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Permalink

<https://escholarship.org/uc/item/0qn3z527>

Journal

American Journal on Intellectual and Developmental Disabilities, 120(4)

ISSN

1944-7515

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Publication Date

2015-07-01

DOI

10.1352/1944-7558-120.4.346

Peer reviewed

Reconceptualizing Family Adaptation to Developmental Delay

Anita L. Pedersen, Keith A. Crnic, Bruce L. Baker, and Jan Blacher

Abstract

This study explores accurate conceptualization of the adaptation construct in families of children with developmental delay aged 3 to 8 years. Parents' self-reported measures of adaptation and observed dyadic relationship variables were examined. Confirmatory factor analysis and longitudinal growth modeling were used to evaluate the nature of adaptational processes. Results indicate that adaptational processes vary across adaptation index, child developmental level, and parent gender. Adaptation indices did not load onto a single construct at any time point. Several adaptational processes remained stable across time, although others showed linear or quadratic change. The findings of the current study indicate that it is time for a change in how adaptation is conceived for families of children with developmental delay.

Key Words: *adaptation; family; child; developmental delay; developmental disability; longitudinal; multigroup longitudinal growth curve analysis; confirmatory factor analysis*

All families grow and adjust in response to challenging and positive events over time. That process of adjustment may vary, depending on the potential risks that may be present and the family's available resources. In particular, a family of a child with developmental delays may experience and respond to both positive and negative changes in their family life. But despite much theoretical and empirical debate about the processes inherent to family adjustment, there is little longitudinal, empirical study of a family's adaptation to risk, particularly when the risk is associated with the presence of children with developmental delay or intellectual disability (Fenning, Baker, Baker & Crnic, 2014; Friedman, Holmbeck, Jandasek, Zukerman, & Abad, 2004; Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001; Mink, Nihira, & Myers, 1983; Neece, Green, & Baker, 2012).

Early theory involving parental adaptation to child intellectual disability suggested that parents would experience "chronic sorrow" (Olshansky, 1962) or a series of crises (Wolfsenberger & Menolascino, 1970) in response to discovering

their child had a disability. Though later conceptual and empirical approaches have focused on a range of adaptive processes associated with having a child with disability in the family (Azad, Blacher, & Marcoulides, in press; Blacher & Baker, 2007; Blacher, Begum, Marcoulides, & Baker, 2013; Crnic, Friedrich, & Greenberg, 1983; Glenn, Cunningham, Poole, Reeves, & Weindling, 2009; Glidden & Johnson, 1999; Hall et al., 2012; Summers, Behr, & Turnbull, 1989; Trute, Benzies, Worthington, Reddon, & Moore, 2010), relatively little is known about how family adaptive processes change over time. Family functioning, whether in a family of typically developing individuals, or in a family of a child with developmental delay, represents a dynamic transactional process that cannot effectively be captured at a single point in time or by focusing exclusively on single family members such as mothers. Indeed, the growing research attention to fathers, who bring unique perspectives to parenting and the family (Day, Lewis, O'Brien, & Lamb, 2005), is illustrative of the need for greater inclusion.

Although there is no single consistent theoretical model that attempts to explain adaptation processes in general (Turnbull, Summers, Lee, & Kyzar, 2007), Sameroff's (2010) unified theory of development provides a coherent framework from which to examine these processes. Sameroff (2010) posits that human development involves the complex integration of multiple factors that continually change over time as a function of ongoing transactions within the child; between the child and his or her family, peers, and teachers; and with the greater community. He further argues that attempts to distill this complex model into smaller, simpler parts ultimately cannot capture the true nature of development, although individual studies may provide insight into one aspect of the greater, multifaceted whole. For example, families likely face multiple adaptational challenges when a child is identified as having developmental delays, including parent psychological adjustment to the child's disability, new contextual stressors such as financial strain and increased caregiving burden, and relationship adjustments both within and outside the family. Each of these adaptational processes can be construed as components of a greater developmental process, although it is not clear that these components actually fit an integrated or coherent "whole" that reflects a single adaptational outcome.

Family response to conditions of risk has been conceptualized in multiple ways, with little consensus on definition of adaptive response and rare focus on more than single-point-in-time assessments of individual family attributes (Turnbull et al., 2007). Indeed, family well-being, family adaptation, family adjustment, and family functioning have been used interchangeably to refer to the adaptation process, and parent stress, parent psychological symptoms, and marital functioning have been frequent adaptational indices of interest (Turnbull et al., 2007). But underlying much of the research has been an implicit notion that family adaptation reflects a single unified construct in which there is reasonable coherence across functional domains (for example, see Dodd, Zabriskie, Widmer, & Eggett, 2009; Povee, Roberts, Bourke & Leonard, 2012; Thompson, Hiebert-Murphy, & Trute, 2013). The validity of this assumption however has yet to be systematically verified. Indeed, research on emotion indicates that individuals can feel both intense positive and negative emotions in response to an event (Larsen, McGraw, & Cacioppo, 2001; Russell & Carroll, 1999). It

stands to reason that these perspectives could be broadened to apply to other adaptational responses, supporting a complex pattern of adjustment in which responses may vary from maladaptive to more positive adjustment.

Whether studies have considered a more multifaceted approach to family adaptation (e.g., Britner, Morog, Pianta, & Marvin, 2003; Friedman et al., 2004; Kazak & Marvin, 1984), or single individual measures of adaptation (Hassall, Rose, & McDonald, 2005; Hauser-Cram et al., 2001; Quittner & DiGirolamo, 1998; Thompsen, Gustafson, Hamlett, & Spock, 1992), unique functional processes differentially predict family adaptational response. For example, in their examination of associations among multiple aspects of family adaptation (parent stress, symptomatology, and marital satisfaction) and child functioning in families of children with and without spina bifida, Friedman and colleagues (2004) found that individual indices of parent functioning differentially predicted child outcomes. Maternal symptomatology predicted child internalizing behavior, whereas paternal symptomatology predicted child externalizing behavior and child depression, and both father parenting stress and mother and father marital satisfaction predicted child adaptive behavior (Friedman et al., 2004).

Evidence is likewise beginning to accrue that family adaptational processes show unique trajectories over time in families of children with developmental delays. In a study of families who had adopted children with developmental delays, Glidden and Johnson (1999) examined maternal adjustment over time and found that, although depression levels showed a small but significant increase over time, maternal stress, assessment of family strengths, and marital satisfaction remained stable. Few other studies of families of children with developmental delays have examined and compared different adaptational processes in this manner over time, making it difficult to reach firm conclusions about the nature of family adaptation across multiple domains of functioning.

In efforts to define family adaptation, constructs involving family stress, parent psychological symptoms, and marital satisfaction have all been considered as key elements. Specifically, parenting stress and the accumulation of numerous minor daily stresses associated with child rearing, in particular, may be uniquely meaningful for the well-being of families of children with developmental delays (Crnic & Low, 2002;

Minnes, 1988; Stoneman, 1997). Longitudinal studies have shown that high levels of parent stress are associated with later child externalizing behaviors (Friedman et al., 2004), as well as less positive mother-child interactions later in childhood (Crnic, Gaze, & Hoffman, 2005). Furthermore, for families of children with developmental delays, findings suggest bidirectionality in the link between parent stress and childhood behavior problems across the early- to middle-childhood period (Neece et al., 2012). When measured concurrently, parent stress is associated with poor maternal perceptions of the family (Dyson, 1997), lower marital satisfaction (McCarthy, Cuskelly, van Kraayenoord, & Cohen, 2006), and poorer satisfaction with parenting (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983). In addition to greater stress, parents of children with developmental delays report more symptoms of depression than parents of typically developing children (Bristol, Gallagher, & Schopler, 1988; Fisman, Wolf, & Noh, 1989; Moes, Koegel, Schreibman, & Loos, 1992; Singer, 2006). In families of children with delays, parent psychosocial maladjustment (e.g., depression, anxiety) has been associated with concurrent poor marital satisfaction (Kilic, Gencdogan, Bag, & Arican, 2013) and later child behavior problems (Friedman et al., 2004), and is also predicted by child behavior problems (Baker, Blacher, & Olsson, 2005). Likewise, marital satisfaction has substantial implications for family well-being, with established links to lower parent stress, fewer psychological symptoms, and fewer child behavior problems in families of children with developmental disabilities (Kersh, Hedvat, Hauser-Cram, & Warfield, 2006; Norlin & Broberg, 2013). Low marital satisfaction has likewise shown predictable associations with later child behavior problems in families of children with spina bifida (Friedman et al., 2004). Although evidence supports the importance of multiple components of family adaptation, and infrequent longitudinal studies suggest the ability of specific family factors to influence both child and parent well-being, a unifying conceptual framework that underlies such connections remains elusive.

Parent stress, parent psychological symptoms, and marital satisfaction each contribute to an understanding of family adaptation, but broader family relationships are also key to family well-being. Though relatively few studies have examined how family relationships are linked to

adaptation under conditions of developmental risk, there is evidence that controlling and negative parenting behavior is associated with parent-reported feelings of caregiving burden and stress in families of children with intellectual disability (Floyd & Saitzyk, 1992). Negative and controlling maternal behavior has also been associated with later child behavior problems, and child behavior problems in turn predicted fathers' later parenting behaviors (Fenning et al., 2014). In contrast, mothers' supportive parenting and mother-child dyadic pleasure has been associated with later increases in child adaptive behavior (Fenning & Baker, 2012). Similarly, observed mother-child warmth and positive regard has been linked with a decreased likelihood of later child behavior problems (Popp & Wilcox, 2012). Although the adaptation literature has focused primarily on parent reports, and concentrated on individual family member reactions rather than the family as a whole (Crnic, Pedersen y Arbona, Baker & Blacher, 2009), observational measures of family relationship quality would provide a much-needed multifaceted approach to family adaptation.

Comprehensive, longitudinal approaches best explore the complexities of family adaptation when children present with substantial developmental risk. However, most studies addressing family adaptation have historically been too limited in scope to fully address the operative transactional processes involved. Nevertheless, recent research has begun to correct the gaps in the literature in several ways. First, fathers are more frequently included in studies of family functioning when a child has a disability (Crnic et al., 2009; Dąbrowska, 2008; Lanfranchi & Vianello, 2012; Shin et al., 2006; Trute, Hiebert-Murphy, & Levine, 2007), as are siblings (Neece, Blacher, & Baker, 2010). Likewise, studies are more frequently employing longitudinal designs, observational methods, and comparison groups, although longitudinal, multifamily member, observation-based research on family adaptation is still infrequent (Blacher & Baker, 2002). The current study seeks to build on recent efforts and provide a more nuanced, complex, and comprehensive view of family adaptational processes over time, particularly by including data from fathers as well as mothers.

Fathers are essential to a full understanding of adaptational processes for families of children with developmental delay (Crnic et al., 2009).

There are contrasting reports as to whether mothers of children with disabilities feel more stressed than fathers (Shin et al., 2006), or whether more equal levels of stress are experienced (Dąbrowska & Pisula, 2010; Lanfranchi & Vianello, 2012; McCarthy et al., 2006). Regardless of stress levels, evidence indicates that fathers' stress shows stronger relations to children's temperament (Krauss, 1993), children's maladaptive behaviors (Frey, Greenberg, & Fewell, 1989; Krauss, 1993; Macias, Saylor, Haire, & Bell, 2007), and quality of the father-child relationships (Krauss, 1993; Macias et al., 2007) than does mothers' stress. Too, there is evidence that fathers of children with disabilities perceive families as less cohesive and adaptive than mothers (Krauss, 1993), have more difficulty adjusting to their child's disabled status than mothers (Frey et al., 1989), and recognize the positive impact of their child later than mothers. But it also appears to be the case that fathers who use problem-focused coping tend to feel more positive about their marriages, and wives of those men in turn feel better about their marriages (Stoneman & Gavidia-Payne, 2006). In general, it seems clear that paternal perspectives add importantly to constructions of family adaptation. Fathers appear to be equally influential as mothers, but the extent to which their influence involves different developmental attributes and processes remains largely unknown.

The Current Study

The current study examines the nature of family adaptation, exploring whether adaptation reflects a single global construct or is better considered from a more differentiated approach in which individual facets of parent and family functioning do not coalesce, but rather vary differentially across parent, across component, and over time. The degree to which child developmental delay is associated with specific adaptational trajectories across childhood is of particular interest.

Historically, adaptation has been considered as unidimensional or consistent across multiple domains. Typically, it has been treated as if it reflected a single composite or latent factor. We challenge that perspective, contrasting a composite construct with a multi-index approach that characterizes variability in adaptive functioning across domain and over time. We hypothesized that adaptation is best characterized by a multi-index approach in which child developmental

competencies are differentially associated with multiple parent and family adaptation indices across time. To evaluate this hypothesis, we first empirically tested whether a global factor conceptualization offers an accurate representation of adaptational processes. Next, we explored adaptation as a multi-index construct, examining the unique trajectories of each adaptation index across time. Finally, we examined how trajectories of adaptation varied by developmental risk group (children with or without developmental delays), in order to more fully understand the complexities of adaptational processes in families of children with developmental delays.

Methods

Design Overview

Data for the current study were drawn from a multisite, longitudinal investigation that prospectively examined the interrelations among children's developmental status, family processes, child characteristics, and the emergence of psychopathology in young children aged 3 to 9 years. Data were collected using a multimethod approach involving structured parent interviews; independent observations of parent-child interaction in naturalistic and lab-based settings; and questionnaires assessing a wide-range of variables related to family functioning, parental psychopathology, and child behavior problems. Children's cognitive functioning was assessed at entry into the study and again at ages 5 and 9 to determine developmental competencies. The current study incorporated longitudinal data collected from child assessments, naturalistic home observations, parent interviews, and parent questionnaires across child from ages 3 to 8.

Participants

Participants for the current study included children with early identified developmental delays as well as children who were typically developing and their families. Families were recruited from community agencies, such as family resource centers, early intervention programs, preschools, and day-care centers, as well as via flyers posted throughout the community. Approximately one-third of the families were recruited from rural/suburban communities in Central Pennsylvania, and two-thirds of the families were recruited from the Los Angeles area. This multisite design allowed for a more

geographically and ethnically diverse sample. Exclusion criteria for the larger study included severe neurological impairment (e.g., cerebral palsy), autism, nonambulation, and a history of abuse.

At entry into the study at 3 years of age, each child's cognitive functioning was assessed with the Mental Development scale from the Bayley Scales of Infant Development II (Bayley, 1993), and children were grouped based on Bayley Mental Development Index (MDI) scores. The original study initially screened 260 children who met inclusion criteria for the study. Of those 260, 17 families chose not to participate, and 9 families did not have complete data at time 1. Thus, in the current study, data from a total of 234 children and their families who were participants in the study at time 1 were utilized, including 130 typically developing (TD) children with MDI scores of 85 and above (Mean MDI = 104.71, $SD = 11.68$, Range: 85–139), 93 children with developmental delays (DD) indicated by MDI scores below 75 (Mean = 57.61, $SD = 11.44$, Range: 30–75), and 11 children whose MDI fell between 75–85 (Mean = 80.18, $SD = 2.32$, Range: 76–84). Those 11 children were included with the DD group for purposes of this study given the indications of risk associated with borderline cognitive functioning (Fenning, Baker, Baker, & Crnic, 2007). Of the original 260 families enrolled in the study, 89 families were no longer participants by time 6 (child age 8 years). This represents an attrition rate of approximately 34% across the 6 years of the study. Attrition analyses for participant demographics (family income, mother age at intake, child race, and mother's highest educational degree) found no significant differences between families who dropped from the study and those who remained for all 6 years. Comparisons of participants on 12 adaptation indices (described in detail in the "Measures" section) found one significant difference: observed mother-father dyadic pleasure was higher for families who stayed in the study compared to families who did not. This statistically significant difference was not considered to be indicative of data missing not at random. Overall, attrition analyses indicated that families who stayed in the study were largely similar to those who did not. In the current study, at time 1, 41% of children were female. Ethnicity was representative of the populations at each site: 60% Caucasian, 17% Hispanic, 7% African American, 3% Asian, and 14% multiracial. At age 3, 57% percent of the

mothers were employed outside the home, 47% of mothers had a college education or higher, and 29% earned \$35,000 per year or less.

Procedure

All study procedures were approved by the institutional review boards of the participating universities: The Pennsylvania State University; University of California, Riverside; University of California, Los Angeles; and Arizona State University. Data collections were conducted yearly from age 3 to 8 years at or near the child's birthday. Questionnaire packets containing all of the self-report assessments were provided individually to both parents with instructions that they be completed independently, and mailed back to the study offices. Naturalistic home observations were also conducted annually. A trained graduate student stood as unobtrusively as possible in the home and observed the child and family interactions. Wherever the focal child went, the observer followed. Observation periods were 10 minutes in length, followed by 5 minutes of coding time. The absolute number of observed episodes varied across the 6 years of data collection. Families were observed for a total of 60 minutes at child ages 3 and 4, 40 minutes at ages 5 and 6, and 20 minutes at ages 7 and 8. Families were compensated for each data collection period, with the amounts increasing for each year of participation.

Measures

Multiple measures of adaptation were assessed for this study at each time period, including a series of three self-report indices and six dyadic observational constructs.

Self-report indices. Mothers and fathers each completed three self-report measures reflective of adaptive functioning. Parenting stress was indexed with the Parenting Daily Hassles questionnaire (PDH; Crnic & Greenberg, 1990), a 20-item scale for which the parent rates both the frequency and intensity of hassles associated with parenting tasks and typical yet challenging child behaviors. Adequate reliability was observed across all time points (Cronbach's $\alpha \geq .86$). For the current study, only the intensity scale was used, as it addresses the more relevant dimension of perceived stressfulness and is also highly correlated with frequency (typically $> .70$). Intensity of parenting and child-related hassles is rated along a 5-point scale (i.e., "no hassle" to "big hassle") for each item,

and a summed total score is generated. Higher scores are indicative of greater stress.

Parental psychological symptoms were indexed with The Symptoms Checklist-35 (SCL-35; Derogatis, 1993), a short form of The Symptoms Checklist-90 (SCL-90) that measures perceived levels of parent distress as rated on a 5-point scale. Adequate reliability was observed across all time points of this study (Cronbach's $\alpha \geq .92$). Five subscales (somatization, interpersonal sensitivity, depression, anxiety, and hostility) can be calculated, as well as a total score of perceived distress. Only the total score of perceived distress was used in this study.

Perceived marital relationship quality was assessed with a short form of the Dyadic Adjustment Scale (DAS; Spanier, 1979). The short form, abbreviated for the purposes of the current study as DS7, is a 7-item scale that asks each parent to rate his or her degree of happiness with the marital relationship on a 7-point scale from "Extremely Unhappy" to "Perfect." It has been shown to adequately differentiate couples' marital satisfaction similarly to the full DAS (Christopher & Rogers, 1984; Hunsley, Pinsent, Lefebvre, James-Tanner, & Vito, 1995). The DS7 met criteria for adequate reliability at each time point (Cronbach's $\alpha \geq 0.80$).

Observed dyadic behavior. The Home Observation Coding System (Belsky, Crnic, & Woodworth, 1995) was used to code the naturalistic home observations of family interaction style that were conducted each of the 6 years of study. The home observation system includes six individual behavior ratings for the child, six individual ratings for the parent (same for both mothers and fathers), and six dyadic codes. The current study focused on the six global measures of dyadic relationship quality, as they best represent the overall quality of relationships within the family. These dyadic ratings separately address the level of pleasure and conflict in the three dyads of interest: mother-child, father-child, and mother-father. A separate code that measured observed interactions between the sibling and target child was not included in the current study. Pleasure and conflict for each dyad were rated on a 5-point scale from 1 (low intensity/frequency) to 5 (high intensity/frequency). Observers were trained with practice videos and in vivo contexts to standards of inter-rater agreements of $> 70\%$ exact, and $> 95\%$ within one scale point. Subsequent ongoing reliability of the observational data was

maintained at a Kappa of .6 or above both within and across sites, a recommended minimum level of inter-rater agreement (Fleiss, 1981).

Using the mean of all observation periods (ranging from 2 to 6 coding periods depending on child age) internal consistency of the observed dyadic ratings across all time points was acceptable for mother-child pleasure (average Cronbach's $\alpha = 0.71$), father-child pleasure (average Cronbach's $\alpha = 0.66$), mother-father pleasure (average Cronbach's $\alpha = 0.66$), and mother-child conflict (average Cronbach's $\alpha = 0.64$). Internal consistency for the father-child conflict and mother-father conflict variables was poor (average $\alpha = .46$ and $.55$, respectively). Therefore, only data from the first coding period were used for these two conflict codes, as this coding period had the least missing data.

Results

Analysis Plan

Confirmatory factor analysis, latent growth curve modeling (LGCM), and multiple group analysis were used to test the hypothesis outlined above. SPSS (versions 17-19) was used to conduct frequency analyses, comparisons of demographic variables, and data reduction, and Mplus (version 5.2) was used to obtain means and standard deviations of all outcome variables, for confirmatory factor analysis, and for LGCM (including multiple group analysis).

Confirmatory factor analysis (CFA) was employed to assess whether adaptation could well fit a single-factor construct, and maximum likelihood estimation was used for factor extraction (Costello & Osborne, 2005; Fabrigar, Wegener, MacCallum, & Strahan, 1999). LGCM is an ideal tool for mapping how variables change over time (Muthén, 2002), and was used to model growth curves of adaptation indices. Further, multiple group analysis was used to compare parameter estimates of growth curves across risk group. Multiple group LGCM is ideal for comparison of trajectories of change across groups (Curran, Obeidat, & Losardo, 2010), and has been used successfully to compare growth curves in small-to-moderately sized samples (e.g., $N \leq 300$; Hardy & Thiels, 2009; van der Zwaluw, Larsen & Engles, 2011). Global fit indices including Chi square, comparative fit index (CFI), Tucker Lewis index (TLI), standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA) were used to assess model

Table 1
Descriptive Statistics for Adaptation Variables: TD Children

		Child Age (years)					
		3	4	5	6	7	8
Mother-Rated Measures							
Marital Satisfaction (DS7)	Mean	23.47	23.20	23.20	23.26	22.97	22.88
	SD	5.91	5.98	5.38	5.29	5.50	5.72
Parenting Stress (PDH)	Mean	45.77	48.09	47.41	47.61	46.16	47.25
	SD	10.64	12.05	10.97	11.81	12.42	12.08
Psychological Symptoms (SCL)	Mean	20.88	20.20	22.11	18.65	19.84	18.14
	SD	19.79	19.30	18.68	16.53	16.79	18.66
Father-Rated Measures							
Marital Satisfaction (DS7)	Mean	23.73	22.91	23.30	22.85	22.72	23.17
	SD	5.36	5.44	5.81	6.12	5.59	5.65
Parenting Stress (PDH)	Mean	43.06	44.90	43.58	43.73	44.13	43.65
	SD	10.16	13.51	12.18	10.39	12.48	11.78
Psychological Symptoms (SCL)	Mean	17.88	18.46	20.06	16.37	17.1	18.01
	SD	16.17	16.19	18.18	15.14	15.24	15.93
Measure							
Mother-Child Pleasure	Mean	1.86	1.57	1.57	1.64	1.94	2.03
	SD	0.77	0.54	0.5	0.59	0.76	0.81
Mother-Child Conflict	Mean	1.22	1.10	1.13	1.17	1.17	1.13
	SD	0.34	0.21	0.24	0.30	0.34	0.30
Father-Child Pleasure	Mean	1.91	1.59	1.61	1.45	1.67	1.84
	SD	0.84	0.58	0.65	0.57	0.69	0.69
Father-Child Conflict	Mean	1.12	1.07	1.07	1.07	1.05	1.06
	SD	0.21	0.13	0.20	0.17	0.16	0.18
Mother-Father Pleasure	Mean	1.72	1.53	1.50	1.45	2.02	2.06
	SD	0.74	0.55	0.47	0.46	0.78	0.83
Mother-Father Conflict	Mean	1.13	1.14	1.16	1.11	1.08	1.17
	SD	0.28	0.34	0.21	0.22	0.23	0.36

Note. TD = typically developing; DS7 = Dyadic Adjustment Scale short form; PDH = Parenting Daily Hassles questionnaire; SCL = The Symptoms Checklist-35.

fit in CFA. Model fit for LGCM was approached in multiple ways: First, multiple different structural models were estimated for each adaptation index and for each group (TD and DD), including a baseline model (no change in mean value of adaptation index over time), linear growth, and quadratic growth. Next, likelihood ratio tests were performed to determine which structural model was the best fit for each set of data. Finally, effect size (Cohen's *d*; Cohen, 1988) was used to measure the magnitude of change in model-implied means over time for each adaptation variable that had a linear or quadratic growth structure.

To address missing data, listwise deletion was used when conducting analyses with SPSS, and

full information maximum likelihood estimation (FIML) was used in all analyses that were conducted with Mplus. FIML has been shown to be the most efficient and least biased treatment of missing data in structural equation modeling approaches, when compared to listwise and pairwise deletion, as well as imputation (Enders, 2001; Enders & Bandalos, 2001). Unlike in other methods of handling missing data, FIML estimates the model parameters using all existing data, rather than imputing or removing critical information from the data set. This minimizes the impact of attrition on the data set, assuming data are missing at random.

Past research using the larger data set has reported several key demographic differences

between groups in the larger study, with families of DD children having somewhat lower incomes and less maternal education (e.g., Baker, Blacher, Crnic, & Edelbrock, 2002; Baker, Blacher, & Olsson, 2005; Brown, McIntyre, Crnic, Baker, & Blacher, 2011). In keeping with past results, significant differences in these variables were seen across groups in the current study as well. Additionally, in the current study maternal age was significantly higher in the families of DD children. Consequently, family income, maternal education, and maternal age were included as covariates in all analyses.

Adaptation as a Unitary Construct

To test whether adaptation fits a single-factor construct, confirmatory factor analysis (CFA) was conducted using Mplus. First, descriptive statistics and intercorrelations were examined among all adaptation variables (i.e., parent stress [PDH], parent psychological symptoms [SCL], marital satisfaction [DS7], observed mother-father pleasure and conflict, and observed parent-child pleasure and conflict; see Tables 1 and 2). Results indicated few significant intercorrelations between parent-report measures and observed measures. In general, correlations between variables were small to moderate (absolute value of r ranges from 0.20 to 0.68), indicating that, although there was significant agreement among certain measures, there remained a considerable amount of variance to be explained. A table of the intercorrelations among all adaptation factors is available on request.

The CFA specified maximum likelihood extraction of a single factor which contained all indices of adaptation (i.e., PDH, SCL, DS7, observed mother-father pleasure, observed parent-child pleasure, observed mother-father conflict, observed parent-child conflict). Factors were created separately for each of the six time points (child age 3 through 8), within each group (TD and DD), and for each parent gender (mother and father). Thus, at each time point, four CFAs were run, totaling 24 CFAs across all time points (see Tables 3 and 4). A factor loading with an absolute value greater or equal to 0.35 was considered to be an adequate loading onto the single-factor construct. At several time points, the model failed to converge after 10,000 iterations. When models did run successfully, results of the single-factor CFAs indicate that the measures of adaptation failed to load onto the single factor at a level of .35 or more

at any time point, for either group, or for either parent gender (see Tables 4 and 5). In general, global fit indices suggested poor model fit for both mothers and fathers across most time points for both the TD and DD groups (see Tables 3 and 4). Despite marginally acceptable fit at certain time points, single-factor structures did not show a consistent pattern of factor loading across time, and at no child age point did all adaptation measures load on a single factor above 0.35.

Differential Change in Adaptational Processes Across Time

To understand whether adaptational processes changed differentially across time, growth curves were estimated for each adaptation index (i.e., mother PDH, father PDH, mother SCL, father SCL, mother DS7, father DS7, observed mother-father pleasure, observed mother-child pleasure, observed father-child pleasure, observed mother-father conflict, observed mother-child conflict, observed father-child conflict). As child developmental status (TD/DD) was expected to differentiate adaptation, growth curves were modeled separately for each of the adaptation indices across both the TD and DD groups, resulting in a total of 24 growth curve models. Structural equation modeling was used (via Mplus) to model a longitudinal growth curve for each index of adaptation, using maximum likelihood estimation to address missing data. Multiple group analysis compared parameter estimates of the TD and DD growth curves. All time points were used (child ages 3–8), the intercept of each growth curve was set at child age 3 years, and the rate of change was set to 1 year. Models and model fit were estimated in the manner described previously, in which progressively more complex models were compared to each other to determine the best model fit.

Self-report of adaptation. Results of likelihood ratio tests of increasingly complex models and Cohen's d calculations indicated that both mother and father stress (PDH) best fit the baseline model for both the TD and DD groups (see Table 5). Baseline model-implied means indicated that reported stress was stable at approximately 47.09 points for mothers of TD children, and at 49.32 points for mothers of DD children. Fathers of TD children showed stable stress at 43.72 points across time, while fathers of DD children showed stable stress at 45.15 points across time. Multiple group analysis indicated no significant differences

Table 2
Descriptive Statistics for Adaptation Variables: DD Children

		Child Age (years)					
		3	4	5	6	7	8
Mother-Rated Measures							
Marital Satisfaction (DS7)	Mean	23.55	23.5	22.98	22.05	21.67	22.42
	SD	7.00	7.08	6.61	7.13	7.45	7.16
Stress (PDH)	Mean	47.48	50.24	50.06	50.19	48.43	48.82
	SD	15.58	14.45	13.98	14.87	14.69	15.5
Psychological Symptoms (SCL)	Mean	24.31	26.07	27.14	23.43	24.26	24.37
	SD	18.37	22.34	25.20	21.40	21.28	22.21
Father-Rated Measures							
Marital Satisfaction (DS7)	Mean	24.36	23.79	23.47	22.20	22.71	23.33
	SD	6.10	6.39	6.40	5.96	5.82	5.23
Stress (PDH)	Mean	44.86	44.7	45.74	45.98	43.71	45.95
	SD	12.23	14.11	13.43	12.79	12.19	11.99
Psychological Symptoms (SCL)	Mean	17.11	16.50	15.61	17.23	14.96	19.69
	SD	15.57	14.88	14.78	18.98	14.59	24.78
Observed Dyadic Measures							
Mother-Child Pleasure	Mean	1.55	1.51	1.48	1.60	1.64	1.77
	SD	0.64	0.55	0.54	0.53	0.55	0.72
Mother-Child Conflict	Mean	1.18	1.17	1.30	1.29	1.27	1.16
	SD	0.37	0.4	0.55	0.45	0.49	0.34
Father-Child Pleasure	Mean	1.62	1.46	1.48	1.45	1.59	1.86
	SD	0.68	0.54	0.62	0.58	0.58	0.79
Father-Child Conflict	Mean	1.07	1.09	1.10	1.21	1.11	1.16
	SD	0.15	0.22	0.30	0.41	0.24	0.36
Mother-Father Pleasure	Mean	1.58	1.40	1.42	1.46	1.79	1.82
	SD	0.67	0.49	0.53	0.50	0.83	0.75
Mother-Father Conflict	Mean	1.11	1.08	1.10	1.14	1.09	1.18
	SD	0.20	0.16	0.23	0.34	0.21	0.52

Note. DD = developmentally delayed; DS7 = Dyadic Adjustment Scale short form; PDH = Parenting Daily Hassles questionnaire; SCL = The Symptoms Checklist-35.

between intercepts across TD and DD groups for either mother stress ($\chi^2[\text{df}] = 1.61[1], p = .20$) or father stress ($\chi^2[\text{df}] = 0.76[1], p = .38$).

Mother psychological symptoms (SCL) also best fit the baseline model for both TD and DD groups (see Table 5). Baseline model-implied means indicated that TD mother psychological symptoms were stable at 20.12 points between child ages 3 and 8, while DD mother psychological symptoms remained stable at approximately 24.59 points. Multiple group analysis indicated that there was a significant difference in intercepts between risk groups ($\chi^2[\text{df}] = 3.99[1], p < .05$), such that mothers of children with DD showed stably higher psychological symptoms

than did mothers of TD children. Father psychological symptoms (SCL) also best fit the baseline model for both TD and DD groups: baseline model-implied means indicated that TD father psychological symptoms stayed stable at 17.82 points between child ages 3 and 8, while DD father psychological symptoms stayed stable at approximately 16.10 points. Multiple group analysis indicated no significant differences in intercept between the two groups ($\chi^2[\text{df}] = 0.97[1], p = .33$).

Regarding mother marital satisfaction, data for the TD group best fit a baseline model, whereas data for the DD group best fit a linear model (see Figure 1). For mothers in the TD

Table 3
Factor Loadings for Single-Factor Confirmatory Factor Analyses: TD Children

Mother																		Father							
		3	4	5	6 ^a	7	8	3 ^a	4 ^a	5 ^a	6 ^a	7	8	3 ^a	4 ^a	5 ^a	6 ^a	7	8						
Child Age (years)		139	128	127	10	108	108	13	12	12	10	108	108	6	6	3	8	108	108						
Analysis					8																				
N																									
Chi-square (df)		69.60 ^{****}	(32)	62.63 ^{****}	(32)	59.56 ^{****}	(32)	—	52.49 [*]	(32)	56.56 ^{****}	(32)	—	—	—	—	61.68 ^{****}	(32)	65.26 ^{****}	(32)					
CFI		0.69	0.60	0.49	—	0.55	0.46	—	—	—	—	—	—	—	—	—	—	0.59	0.32						
TLI		0.59	0.48	0.34	—	0.41	0.29	—	—	—	—	—	—	—	—	—	—	0.46	0.10						
RMSEA		0.09	0.09	0.08	—	0.08	0.08	—	—	—	—	—	—	—	—	—	—	0.09	0.10						
SRMR		0.09	0.09	0.09	—	0.09	0.09	—	—	—	—	—	—	—	—	—	—	0.09	0.11						
Parent Stress (PDH)		-.10	-.15	-.56	—	-.27	-.12	—	—	—	—	—	—	—	—	—	—	-.30	.05						
Parent Psych. Symp. (SCL)		-.20	.01	-.25	—	-.07	-.17	—	—	—	—	—	—	—	—	—	—	-.14	-.10						
Marital Satisfaction (DS7)		.12	.04	.50	—	.02	-.24	—	—	—	—	—	—	—	—	—	—	.23	.05						
Parent-Child Pleasure		.82	.61	.46	—	.73	.73	—	—	—	—	—	—	—	—	—	—	.90	.47						
Parent-Child Conflict		-.04	-.12	-.02	—	-.30	-.02	—	—	—	—	—	—	—	—	—	—	-.18	-.12						
Mother-Father Pleasure		.85	.96	.49	—	.59	.67	—	—	—	—	—	—	—	—	—	—	.69	.89						
Mother-Father Conflict		-.03	-.10	.03	—	-.26	-.27	—	—	—	—	—	—	—	—	—	—	-.16	-.12						

Note. Values noted are unrotated factor loadings. Psych. Symp. = psychological symptoms; TD = typically developing; CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; PDH = Parenting Daily Hassles questionnaire; SCL = The Symptoms Checklist-35; DS7 = Dyadic Adjustment Scale short form.

^aModel failed to converge after 10,000 iterations due to model misspecification. * $p < .05$. **** $p < .005$.

Table 4
Factor Loadings for Single-Factor Confirmatory Factor Analyses: DD Children

	Mother								Father							
	3	4 ^a	5	6	7	8	3 ^a	4 ^a	5	6	7	8 ^a				
Child Age (Years)	109	97	92	79	79	79	105	96	89	79	79	79				
Analysis N	95.05 ^{***}	—	59.35 ^{***}	(32)	63.67 ^{***}	(32)	46.81 ^{***}	(32)	32.59 (32)	36.13 (32)	38.07 (32)	43.19 (32)				
Chi-square (df)	0.40	—	0.67	0.63	0.79	0.99	—	—	0.86	0.83	0.72	—				
CFI	0.21	—	0.56	0.51	0.72	0.99	—	—	0.81	0.77	0.63	—				
TLI	0.13	—	0.10	0.11	0.08	0.02	—	—	0.04	0.05	0.07	—				
RMSEA	0.12	—	0.11	0.10	0.11	0.08	—	—	0.08	0.08	0.10	—				
SRMR	-.21	—	-.76	-.77	-.67	-.79	—	—	-.84	-.61	-.47	—				
Parent Stress (PDH)	-.24	—	-.83	-.81	-.80	-.90	—	—	-.46	-.47	-.53	—				
Parent Psych. Symp. (SCL)	.26	—	.28	.41	.61	.53	—	—	.55	.66	.82	—				
Marital Satisfaction (DS7)	.70	—	.17	.15	.28	.07	—	—	.11	.29	.50	—				
Parent-Child Pleasure	.09	—	-.17	-.37	-.18	-.10	—	—	.00	-.26	-.14	—				
Parent-Child Conflict	.81	—	.19	.29	.17	.02	—	—	.12	.59	.39	—				
Mother-Father Pleasure	-.08	—	-.23	.20	-.57	.18	—	—	-.08	.12	-.19	—				
Mother-Father Conflict																

Note. Values noted are unrotated factor loadings. Psych. Symp. = Psychological Symptoms; DD = developmentally delayed; CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; PDH = Parenting Daily Hassles questionnaire; SCL = The Symptoms Checklist-35; DS7 = Dyadic Adjustment Scale short form.

^aModel failed to converge after 10,000 iterations due to model misspecification. *** $p < .005$.

Table 5
Observed and Model-Implied Means: Self-Report Adaptational Processes

	Child Age (Years)					
	3	4	5	6	7	8
Mother Stress (PDH) – TD						
Observed Mean	45.77	48.09	47.41	47.61	46.16	47.25
Standard Deviation	10.63	12.05	10.97	11.81	12.42	12.08
Baseline Model-Implied Mean	47.10	47.10	47.09	47.08	47.08	47.07
Mother Stress (PDH) – DD						
Observed Mean	47.48	50.24	50.06	50.19	48.43	48.82
Standard Deviation	14.58	14.44	13.98	14.87	14.69	15.50
Baseline Model-Implied Mean	49.32	49.32	49.32	49.32	49.32	49.32
Father Stress (PDH) – TD						
Observed Mean	43.06	44.90	43.58	43.73	44.13	43.65
Standard Deviation	10.16	13.51	12.18	10.39	12.48	11.78
Baseline Model-Implied Mean	43.72	43.72	43.72	43.72	43.72	43.72
Father Stress (PDH) – DD						
Observed Mean	44.86	44.70	45.74	45.98	43.71	45.95
Standard Deviation	12.23	14.11	13.43	12.79	12.19	12.00
Baseline Model-Implied Mean	45.15	45.15	45.15	45.15	45.15	45.15
Mother Psychological Symptoms (SCL) – TD						
Observed Mean	20.88	20.20	22.11	18.75	19.84	18.14
Standard Deviation	19.79	19.29	18.68	16.53	16.79	18.66
Baseline Model-Implied Mean	20.12	20.12	20.12	20.12	20.12	20.12
Mother Psychological Symptoms (SCL) – DD						
Observed Mean	24.31	26.07	27.14	23.43	24.26	24.37
Standard Deviation	18.37	22.34	25.20	21.41	21.28	22.21
Baseline Model-Implied Mean	24.58	24.59	24.59	24.59	24.59	24.59
Father Psychological Symptoms (SCL) – TD						
Observed Mean	17.88	18.46	20.06	16.37	17.10	18.01
Standard Deviation	16.17	16.19	18.18	15.14	15.24	15.93
Baseline Model-Implied Mean	17.82	17.82	17.82	17.82	17.82	17.82
Father Psychological Symptoms (SCL) – DD						
Observed Mean	17.11	16.50	15.61	17.23	14.96	19.69
Standard Deviation	15.57	14.88	14.78	18.98	14.59	24.78
Baseline Model-Implied Mean	16.10	16.10	16.10	16.10	16.10	16.10

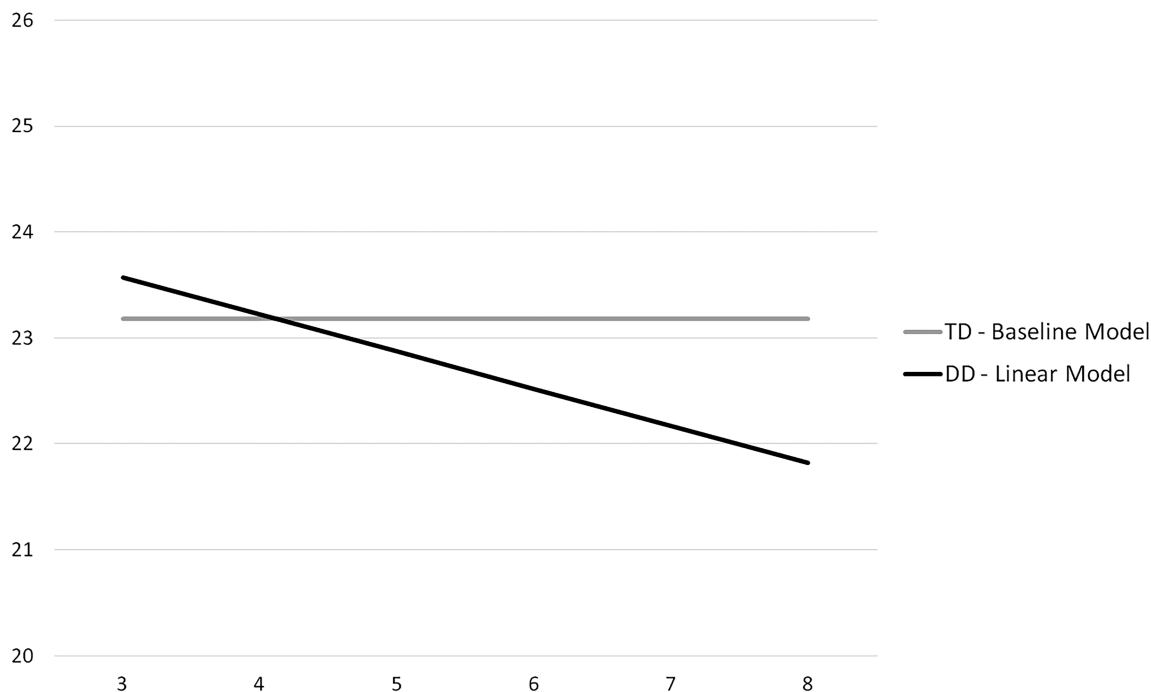
Note. TD = typically developing; DD = developmentally delayed; PDH = Parenting Daily Hassles questionnaire; SCL = The Symptoms Checklist-35.

group, marital satisfaction remained stable at 23.18 points between ages 3 and 8, whereas mothers in the DD group showed a significant and consistent decrease over time of .35 points per year, from 23.57 points at age 3 to 21.82 points by age 8 (first-last $d = 0.32$). For fathers, data for the TD group best fit a baseline model, whereas data for the DD group best fit a quadratic model (see Figure 2). Marital satisfaction of fathers of TD children remained stable at 23.16 points across the

3–8 year period; however, marital satisfaction fathers of children with DD showed an initial decrease from 24.61 points at age 3 to 22.80 points at age 6, followed by an increase to 23.41 points by age 8 (first-last $d = 0.23$; min-max $d = -0.37$).

Observed dyadic relationships. Mother-child pleasure showed quadratic change for both the TD (first-last $d = -0.29$; min-max $d = -0.61$) and DD groups (first-last $d = -0.25$; min-max $d = -0.33$; see Figure 3). For mothers of TD

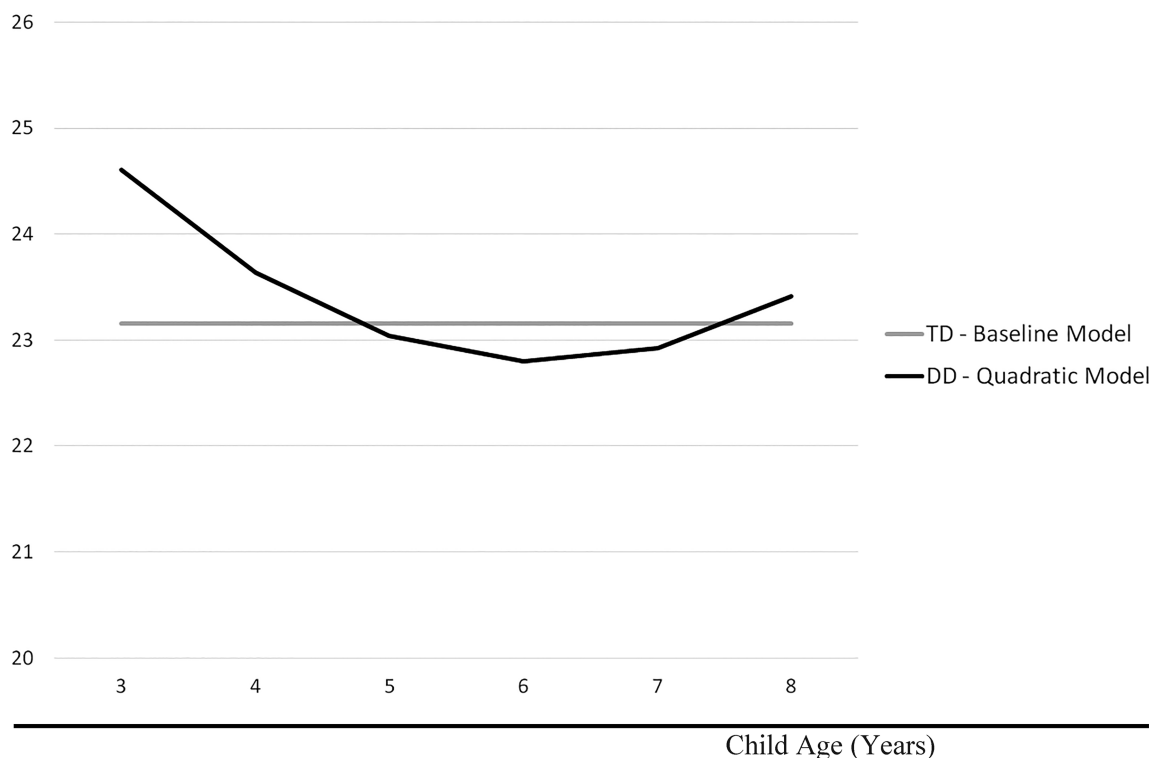
Mother Marital Satisfaction



	Child Age (Years)					
	3	4	5	6	7	8
Mother Marital Satisfaction (DS7) – TD						
Observed Mean	23.47	23.20	23.20	23.26	22.97	22.88
Standard Deviation	5.91	5.98	5.38	5.29	5.50	5.72
Baseline Model-Implied Mean	23.18	23.18	23.18	23.18	23.18	23.18
Mother Marital Satisfaction (DS7) – DD						
Observed Mean	23.55	23.50	22.98	22.05	21.67	22.42
Standard Deviation	7.00	7.08	6.61	7.13	7.45	7.16
Linear Model-Implied Mean	23.57	23.22	22.87	22.52	22.17	21.82

Figure 1. Plot of model-implied means for the mother marital satisfaction (DS7) variable. Model parameters for TD baseline model: intercept = 23.18^{***}, intercept variance = 22.51^{***}. Model parameters for DD linear model: intercept = 23.57^{***}, intercept variance = 35.28^{***}, slope = -0.35^{**}, slope variance = 0.37. DS7 = Dyadic Adjustment Scale short form; TD = typically developing; DD = developmentally delayed. ^{**} $p < .01$, ^{***} $p < .005$.

Father Marital Satisfaction



	Child Age (Years)					
	3	4	5	6	7	8
Father Marital Satisfaction (DS7) – TD						
Observed Mean	23.73	22.91	23.30	22.85	22.72	23.17
Standard Deviation	5.36	5.44	5.81	6.12	5.59	5.65
Baseline Model-Implied Mean	23.16	23.16	23.16	23.16	23.16	23.16
Father Marital Satisfaction (DS7) – DD						
Observed Mean	24.36	23.79	23.47	22.20	22.71	23.33
Standard Deviation	6.10	6.39	6.40	5.96	5.82	5.23
Quadratic Model-Implied Mean	24.61	23.64	23.04	22.80	22.92	23.41

Figure 2. Plot of model-implied means for the father marital satisfaction (DS7) variable. Model parameters for TD baseline model: intercept = 23.16^{***}, intercept variance = 23.01^{***}. Model parameters for DD quadratic model: intercept = 24.58^{***}, intercept variance = 27.87^{***}, linear slope = -1.15^{***}, linear slope variance set to 0, quadratic slope = 0.18^{***}, quadratic slope variance = 0.03. DS7 = Dyadic Adjustment Scale short form; TD = typically developing; DD = developmentally delayed. ^{***}*p* < .005.

children, mother-child pleasure decreased from 1.79 points at age 3 to 1.56 points at age 5, followed by an increase to 2.13 points by age 8. Similarly, mother-child pleasure in the DD group decreased from 1.55 points at age 3 to 1.51 points at ages 4 and 5, followed by an increase to 1.77 points by age 8. Multiple group analysis indicated that intercepts and slopes differed for the groups. Mother-child pleasure started higher for the TD group ($\chi^2[\text{df}] = 9.79[1], p < .005$), and TD pleasure changed at a faster rate over time than was seen in the DD group (linear slope: $\chi^2[\text{df}] = 7.57[1], p < .01$; quadratic slope: $\chi^2[\text{df}] = 8.30[1], p < .005$).

Father-child pleasure also showed quadratic change in both the TD (first-last $d = 0.03$; min-max $d = -0.43$) and DD groups (first-last $d = -0.14$; min-max $d = -0.35$). For fathers of TD children, dyadic pleasure decreased from 1.88 points at age 3 to 1.52 points at age 5 and 6, and increased to 1.85 points by 8 (see Table 6). In the DD group, dyadic pleasure decreased from 1.60 points at age 3 to 1.43 points at age 5, then increased to 1.72 points by age 8 (see Table 6). Multiple group analysis indicated that the TD group showed higher initial father-child pleasure ($\chi^2[\text{df}] = 8.77[1], p < .01$), though both TD and DD groups showed similar quadratic change over time (linear slope: $\chi^2[\text{df}] = 2.83[1], p = .09$; quadratic slope: $\chi^2[\text{df}] = 1.46[1], p = .23$).

Mother-father pleasure also showed quadratic change in both the TD (first-last $d = -0.40$; min-max $d = -0.73$) and DD groups (first-last $d = -0.36$; min-max $d = -0.51$). For parents of TD children, mother-father pleasure decreased from 1.73 points at age 3 to 1.46 points at age 6, followed by an increase to 2.13 points by age 8. For the parents of DD children, mother-father pleasure showed a decrease from 1.54 points at age 3 to 1.40 points at age 5, followed by an increase to 1.91 points by age 8 (see Table 6). Multiple group analysis indicated similar starting points (intercept: $\chi^2[\text{df}] = 3.08[1], p = .08$), and similar rates of quadratic change over time (linear slope: $\chi^2[\text{df}] = 1.49[1], p = .22$; quadratic slope: $\chi^2[\text{df}] = 2.11[1], p = .15$) for both TD and DD groups.

With regard to indices of dyadic conflict, the baseline model best fit the data for mother-child conflict for both the TD or DD groups (see Table 6). Mother-child conflict in the TD group remained stable at 1.14 points from ages 3 to 8, while in the DD group conflict was stable at 1.21 points. Multiple group analysis indicated stably

higher levels of relationship conflict in the DD group relative to the TD group across time ($\chi^2[\text{df}] = 4.64[1], p < .05$). Similarly, TD father-child conflict was stable at 1.06 points across time, and DD father-child conflict remained stable at 1.11 points. Multiple group analysis indicated that the DD group showed stably higher levels of relationship conflict than the TD group across time ($\chi^2[\text{df}] = 6.37[1], p < .05$).

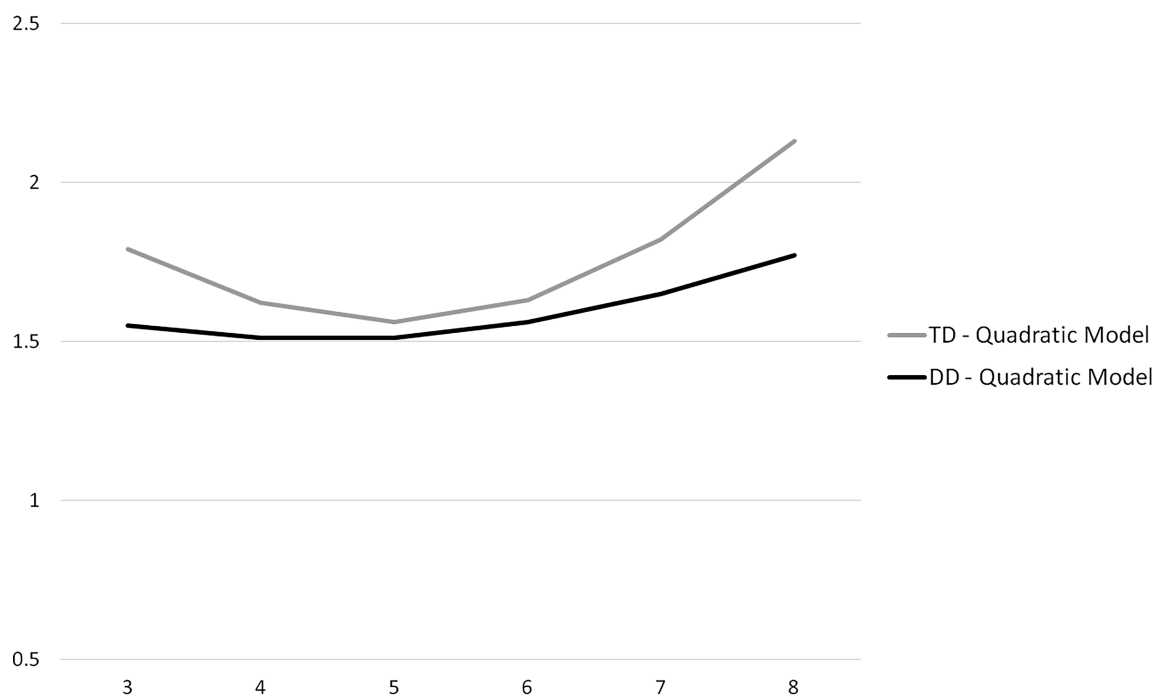
Finally, mother-father conflict best fit a baseline model for both the TD and DD groups (see Table 6). Mother-father conflict in the TD group remained stable at 1.10 points; conflict in the DD group was stable at 1.08 points. Multiple group analysis indicated that there were no differences between TD and DD groups on conflict between parents ($\chi^2[\text{df}] = 0.35[1], p = .55$).

Discussion

The current study provides new conceptual insight into adaptation as a complex, multidimensional, time-varying construct. Although a global adaptation construct has a certain parsimonious appeal, our results indicate that adaptation is neither unidimensional nor time invariant, but instead better reflects a dynamically varied multifaceted process that is characterized by change over time. Our longitudinal perspective builds on the more common cross-sectional research on family adjustment that has been historically dominant (Blacher & Baker, 2007; Britner et al., 2003; Magaña, Schwartz, Rubert, & Szapocznik, 2006; Turnbull et al., 2007), providing a deeper understanding of growth and change within the family over time, and allowing more complex inferences to be made about long-term family adjustment.

This study is, to our knowledge, the first longitudinal examination of how family adaptation to child disability might best be conceptualized. Whereas previous studies have explored multiple elements of family adjustment either cross-sectionally or longitudinally (Blacher & Baker, 2007; Britner et al., 2003; Magaña et al., 2006; Turnbull et al., 2007), until now there has been no empirical test of adaptation as a construct. But put to the test, very different conclusions about families may be reached depending on the functional index of interest despite the fact that family adjustment, well-being, functioning, and adaptation are often used interchangeably to describe family response (Turnbull et al., 2007).

Mother-Child Pleasure



	Child Age (Years)					
	3	4	5	6	7	8
Mother-Child Pleasure – TD						
Observed Mean	1.86	1.57	1.57	1.64	1.94	2.03
Standard Deviation	0.77	0.54	0.50	0.59	0.76	0.81
Quadratic Model-Implied Mean	1.79	1.62	1.56	1.63	1.82	2.13
Mother-Child Pleasure – DD						
Observed Mean	1.55	1.51	1.48	1.60	1.64	1.77
Standard Deviation	0.64	0.55	0.54	0.53	0.55	0.72
Quadratic Model-Implied Mean	1.55	1.51	1.51	1.56	1.65	1.77

Figure 3. Plot of model-implied means for the observed mother-child pleasure variable. Model parameters for TD quadratic model: intercept = 1.79^{***}, intercept variance = 0.18^{***}, linear slope = −0.24^{***}, linear slope variance set to 0, quadratic slope = 0.06^{***}, quadratic slope variance = 0.00. Model parameters for DD quadratic model: intercept = 1.55^{***}, intercept variance = 0.15^{*}, linear slope = −0.06, linear slope variance = 0.01, quadratic slope = 0.02^{*}, quadratic slope variance = 0.00. TD = typically developing; DD = developmentally delayed. ^{*} $p < .05$, ^{***} $p < .005$.

Table 6
Observed and Model-Implied Means: Observed Dyadic Pleasure and Conflict

	Child Age (Years)					
	3	4	5	6	7	8
Father-Child Pleasure – TD						
Observed Mean	1.91	1.59	1.61	1.45	1.67	1.84
Standard Deviation	0.84	0.58	0.65	0.57	0.69	0.69
Quadratic Model-Implied Mean	1.88	1.64	1.52	1.52	1.63	1.85
Father-Child Pleasure – DD						
Observed Mean	1.60	1.46	1.48	1.44	1.56	1.78
Standard Deviation	0.68	0.54	0.61	0.59	0.59	0.77
Quadratic Model-Implied Mean	1.60	1.48	1.43	1.46	1.55	1.72
Mother-Father Pleasure – TD						
Observed Mean	1.72	1.53	1.50	1.45	2.02	2.06
Standard Deviation	0.74	0.55	0.47	0.46	0.78	0.83
Quadratic Model-Implied Mean	1.73	1.52	1.46	1.54	1.77	2.13
Mother-Father Pleasure – DD						
Observed Mean	1.58	1.40	1.42	1.46	1.79	1.82
Standard Deviation	0.67	0.49	0.53	0.50	0.83	0.75
Quadratic Model-Implied Mean	1.54	1.43	1.40	1.48	1.65	1.91
Mother-Child Conflict – TD						
Observed Mean	1.22	1.10	1.13	1.17	1.17	1.13
Standard Deviation	0.34	0.21	0.24	0.30	0.34	0.30
Baseline Model-Implied Mean	1.14	1.14	1.14	1.14	1.14	1.14
Mother-Child Conflict – DD						
Observed Mean	1.18	1.17	1.30	1.29	1.27	1.16
Standard Deviation	0.37	0.40	0.55	0.45	0.49	0.34
Baseline Model-Implied Mean	1.21	1.21	1.21	1.21	1.21	1.21
Father-Child Conflict – TD						
Observed Mean	1.12	1.08	1.06	1.06	1.05	1.04
Standard Deviation	0.44	0.28	0.34	0.28	0.21	0.19
Baseline Model-Implied Mean	1.06	1.06	1.06	1.06	1.06	1.06
Father-Child Conflict – DD						
Observed Mean	1.08	1.15	1.07	1.28	1.12	1.18
Standard Deviation	0.30	0.38	0.30	0.70	0.33	0.44
Baseline Model-Implied Mean	1.11	1.11	1.11	1.11	1.11	1.11
Mother-Father Conflict – TD						
Observed Mean	1.07	1.10	1.19	1.07	1.09	1.13
Standard Deviation	0.29	0.29	0.47	0.26	0.31	0.33
Baseline Model-Implied Mean	1.10	1.10	1.10	1.10	1.10	1.10
Mother-Father Conflict – DD						
Observed Mean	1.16	1.04	1.13	1.15	1.09	1.26
Standard Deviation	0.56	0.20	0.37	0.51	0.27	0.75
Baseline Model-Implied Mean	1.08	1.08	1.08	1.08	1.08	1.08

Note. TD = typically developing; DD = developmentally delayed.

In retrospect, it seems unlikely that more global frameworks of family adaptation could truly capture the variation inherent in the ways that families and their members respond over time to the presence of developmental risk in a child. A construction in which a family may be considered to be “well adapted” or “poorly adapted” belies the complexity inherent in functioning along the myriad of psychological and behavioral domains that comprise individual and family well-being. In our study, not only did indices of adaptation fail to load onto a single factor, but different adaptational indices showed unique trajectories of growth or stability that varied by structural characteristics involving parent gender, age of child, and the presence of developmental delay in the child. Given the apparent structural complexity of adaptational processes, conceptually clear and consistent definitions of adaptation take on even greater importance in guiding subsequent research (Turnbull et al., 2007).

Results from the current study engage debate on which components best comprise or are well reflected within the adaptation construct. Our findings as well as past research suggest that parenting stress (Thompson, Gustafson, Hamlett, & Spock, 1992), parent psychological symptoms (Singer, 2006), and marital satisfaction (Friedman et al., 2004) merit attention in understanding family adaptation. However, our findings also emphasize the importance of including observed family relationships, particularly the pleasure derived from dyadic interactions experienced within the family, when evaluating adaptational processes. Although several traditional adaptation indices in our study did not show meaningful change over time, observed dyadic pleasure demonstrated a complex pattern of change in which relationship pleasure initially decreased in early childhood, then increased as children entered middle childhood. These findings provide added nuance to existing cross-sectional research that suggested the presence of more negative and controlling parent-child interactions when a child has developmental delay (Floyd & Phillippe, 1993; Floyd & Saitzyk, 1992; Tannock, 1988). Our findings are also in contrast to past longitudinal work suggesting that both positive and negative interactions decrease over time in families of children with developmental delay across an 18-24 month period (Floyd, Costigan, & Phillippe, 1997). Studying families over a long

period of time may provide a more accurate picture of the complex interactions in families of children with developmental delay, or better characterize the variability apparent across developmental periods. Given indications that pleasure in the mother-child relationship may be related to reduced risk for child intellectual disability and higher levels of adaptive behavior (Fenning & Baker, 2012), changes in dyadic relationship quality over time may be especially salient as determinants of child functioning across critical developmental domains.

In addition, marital satisfaction in parents of children with developmental delays showed unique trajectories of change over time. Though the linear decrease in maternal marital satisfaction could be considered to be consistent with earlier studies of families of children with developmental delay that suggested a pattern of maladaptive responses in the family (Beckman, 1991; Bristol et al., 1988; Frey et al., 1989; Kazak & Martin, 1984), that did not appear to be the case for fathers' marital satisfaction, which decreased through early childhood, but then increased in middle childhood. Quadratic change such as this stands in contrast to more global perspectives on family adaptation, which suggests that families consistently show negative or at times positive adaptations. Instead, dyadic relationship quality and fathers' marital satisfaction show a complex picture of waxing and waning challenges and strengths across time that may coincide with points of developmental transition. Concurrent stabilities in other facets of adaptation (e.g., parent stress, parent psychological symptoms, relationship conflict) further underscores the varied nature of adaptational processes. Although parent stress might be high in families of children with developmental delays, or parents may experience more psychological symptoms, relationship quality may still be adequate or at least comparable to that in families of children who are typically developing.

The complex patterns of change observed for relationship quality and fathers' marital satisfaction also highlight potentially salient points in child and family development, regardless of the presence of developmental risk. Change in these domains proved to be curvilinear, where decreasing levels of pleasure and marital satisfaction reached their lowest point between child ages 5 and 6, but rebounded by age 8. This may reflect that entry into school is a particularly difficult time for families (Rimm-Kaufman & Pianta, 2000;

Rosenkoetter, Hains, & Dogaru, 2007), though this appears to resolve later in childhood. The mechanisms that underlie such developmental changes across time remain to be identified.

Not only did different adaptation indices change in unique ways across this early to middle childhood period, but change differed as a function of child status and parent gender. This highlights the importance of continuing to include relevant comparison groups as well as both parents (if present in the family) when studying developmental or intellectual disability. Though families with and without children experiencing early developmental delay did show similarities in adaptational functioning, families of children with developmental delays showed different levels of functioning or different rates of change than did families of typically developing children. In some instances this matched early pathological models of negative family response (Caldwell & Guze, 1960; Olshansky, 1962; Wolfenberger & Menolascino, 1970). Indeed, families of children with developmental delays showed some stably higher adaptational problems than did families of TD children, particularly with respect to perceived parent psychological well-being and indices of relationship conflict. However, marital satisfaction and relationship pleasure in families of children with delays showed unique trajectories of change, while families of children without delays remained more stable. These unique patterns of change contribute both nuance and greater complexity to emerging models of family response, either positive or negative, to the context of child disability (Blacher & Baker, 2007; Glidden & Johnson, 1999).

Finally, the differences and similarities in how mothers and fathers perceive their families offer further evidence for the importance of including both fathers and mothers in studies of families of children with disabilities. In the current study, fathers showed more similarities than differences with mothers, particularly in the areas of stress, subjective distress, and relationship quality. This is somewhat in keeping with previous literature (Crnic et al., 2009; Dyson, 1997; Ha, Hong, Seltzer, & Greenberg, 2008; McCarthy et al., 2006; Rimmerman, Turkel, & Crossman, 2003; Saloviita, Itälä, & Leinonen, 2003), although our findings that stress was stable for both mothers and fathers contrasts with earlier research suggesting that both mothers and fathers increase in stress over time (Hauser-Cram et al., 2001).

These contrasting findings likely reflect the differences inherent in different types and sources of stress that parents experience, and the measurement differences involved. Our focus on daily hassles of parenting differs in substantive ways from the parenting stress measurement utilized by Hauser-Cram and colleagues (2001), but this again highlights the important variability in adaptation even within what are likely to be conceptually related constructs.

Despite multiple similarities, mothers and fathers showed a key difference in marital satisfaction. Although little longitudinal research has explored how father marital satisfaction compares to mothers in families of children with developmental delays, cross-sectional research has indicated more similarity in marital satisfaction than difference (Rimmerman et al., 2003). Fathers' and mothers' differing perspectives on marital satisfaction in the current study are indicative of the unique ways that mothers and fathers perceive and experience their families in general (Proulx, Helms, & Buehler, 2007), but perhaps especially in the context of developmental risk in a child. Fathers of the children with developmental delays decreased, then increased in marital satisfaction, potentially reflecting a more resilient pattern of response than is found for mothers. Whether such variability between mothers and fathers will show continuity remains to be determined, as do the mechanisms that might well explain such differences in these families.

Limitations and Next Steps

Although this study has a number of conceptual and methodological strengths, several limitations merit consideration in interpreting the findings. First, as in all longitudinal studies, attrition was an important issue, leading to missing data that required statistical management. Ideally, attrition would have been less across the 5-year span. However, as discussed above, attrition analyses did not identify meaningful differences between families who dropped from the study and those who remained for all 6 years. In addition, employing an FIML approach to address missing data allowed for maximal use of the data across all time points, with less bias than other methods of handling missing data.

Second, although measurements included parent self-report and independently observed dyadic behavior as indices considered to represent

elements of family functioning, no measures captured the family system as a whole. The use of observational measurements that capture a more holistic sense of the family are needed to provide a more comprehensive view of transactional processes within the family unit (Gerstein, 2011).

The current study primarily examined the family's response to a child with developmental delays, rather than exploring the ongoing transactional processes involving reciprocity within the family-child relationship over time. It will be crucial to address such transactional processes in ways that can be both observed and quantified across developmental periods in efforts to better understand the mechanisms that determine child and family well-being. Though historically difficult to test (Sameroff & Mackenzie, 2003), attention to such mechanisms will deepen our understanding of the developmental processes involved in understanding child and family functions under conditions of risk.

Comparison groups are valuable in research with families of children with developmental delays. The absence of comparison groups limits our understanding of the degree to which children at risk are truly different from their typically developing counterparts (Baker, Neece, Fenning, Crnic, & Blacher, 2010). For example, although there is evidence that children with developmental delays show more behavior problems than typically developing children (Baker et al., 2002; Dekker, Koot, van der Ende, & Verhulst, 2002; Emerson & Hatton, 2007), longitudinal evidence may show a more nuanced picture of similarities between groups, in which behavior problems remain stable in early childhood for both children with and without delays (Baker et al., 2010). Although there are questions that may be answered appropriately without comparison groups, and there is value to studying populations of children with disabilities in their own right, the inclusion of comparison samples will clarify the extent to which families of children with disabilities are similar and different from those with typically developing children.

In summary, adaptation is a complex, multifaceted construct that has been somewhat misconstrued for years. Rather than operating as a global construct characterized by a single descriptor (i.e., good or poor), it is well apparent that family adaptation is a much more complicated, varied, and nuanced construct comprised of multiple dimensions that can vary in valence

and as a function of time. Family processes differ importantly as a function of developmental risk, and different adaptation indices are likely to have unique moderating and mediating associations with other family factors and child competencies over time that beg new conceptual approaches that can capture the complexity of family lives.

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- Received 11/27/2013, accepted 7/13/2014.*
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- Selected results detailed in this manuscript were orally presented at the 2013 Biennial Meeting of the Society for Research in Child Development. This study was supported by Grant Number MGS 0166, a Ruth L. Kirschstein National Research Service Award provided by the National Institutes of Health to Anita L. Pedersen (PI), and Grant Number HD34879 awarded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development to Keith A. Crnic (PI), Bruce L. Baker, & Jan Blacher, co-investigators.*
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