behavior	56.3	11.5	51.5	10.5	-2.78**
3 year parenting stress	17.9	12.4	10.8	7.6	4.26***
5 year parenting stress	17.1	12.1	10.4	8.2	-4.03***
7 year parenting stress	16.7	11.2	10.4	8.5	-3.94***

Note: DD = Developmentally Delayed;

TD = Typically Developing.

* *p* < .05.

** *p* < .01.

*** *p* < .001.

TABLE 3

Correlations Between Positive Beliefs Assessed at Age 3 and Child Behavior and Parenting Stress Across Age and Delay Status ($n = 167$)

	Externalizing behavior		Parenting stress	
	DD	TD	DD	TD
3 year	-.54***	-.22*	-.58***	-.30**
5 year	-.27*	-.16 ^{ns}	-.31**	-.17 ^{ns}
7 year	-.38**	.06 ^{ns}	-.34**	-.19 ^{ns}

Note: DD = Developmentally Delayed;

TD = Typically Developing.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

TABLE 4

Externalizing Behavior as a Mediator of the Positive Beliefs/Parenting Stress Relation for Mothers of Children with Developmental Delays at Child Age 3, 5, and 7 ($n = 72$)

Mothers—age 3 Regression model						
Parenting stress	Mean square	df	β	SE β	β	Sobel test
Model 1	3644.20	1				
Positive beliefs			-.387	.66	-.58***	-3.59***
Model 2	2763.72	2				
Positive beliefs			-2.09	.68	-.31**	
Externalizing behavior			.71	.15	.49***	
Note. $R^2 = .33$ for Step 1 ($p < .001$); $\Delta R^2 = .17$ for Step 2 ($p < .001$).						
Mothers—age 5 Regression model						
Parenting stress	Mean square	df	β	SE β	β	Sobel test
Model 1	992.37	1				
Positive beliefs			-2.02	.74	-.31**	-2.27*
Model 2	2996.71	2				
Positive beliefs			-.74	.53	-.11	
Externalizing behavior			.81	.09	.73***	
Note. $R^2 = .10$ for Step 1 ($p < .01$); $\Delta R^2 = .49$ for Step 2 ($p < .001$).						
Mothers—age 7 Regression model						
Parenting stress	Mean square	df	β	SE β	β	Sobel test
Model 1	1037.30	1				
Positive beliefs			-2.06	.69	-.34**	-2.81**
Model 2	1519.36	2				

Mothers—age 3 Regression model	Mean square	df	β	SE β	β	Sobel test
Positive beliefs			-.87	.65	-.14	
Externalizing behavior			.62	.13	.51***	

Note. $R^2 = .12$ for Step 1 ($p < .01$); $\Delta R^2 = .22$ for Step 2 ($p < .001$).

*
 $p < .05$.
**
 $p < .01$.

 $p < .001$.

Externalizing Behavior as a Mediator of the Positive Beliefs/Parenting Stress Relation for Mothers of Typically Developing Children at Child Age 3 Years
(*n* = 95)

TABLE 5

Mothers—age 3 Regression model	Mean square	<i>df</i>	β	<i>SE</i> β	β	Sobel test
Parenting stress						
Model 1	496.28	1				−2.07 *
Positive Xs			−1.45	.47	−.30 **	
Model 2	1209.43	2				
Positive Xs			−.81	.38	−.17 *	
Externalizing behavior			.60	.08	.61 ***	

* *p* < .05.
** *p* < .01.
*** *p* < .001.