# Trajectories of Parenting Stress among Mothers and Fathers of Children with Developmental Disabilities: From Early Childhood through Adolescence

Author: Ashley Cynthia Woodman

Boston College

Lynch School of Education

Department of

Counseling, Developmental, and Educational Psychology

Applied Developmental and Educational Psychology

# TRAJECTORIES OF PARENTING STRESS AMONG MOTHERS AND FATHERS OF CHILDREN WITH DEVELOPMENTAL DISABILITIES: FROM EARLY CHILDHOOD THROUGH ADOLESCENCE

Dissertation by

ASHLEY CYNTHIA WOODMAN

Submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy

May 2012

**Acknowledgements**

Special thanks to my dissertation chair, Dr. Penny Hauser-Cram, for her endless wisdom and guidance throughout the dissertation process as well as my graduate career. It has been a pleasure and an honor to work on the Early Intervention Collaborative Study. I would also like to thank Drs. Eric Dearing and James Mahalik for their helpful suggestions and detailed feedback on several drafts of this dissertation.

I extend my appreciation toward my classmates, friends, family, and partner for their support in this journey. In particular, I would like to thank my grandfather, Philip Haselton, for supporting me through so many years of higher education and my family, both old and new, for refusing to accept that disabilities limit your possibilities in life. A special thank you to the families of the Early Intervention Collaborative Study, whose time and effort make this research possible.

**Table of Contents**

CHAPTER I. PROBLEM STATEMENT 1

CHAPTER II. LITERATURE REVIEW 8

Theoretical Overview 8

Parenting Stress 23

Child Characteristics 39

Resources and Supports 49

Research Questions and Hypotheses 62

CHAPTER III. METHODS 69

Participants 69

Procedure 71

Measures 72

Analytic Plan 85

CHAPTER IV. RESULTS 97

Preliminary Analyses 97

Unconditional Growth Model 104

Hypotheses 107

Combined Model 121

Dyad Model 125

CHAPTER V. DISCUSSION 134

Parenting Stress 138

Child Characteristics 145

Resources and Supports 149

Limitations 161

Implications 164

Conclusions 168

CHAPTER VI. REFERENCES 170

CHAPTER VII. APPENDIX 204

**List of Tables and Figures**

Figure 1: McCubbin & Patterson's (1983) Double ABCX Model of Adjustment and Adaptation 204

Figure 2: Perry's Model of Stress in Families of Children with Developmental Disabilities 205

Figure 3: Conceptual Model 205

Table 1: Demographic Characteristics of Participants at T3 (N=159 families) 206

Table 2: List of Measures 207

Table 3: Percentage of Missing Data for Mother and Child Data at each Time Point (N=147 at T3) 208

Table 4: Percentage of Missing Data for Father Data at each Time Point (N=110 at T3) 208

Table 5: Measures used for Multiple Imputation 209

Table 6: Descriptive Statistics for Predictor and Outcome Variables – Mothers (N=147) 210

Table 7: Descriptive Statistics for Predictor and Outcome Variables – Fathers (N=110) 211

Table 8: Comparison of Mothers and Fathers in the EICS Sample to Normative Data on Select Variables 212

Table 9: Comparison of Boys and Girls in the EICS Sample to Normative Data on the Child Behavior Checklist 213

Table 10: Intercorrelations among Level 1 Predictors for Mothers (N=147) 214

above the diagonal and Fathers (N=110) below the diagonal

Table 11: Intercorrelations among Level 2 Predictors for Mothers (N=147) 215
above the diagonal and Fathers (N=110) below the diagonal

Table 12: Correlations for Parenting Stress Index-Parent Domain Scores and 216
Predictors for Mothers (N=147) and Fathers (N=110)

Table 13: Unconditional Growth Model of Mothers' (N=147) Parenting Stress 218

Figure 4: Average Trajectory of Parenting Stress for Mothers (N=147) 218

Table 14: Unconditional Growth Model of Fathers' (N=110) Parenting Stress 219

Figure 5: Average Trajectory of Parenting Stress for Fathers (N=110) 219

Table 15: List of Research Hypotheses and Findings 220

Table 16: Model for Hypothesis 1 for Mothers (N=147) and Fathers (N=110) 223

Table 17: Piecewise Models for Hypothesis 1 for Mothers (N=147) and Fathers 224
(N=110)

Table 18: Models for Hypothesis 2a for Mothers (N=147) and Fathers (N=110) 225

Table 19: Models for Hypothesis 2b for Mothers (N=147) and Fathers (N=110) 226

Table 20: Models for Hypothesis 2c for Mothers (N=147) and Fathers (N=110) 227

Table 21: Models for Hypothesis 3a for Mothers (N=147) and Fathers (N=110) 228

Table 22: Models for Hypothesis 3b for Mothers (N=147) and Fathers (N=110) 229

Table 23: Models for Hypothesis 3c for Mothers (N=147) and Fathers (N=110) 230

Table 24: Models for Hypothesis 4a for Mothers (N=147) and Fathers (N=110) 231

Table 25: Alternative Models for Hypothesis 4a for Mothers (N=147) and 232
Fathers (N=110)

Table 26: Models for Hypothesis 4b for Mothers (N=147) and Fathers (N=110) 233

Table 27: Alternative Models for Hypothesis 4b for Mothers (N=147) and Fathers (N=110) 234

Table 28: Models for Hypothesis 4c for Mothers (N=147) and Fathers (N=110) 235

Table 29: Alternative Models for Hypothesis 4c for Mothers (N=147) and Fathers (N=110) 236

Table 30: Combined models for Mothers (N=147) and Fathers (N=110) 238

Figure 6: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Child Behavior Problems 239

Figure 7: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Child Adaptive Behavior 240

Figure 8: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Social Support 241

Figure 9: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Family Climate 242

Figure 10: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Use of Distancing/Avoidance 243

Figure 11: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Use of Problem 244

Focused Coping

Table 31: Comparison of Mothers and Fathers on Predictor and Outcome Variables (N=108 dyads) 245

Table 32: Unconditional Growth Model for Mothers and Fathers within Dyads (N=108) 246

Figure 12: Average Trajectory of Parenting Stress for Mothers and Fathers within Dyads (N=108) 246

Table 33: Final Model for Mothers and Fathers within Dyads (N=108) 247

Figure 13: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Child Behavior Problems within Dyads 248

Figure 14: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Child Adaptive Behavior within Dyads 249

Figure 15: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Social Support within Dyads 250

Figure 16: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Family Climate within Dyads 251

Figure 17: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Use of 252

Distancing/Avoidance within Dyads

Figure 18: Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Use of Problem Focused Coping within Dyads 253

Trajectories of Parenting Stress among Mothers and Fathers of Children with Developmental Disabilities: From Early Childhood through Adolescence

Ashley Cynthia Woodman

Dissertation Director: Penny Hauser-Cram

## Abstract

Parents of children with developmental disabilities (DD) face greater caregiving demands than other parents, which may lead to heightened levels of stress. The problematic behavior and functional limitations of the child with DD have been found to contribute to parenting stress (Baker et al., 2002; Beckman, 1991). Despite heightened demands, many parents successfully adapt to raising a child with DD. A goal of recent research has been to identify resources and supports that explain the considerable variability in parental adjustment (Neece & Baker, 2008). This dissertation examined trajectories of parenting stress among mothers (N=147) and fathers (N=110) of children with diverse developmental disabilities, from their child's early years (age 3) through adolescence (age 15). Using hierarchical linear modeling, stress was found to increase from early to middle childhood and subsequently decrease from middle childhood to adolescence. Characteristics of the child with DD were found to contribute to parents' stress, with higher behavior problems and lower functional skills predicting greater stress. Parent resources and supports were also found to relate to parenting stress. Greater social support, use of adaptive coping strategies, and more positive perceptions of the family climate predicted lower stress. An additional model was conducted using a modified hierarchical linear modeling approach to examine the role of child stressors and family

resources and supports within parenting dyads. The findings of this study contribute to the limited literature on patterns of change in stress among parents, particularly fathers, of children with DD. Following these results, interventions for families of children with DD should aim to reduce child-related stressors and promote parent resources and supports.

## Chapter 1: Problem Statement

The demands of raising any child require parents to continuously accommodate and cope with changing caregiving challenges. Parents of children with developmental disabilities (DD) face greater caregiving demands than parents of typically developing children, however. The accumulation of stressors beyond those typically experienced in family life may place parents of children with DD at risk for poor mental health outcomes (Benson & Karloff, 2009; Olsson & Hwang, 2001). Indeed, caring for a child with a disability is typically associated with a heightened level of stress for parents (Dyson, 1991). High levels of parental stress have been found to remain stable (Baker et al., 2003) or to increase over time (Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001) within this population. There is some empirical support to suggest that mothers and fathers of children with disabilities have differing parenting experiences. Mothers have been found to report higher overall levels of stress (Sharpley, Bitsika, & Efremidis, 1997), but fathers may experience greater stress related to their child's temperament, communication difficulties, and feelings of attachment to their child (Frey, Greenberg, & Fewell, 1989; Krauss, 1993).

Higher problematic behavior and lower adaptive skills among children with disabilities have been found to contribute to parents' experiences of stress (Baker, Blancher, Crnic, & Edelbrock, 2002; Beckman, 1991). Children with disabilities tend to display heightened levels of problematic behavior (Fombonne, Simmons, Ford, Meltzer, & Goodman, 2001; Totsika, Hastings, Emerson, Lancaster, & Berridge, 2011) that persist over time (Baker et al., 2003; Einfeld et al., 2006). Internalizing and externalizing

problems have been consistently associated with parental stress in families of children with varying disability diagnoses (Fidler, Hodapp, & Dykens, 2000; Spratt, Saylor, & Macias, 2007). Although problematic behavior may be a more immediately demanding child characteristic to parents, the adaptive behavior children with disabilities has also been found to relate to parental stress (Hanson & Hanline, 1990). In particular, difficulties with socialization skills may be influential on parental stress (Beck, Hastings, Daley, & Stevenson, 2004; Lecavalier, Leone, & Wiltz, 2006; Smith, Oliver, & Innocenti, 1999).

Although raising a child with a disability can pose a variety of challenges to family functioning, many parents successfully adapt to caregiving demands and view their child as a positive contributor to their family and to their quality of life (Behr & Murphy, 1993; Glidden, 2012; King et al., 2006). A goal of recent research has been to explain the variability in parents' adjustment to raising a child with a disability (Neece & Baker, 2008). In line with a strengths based approach (Glidden, Billings, & Jobe, 2006; Judge, 1998), various family resources and supports have been explored as potential resiliency factors among families raising children with disabilities. This dissertation will focus on the role of parent and family resources and supports, including parents' coping strategies, parents' social support, and family climate.

One set of resources that individuals bring to the parenting experience is their skill in coping with caregiving challenges. Coping refers to cognitive and behavioral efforts to manage internal or external demands (Lazarus & Folkman, 1984). In line with recent recommendations to explore coping as a multidimensional construct (Skinner,

Edge, Altman, & Sherwood, 2003), this dissertation will examine the contribution of four distinct coping strategies to parental stress. Confrontive/social support seeking strategies and problem focused strategies were selected based on the consistent finding that their use is associated with positive outcomes among parents of children with disabilities (e.g., Glidden et al., 2006). Use of denial and distancing/avoidance strategies is expected to predict heightened levels of parental stress, given the existing literature on their negative impact on parental well-being (e.g., Smith et al., 2008). Greater use of confrontive/seeking social support and problem focused strategies but lower use of denial and distancing/avoidance strategies is expected to predict lower parenting stress.

In addition to coping, social support is a resource that has received considerable attention in research on families of children with DD (Hauser-Cram et al., in press). Social support is a multidimensional construct that includes physical and instrumental assistance, resource sharing, and emotional and psychological support (Dunst, Trivette, & Cross, 1986). Research on families of children with disabilities has generally supported the importance of parents' satisfaction with the helpfulness of their social support networks in predicting parent well-being (Crnic & Stormshak, 1997). Perceived helpfulness of social support has been associated with marital quality, satisfaction with parenting, and general life satisfaction among parents of children with disabilities (Hauser-Cram & Howell, 2003). With respect to parenting stress, satisfaction with social support has been associated with lower levels of stress among parents of children with intellectual disabilities (Feldman, Varghese, Ramsay, & Rajska, 2002), cerebral palsy (Wanamaker & Glenwick, 1998), autism (Sharpley et al., 1997) and special health care

needs (Spratt et al., 2007). Greater perceived helpfulness of social support is expected to predict lower parental stress.

While coping strategies and social support are individual resources, the family emotional climate is a family level resource that may protect parents of children with DD from experiencing heightened levels of stress. The relational aspects of the family environment include the connectedness, expressiveness, and degree of conflict among members of the family unit (Moos & Moos, 1986). The quality of family relationships has been found to impact various aspects of parent well-being and child development (e.g., Cassidy, Parke, Butkovsky, & Braungart, 1992; Hauser-Cram et al., 2001; Hoffman, Rodrigue, Andres, & Novak, 1995; Morris et al., 1997). Aspects of the family environment, family cohesion in particular, have been predictive of parental stress (Boyce, Behl, Mortensen, & Akers, 1991; Warfield, Krauss, Hauser-Cram, Upshur, & Shonkoff, 1999). Perceptions of more positive family climates are expected to predict lower levels of stress among mothers and fathers.

In addition to main effects, this dissertation will also examine the role of coping strategies, social support, and family cohesion in moderating the relationship between child behavior problems and parental stress. Among parents of children with disabilities, greater use of confrontive strategies (e.g., planning, problem-focused) but lower use of avoidance strategies (e.g., denial, distancing) has been found to buffer the impact of child-related stressors on parental well-being (Essex, Seltzer, & Krauss, 1999; Smith et al., 2008). Greater social support has also been found to buffer the impact of problematic behavior on caregiving stress of parents of children with DD (Plant & Sanders, 2007).

Similarly, a more positive family emotional climate has been reported to buffer the impact of child behavioral characteristics on the well-being of parents of children with DD (Keller, 1999). Much of this research has focused on specific subgroups of children with disabilities (e.g., autism, Down syndrome) within cross-sectional designs. The present study aims to extend this work by examining buffering hypotheses within a sample of children with diverse developmental disabilities within a longitudinal framework. In sum, greater use of confrontive/seeking social support and problem focused coping but lower use of denial and distancing/avoidance coping, greater helpfulness of social support, and more positive perceptions of family climate are expected to buffer the impact of child behavior problems on parental stress. These family resources and supports are expected to exert a greater impact on parental stress among parents of children with higher levels of problematic behavior.

This dissertation aims to address several gaps in the existing literature. Studies on stress among parents of children with DD have typically relied on cross-sectional designs. For instance, Orr, Cameron, Dobson, and Day (1993) explored differences in the level of parenting stress among mothers of children in their early childhood, middle childhood, or adolescent stage of development. In contrast, longitudinal designs allow researchers to examine change over time within the same group of individuals. The few longitudinal studies on parenting stress among parents of children with disabilities available to date have focused on the early childhood period of development (e.g., Baker et al., 2003; Hauser-Cram et al., 2001; Hanson & Hanline, 1990). This dissertation would extend our understanding of how parenting stress changes over an extended period of

development, from their child's early childhood through adolescent years. Longitudinal designs permit exploration of differences between individuals as well as changes within individuals over time.

This dissertation will examine both mothers' and fathers' experiences of stress over time. Fathers have been historically neglected in research in the social sciences in general and in research on the adjustment of parents of children with disabilities in particular. It has long been assumed that the mother is the primary caregiver and as such bears a disproportionate amount of the caregiving burden. As gender roles in the family are becoming increasingly egalitarian in our society, fathers are participating in the daily caregiving tasks of their children to a greater extent (Lamb, 2000). The problematic behavior and functional limitations of a child with a disability in the family are likely to also impact fathers' well-being. There is growing evidence that fathers experience levels of parenting stress similar to mothers (Dyson 1997; Roach, Orsmond, & Barratt, 1999). There is preliminary evidence that fathers' stress levels may relate to different child and family factors than mothers' stress levels (Krauss, 1993), pointing to the importance of examining differences in predictors of stress for mothers and fathers.

In summary, the goal of this dissertation is to examine trajectories of parenting stress among mothers and fathers of children with developmental disabilities over time, from their child's early years (age 3) through adolescent years (age 15). This study will examine the contribution of the characteristics of the child with a disability (behavior problems, adaptive behavior) and family resources and supports (social support, coping, family climate) in predicting parenting stress over time, while controlling for negative

life events, family income, and parental education. Lastly, this study will explore the role of social support, coping, and family climate as moderators of the impact of child behavior problems on parenting stress to determine if family resources and supports have a differential impact on parenting stress depending on the level of the child's problem behavior (see Figure 1 for conceptual model).

# Chapter 2: Literature Review

## Theoretical Overview

In this section I will review the guiding theoretical perspectives for this dissertation. The overarching theoretical orientation for this study is a family systems perspective (Minuchin, 1985). I will begin by outlining the basic principles of this perspective. Next, I will discuss a theoretical model of family adaptation that stems from a family systems framework, the Double ABCX Model of Adjustment and Adaptation (McCubbin & Patterson, 1983). Last, I will review a theoretical model that was specifically developed to explain the adaptation of parents of children with developmental disabilities (Perry, 2004). Elements from each of these perspectives are incorporated into the conceptual model for this dissertation.

**Family systems theory.** The overarching theoretical orientation for this dissertation is a family systems perspective. This perspective emphasizes the centrality of the family unit as a critical context of development. A systems approach to studying family functioning views the family as a complex and dynamic system of individuals and interactions (Britner, Morog, Pianta, & Marvin, 2003). In this view, the family system is organized by processes of self-regulation that serve to maintain equilibrium as well as processes of adaptation that serve to reorganize the system as it encounters challenges and transition points (Minuchin, 1985).

At the core of a systems orientation is the view that the family system is an organized whole and elements within the system are necessarily interdependent (Minuchin, 1985). From this perspective, an individual should not be considered in

isolation but rather within the context of the family unit as a whole. The larger family system is composed of several subsystems, such as the spouse subsystem or the sibling subsystem. Like the family system as a whole, these subsystems are organized by processes of self-regulation and adaptation. Relationships within the family are viewed as complex and multidirectional in this perspective, such that family members are concurrently and constantly interacting (Minuchin, 1985). Patterns of interactions between family members are viewed as circular and bi-directional, rather than linear and uni-dimensional.

There are features within the family system that serve to stabilize patterns of interactions among family members (Minuchin, 1985). In light of changes intrinsic (e.g., onset of puberty in one family member) or extrinsic (e.g., changes in the job market) to the system, families reestablish familiar patterns of interactions through corrective feedback loops. This process of self-regulation is largely adaptive, as it serves to maintain equilibrium. However, in some cases these processes may reestablish maladaptive patterns of interactions within the family. The concept of homeostasis is central to a systems perspective. Evolution and change are also inherent to open systems, however (Minuchin, 1985). Family systems adjust to mundane changes through processes of self-regulation, but critical changes may challenge existing patterns of interaction and prompt a reorganization of the family system. This process of morphogenesis is a necessary part of the family life cycle, as families will inevitably encounter critical changes and transitions as members of the family develop (Minuchin, 1985).

Changing demands introduce stress into the family system (Britner et al., 2003). The family unit can self-correct to maintain a balance within certain limits, but heightened demands may prompt the family unit to reorganize in order to adapt to new demands. If the family system is unable to reorganize, it may rely on dysfunctional patterns of interaction. The addition of a child with a developmental disability to the family, for instance, may trigger a series of challenges to the family system. The processes through which families manage to reorganize and adapt to new caregiving challenges are the focus of much research, including this dissertation. There is a need for more research on the adaptation of families of children with disabilities from a family systems perspective, in order to move beyond simple linear models that assume that heightened demands inevitably lead to dysfunctional outcomes for families (Crnic, Friedrich, & Greenberg, 1983).

**The Double ABCX Model of Adjustment and Adaptation.** McCubbin and Patterson's (1983) model of family stress stems from a family systems perspective, which emphasizes the ability of the family system to accommodate to changing demands across the family life cycle. This model elaborates on the processes through which families adapt and adjust to everyday challenges and major life changes. The Double ABCX Model of Adjustment and Adaptation (Figure 2) is an extension of Hill's (1949) ABCX Model of family adaptation. In Hill's model, the family's adaptation to an atypical event, or "crisis", is explained by several factors, including the nature of the crisis, the internal and external resources of the family, and the meaning ascribed to the crisis event.

In the ABCX Model the stressor event (A) interacts with the family's crisis-meeting resources (B), which interacts with the definition the family makes of the event (C), which produces the crisis (X). Hill's original ABCX factors are included in McCubbin and Patterson's (1983) revised model. In this model, the authors define the A factor as family demands, consisting of stressors and hardships. Stressors refer to life events or transitions that impact the family unit and have the potential to change the family social system. Hardships refer to the demands on the family unit that are associated with a stressor event, such as the need to obtain more money to cover increased medical expenses following an injury. Both stressors and their associated hardships place demands on the family system.

The impact of demands on the family depends in part on the family's resources and appraisals of the meaning of the situation (McCubbin & Patterson, 1983). The B factor consists of the family's available capabilities and resources to meet the demands of a stressor and its associated hardships. This factor represents the family's ability to prevent an event from disrupting the family system. The family's appraisal of the meaning of the stressful event represents the C factor. The definition of the stressor and the perspective on how this stressor will affect the family is subjective and likely to be influenced by the family's values and their previous experiences dealing with demands (McCubbin & Patterson, 1983).

Stressor events and related hardships challenge the family system and need to be managed. When family resources and appraisals do not overcome this tension, stress emerges. While stressors are defined as the objective events that place demands on the

family unit, stress is defined as a state of actual or perceived demand-capability imbalance in the family's functioning (McCubbin & Patterson, 1983). In other words, stress is not a constant state but rather changes as family demands, resources, and appraisals change. Stress leads to distress when it is subjectively defined by the family unit as undesirable or unpleasant. The family's level of distress is captured by the X factor, which is conceptualized as the level of "disruptiveness, disorganization, or incapacitatedness in the family social system" (Burr, 1973 as cited in McCubbin & Patterson, 1983). Families may utilize existing resources and redefine the situation to resist disruption and maintain stability.

McCubbin and Patterson (1983) expanded Hill's model to account for changes in stressors, resources, and ascribed meanings over time. Based on longitudinal observations of 216 families in crisis, brought on by an extended period of absence of fathers in the Vietnam War, four additional factors were noted to influence family adaptation over time (McCubbin, Olson, & Patterson, 1983). First, it was observed that families are rarely dealing with a single stressor, but rather experience a pile-up of stressors. The pile-up of family demands was added to the Double ABCX model as the aA factor. The model specifies at least five broad types of stressors and strains, including the initial stressor, normative transitions, prior strains, consequences of family efforts to cope, and ambiguity/uncertainty about the future.

It was also observed that families would seek out additional resources from within the family and from the community. The bB factor was thus added to represent both existing resources and expanded family resources. Resources include characteristics of

individual family members (e.g., mother's ability to manage the home), the family unit (e.g., togetherness, role flexibility), and of the community (e.g., friendships, religious involvement). One of the most important resources included in the bB factor is social support according to the authors, which was noted to make families more resistant to major crises and better able to recover from crises (McCubbin, Olson, & Patterson, 1983). In addition to family resources, family appraisals of the situation also changed over time. The cC factor is the meaning the family gives to the total crisis situation, including the subjective definition of the original stressor as well as added stressors and strains. Perceptions and evaluations of existing and new resources also fall within the scope of the cC factor.

Finally, McCubbin and colleagues (1982) observed the use of coping strategies among family members aimed to bring about changes in family structure and restore balance. Family adaptive coping was added as a new element of the model and seen as the interaction of resources, perceptions and behavior. Coping is "a bridging concept which has both cognitive and behavioral components wherein resources, perception, and behavioral responses interact as families try to achieve a balance in family functioning" (McCubbin & Patterson, 1982, p. 16). The authors identified five functions of family coping efforts. Coping was aimed to eliminate or avoid stressors, manage the hardships of a situation, or maintain the family's integrity and morale. Other efforts were aimed to acquire and develop new resources to meet demands and make structural changes in the family system to accommodate new demands. In this view, coping efforts are not specific to one stressor, but are rather directed at multiple stressors and hardships simultaneously.

The final component added to the Double ABCX model represents the family's adaptation over time. Whereas the outcome of Hill's (1949) model was conceptualized as the amount of crisis in the family system, family outcomes in the extended model fall along a continuum from maladaptation to bonadaptation. Family disruptions have the ability to promote desirable as well as undesirable outcomes (McCubbin & Patterson, 1983). In line with systems theory, it is noted that a characteristic of systems is to evolve to greater complexity and perhaps growth, thus family adjustment was expanded from simply "reduction in crisis" to also include growth (McCubbin & Patterson, 1983, p. 17). Similar to family resources, family outcomes are conceptualized at multiple levels: the individual family member, the family system, and the community which houses the family system. The model purposefully avoids identifying a single measure of maladaptation or bonadaptation, as family adaptation will depend on the particular family, context, and stage of the family life cycle.

The Double ABCX model was developed to describe the adaptation of families to crisis, but it has been widely used to study the adaptation of families to raising a child with a developmental disability. In a literature review of parenting stress models, Hill and Rose (2010) found 85 empirical articles that applied this model to parents of offspring with intellectual disabilities. Support for the model was found within samples of parents of young children with intellectual disabilities (Reddon, McDonald, & Kysela, 1992), children with autism and severe communication disorders (Bristol, 1987), and children with intellectual disabilities and/or behavior problems (Jones & Passey, 2005). The majority of studies have focused on young or school-aged children, but support for the

Double ABCX model has also been found within samples of parents of adult children with intellectual disabilities (Minnes, Woodford, & Passey, 2007).

The majority of empirical articles supported the effectiveness of the Double ABCX model in capturing processes of adaptation in families of children with DD. Orr and colleagues (1993) suggested an alternative ordering of the model, however. Orr and colleagues (1993) evaluated the Double ABCX model in families (N=86) of children, adolescents, and young adults with intellectual disabilities using path analysis. They suggested the causal ordering of the model to be ACBX rather than ABCX based on model fit, with A as the frequency of behavior problems, B as the family social and psychological resources, C as problem solving strategies used by families, and X as parental stress. They interpreted their findings to suggest that the effectiveness of family resources depends on the family's perception of the stressor. Their study was limited by a cross-sectional design, however. In addition, it could be argued that the C factor, which involved the family's use of reframing strategies, is more a measure of the family's coping strategies than appraisal of the stressor (Hill & Rose, 2010).

The lack of conceptual clarity exemplified by Orr et al. (1993) has been argued to be the primary limitation of the Double ABCX model for use in research (Hill & Rose, 2010; Minnes et al., 2007; Perry, 2004). Minnes and colleagues (2007) point to the lack of consensus on which variables to include in the model and how to operationally define each of the variables. Indeed, the model is graphically presented differently across studies (Hill & Rose, 2010). Perry (2004) echoes this concern regarding conceptual clarity, stating there is considerable confusion between the C and A components in studies using

this model. She argues that parent reports of child difficulty (A factor) are often confounded with the meaning they attribute to the stressor (C factor). Perry also highlights the lack of definition of the B and bB factors. In her view this factor is too broadly defined, as it includes a combination of new and old resources, individual and family level resources, and resources stemming from both within and outside the family.

There is a general lack of clarity as to whether factors in the model should be measured at the individual or family level. The Double ABCX model purports to be a family model, yet components of the model are operationally defined by individual family members' reports. In addition, Perry criticizes the model's conceptualization of the stressor as a crisis event, since this may not be a helpful assumption in studies where the stressor is defined as the birth of a child with a disability. Despite its limitations, the Double ABCX model has stimulated a vast amount of research and provides a helpful conceptual model for understanding processes of adaptation among families of children with disabilities. Several of the model's limitations are addressed in a model of stress developed specifically for families of children with developmental disabilities (Perry, 2004).

**A Model of Stress in Families of Children with Developmental Disabilities.** In response to a lack of conceptual clarity in existing models, Perry (2004) proposed a theoretical model for understanding stress and related outcomes in families of children with developmental disabilities (Figure 3). The model aimed to address the weaknesses of existing theories in defining stress consistently across studies, disentangling independent from dependent variables, and measuring components of the model as

distinct constructs. The model is intended to be conceptually clear and concise, yet practical for research and clinical practice.

Perry's model incorporates elements of family systems theory, ecological theory, and coping theory, among other influential bodies of literature (Perry, 2004). More specifically, she incorporates components of existing theoretical models developed uniquely to understand stress and adaptation among families of children with developmental disabilities. Perry reviews four bodies of literature that conceptualize stress among families raising children with disabilities in distinct ways. Historically, it was assumed that families progressed through a series of stages of shock, denial, anger, bargaining, and acceptance following the birth of a child with a disability (Selye, 1980). This grieving perspective is not widely accepted by professionals or parents of children with disabilities (Perry & Condillac, 2010). A second paradigm conceptualizes stress as stressful life events that impact mental and physical health (Perry, 2004). This model is useful in capturing the impact of life events such as the loss of a job or parental divorce, but it fails to consider the role of moderating variables that may explain the extensive variability in families' reactions to life events.

A third approach views stress not as critical life events, but rather as the everyday stresses and hassles of caregiving (Crnic et al., 1983). This approach has been widely used in research on families of children with disabilities since it captures the day-to-day challenges take cumulative effect on parents. Lastly, stress among parents of children with disabilities has also been viewed as the result of an imbalance in resources available to meet the demands of a situation (Perry, 2004). This approach assumes there is an

indirect relationship between a stressor and perceived stress, which is partially explained by protective factors such as coping or social support. McCubbin and Patterson's (1983) Double ABCX model is an example of this paradigm of stress among parents of children with DD.

Drawing on these existing bodies of literature, the major components of Perry's (2004) model include Stressors, Resources, Supports, and Outcomes. Each of the components is divided into two domains. Stemming from the life events and daily hassles paradigms described above, the Stressors in this model include both the major and minor stressful events in parents' lives. This distinction is similar to the separation of stressors and hardships in the Double ABCX model. The Stressors component in Perry's model is divided into the domains of Child Characteristics and Other Life Stressors. Relevant child characteristics include level of dependency, cognitive or developmental level, and frequency or severity of problematic behavior. In addition, the child's type of disability, age, and gender may be relevant characteristics. Perry emphasizes the importance of distinguishing between the stressors related to child characteristics and parents' stress response, as these constructs have been confounded in previous work.

The domain of Other Life Stressors incorporates stressful life events that are not associated with the child with a disability, such as employment, illness, financial problems, and marital transitions. Families of children with DD encounter these life stressors just as other families do. Families may encounter an additional set of life stressors unique to raising a child with special needs, however, such as the cost of special

treatments or home modifications. The impact of life events on parents' perceptions of stress is captured by the Other Life Stressors domain.

Unlike the Double ABCX model, Perry distinguishes between the resources and sources of supports that may protect families from the negative impact of stressors. The Resources component is further subdivided into resources at the individual and family level. The Individual's Personal Resources domain consists of factors relating to personality, coping strategies, and beliefs as well as demographic variables (e.g., education, employment). Parents' self-esteem and locus of control are also relevant personal resources. Perry points to the importance of research in highlighting the efficacy of personal resources in preventing or reducing stress. In addition, she suggests that researchers explore potential differences in the efficacy of personal resources between mothers and fathers.

The domain of Family System Resources is likewise an important area of inquiry for researchers. This domain is comprised of variables that measure family functioning, marital satisfaction, and demographic variables (e.g., socioeconomic status, marital status). Perry makes an effort to disentangle constructs measured at the individual and family level, since existing models do not make this distinction (e.g., the Double ABCX model). She notes, however, that family level constructs continue to be measured at the individual level in research, since family members report on their own individual perceptions of the family as a whole.

The Supports component consists of both informal and formal supports. Informal Social Support is defined as emotional or instrumental support provided by extended

family members, friends, neighbors, social organizations, and religious communities (Perry, 2004). Social support has been widely researched in families of children with disabilities. Different aspects of social support have been discussed in the literature on families of children with DD, including quantity vs. quality of support, perceived vs. actual support, and helpfulness vs. stressfulness of supports.

The Formal Supports and Services domain includes services from professional interventions such as education or treatment programs. Family interventions such as marital or family counseling, respite care, parent support groups and parent organizations can also be considered formal supports. The number of formal supports may be measured, but also their quality, effectiveness and relevance to family needs could be considered. Separating informal from formal supports may have important implications for practice (Perry, 2004).

The Outcomes component of Perry's model includes both positive and negative dimensions of parent well-being. The inclusion of measures of positive well-being stems from an historical focus on negative outcomes in research and theory on families of children with DD. Family stress research has focused on parental depression, pessimism, burnout, and distress as outcome variables, yet there is support from clinical and empirical work that positive dimensions should be considered as well since these dimensions are not necessarily mutually exclusive (Trute & Hiebert-Murphy, 2002). The consideration of parental outcomes as distinct constructs departs from McCubbin and Patterson's (1983) view of family adaptation along a continuum of maladaptation to

bonadaptation. It is possible for families to simultaneously experience positive and negative effects (Perry, 2004).

Perry's (2004) model of stress borrows from several bodies of literature, including general theories of child development as well as models developed for families of children with disabilities. Although informed by a family systems perspective, the model is measured at the individual level. Perry justifies an individual framework since many of the important resources and supports are inherently individual constructs (e.g., coping, social support). Family level variables, such as family cohesion or marital satisfaction, are often measured as one individual's perspective of the family as a whole. Perry also notes that a model measured at the family level would obscure important differences of perspectives within the family. An individual framework would potentially allow researchers to observe important mother-father differences in the efficacy of resources and supports. This model has the advantage of being concise and conceptually clear for the purposes of research. The model is essentially static, however, and does not account for changes in Stressors, Resources, Supports, or Outcomes over time. It also fails to account for the role of individuals' perceptions of events. Although this model improves upon the conceptual ambiguities of the Double ABCX model, it does not clarify whether resources and supports should be considered as mediators or moderators of the relationship between child characteristics and parent outcomes.

**Summary.** The present dissertation is guided by several theoretical perspectives. Family systems theory provides the overarching theoretical orientation for this dissertation, upon which both McCubbin and Patterson's (1983) and Perry's (2004)

models are also based. This theory emphasizes the importance of the family as an organized, dynamic system. Most relevant to this dissertation, family systems theory highlights the ability of the family system to maintain equilibrium in the face of everyday challenges (homeostasis) as well as to adapt to heightened demands and developmental transitions encountered across the family life cycle (morphogenesis).

These concepts are echoed in McCubbin and Patterson's (1983) Double ABCX theory, which identifies key resources and appraisals that serve as both protective and resiliency factors among families. Although the Double ABCX model provides a helpful model of the processes of adjustment and adaptation in families, its use in research is limited by conceptual ambiguities. These ambiguities are in part addressed by Perry's (2004) model of stress in families of children with developmental disabilities. Perry expands upon McCubbin and Patterson's notion of family resources and delineates specific aspects of individual and family level resources and informal and formal supports that partially explain the relationship between stressors and outcomes in families of children with DD. Perry's model is static, but can be extended to capture longitudinal changes in stressors, resources, supports, and outcomes.

The conceptual model for this dissertation includes components of the theories described above (Figure 1). The outcome variable in this conceptual model is parent-related stress. Stressors in this model are conceptualized as negative life events and specific child characteristics (behavior problems, adaptive behavior), similar to Perry's (2004) model. Negative life events will serve as a control variable, accounting for the impact of life events on parenting stress unrelated to the child with a disability (Taylor,

Roberts, & Jacobson, 1997). Similar to Perry (2004), this conceptual model distinguishes between individual and family level resources. At the individual level, parents' use of various coping strategies and their perceptions of social support will be explored. Individuals will also report on their perceptions of the family climate, a family level resource. Resources and supports are expected to have direct impacts on levels of parenting stress. They are also expected to moderate the relationship between child behavior problems and parenting stress, such that resources and supports will have a greater impact on parenting stress among parents of children with higher levels of behavior problems.

The next few sections will review the literature on the major components of this conceptual model as it applies to parents of children with disabilities. First, the literature on parenting stress among parents of children with disabilities will be reviewed, including definitions of stress, comparative studies of parents of children with and without disabilities, the role of parent gender, and changes in parental stress over time. Next, the literature on child characteristics, behavior problems and adaptive behavior, in relation to parenting stress will be discussed. Lastly, the role of resources and supports in predicting parenting stress will be reviewed, specifically coping strategies, family climate, and social support.

## Parenting Stress

**Defining stress.** As previously noted, stress among parents of children with disabilities has been conceptualized in various distinct ways (Perry, 2004). Stress can be generally viewed as an individual's "emotional and behavioral response to some

unpleasant event" (Crnic & Low, 2002, p. 243). Stress includes behavioral, emotional, and physiological reactions that affect well-being (Crnic & Low, 2002). In research on families, stress has been assessed as either objective indicators or subjective perceptions of stress. Objective assessments of stress address the presence or absence of adverse life events, without consideration of the individual's perceptions of these events. This life events paradigm dominated early research on stress (Holmes & Rahe, 1967). Researchers began to question the usefulness of this paradigm in capturing the nature of the stress experience, however, and extended the definition of stress to include the individual's cognitive appraisal of life events (Lazarus, 1984; Sarason, Johnson, & Siegel, 1978). A subjective assessment of stress has dominated contemporary research (Deater-Deckard, 1998).

There has been a shift from an exclusive focus on individuals' appraisals of major life events to include the individual's evaluation of the impact of minor daily hassles as well (Kanner, Coyne, Schaefer, & Lazarus, 1981). The daily hassles paradigm views stress as the cumulative impact of relatively minor daily hassles associated with caregiving. Hassles have been conceptualized as the "irritation, frustrating, annoying, distressing demands" that characterize parents' daily interactions with their environment (Crnic & Low, 2002, p. 247). This measurement approach has been applied to research on families of children with disabilities to capture the cumulative effect of daily challenges related to caregiving (e.g., changing child's diapers, taking child to doctor) (Crnic et al., 2005).

Aspects of the daily hassles perspective are incorporated into Abidin's (1990) conceptualization of stress along two dimensions: child-related stress and parent-related stress. The construction of the Parenting Stress Index (PSI; Abidin, 1983, 1990, 1995) was guided by Abidin's (1976) theoretical model of dysfunctional parenting that included salient child characteristics, parental characteristics, and situational variables. The PSI is a parent-report questionnaire designed to measure the level of stress in the parent-child system and to identify various sources of stress (McKinney & Peterson, 1984). Similar to the daily hassles paradigm, the domain of child-related stress captures relatively factual child characteristics (e.g., my child needs help getting on the bus to school). The subscales of Adaptability, Demandingness, Mood, and Distractibility/Hyperactivity subscales are considered objective indicators of the child's level of demand on the parent (Abidin, 1995). Beyond objective indicators, the Acceptability and Reinforces Parent subscales of the child-related stress domain involve the parent's subjective evaluation of how closely the child meets their expectations and how satisfied they are with the parent-child relationship. Following Lazarus (1966), Abidin constructed these subscales to capture the appraisal component of the experience of stress. Thus, the child-related stress domain of the PSI incorporates elements of the daily hassles and cognitive appraisal stress paradigms.

The parent-related stress domain is designed to assess the level of dysfunction in the parent-child system related to the parent's functioning in particular (Abidin, 1995). The parent personality and pathology components are captured by the Depression, Competence, and Attachment subscales. These subscales assess the parent's subjective

feelings of emotional availability, parenting confidence, and investment in parenting. The remaining four subscales of the parent domain capture the amount of stress related to situational factors, including Spouse, Isolation, Health, and Role Restriction. The parent domain of the PSI follows the cognitive appraisal stress paradigm.

The construct validity of the child-related stress domain for parents of children with disabilities has been called into question. Innocenti, Huh, & Boyce (1993) compared levels of child-related and parent-related stress in a sample of parents of young children with disabilities (N=725) to the PSI normative sample. The children in the disability sample had diverse diagnoses, with developmental delay (19%), medically fragile (17.9%), and Down syndrome (13.9%) as the most frequently represented diagnoses. The normative sample and disability sample were generally comparable on major demographic variables. The authors grouped the children in the disability sample into the same age categories reported in the PSI manual (ages 1, 2, 3, 4, and 5) and compared their parents' levels of child-related and parent-related stress to the normative sample using a series of t-tests. Parents of children with disabilities reported significantly higher levels of child-related stress than parents in the normative sample across all age groups. Overall, levels of parent-related stress among parents of children with disabilities were comparable to the normative sample, with the exception of parents of three-year-old children. For this group, parents of children with disabilities reported significantly higher levels of parent-related stress.

Given the significantly higher levels of child-related stress reported by parents of children with disabilities, Innocenti et al. (1993) conducted a follow-up item analysis to

explore for which types of items the greatest amount of stress was reported among parents of children with DD. The authors identified nine items for which the mean for parents of children with disabilities was more than one standard deviation above the mean for the normative sample. The authors noted that these items almost all dealt with characteristics common to all children with disabilities (e.g., "my child doesn't seem to learn as quickly as most children", "my child has had more health problems than I expected"). As a result, the authors suggested that items that indicate stress for typical parents may not indicate stress for parents of children with disabilities. In other words, these items may simply capture characteristics common to the population and may not be sensitive to parents' experience of stress in their view.

Work by Baker and colleagues (2003) echoes this concern about the measurement of child-related stress among parents of children with disabilities. They note that the Parenting Stress Index, as well as other popular measures of stress (e.g., Questionnaire on Resources and Stress), confound child-related stressors with parents' perceptions of stress. They argue that these measures assess both parent experiences and child characteristics simultaneously, thus there is an assumption in the items that there is a relationship between child challenges and parenting stress – yet this is the very assumption researchers aim to test: "When the parents of children with disabilities score higher than those of normally developing children on these measures, the conclusion that these parents are more stressed is to some degree circular" (Baker et al., 2003, p. 221). Indeed, independent raters of PSI items labeled many items related to child characteristics as stressors, rather than as indicators of a stress reaction (McKinney &

Peterson, 1984). Given the importance of distinguishing stressors from stress reaction in research (Perry, 2004), this dissertation will focus exclusively on parent-related stress as an outcome variable.

**Comparative studies.** Stress is an inherent part of the parenting experience. Some level of parenting stress and daily hassles is considered to be normal and adaptive for all parents (Deater-Deckard & Scarr, 1996; Crnic et al., 2005), but parents of children with disabilities tend to report greater than average levels of stress (Baker et al., 2003; Emerson, 2003; Fidler et al., 2000; Orr et al., 1993). This finding has not held true for all types of stress, however. Many studies have directly compared the levels of stress experienced by parents of children with and without disabilities. The majority of studies have focused on early childhood, with few extending to middle childhood or adolescence. Group differences in stress have been found within samples of parents of children in their infancy (Scott, Atkinson, Minton, & Bowman, 1997), early childhood (Baker et al., 2002, 2003; Britner, Morog, Pianta, & Marvin, 2003; Cameron, Dobson, & Day, 1991; Innocenti et al, 1993; Lopez, Clifford, Minnes, & Ouellette-Kuntz, 2008; Most, Fidler, Laforce-Booth, & Kelly, 2006; Roach, Orsmond, & Barratt, 1999), middle childhood (Sanders & Morgan, 1997), and adolescence (Emerson, 2003).

Most comparative studies have focused on parents of children with general developmental delays or intellectual disabilities (Baker et al., 2002, 2003; Cameron et al., 1991; Dyson, 1991; Emerson, 2003; Innocenti et al., 1993; Lopez et al., 2008). As previously described, Innocenti et al. (1993) compared stress among parents of 725 young children with diverse disabilities to normative data on the Parenting Stress Index

and found that parents of children with disabilities reported higher levels of child-related stress but not parent-related stress, with the exception of parents of three-year-old children with disabilities who reported higher levels of parent-related stress. This pattern was also found in Cameron et al. (1991), where mothers of pre-school children with developmental delays (N=39) displayed higher levels of child-related, but not parent-related, stress than mothers of children without delays (N=40). In particular, the mothers of children with developmental delays reported higher levels of stress related to the acceptability, demandingness, and distractibility of their child.

Baker et al. (2002) also found heightened levels of stress among parents of three-year-old children with developmental delays (N=92) compared to parents of typically developing three-year-olds (N=133). Using the Family Impact Questionnaire (Donenberg & Baker, 2003), the authors found that parents of children with delays reported higher overall negative child impact, in particular impact on finances. There were no differences in negative impact on siblings, marriage, or feelings about parenting by disability status. In a longitudinal extension of this study (Baker et al., 2003) parents of children with delays (N=82) were found to also have higher negative impacts related to views on parenting and social relations compared to parents of children without delays (N=123). Dyson (1991) reported similar findings, with parents of children with disabilities (N=55) reporting higher levels of parent and family problems, pessimism, negative child characteristics, and child physical incapacitation than parents of children without disabilities (N=55).

Parents of children with more specific diagnoses have also been the focus of comparative studies. Parents of children with Down syndrome (DS), for instance, have been found to report higher levels of stress than parents of typically developing children (Most et al., 2006; Roach et al., 1999; Sanders & Morgan; Scott et al., 1997). Roach et al. (1999) compared levels of child-related and parent-related stress among parents of young children with DS (N=41) to parents of typically developing young children (N=58) using the Parenting Stress Index. Parents of children with DS reported significantly higher levels of child-related stress, in particular stress related to their child's distractibility, demandingness, and acceptability. Group differences were also found in parent-related stress. Parents of children with DS reported significantly more stress associated with parental competence, health, role restriction, and depression than did parents of children who were typically developing. Analyses controlled for the child's age and number of siblings.

Similarly, Sanders and Morgan (1997) found that parents of school-aged children with Down syndrome (N=31) reported higher levels of stress than parents of typically developing children (N=32), as measured by the Questionnaire on Resources and Stress. More specifically, parents of children with DS reported higher pessimism about their child's future and more negative child characteristics than did parents of typically developing children. Mothers, but not fathers, of children with DS also viewed their child as having more physical incapacitation.

Parents of children with autism (Sanders & Morgan, 1997) and cerebral palsy (Britner et al., 2003) have also displayed higher overall levels of stress than parents of

children without disabilities. Within a sample of 18 children with autism and 18 children without any diagnosed disabilities, Sanders & Morgan (1997) found significant differences in parents' levels of stress using the Family Impact Questionnaire. Parents of children with autism perceived significantly more parent and family problems and greater pessimism about the child's future, negative child characteristics, and physical incapacitation than did parents of typically developing children. Britner et al. (2003) found parents of young children with mild (N=30) and severe (N=27) cerebral palsy to have higher total scores on the Parenting Stress Index than parents of children with no medical diagnosis (N=30).

The studies described above compared stress levels among parents of children with various types of disabilities to parents of children without any disability diagnoses. Further studies have compared parental stress across different types of child disability, such as Down syndrome vs. autism (Sanders & Morgan, 1997), Down syndrome vs. developmental delay (Most et al., 2006), or Down syndrome vs. Williams Syndrome (Fidler et al., 2000). Many researchers have highlighted the weaknesses and limitations of comparative studies, however (Cahill & Glidden, 1996; Lamb & Billings, 1997; Roach et al., 1999). It has been argued that many comparative studies use inappropriate comparison groups, fail to control for key demographic and family variables (e.g., marital status, socioeconomic status), and fail to account for differences in the severity of the child's disability or the child's age (Roach et al., 1999). Several studies have attempted to address these limitations through matched designs, but continue to find significant

differences in stress among parents of children with and without disabilities (e.g., Dyson, 1991; Roach et al., 1999).

Comparative studies highlight the need for researchers and practitioners to address potentially high levels of stress among parents of children with disabilities. There is considerable variability in the extent of stress experienced by parents of children with disabilities, however, and these comparative studies fail to address critical within group differences. Although parenting a child with a disability is associated with a risk for heightened stress, the majority of parents do not experience clinically high levels of stress (Innocenti et al., 1991). The remainder of this discussion of parenting stress will focus on differences in parenting stress within families raising children with disabilities, over time and across parent gender.

**Developmental changes.** Few studies have examined longitudinal changes in stress among parents of children with disabilities. The majority of longitudinal studies have focused on parents' trajectories of stress across their child's pre-school years. Among these studies, several have found levels of parenting stress to be stable over time (Baker et al., 2003; Hanson & Hanline, 1990; Dyson, 1993). For instance, Baker et al. (2003) found the child's impact on the family to be stable among mothers and fathers of children with and without disabilities from age 36 to 48 months. Using the Parenting Stress Index, Hanson and Hanline (1990) found levels of child and parent related stress to be constant from toddlerhood through age 4 among mothers of children with Down syndrome, hearing impairment, and neurological impairment (N=35). Dyson (1993)

reported stability in parental well-being and family functioning among families of children with and without disabilities over a four year period.

Other studies have reported mixed findings. Gerstein, Crnic, Blacher, and Baker (2009) reported increases in daily parenting stress among mothers of children with intellectual disabilities (N=115) from 36 to 60 months of age. Levels of daily parenting stress were stable among fathers across this period, however. Most et al. (2006) explored trajectories of stress among mothers of young children with Down syndrome (N=25) and mixed etiology (N=49). Mothers of children with Down syndrome (DS) initially reported lower levels of stress, but were matched to mothers of children with mixed etiology at the conclusion of the study. Trajectories of stress remained stable for mothers of children with mixed etiology, but were found to increase for mothers of children with DS, from child age 15 to 45 months.

Several studies have found stress to increase as the child with a disability ages. Increases in stress over time may be expected as the child becomes more difficult to manage or the differences between the child and his or her peers become more noticeable (Gallagher, Beckman, & Cross, 1983). In a longitudinal study of parents of children with Down syndrome, motor impairment, and developmental delay, Hauser-Cram et al. (2001) found levels of parent and child-related stress to increase over time. Increasing trajectories were observed for both mothers and fathers from when their child was age 3 to age 10. An increase in stress over time has been found in cross-sectional studies of parents of children with disabilities as well. For instance, Innocenti et al. (1993) compared levels of stress among families of children with diverse disabilities at different

ages. The authors found significant differences in parents' child-related, but not parent-related, stress by child age. Specifically, it was found that parents of children aged less than 12 months reported significantly less child-related stress than parents of children aged 1 to 3 years or children aged 3 years and above.

Orr et al. (1993) extended their cross-sectional study to include parents of children with developmental delays age 2 through 18 years. The authors compared levels of stress among mothers of children in their early childhood (N=39), middle childhood (N=40), and adolescence (N=33). Contrary to the authors' expectations, the findings suggested that the relation between age and stress is an inverted U-shape, with the most stress experienced by parents during the middle childhood period. This pattern was observed with respect to child-related, parent-related, and total stress scores. An analysis of the subscales of each domain revealed significant group differences in adaptability and acceptability within the child domain and depression and sense of competence within the parent domain. The authors attribute the decrease in stress from middle childhood to adolescence to families' adjustment to the daily demands of caring for a child with a disability.

Orr et al.'s (1993) study was limited by its use of a cross-sectional design, however. The authors note several alternative explanations for their findings, for instance that children with the most severe conditions may not survive to adolescence or that alternative care arrangements have been obtained for children with severe conditions by the time they reach adolescence. To date, no longitudinal study has explored changes in parenting stress beyond middle childhood. Moreover, Orr et al. did not include fathers in

their sample. This dissertation aims to address these gaps in the literature on changes in parenting stress over time among parents of children with disabilities.

**Parent gender.** Research on parenting stress has focused almost exclusively on mothers, but there is growing interest in differences in the perspectives of mothers and fathers regarding their parenting experience. Several hypotheses of parent differences exist, with many focusing on biological sex differences or differences in the social roles of men and women in the household (Deater-Deckard & Scarr, 1996). The sex role hypothesis argues that observed gender differences in parenting stress may relate to sex differences in depression and distress more generally (Scott et al., 1997). In contrast, the social role hypothesis suggests that gender differences can be explained by differences in the social roles of men and women in the household. With respect to parenting stress, for instance, it is argued that women are more likely to be exposed to strain-inducing experiences because they spend more time in child care and household chores and are more likely to juggle family responsibilities and work commitments (Scott & Alwin, 1989).

The social role perspective has unique implications for parents of children with disabilities, since these families may take on more traditional gender roles than other families (Heller, Hsieh, & Rowitz, 1997). The additional strains of raising a child with special needs may fall disproportionately to mothers, placing them at risk for heightened levels of stress (Beckman, 1991; Krauss, 1993; Smith, Innocenti, Boyce, & Smith, 1993). Roach et al. (1993) explored the contribution of involvement in child care to parental stress among mothers and fathers of children with Down syndrome. Mothers reported

greater involvement in daily caregiving, child-related tasks and child socialization than fathers. Greater responsibility for child care was associated with difficulties with health, role restriction, and spousal support for mothers.

The salience of the parental identity may also contribute to gender differences in parenting stress. Simon (1992) documented gender differences in the parenting experience among parents of typically developing children. He found higher levels of distress, exposure to parental role strains, and salience of the parental identity among mothers as compared to fathers. Women identified more strongly to their parental role and the salience of this identity contributed to their vulnerability to parental role strains. Interestingly, although fathers identified less strongly with the parental identity, those that did were also more vulnerable to parental role strains. It appears the strength of an individual's identity as a parent plays a role in his or her sensitivity to child related stressors.

There is some empirical support to suggest that mothers and fathers of children with disabilities have differing parenting experiences. Several studies have reported elevated levels of stress and depression among mothers of young children with disabilities as compared to fathers (Beckman, 1991; Bristol, Gallagher, & Schopler, 1988; Frank et al., 1991; Moes, Koegel, Schreibman, & Loos, 1992; Oelofsen & Richardson, 2006; Sharpley et al., 1997). Yet other studies have reported higher levels of stress among fathers of children with disabilities, specifically related to their child's temperament (Goldberg, Marcovitch, MacGregor, & Lojkasek, 1986; Krauss, 1993; Noh, Dumas, Wolf, & Fisman, 1989), communication difficulties (Frey, Greenberg, & Fewell,

1989), and their feelings of attachment to their child (Beckman, 1991; Keller & Honig, 2004; Krauss, 1993). Other studies have found no gender differences in well-being (Dyson, 1997; Hadadian, 1994; Hastings et al., 2005; Roach et al., 1999). Mixed findings have also been reported in the literature on parents of typically developing children (Deater-Deckard & Scarr, 1996).

The experience of parenting may be more alike than different for mothers and fathers of children with disabilities, but the factors that influence their well-being may be distinct (Hastings, 2003; Keller & Honig, 2004; Krauss, 1993). Among parents of 121 toddlers with diverse disabilities, for example, Krauss (1993) found differences in the predictors of stress by parent gender. For mothers, levels of parenting stress related to the perceived helpfulness of their social support networks. Parenting stress among fathers was more sensitive to the effects of the family environment. Although mothers perceived their families as more cohesive than did fathers, this cohesiveness had no discernable effect on mothers' stress levels. This pattern suggests that while fathers look to the family for support, mothers' sense of support comes from outside the family. Similarities in the predictors of stress were also observed. Parents' appraisals of professional or personal control over their child's development and their perceptions of the adaptability of the family impacted stress similarly among mothers and fathers.

Fathers have historically been neglected in research on parenting stress and in the social sciences more broadly. Few studies have examined the unique needs and patterns of adjustment among fathers of children with special needs (Hornby, 1995). Fathers have been identified in research as 'hard to reach', 'the invisible parent', and the 'peripheral

parent' (Carpenter & Towers, 2008). Often father data are merged with mother data with no direct comparisons of their experiences, yet there is emerging support for the notion that there are important differences in the experiences of mothers and fathers of children with disabilities. Further research is needed to understand differences in the level and predictors of parenting stress among mothers and fathers of children with DD. This dissertation aims to address this gap in the literature.

**Consequences of stress.** Some argue that life stress is "role specific", suggesting stress in the parenting role is distinct from stress in other domains, such as work (Creasey & Reese, 1996). Stress related to the parenting role may be more strongly related to parenting behavior and child adjustment than other life stress (Deater-Deckard, 1998). Crnic et al. (2005) found parenting stress and other life stress to have independent and differential effects on parent well-being, child adjustment, and quality of parent-child interactions. Parenting stress relates to other aspects of parent well-being, including satisfaction with parenting (Crnic & Booth, 1991), negative mood (Bolger, DeLongis, Kessler, & Schilling, 1989), psychological well-being (Kanner et al., 1981) and life satisfaction (Crnic & Greenberg, 1990).

Beyond individual parent well-being, parenting stress has been found to impact parent behavior during interactions with their children. Parents who report higher levels of parenting stress are more likely to be authoritarian, harsh, and negative in their parenting (e.g., Belsky, Woodworth, & Crnic, 1996; Conger, Patterson, & Ge, 1995; Deater-Deckard & Scarr, 1996) and less involved with their children (McBride & Mills, 1994). Stressed parents are less likely to provide adequate stimulation for their child

(Adamakos et al., 1986) and more likely to abuse or neglect their child (Chan, 1994; Holden & Banez, 1996). A reduction in the quality of parenting behaviors may in turn lead to problems in emotional, behavioral, cognitive, and physical development for the child (Deater-Deckard, 1998). Harsh and inconsistent parenting is associated with greater maladjustment in children and adolescents (Patterson, Reid, & Dishion, 1992; Rothbaum & Weisz, 1994).

The impact of parenting stress on child adjustment may be mediated by parenting behavior. Deater-Deckard and Scarr (1996) found higher amounts of parenting stress to correlate with more authoritarian parent discipline behavior, which in turn correlated with more behavior problems among children. Other studies have found no evidence of parent behavior as a mediating factor, however, and argue that parenting stress has a direct impact on child adjustment (Conger et al., 1995; Crnic et al., 2005). Parental stress has detrimental impacts on various aspects of children's functioning, including the development of psychopathology (Cummings, Davies, & Campbell, 2000), behavior problems (Crnic & Greenberg, 1990), attachment security (Jarvis & Creasey, 1991), and cognitive functioning (Thompson et al., 1994). In sum, parenting stress has direct and effect effects on various aspects of parent and child well-being.

**Child Characteristics.**

**Behavior problems.** Parenting stress among mothers and fathers of children with DD has been found to relate to a number of child characteristics. Previous studies focused on child characteristics such as type of disability (Minnes, 1988), functional skills (Reiss, 1990), and cognitive skills, such as IQ or mental age (Beckman, 1983; Frey, Greenberg,

& Fewell, 1989). More recently, however, the focus has shifted to the role of child behavior problems in predicting parental well-being. Several studies have demonstrated that it is behavior problems, and not cognitive limitations, that predict poor maternal psychological well-being (Abbeduto et al., 2004; Herring et al., 2006) and high levels of stress (Baker et al., 2002; Bromley, Hare, Davison, & Emerson, 2004; Hastings et al., 2005; Hauser-Cram et al., 2001; Smith et al., 2008). Behavior problems have also been shown to account for differences in parental well-being across differing disability diagnoses (Abbeduto et al., 2004; Blacher & McIntyre, 2006). Even when important family and parent characteristics such as socioeconomic status, family size, and social support are controlled, child behavior problems remains a significant predictor of parenting stress (Quine & Pahl, 1991; Sloper et al., 1991).

Behavior problems are generally referred to as being either internalizing or externalizing in nature. Internalizing behaviors include behaviors such as anxiety, sadness, social withdrawal and fearfulness (Achenbach & Edelbrock, 1981). Externalizing behaviors include behaviors such as hyperactivity, poor impulse control, non-compliance, and aggression (Achenbach & Edelbrock, 1981). Behavior problems can include behaviors that are dangerous to oneself or others, such as self-injury, self-isolating, biting or hitting (Nachshen, Garcin, & Minnes, 2005). Problematic behavior may result in injuries to people or property and lost opportunities for inclusive education, community integration or employment (Feldman, Hancock, Reilly, Minnes, & Cairns, 2000). Social and academic functioning may also be adversely affected by behavior problems (Campbell, 2002; Guralnick, 2006).

The presence of behavioral problems is likely the result of a complex interaction between biological (e.g., syndrome) and environmental (e.g., family) variables (Sameroff & Chandler, 1975). Factors related to child vulnerability include lower cognitive skills (Cook, Greenberg, & Kusche, 1994) and specific genetic or biological syndromes (Feldman et al., 2000). Overall, there is strong empirical support that children with DD display greater levels of behavior problems than children without DD (e.g., Feldman et al., 2000; Fombonne et al., 2001; Totsika et al., 2011).

Several population based studies have documented the prevalence and developmental course of behavior problems among children with DD. Fombonne et al. (2001) reported a higher prevalence of behavior problems among children with DD compared to children without DD within a sample of 10,438 British children and adolescents. Within a sample of 18,415 British children aged 5-16 years, Totsika et al. (2001) found the prevalence of clinical levels of behavioral problems to be higher among children with intellectual disabilities (ID) than comparison children, particularly those with autism spectrum disorders (ASD) and ID. Among children with ASD and ID the prevalence of conduct problems was 65.3%, compared to 46.3% for children with intellectual disability (without ASD) and 21.8% for comparison children. A similar pattern was found for hyperactivity behaviors, with children with ASD and intellectual disability reporting higher levels (87.5%) than children with intellectual disability alone (63.2%) and comparison children (19.1%).

Of particular concern, levels of problematic behavior tend to remain high across childhood (Baker et al., 2003; Einfeld et al., 2006; Tonge & Einfeld, 2000; Totsika &

Hastings, 2009) and adulthood (Cooper et al., 2009) for individuals with DD. Tonge and Einfeld (2000) reported that 40% of Australian children and adolescents with ID (N=582) had a psychiatric disorder (e.g., disruptive, antisocial) that persisted over 4 years. Only 14% of participants either deteriorated or showed improvement in symptoms over the course of the study. Using a large representative sample of Australian children, Einfeld et al. (2006) identified 578 children and adolescents with ID and reported on changes in their behavior problems over the course of 14 years. The percentage of children meeting criteria for clinical behavior problems was 43% at the start of the study. High initial levels of behavior problems decreased only slowly over time, remaining high into young adulthood (39% above clinical cutoff).

Similarly, de Ruiter, Dekker, Verhulst and Koot (2007) used population based data from the Netherlands to follow children and adolescents with intellectual disability (N=978) and without (N=2,047) over the course of 6 years. Overall, children with ID displayed higher behavior problems than children without ID. Trajectories of problem behaviors across childhood and adolescence differed by type of problem behavior. Certain problem areas, as measured by the Child Behavior Checklist, were found to remain constant over time (withdrawn, thought problems) while others were found to decrease over time (social problems, anxious/depressed, aggressive behavior, attention problems). Delinquent behaviors and somatic complaints were found to increase over time, however. The shapes of the trajectories for children with and without ID were similar, but children with ID consistently reported higher levels of each type of problem behavior across all ages.

Given the prevalence and stability of behavior problems among children with DD, it is not surprising that problematic behavior is often cited as the most salient child characteristic to parents of children with developmental disabilities (e.g., Beck et al., 2004). Many studies have documented the adverse effects of child behavior problems on parental well-being. For instance, Baker and colleagues (Baker et al., 2002, 2003; Bruce, Blacher, & Olsson, 2005) followed pre-school children with and without developmental delay from age 3 to age 5. At age 3, children with delays were 3 to 4 times more likely to have a score on the Child Behavior Checklist indicative of clinically significant behavior problems (Baker et al., 2002). In particular, children with delays showed higher behavior problems related to internalizing problems, withdrawal and attention. Parents of children with delays perceived their child to have a greater negative impact on the family than did parents of children without delays. The level of the child's behavior problems was a stronger predictor of parental stress than delay status. In a longitudinal follow-up at age 4 (Baker et al., 2003), the children with delays continued to evidence greater behavior problems related to internalizing problems, withdrawal, and attention than the children without delays. At age 4, the children with delays also had higher externalizing problems and aggression than the children without delays. Parents of children with delays continued to report significantly greater negative impact of the child on the family. Controlling for delay status, greater behavior problems contributed to higher depressive symptoms and lower marital adjustment among parents in this sample (Baker et al., 2005).

Consistent with Baker et al. (2002, 2003), Herring et al. (2006) reported that the behavior problems of young children with pervasive developmental delay (N=84) and no diagnosis (N=39) contributed significantly more to parental stress, mental health problems, and family dysfunction than did their diagnosis or delay status. Child behavior problems was shown to be a stronger predictor of parenting stress than intellectual status and social skills among elementary school children with (N=74) and without (N=115) intellectual disabilities (Neece & Baker, 2008). Other studies have reported on the role of behavior problems across child diagnostic categories. Donenberg and Baker (1993) found that levels of behavior problems and parenting stress were similar for parents of children with autism (N=20) and clinically significant behavior problems (N=22). The role of externalizing, internalizing, and/or total behavior problems emerged as consistent correlates of parenting stress among mothers and fathers of children with a variety of health, developmental, behavioral, and neurological problems (Spratt, Saylor, & Macias, 2007). Behavior problems also contributed to stress in families of children with Williams syndrome and Smith-Magenis syndrome (Fidler et al., 2000). Overall, these findings highlight the salience of problematic behavior to parents of children with varying levels of disability and diagnoses.

Several studies have assessed the unique contributions of internalizing and externalizing behaviors on parental stress. Some studies find externalizing problems to impact parenting stress to a greater extent than internalizing problems. Among parents of children with developmental delays, externalizing behaviors were stronger correlates of perceived negative impact of the child on the family than internalizing behaviors (Baker

et al., 2002). Externalizing behaviors predicted fathers' parenting stress but internalizing behaviors were unrelated to parenting stress for fathers and mothers of toddlers with autism spectrum disorders (Davis & Carter, 2008). Conduct problems emerged as a strong predictor of parental stress among parents of children with autism spectrum disorders, whereas social and insecure/anxious problems did not (Lecavalier et al., 2006).

Other studies have reported the inverse pattern. Internalizing behaviors more strongly correlated with parenting stress than externalizing behaviors among parents of young children with mixed etiology (Donenberg & Baker, 1993). Internalizing and externalizing problems appear to have differential effects on parenting stress, but the pattern of influence differs across samples. For instance, Spratt et al. (2007) examined the impact of internalizing and externalizing symptoms within multiple samples of children with special needs. Among children with developmental and behavioral issues and children with intraventricular hemorrhage, externalizing behavior problems alone contributed to mothers' parenting stress. Yet internalizing problems, but not externalizing problems, uniquely impacted levels of parenting stress for mothers of children with learning/attention problems and neural tube defects. Internalizing and externalizing problems frequently co-occur (Achenbach & Edelbrock, 1981). The presence of a combination of internalizing and externalizing problems may place parents at an increased risk for stress compared to the presence of internalizing or externalizing problems alone (Nachshen et al., 2005).

Few studies have compared the impact of behavior problems on parenting stress for mothers and fathers of children with DD. As previously discussed, the majority of

studies on parenting stress have focused on mothers. When fathers are included, they are often underrepresented or results are collapsed across mothers and fathers (Carpenter & Towers, 2008). There is little research directly comparing the effect of behavior problems on parenting stress, but some have argued that attributes of the child are more likely to impact mothers' than fathers' stress (Morgan, Robinson, & Aldridge, 2002; Stoneman, Brody, & Burke, 1989). Several studies support this hypothesis. For instance, behavioral and emotional disturbances contributed to mothers', but not fathers', stress related to parenting their child with pervasive developmental delay (Herring et al., 2006). Among parents of children with neural tube defects, only mothers' stress was impacted by their child's level of behavior problems (Spratt et al., 2007). For mothers of children with developmental delays, child behavior problems related to well-being both cross-sectionally and longitudinally, not only to parenting stress but also to more distal domains of depression and marital adjustment. Child behavior problems were not predictive of fathers' well-being longitudinally in this study. Other studies find that mothers' and fathers' stress relate to different types of problem behavior (e.g., Davis & Carter, 2008) while still other studies find no difference in the impact of problem behavior on mothers' and fathers' stress (e.g., Baker et al., 2002). Additional research is needed to clarify the short- and long-term contribution of child behavior problems to stress among mothers and fathers of children with DD.

**Adaptive behavior.** An additional child characteristic that has been examined in relation to parent well-being is adaptive behavior. Adaptive behavior refers to an overarching set of skills, such as communication, socialization, and daily living skills,

that are related to general intelligence but may provide a more nuanced representation on an individual's strengths and limitations in daily life (Paskiewicz, 2009). The Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984) is a widely used measure of adaptive behavior for children, adolescents, and adults with and without DD. The VABS assesses adaptation in relation to everyday demands and expectations in the domains of communication, daily living, skills, socialization, and motor skills.

Intelligence and adaptive behavior are separate, but related constructs. Whereas intelligence testing assesses an individual's ability to think abstractly, adaptive behavior scores capture what the individual is capable of doing on a day-to-day basis (Harrison & Boan, 2000). In other words, intelligence focuses on maximum performance whereas adaptive behavior focuses on common or typical behaviors (Keith, Fehrmann, Harrison, & Pottebaum, 1987). In this way, adaptive behavior may be a more relevant aspect of child functioning to parents than intelligence. Children with the same diagnosis may vary considerably in their level of adaptive behavior (Griffith, Hastings, Nash, & Hill, 2010). Intelligence is also seen as a stable construct whereas adaptive behavior is viewed as malleable across the lifespan (Harrison & Boan, 2000). Researchers generally find low to moderate correlations between intelligence scores and adaptive behavior scores (Keith et al., 1987; Platt, Kamphaus, Cole, & Smith, 1991), providing support for the notion that they are separate but related constructs. The strength of the association differs depending on the combination of assessments used, however (Roszkowski & Bean, 1980).

The adaptive behavior of children with DD has been found to relate to aspects of parental well-being. Lower adaptive behavior is often associated with higher stress

among parents (Frey et al., 1989; Gallagher et al., 1983; Hanson & Hanline, 1990). Children's socialization skills appear to be particularly influential on parenting stress (Beck et al., 2004; Lecavalier et al., 2006; Smith et al., 1999). Within a large sample of parents of children with intellectual disabilities (N=880), greater child functional skills correlated with lower levels of parenting stress (Smith et al., 1999). When various aspects of functional skills were considered as separate predictors of parenting stress, only social skills were predictive. Children's motor, communicative, adaptive behavior, and cognitive abilities were unrelated to parental stress in this study. Similarly, social skills accounted for unique variance in maternal parenting stress above and beyond child intellectual status and behavior problems within a sample of families of children with intellectual disabilities (Neece & Baker, 2008). Moreover, changes in social skills across middle childhood predicted changes in levels of parental stress in this study. An effect of socialization skills on parenting stress was also found within a large sample of mothers of young children with autism spectrum disorders (Lecavalier et al., 2006). Social and communication skills, but not personal or community living skills, correlated with parents' stress.

Many studies have failed to find an association between child adaptive behavior and parental well-being, however, particularly once child behavior problems have been accounted for (Baker et al., 2002; Hodapp, Dykens, & Masino, 1997; Sloper et al., 1991). For instance, among mothers of children with intellectual and developmental disabilities (N=74), adaptive behavior did not predict parenting stress above and beyond child behavior problems and family demographics (Beck et al., 2004). The maladaptive

behavior of young children with cerebral palsy contributed to their parents' stress relating to the parenting role to a greater extent than their functional skills (Ketelaar, Volman, Gorter, & Vermeer, 2008). In particular, maladaptive behavior, but not functional skills, contributed to parents' stress related to their sense of competence in the parenting role, attachment to their child, relationship with their spouse, and depressive symptoms. Neither maladaptive behavior nor functional skills contributed to parents' stress related to health, social isolation, or restriction of role in this study.

Other studies have reported no effect of adaptive behavior on parent well-being even at the bivariate level (Hassall, Rose, & McDonald, 2005; Herring et al., 2006; Skok et al., 2006). Among mothers of children with intellectual disability, scores on the Vineland Adaptive Behavior Scales were unrelated to child-related, parent-related, or total stress (Hassall et al., 2005). Scores on the Vineland Adaptive Behavior Scales were also unrelated to parenting stress, parental mental health, and family functioning among parents of toddlers with pervasive developmental delay (Herring et al., 2006). There is mounting empirical support for the primacy of behavior problems, yet there is sufficient existing literature to suggest that the limitations in children's adaptive behavior may contribute to parents' levels of stress. Further exploration of how children's adaptive behavior impacts changes in parental stress is needed.

**Resources and Supports**

**Coping.** One set of resources that individuals bring to the parenting experience is their skill in coping with caregiving challenges. Coping can be defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal

demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). Coping efforts may include adaptive as well as maladaptive strategies. Research on coping has largely focused on the distinction between problem-focused and emotion-focused strategies. Problem-focused ways of coping are strategies aimed at managing or altering the cause of the stressor while emotion-focused ways of coping are strategies directed at regulating emotional responses to the stressor (Lazarus & Folkman, 1984).

Among families of children with disabilities, greater use of problem-focused strategies has been predictive of higher psychological well-being (Smith, Seltzer, Tager-Flusberg, Greenberg, & Carter, 2008), higher quality mother-child relationships (Abbeduto et al., 2004), lower depressive symptoms (Seltzer, Greenberg, & Krauss, 1995; Abbeduto et al., 2004), and lower pessimism (Abbeduto et al., 2004). Greater use of emotion-focused coping strategies has been associated with lower psychological well-being (Glidden, Billings, & Jobe, 2006; Smith et al., 2008), lower quality mother-child relationships (Abbeduto et al., 2004) higher depressive symptoms (Abbeduto et al., 2004; Glidden, Billings, & Jobe, 2006; Seltzer et al., Krauss, 1995; Smith et al., 2008), higher pessimism (Abbeduto et al., 2004), greater feelings of anger (Smith et al., 2008), and greater feelings of caregiving burden (Essex et al., 1999) among parents of children with disabilities. In a longitudinal study of families of children with DD, Hauser-Cram et al. (2001) found that fathers who used low levels of problem-focused coping experienced greater parenting stress over time. Researchers have found that parents of children with

disabilities prefer problem-focused strategies when dealing with issues related to their child (Frey et al., 1989; Judge, 1998).

Many have argued that the distinction between problem-focused and emotion-focused coping is oversimplified, however, and there is little consensus on the definitions of these dimensions of coping across studies (Carver, Sheier, & Weintraub, 1989; Skinner et al., 2003). Several coping researchers have recommended no longer using the problem-focused versus emotion-focused distinction as a way of classifying coping in research (Carver, Sheier, & Weintraub, 1989; Lazarus, 1996; Skinner et al., 2003). In line with these recommendations, this dissertation will use a multidimensional approach to measuring coping in order to further our understanding of the unique relationships between specific coping strategies and parenting stress. Specifically, this study will assess the role of four coping strategies: confrontive/social support seeking, problem focused, distancing/avoidance, and denial.

Confrontive/social support seeking strategies and problem focused strategies were selected based on the consistent finding that their use is associated with positive outcomes among parents of children with disabilities (Glidden et al., 2006; Miller, Gordon, Daniele, & Diller, 1992; Smith et al., 2008). Confrontive/seeking social support refers to efforts to obtain informational, tangible, and emotional support. Use of confrontive strategies predicted greater subjective well-being (Glidden & Natcher, 2009) and lower depression (Glidden et al., 2006) among mothers of children with DD. Seeking social support has been found to relate to family strengths, including confidence, challenge, and commitment (Judge, 1998). Problem focused coping refers to deliberate

and analytic efforts to remedy a stressful situation. Active and planful coping efforts were associated with greater feelings of personal growth among mothers of toddlers and adolescents with autism (Smith et al., 2008) and lower depression among mothers of adults with intellectual disabilities (Seltzer et al., 1995). Among fathers of children with DD, planful problem solving efforts were associated with greater child-related subjective well-being (Glidden et al., 2006).

Use of denial and distancing/avoidance strategies is expected to predict heightened levels of parental stress. Denial refers to efforts to deny the existence of the problem or dissociate oneself from the problem. Greater denial has been associated with increased depression for mothers and increased depression and anxiety for fathers of school-aged children with autism (Hastings et al., 2005). Similarly, denial was found to contribute to depressive symptoms among mothers of adults with intellectual disabilities (Seltzer et al., 1995). Distancing/avoidance strategies include efforts detach oneself from the problem or avoid thinking about the problem. Use of avoidance strategies has been associated with negative outcomes among parents of children with disabilities (Glidden, Billings, & Jobe, 2006; Smith et al., 2008). Among parents of children with autism, active avoidance strategies were associated with greater anxiety, depression, and stress (Hastings et al., 2005). Greater use of escape-avoidance has been associated with higher depressive symptoms for fathers of children with DD (Glidden & Natcher, 2009) and higher depressive symptoms and lower subjective well-being for mothers (Glidden et al., 2006) of children with DD. Similarly, use of behavioral disengagement strategies has been associated with greater depression and anger and lower personal growth among

mothers of toddlers and adolescents with autism (Smith et al., 2008) and greater depression among mothers of adults with intellectual disability (Seltzer et al., 1995). Among parents of children with autism, escape-avoidance predicted greater depression, social isolation, and spousal relationship problems (Dunn et al., 2001). Distancing has also been found to relate to lower subjective well-being among fathers of children with DD (Glidden et al., 2006).

Beyond a main effect, several studies have found coping strategies to moderate the relationship between child-related stressors and parental well-being. Among mothers of adults with intellectual disabilities, several coping strategies were found to buffer the negative impact of caregiving demands on depressive symptoms (Seltzer et al., 1995). Use of planning or positive reinterpretation coping efforts buffered the negative impact of heightened caregiving demands on maternal depressive symptoms. Consistent with these findings, the impact of child functional limitations on depressive symptoms was buffered by mothers' use of problem-focused strategies within a sample of aging mothers of adults with intellectual disabilities (Essex et al., 1999). Problem-focused strategies were also found to buffer against the negative impact of behavior problems on mothers' pessimism in that study.

Other coping strategies, such as distancing and denial, have been found to moderate the relationship between child-related stressors and parental well-being such that the impact of child-related stressors is heightened when these coping strategies are used. Smith et al. (2008) explored the role of various coping strategies as moderators of the relationship between symptoms of autism and aspects of well-being among mothers

of toddlers and adolescents with autism. Use of venting and focusing on emotions as coping strategies exacerbated the negative impact of social reciprocity impairments on mothers' sense of personal growth. Among mothers of adolescents, behavioral disengagement was found to amplify the negative impact of children's impairments in social reciprocity and repetitive behavior on mothers' personal growth. Lastly, denial was also a significant moderator, such that greater denial increased the negative impact of communication difficulties on mothers' personal growth. Essex et al. (1999) reported consistent findings among aging mothers of adults with intellectual disabilities. Use of emotion-focused strategies, such as denial, venting, and behavioral/mental disengagement, exacerbated the negative impact of child functional limitations on mothers' perceived caregiving burden. This dissertation aims to extend the existing literature on coping strategies to include both mothers and fathers. In addition, this dissertation will examine the main effect and moderating effect of distinct coping strategies on changes in parenting stress over time.

**Social support.** In addition to coping, social support is a resource that has received considerable attention in research on families of children with DD (Floyd & Gallagher, 1997; Hauser-Cram et al., in press). Social support is a multidimensional construct that includes physical and instrumental assistance, resource sharing, and emotional and psychological support (Dunst et al., 1986). Cobb (1976) defines social support as information leading the person to believe that he or she is cared for, valued, and part of a network of mutual obligation and communication. Social support is generally described in terms of linkages among individuals and groups. For parents of

children with DD, social networks may consist of formal supports, such as professionals or service providers, and informal supports, such as friends and neighbors (Hauser-Cram & Howell, 2003). Informal and formal supports may contribute to the well-being of parents of children with DD to a greater extent than professional support (Gallagher et al., 1983). Linkages can be operationally defined in terms of network size, satisfaction, density, connectedness, or frequency of contact (Mitchell & Trickett, 1980).

Research on families of children with disabilities has generally supported the importance of parents' satisfaction with the helpfulness of their social support networks, rather than the size of their social support network, in predicting parent well-being (Crnic & Stormshak, 1997; Frey et al., 1989). Satisfaction with social support, but not the size of their social support network, correlated with lower levels of parent-related stress and more positive parent-child interactions among mothers of children with intellectual disabilities (Feldman et al., 2002). Fathers' satisfaction with social support, but not amount of social support, significantly correlated with their adaptation to the birth of a child with a Down syndrome (Hornby, 1995). Among mothers of children with DD, helpfulness of social support was predictive of parenting stress but not size of social support network (Krauss, 1993). This dissertation will therefore focus on parents' perceptions of the helpfulness of their social support networks.

Social support has been extensively researched among parents of children with DD since it is seen as a potential point of intervention for some families (Dunst, Trivette, & Jodry, 1997). Public programs such as early intervention aim to enhance the helpfulness of social support by connecting parents to other families of children with DD

and creating access to knowledgeable service providers, which makes it possible to mobilize the resources necessary to meet their needs (Hauser-Cram & Howell, 2003). Social support is presumed to have a direct effect on well-being by communicating a sense of belonging and self-worth to the individual (Skok, Harvey, & Reddihough, 2006). Social support may also have an indirect effect on well-being by protecting individuals against the impact of stressful life events (Cohen & Wills, 1985).

Social support has been found to predict various aspects of parent and family well-being among parents of children with disabilities. Perceived helpfulness of social support has been associated with marital quality, satisfaction with parenting, and general life satisfaction among parents of children with disabilities (Hauser-Cram & Howell, 2003). For instance, Dunst and colleagues (Dunst et al., 1986) explored the influences of social support on various aspects of parent, child, and family functioning among 137 parents of children with intellectual, developmental, or physical disabilities. More supportive social networks were associated with better personal well-being, more positive attitudes, and more positive influences on parent-child play opportunities and child behavior and development. Satisfaction with social support has been related to lower parent and family problems among parents of young children with autism (Hastings & Johnson, 2001), greater adaptation to the birth of a child with Down syndrome among fathers (Hornby, 1995), and decreases in depressed mood among parents of children with ASD (Benson & Karlof, 2009).

With respect to parenting stress, satisfaction with social support has been associated with lower levels of stress among parents of children with intellectual

disabilities (Feldman et al., 2002), cerebral palsy (Wanamaker & Glenwick, 1998), autism (Sharpley et al., 1997) and special health care needs (Spratt et al., 2007). Perceived support from family, friends, social groups, and professional services predicted lower parental stress over and above family and child characteristics within a large sample (N=880) of families of children with disabilities (Smith et al., 1999). Hassall et al. (2005) also found that support from informal kinship, formal kinship, and social organizations correlated with lower parenting stress among mothers of children with diverse disabilities. Among mothers of preschoolers with cerebral palsy, high levels of social support satisfaction related to low levels of depression and parenting stress and high levels of parenting satisfaction (Wanamaker & Glenwick, 1998). Parents of children with autism with access to support from extended family members felt less frequently stretched beyond their personal limit and less anxiety, depression, and daily stress than those without access to support from family (Sharpley et al., 1997).

Several authors have found social support to buffer against the impact of child-related stressors on parent well-being. For parents of children with autism, social support moderated the relationship between stressors and social isolation, such that higher social support corresponded with a decreased likelihood that stressors would impact parents' feelings of isolation (Dunn et al., 2001). Plant and Sanders (2007) examined several sources of social support as moderators of child-related stressors and caregiving stress among mothers of pre-school aged children with DD. Family and partner support was found to buffer the impact of the level of the child's disability on mothers' caregiving stress. Support from friends and professionals buffered the impact of difficult child

behavior during caregiving tasks and child behavior problems, respectively, on maternal caregiving stress. Overall, the findings of this study supported the notion that social support is particularly important to parents with heightened caregiving demands. The findings of this dissertation will extend our understanding of the role of social support in predicting changes in parenting stress over time among both mothers and fathers.

**Family climate.** While coping strategies and social support are individual resources, the family emotional climate is a family level resource that may protect parents of children with DD from experiencing heightened levels of stress. The relational aspects of the family environment include the connectedness, expressiveness, and degree of conflict among members of the family unit (Moos & Moos, 1986). Moos (1974) states that family members report greater comfort and self-esteem and less depression and irritation in families that emphasize involvement, support, and expressiveness. The quality of family relationships has been found to impact various aspects of parent well-being and child development (e.g., Cassidy et al., 1992; Hauser-Cram et al., 2001; Hoffman et al., 1995; Morris et al., 1997).

The Family Environment Scale (FES; Moos & Moos, 1986) is a widely used and comprehensive measure of various aspects of the family social climate. The Cohesion, Expressiveness, and Conflict scales combine to form the Relationship Dimension of the FES, which assesses the quality and intensity of relationships within the family. Cohesion and Expressiveness are expected to correlate positively with one another but negatively with Conflict. The Cohesion scale measures the extent to which family members actively participate in family activities and are emotionally connected with other family members.

This scale reflects the degree of belongingness or connectedness experienced by family members. The amount of communication and emotional expression within the family is captured by the Expressiveness scale. Emotional expression during day-to-day interactions may provide opportunities for individuals to express their thoughts and feelings and resolve disputes. A final feature of family functioning is family conflict. Although the presence of some conflict may be healthy for family functioning when managed effectively, greater amounts of conflict can impact family relationships and individual well-being.

Some studies have suggested that families with a child with a disability have less supportive family relationships and fewer opportunities to pursue personal growth activities (e.g., Margalit & Ankonina, 1991). Rodrigue, Morgan and Geffken (1992) found that mothers of autistic children reported less parenting competence, less marital satisfaction, more family cohesion and less family adaptability than did mothers of children with Down syndrome or no disability. Sanders and Morgan (1997) compared family stress and adjustment problems among parents of children with Down syndrome, autism, and no disability. They reported group differences related to the families' involvement in active recreational activities and in intellectual and cultural activities. In particular, mothers of children with autism and Down syndrome reported less family participation in recreational activities and intellectual and cultural activities than did mothers of children without disabilities. There were no significant differences between mothers of children with Down syndrome and autism on these dimensions.

Other studies have supportive a normality perspective, however. For instance, Perry, Harris, and Minnes (2004) explored aspects of the family environment among mothers and fathers of children with diverse developmental disabilities. The family environment profiles within their sample resembled the normative profile to a greater extent than the distress profile across all 10 scales of the FES. There were no significant differences in the profiles as a function of the type of DD, severity of DD, or age of the child with DD. There was no significant relationship between family harmony and either severity of DD or age of the child with a DD. Family harmony was impacted by the type of the child's disability, with parents of children with more ambiguous diagnoses (e.g., autism, DD of unknown etiology) reporting lower family harmony than parents of children with more established etiologies (e.g., Down syndrome, Fragile X syndrome). Warfield et al. (2000) also found levels of family cohesion to differ by the child's type of disability, with mothers of children with motor impairment reporting lower cohesion than mothers of children with Down syndrome and developmental delay. Comparative studies of families with and without children with disabilities have yielded mixed findings. Moreover, these between-group studies have done little to elucidate the impact of the family emotional climate within families of children with DD.

Within families of children with DD, aspects of the family climate have been found to relate to parental stress. Several studies have focused on family dynamics during the early intervention years. Warfield et al. (1999) found family climate to predict parent-related and child-related stress among mothers of children with diverse developmental disabilities participating in early intervention programs. Greater family cohesion at the

start of early intervention contributed to lower maternal stress when their child left early intervention services at age 3 and again at a follow-up at age 5. Consistent with these findings, increased family cohesion related to lower parenting stress among mothers after one year of early intervention services with their infant with a disability (Margalit & Kleitman, 2006). Boyce and Behl (1991) reported that family resources, support, life events, and cohesion in the family predicted parent-related stress among mothers of young children with early onset disabilities.

Other studies have examined the role of family climate, particularly family cohesion, among parents of school-age children with DD. Johnston et al. (2003) explored the role of child characteristics and family cohesion in relation to parenting stress among mothers and fathers of children with Fragile X syndrome (N=75). Above and beyond child IQ and behavior problems, parents' perceptions of the level of cohesion within the family predicted their stress related to parenting. Family climate was found to have a differential effect on specific aspects of parenting stress. Greater cohesion predicted lower stress related to social isolation, but was not related to parenting competence and acceptability of the child. Aspects of the physical and relational family environment were also found to relate to parenting stress among mothers with a young child with cerebral palsy (Glenn, Cunningham, Poole, Reeves, & Weindling, 2008). Parenting stress was higher for mothers who perceived their family as less cohesive and adaptable. The extent to which the physical environment was child-focused also related to mothers' parent-related stress, with greater child-focused environments associated with lower parent-related stress. The benefit of family cohesion has been reported across ethnic group and

family structures. African-American mothers' positive adjustment to rearing a child with a disability was related to higher levels of cohesiveness, moral and religious emphasis, and achievement orientation of the family (Alston & McCowan, 1994). Cohesion was a strong predictor of child-related and parent-related stress for single-parent and two-parent households, with higher levels of cohesion predicting lower stress (Duis, Summers, & Summers, 1997).

Few studies have examined family climate as a moderator of the relationship between child stressors and parent well-being. As an exception, Keller (1999) examined stress factors within families of school-aged children with a disability. Family harmony was found to buffer the impact of child behavioral characteristics on both mothers and fathers. This dissertation aims to extend our understanding of the role of family climate in buffering child-related stressors on parent well-being. In addition, this dissertation will examine the role of family cohesion in predicting parental stress beyond early childhood into middle childhood and adolescence.

**Research Questions and Hypotheses**

Several research questions will be examined in this dissertation. First, how does parenting stress change over time for mothers and fathers of children with developmental disabilities, from early childhood (age 3) to adolescence (age 15)? Next, how do child characteristics (behavior problems, adaptive behavior) and parental resources and supports (parental social support, parental coping, family climate) relate to parenting stress over time for mothers and fathers? Lastly, do parental resources and supports

moderate the relationship between child behavior problems and parenting stress for mothers and fathers? The specific hypotheses are listed below.

*Hypothesis 1:* Parenting stress is expected to increase from early to middle childhood then decrease from middle childhood to adolescence.

*Rationale.* Parenting stress was found to increase from early childhood through middle childhood among mothers and fathers of children with developmental disabilities (Hauser-Cram et al., 2001). Orr et al. (1993) found parenting stress to be higher during middle childhood than early childhood or adolescence among mothers of children with developmental delays. Taken together, the results from these studies suggest that parenting stress will increase from early to middle childhood and subsequently decrease from middle childhood to adolescence. Negative life events will be included as a time varying covariate to account for the impact of stressful experiences (unrelated to the child with DD) on perceptions of stress. Negative life events have been demonstrated to impact mothers' psychological well-being (Taylor et al., 197).

*Hypothesis 2a.* Changes in child behavior problems over time will predict changes in parenting stress for mothers and fathers. Specifically, increases in child behavior problems are expected to predict increases in parenting stress.

*Rationale:* Problematic behavior among children with developmental disabilities is strongly associated with aspects of their parents' well-being (e.g., Beck et al., 2004). More specifically, child behavior problems have to been found to contribute to parents' experience of stress (e.g., Baker et al., 2002). Few studies have examined the impact of changes in child behavior problems over time. Within the family systems perspective,

relationships within the family are viewed as complex and multidirectional, such that family members are concurrently and constantly interacting (Minuchin, 1985). From this perspective, changes in child behavior are expected to impact changes in parental stress.

*Hypothesis 2b.* Higher levels of child behavior problems are expected to predict higher levels of parenting stress among both mothers and fathers.

*Rationale.* As stated above, child problematic behavior has a well-documented negative impact on parent well being in research on families of children with DD (e.g., Beck et al., 2004). Child behavior problems have been associated with parenting stress among mothers and fathers of children with developmental delays (Baker et al., 2002, 2003), pervasive developmental delay (Herring et al., 2006), intellectual disabilities (Neece & Baker, 2008) and autism (Donenberg & Baker, 1993) among other diagnoses. Higher overall levels of child behavior problems are therefore expected to predict higher levels of parenting stress among both mothers and fathers.

*Hypothesis 2c.* Lower levels of child adaptive behavior are expected to predict higher levels of parenting stress among both mothers and fathers.

*Rationale.* The adaptive behavior of children with DD has been found to relate to aspects of parental well-being. Lower adaptive behavior is often associated with higher stress among parents (Frey et al., 1989; Gallagher et al., 1983; Hanson & Hanline, 1990). Although the evidence is mixed, lower overall levels of adaptive behavior are expected to predict higher levels of parenting stress among both mothers and fathers in this dissertation.

*Hypothesis 3a.* Lower helpfulness of social support is expected to predict higher levels of parenting stress for both mothers and fathers.

*Rationale.* Parents' satisfaction with the helpfulness of their social support networks has been found to predict aspects of their well-being (Crnic & Stormshak, 1997; Frey et al., 1989). With respect to parenting stress, social support has been associated with lower levels of stress among parents of children with intellectual disabilities (Feldman et al., 2002), cerebral palsy (Wanamaker & Glenwick, 1998), autism (Sharpley et al., 1997) and special health care needs (Spratt et al., 2007). Perceptions of lower helpfulness of social support are therefore expected to predict higher levels of parenting stress for both mothers and fathers.

*Hypothesis 3b.* Lower quality family climate is expected to predict higher levels of parenting stress for both mothers and fathers.

*Rationale.* The quality of family relationships has been found to impact various aspects of parent well-being and child development (Cassidy et al., 1992; Hauser-Cram et al., 2001; Hoffman et al., 1995; Morris et al., 1997). Within families of children with DD, aspects of the family climate are associated with parenting stress. More positive perceptions of the family emotional climate predicted lower stress among parents of children with DD (Boyce & Behl, 1991; Margalit & Kleitman, 2006; Warfield et al., 1999). Lower quality family climate is therefore expected to predict higher parenting stress for both mothers and fathers.

*Hypothesis 3c.* Higher use of distancing/avoidance and denial as coping strategies but lower use of confrontive/seeking social support and problem focused coping as

coping strategies is expected to predict higher levels of parenting stress for both mothers and fathers.

*Rationale.* Use of confrontive coping strategies predicted greater subjective well-being (Glidden & Natcher, 2009) and lower depression (Glidden et al., 2006) among mothers of children with DD. Problem focused coping efforts were associated with greater feelings of personal growth among mothers of toddlers and adolescents with autism (Smith et al., 2008) and lower depression among mothers of adults with intellectual disabilities (Seltzer et al., 1995). Greater use of denial as a copy strategy is associated with increased depression for parents of children with autism (Hastings et al., 2005) and adults with intellectual disabilities (Seltzer et al., 1995). Use of avoidance strategies was associated with greater anxiety, depression, and stress for parents of children with autism (Hastings et al., 2005). Higher use of distancing/avoidance and denial as coping strategies but lower use of confrontive/seeking social support and problem focused coping as coping strategies is therefore expected to predict higher levels of parenting stress for both mothers and fathers.

*Hypothesis 4a.* Social support will moderate the relationship between child behavior problems and parenting stress, such that higher social support will buffer the negative impact of child behavior problems on parenting stress.

*Rationale.* Several authors have found social support to buffer the impact of child-related stressors on the well-being of parents of children with DD. For parents of children with autism, social support moderated the relationship between stressors and social isolation, such that higher social support corresponded with a decreased likelihood that

stressors would impact parents' feelings of isolation (Dunn et al., 2001). Similarly, Plant and Sanders (2007) found social support to buffer the impact of difficult child behavior on caregiving stress among mothers of children with DD. Social support is therefore expected to moderate the relationship between child behavior problems and parenting stress, such that higher social support will buffer the negative impact of child behavior problems on parenting stress.

*Hypothesis 4b.* Family climate will moderate the relationship between child behavior problems and parenting stress, such that higher family climate will buffer the negative impact of child behavior problems on parenting stress.

*Rationale.* Few studies have examined family climate as a moderator of the relationship between child stressors and parent well-being. As an exception, Keller (1999) found family harmony to buffer the impact of child behavior characteristics on mothers and fathers of school-aged children with DD. Perceptions of positive family climate are therefore expected to moderate the relationship between child behavior problems and parenting stress, such that higher perceptions of family climate will buffer the negative impact of child behavior problems on parenting stress.

*Hypothesis 4c.* Parents' use of coping strategies will moderate the relationship between child behavior problems and parenting stress, such that greater use of confrontive/seeking social support and problem focused coping but lower use of distancing/avoidance and denial as coping strategies is expected to buffer the negative impact of child behavior problems on parenting stress.

*Rationale.* Several studies have found coping strategies to moderate the relationship between child-related stressors and parental well-being. Use of problem focused coping buffered the negative impact of caregiving demands on the depressive symptoms of mothers of adults with intellectual disabilities (Seltzer et al., 1995). Distancing strategies were found to moderate the relationship between children's autism symptoms and maternal well-being, such that distancing amplified the negative impact of autism symptoms (Smith et al., 2008). In the same study, denial was also a significant moderator, such that greater denial increased the negative impact of children's communication difficulties on maternal well-being. Given these findings, greater use of confrontive/seeking social support and problem focused coping but lower use of distancing/avoidance and denial as coping strategies is expected to buffer the negative impact of child behavior problems on parenting stress.

# Chapter 3: Methods

## Participants

The data for this dissertation will be drawn from the Early Intervention Collaborative Study (EICS), a longitudinal investigation of children with developmental disabilities and their families (Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992; Hauser-Cram et al., 2001). The study was designed as a prospective, non-experimental investigation to generate and test conceptual models of child and family development that included hypothesized predictors of change in children's capacities and parent well-being. Home visits were conducted when the children were age 1, 2, 3, 5, 10, 15, 18, and 23 years. This dissertation will focus on data collected when the child was age 3 (T3), age 5 (T5), age 10 (T10), and age 15 (T15). Age 3 was selected as the beginning of the trajectories since this was the first time point in which the Child Behavior Checklist was administered to parents. Age 15 was selected as the end of the trajectories since this was the last time point in which the Parenting Stress Index was administered.

Participants were initially recruited at the time of their children's enrollment in 29 publicly funded early intervention programs in Massachusetts and New Hampshire. The sample was recruited over a 2-year period from November 1985 to December 1987. The sample was selected to represent the three most common categories of disability served by early intervention programs in Massachusetts. Families were invited to participate if their child was less than 24 months old with a diagnosis of Down syndrome (N=54), motor impairment (N=77), or developmental delay of unknown etiology (N=59). The diagnosis of children with Down syndrome was confirmed with medical record review.

Children with motor impairment were invited to participate if they evidenced abnormal muscle tone or a coordination deficit along with deviant motor development, with or without other areas of delay. Children with developmental delay were invited to participate if they evidenced delays in two or more areas of development, with no specific diagnosis at the time of entry into early intervention services. Medical records for each enrolled child were reviewed by research staff to confirm assignment to type of disability group.

This dissertation focuses on 147 mothers and 110 fathers and their children. Data from both parents were available for 108 families, with the remaining 41 families having a single parent reporter (39 mothers and 2 fathers). At T3, child type of disability during early intervention was roughly distributed across the three diagnostic categories, with 30% with Down syndrome, 39% with motor impairment, and 32% with developmental delay of unknown etiology (Table 1). Slightly more than half of the children were male (56%). The majority of children were of European American descent (90%), reflecting the racial and ethnic composition of MA and NH at the time when the participants were initially recruited. The majority of children were living with both parents (83%) at age 3. Slightly less than half of the children were first born (42%).

Approximately 54% of families reported annual family incomes higher than $30,000 at T3 (data collected between 1989 and 1991). The median income in 1989 was $36,952 in Massachusetts and $36,329 in New Hampshire according to the 1990 United States Census. The average number of children in the household was approximately 2. The majority of mothers (82%) and fathers (84%) were married. Mothers and fathers had

completed approximately 14 years of education on average. At T3, the mean maternal age was 31.70 (SD = 2.38) years and mean paternal age was 33.85 (SD = 5.64) years. The majority of fathers were employed (93%), with slightly less than half of mothers were employed (57%). Compared to the U.S. population of comparable age and time, EICS participants were more highly educated and fewer were living in poverty (Hauser-Cram et al., 2001). In addition, a greater percentage of families in the EICS sample were headed by married couples (80.7%) than the national average (78.4%) (U.S. Bureau of the Census, 1992).

**Procedure**

Six months prior to their child's third, fifth, tenth, and fifteenth birthdays, parents were contacted to request their continued participation in the Early Intervention Collaborative Study. Parents were sent letters requesting their continued participation, which were followed up with phone calls from research assistants to schedule home visits. Parents were sent consent forms and then questionnaire packets several weeks prior to the interview, which were collected by staff members during the home visit. The Early Intervention Collaborative Study was approved by the institutional review boards of the University of Massachusetts Medical School, Brandeis University, and Boston College.

Participating families were visited in their homes by two field staff members trained to be reliable for all measures used in data collection. Research assistants were blind to the study's hypotheses. While one staff member conducted a multidimensional, structured evaluation of the child followed by an interview with the father, the other staff

member interviewed the mother. If either the mother or child was experiencing an atypical day, the visit was rescheduled for a later date. Home visits lasted approximately 2-3 hours. Participants were compensated for their time.

## Measures

**Socioeconomic status.** Parent educational attainment and family income were used to represent socioeconomic status. Educational attainment was measured as the number of years of education completed by each parent (averaged across time points). Mothers were asked to report on their annual household income at each time point. Since the response categories on the demographic questionnaire differed at each time point to reflect inflation, individuals' responses were standardized as z-scores within each time point. Preliminary analyses indicated that family income did not change significantly over time, therefore a family income composite score was created by averaging families' z-scores across time points. Parent educational attainment and family income were combined to form a socioeconomic status composite variable. This variable was included as a level 2 predictor. Measures used for this dissertation are listed in Table 2.

**Negative life events.** Mothers and fathers completed the Life Events scale (Abidin, 1995) at each time point. Parents were asked to indicate whether 19 life events occurred within their immediate family within the past 12 months (0=no, 1=yes). This checklist was intended to index the amount of stress a parent may be experiencing due to events outside of the parent-child relationship. The total number of a subset of 10 negative life events (e.g., divorce, legal problems) experienced by the parent or his or her immediate family was used as a level 1, time varying covariate.

**Child adaptive behavior.** Child adaptive behavior was assessed using the second edition of the Vineland Adaptive Behavior Scales-Interview form (VABS; Sparrow et al., 1984). The VABS was administered at each time point through a semi-structured interview format with the child's primary caregiver (usually the mother). It is designed to identify the skills the child demonstrates on a regular basis. The 577-item questionnaire measures three broad domains of functioning: Communication, Daily Living Skills, and Socialization. Not all questions on the measure are asked; rather the interviewer estimates the adaptive level of the child and asks in detail about skill items within this range to arrive at an accurate estimate of the child's abilities. The interviewer codes each item as 0 = a skill the child never completes on a regular basis, 1 = a skill the child sometimes or partially completes on a regular basis, 2 = a skill the child usually completes on a regular basis.

Each of the domains is further divided into subdomains. The communication domain assesses the child's receptive, expressive, and written communication. Sample items include "follows instruction requiring an action and an object" and "speaks in full sentences". The daily living skills domain assesses the child's personal skills (e.g., eating, hygiene), domestic skills (e.g., participation in household chores), and community skills (e.g., using money, job skills). Sample items include "sucks from straw" and "bathes self without assistance". The socialization domain assesses the child's interpersonal relationships, engagement in play and leisure, and coping skills. Sample items include "shows affection toward other people" and "responds appropriately when introduced to strangers". Raw and standardized scores are calculated for each subdomain, domain, and

measure as a whole. The standardized score for the Adaptive Behavior Composite (across all three domains) represents the child's level of adaptive behavior compared to his or her same-age peers. The standard score for the Adaptive Behavior Composite was averaged across time points and used as a level 2 predictor. Higher scores indicate higher levels of adaptive behavior.

The Vineland has demonstrated good reliability. Split-half, test-retest, and inter-rater reliability for the adaptive behavior composite is reported in the VABS manual (Sparrow et al., 1984). Split-half reliability coefficients (odd and even numbered items) ranged from $r = .89$ to $r = .98$ across child age groups (N=3,000). The test-retest reliability coefficient was $r = .88$ across child age groups (N=340). Inter-rater reliability was $r = .74$ across child age groups (N=160). The internal consistency as measured by the Cronbach's alpha was satisfactory ($\alpha = .99$) within a sample of parents of children and adolescents with intellectual disabilities (de Bildt, Kraijer, Sytema, & Minderaa, 2005). Within the EICS sample, internal consistency for the Adaptive Behavior Composite was $\alpha = .98$, $\alpha = .99$, $\alpha = .99$, and $\alpha = .97$ at T3, T5, T10, and T15, respectively.

Scores on the VABS are correlated with other measures of adaptive behavior. Among parents of children with autism (N=15), the correlation between the VABS adaptive behavior composite and the Adaptive Behavior Scale-School Edition (ABS-SE) was $r = .62$ (Perry & Factor, 1989). The correlation between the adaptive behavior composite on the VABS and the Scales of Independent Behavior (SIB) was $r = .83$ for a sample of children aged 3 through 7 (N=53) with intellectual disabilities (Middleton, Keene, & Brown, 1990). In another study, adaptive behavior scores on the VABS

correlated strongly ($r$ = .93) with scores on a measure of adaptive behavior assessing self-help, communication, persistence, and social skills for children and adolescents with intellectual disabilities (de Bildt, Kraijer, Sytema, & Minderaa, 2005). Evidence for discriminant validity was supported in that study through low to moderate correlations between the VABS and measures of intelligence ($r$ = .18 to $r$ = .65), general problem behavior ($r$ = -.14 to $r$ = -.31) and autism symptoms ($r$ = -.49).

**Child behavior problems.** Mothers completed two different versions of the Child Behavior Checklist over the course of the study to be appropriate to the age of the child. At T3 and T5, mothers completed the Child Behavior Checklist/2-3 (CBCL/2-3; Achenbach, Edelbrock, & Howell, 1987; Achenbach, 1992). The CBCL/2-3 version was used when the children were aged 5 as well since their average mental age was more similar to two- to three-year-olds than four- to eighteen-year-olds. On the CBCL/2-3, mothers were asked if 100 statements regarding child behavior were not true (0), sometimes/somewhat true (1), or very true/often true (2) of their child. Items fall within six syndrome scales: anxious/depressed, withdrawn, sleep problems, somatic complaints, aggressive behavior, and destructive behavior. Certain syndrome scales are grouped together to form the internalizing behavior scale (anxious/depressed, withdrawn) and the externalizing behavior scale (aggressive behavior, destructive behavior). Internalizing behaviors include behaviors such as anxiety, sadness, social withdrawal, and fearfulness (e.g., “upset when separated”, “little affection”) while externalizing behaviors include behaviors such as hyperactivity, poor impulse control, and aggression (e.g., “hits others”, “destroys others’ things”). The total behavior problems score represents the child’s

behavior across syndrome scales, with higher scores indicating higher levels of problematic behavior.

At T10 and T15, mothers completed the Child Behavior Checklist/4-18 (CBCL; Achenbach & Edelbrock, 1983; Achenbach, 1991). This version of the CBCL has 112 items, which fall within eight subscales: withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent problems, and aggressive behavior. The withdrawn, somatic complaints, and anxious/depressed subscales form the internalizing behavior scale. The delinquent behavior and aggressive behavior subscales form the externalizing behavior scale. The internalizing, externalizing, and total behavior problems scores are comparable across versions since they are calculated as t scores.

The t-score for total behavior problems was used as a predictor for this dissertation. According to the Child Behavior Checklist/2-3 manual (Achenbach, 1992), researchers are recommended to use t-scores when comparing internalizing, externalizing, and total problem scales across age groups. These t-scores reflect each participant's deviation from the mean of his/her normative group. Because the t-scores for the internalizing, externalizing, and total problem scales were not truncated, statistical analyses using the t-scores should yield results similar to those using the raw scores according to Achenbach (1992). Total child behavior problems will be included as a level 1, time varying predictor. Average total behavior problems across time points will be included as a level 2 predictor.

The CBCL/2-3 has demonstrated high reliability (Achenbach, 1992). Test-retest

reliability after one week was high ($r$ = .91) among 41 2- to 3-year-old children. Internal consistency as measured by the Cronbach's alpha was also very high (α = .96) in that study. Within the EICS sample, Cronbach's alpha for total behavior problems was α = .93 and α = .94 at T3 and T5, respectively. The CBCL/4-18 has also demonstrated satisfactory reliability (Achenbach, 1991). Test-retest coefficients for total behavior problems was $r$ = .90 for boys (N=24) and $r$ = .88 for girls (N=29) over a one week period. Inter-parent agreement is high ($r$ = .76) for mothers and fathers of children aged 4-18 (N=599). Within the EICS sample, Cronbach's alpha for total behavior problems was α = .93 and α = .99 at T10 and T15, respectively.

Inter-rater reliability for the CBCL is strong. At age 3, Achenbach (1992) reported no significant differences between mothers' and fathers' ratings of total behavior problems. Baker et al. (2002) reported a correlation of $r$ = .75 ($p$ < .001) for total behavior problems, $r$ = .75 ($p$ < .001) for internalizing behaviors, and $r$ = .71 ($p$ < .001) for externalizing behaviors between parents of children with developmental delays. A meta-analysis of studies reporting correlations between maternal and paternal ratings of child behavior problems found an average correlation of $r$ = .70 for total behavior problems (Duhig, Renk, Epstein, & Phares, 2000). Although this study is limited by reliance on mother report of behavior problems, overall the effect size for parent gender was nonsignificant in the literature (Duhig et al., 2000).

The CBCL/2-3 has demonstrated strong content, construct, and criterion-related validity (Achenbach, 1992). Items on the CBCL/2-3 tap a broad range of problems of clinical concern to parents and mental health care professionals. Clinically referred

children obtain significantly higher scores than their demographically-matched peers. In terms of construct validity, the CBCL/2-3 demonstrates good convergent validity as scores on this measure significantly correlate ($r$ = .58) with existing measures of behavior problems such as the Behavior Checklist (BCL). The CBCl/2-3 demonstrates good discriminant validity in that it does not significantly correlate with measures of general development such as the Bayley Mental Scale or the Minnesota Child Development Inventory (MCDI). Criterion-related validity is supported by the ability of clinical cutoff scores on the CBCL/2-3 to discriminate between children who are referred for emotional and behavioral issues and children who are not referred. Others studies have shown significant relations between scores on the CBCL/2-3 and DSM diagnoses. Scores on the CBCL/4-18 also correlate with scores on other behavior inventories, such as the Parent Questionnaire ($r$ = .82) and the Revised Behavior Problem Checklist ($r$ = 81) (Achenbach, 1991). Children diagnosed with behavior problems (N=2,110) were more likely to score above the clinical cutoff (82%) than were demographically-matched children with no diagnoses (30%).

**Parental coping.** Mothers and fathers completed the Ways of Coping Questionnaire (Folkman & Lazarus, 1988) at T3. The Ways of Coping Questionnaire is a 66-item measure designed to measure the cognitive and behavioral efforts individuals engage in to manage demands. Parents were asked to think of a recent stressful situation and indicate to what extent they used a variety of strategies to cope with that stressful situation on a 4-point Likert scale from 0=not used to 3=used a great deal. Based on a community sample of 75 middle-aged married couples, Folkman, Lazarus and colleagues

(Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986) proposed eight scales: confrontive coping, distancing, self-controlling, seeking social support, accepting responsibility, escape-avoidance, planful problem-solving, and positive reappraisal. Other researchers have been unable to replicate these factors in other samples, however (Edwards & O'Neill, 1998).

Alternative factor structures for the Ways of Coping Questionnaire have been proposed. Parker and colleagues (Parker, Endler, & Bagby, 1993) found support for a four-factor model using the Ways of Coping Questionnaire. In a sample of 530 college students, exploratory factor analyses yielded four factors: distancing/avoidance, confrontive/seeking social support, problem-focused, and denial. Folkman and Lazarus' eight-factor structure was a poor fit to the data, a finding that has been replicated elsewhere (Edwards & O'Neill, 1998). Distancing/avoidance refers to efforts to detach oneself from the problem or avoid thinking about the problem (e.g., "I tried to make myself feel better by eating, drinking, smoking, using drugs or medication, etc.", "I daydreamed or imagined a better time or place than the one I was in"). Confrontive/seeking social support refers to efforts to obtain informational, tangible, and emotional support (e.g., "I talked to someone to find out more about the situation", "I talked to someone who could do something concrete about the problem"). Problem focused refers to deliberate and analytic efforts to remedy the situation (e.g., "I tried to analyze the problem in order to understand it better", "I came up with a couple of different solutions to the problem"). Lastly, denial refers to efforts to deny the existence of the problem or dissociate oneself from the problem (e.g., "I went on as if nothing had

happened", "I didn't let it get to me, refused to think too much about it").

Although other researchers have proposed alternative scales for the Ways of Coping Questionnaire (Edwards & O'Neill, 1998), Parker et al.'s four-factor was selected for this dissertation. First, this factor structure yields a more concise set of coping strategies. Secondly, these coping scales are more conceptually distinct than Folkman and Lazarus' eight scales. Lastly, the internal consistency of each of these four scales is much higher than for the eight scales proposed by Folkman and Lazarus (Parker et al., 1993). For the sample used in this dissertation, internal consistency for mothers was $\alpha = .83$ for distancing/avoidance, $\alpha = .70$ for confrontive/seeking social support, $\alpha = .69$ for problem focused coping, and $\alpha = .69$ for denial. For fathers, internal consistency was $\alpha = .86$ for distancing/avoidance, $\alpha = .80$ for confrontive/seeking social support, $\alpha = .81$ for problem focused coping, and $\alpha = .70$ for denial. The four ways of coping were used as level 2 predictors of parenting stress.

**Parental social support.** Mothers and fathers completed an adapted version of the Family Support Scale (FSS; Dunst, Trivette, & Deal, 1988) at T3. The FSS is an 18-item self-report measure designed to assess the degree to which potential sources of support have been helpful to families rearing children (Dunst, Trivette, & Hamby, 1994). For use in EICS, the measure was adapted to 15 items and included Early Intervention as a potential source of support. To avoid overlapping with the Family Environment Scale, the item regarding the helpfulness of support from one's spouse was dropped for the purposes of this dissertation. Parents rated the helpfulness of each of the remaining 14 sources of support on a 5-point Likert scale from 0=not at all helpful to 4=extremely

helpful. Sources of support were either informal (e.g., relatives, friends) or formal (e.g., medical doctor, early intervention program). The total perceived helpfulness of all sources of support was used as a level 2 predictor, with higher scores indicating higher perceived social support.

Within a sample of 224 parents of children with developmental disabilities, the FSS demonstrated good reliability and validity (Dunst et al., 1994). Internal consistency as measured by Cronbach's alpha ($\alpha = .79$) and split-half reliability ($r = .77$) was satisfactory. Test-retest reliability after one month within a subsample of 25 participants was strong ($r = .91$). Test-retest reliability after one to two years within a subsample of 60 participants was also statistically significant, but only moderately strong ($r = .50$). Cronbach's alphas for the EICS sample were $\alpha = .89$ for mothers and $\alpha = .93$ for fathers. The helpfulness of total social support will be used for this dissertation since the internal consistency of informal support and formal support scales were below the acceptable cutoff ($\alpha < .60$).

A principal components analysis of the Dunst et al. (1994) sample yielded five factors that measure distinct aspects of social support consistent with the authors' theoretical model of a nested arrangement of social units (informal kinship, spouse/partner support, social organizations, formal kinship, and professional services). Total helpfulness scores on the FSS correlated with scores on selected familial and personal well-being scales on the Questionnaire on Resources and Stress.

**Family climate.** Mothers and fathers completed the Family Environment Scale-Second Edition (FES; Moos & Moos, 1986) at T3. The FES was designed to measure the

social and environmental characteristics of families. Parents were asked to indicate whether 90 statements about families were true/mostly true or false/mostly false for most members of their family (e.g., "Family members really help and support one another"). The 10 FES subscales assess three underlying domains or dimensions: the Relationship dimension (Cohesion, Expressiveness, Conflict), the Personal Growth dimension (Independence, Achievement Orientation, Intellectual-Cultural Orientation, Active-Recreational Orientation, Moral-Religious Emphasis), and the System Maintenance dimension (Organization, Control). The Relationship Dimension was used for this dissertation.

The Relationship Dimension is calculated by summing the scores for the Cohesion and Expressiveness subscales and subtracting the score for the Conflict subscale. Each of the subscales has 9 items. The Cohesion subscale measures the degree of commitment, help, and support family members provide to one another. The Expressiveness subscale measures the extent to which family members are encouraged to act openly and to express their feelings directly. Lastly, the Conflict subscale measures the amount of openly expressed anger, aggression, and conflict among family members. Higher scores indicate more positive perceptions of the family climate. The Relationship Dimension score was entered as a level 2 predictor of parenting stress.

The FES has demonstrated good internal consistency and stability (Moos & Moos, 1981). Cronbach's alphas were $\alpha = .78$ for the cohesion subscale, $\alpha = .69$ for the expressiveness subscale, and $\alpha = .75$ for the conflict subscale within a sample of 1,067 families. Test-retest reliability was good for each of the subscales after 2 months ($r = .73$

to $r$ = .86), 4 months ($r$ = .66 to $r$ = .72), and 12 months ($r$ = .63 to $r$ = .76). Cronbach's alphas for the EICS sample were $\alpha$ = .69 for mothers and $\alpha$ = .70 for fathers.

The FES has demonstrated convergent validity with other measures of family emotional climate (Sanford, Bingham, & Zucker, 1999). Within a sample of mothers and fathers (N=319), scores on the Family Adaptability and Cohesion Evaluation Scale-Cohesion and Structural Analysis of Social Behavior Index-Interpersonal Affiliation loaded heavily onto the cohesion subscale of the FES. Scores on the Conflict Tactics Scale and the Antisocial Behavior checklist loaded heavily onto the conflict subscale of the FES. Overall, the validity evidence was strong for the cohesion and conflict subscales across self-report and observational measures of parent behavior.

**Parenting stress.** Mothers and fathers completed the Parenting Stress Index (PSI; Abidin, 1995) at each time point. The PSI is a self-report measure designed to assess the amount of stress in parent-child system. Parents were asked to indicate on a 5-point Likert scale the extent to which they agree or disagree with a variety of statements, from 1=strongly agree to 5=strongly disagree. Total stress is divided into two domains: Child Domain and Parent Domain. The Child Domain is a 47-item scale that measures the child's behavior and temperament across six subscales: moodiness, adaptability, acceptability, demandingness, distractibility, and reinforces parent. As previously noted, the Child Domain will not be used for this dissertation given its conceptual overlap with child behavior problems. The Parent Domain is a 54-items scale that measures the parent's reaction to the parenting experience, including statements regarding the respondent's reactions to the experience of being a parent and a sense of emotional

equilibrium associated with the parent experience. Parent Domain scores consists of seven subscales: depression, attachment, restrictions in role, sense of competence, social isolation, relations with spouse, and parent health. The total score on the Parent Domain was used as the outcome variable, with higher scores indicating higher levels of parenting stress.

The Depression subscale measures the extent to which the parent's emotional and physical energy is compromised. The Competence subscale assesses the parent's sense of competence in the parental role, including his or her ability to manage the child and make decisions. The Attachment subscale assesses the intrinsic investment the parent has in the role of parent, in other words the motivation to parent. The Spouse subscale assesses the emotional and physical support provided by the spouse to facilitate the parental role. This subscale determines the level of conflict in the relationship related to parenting. The Isolation subscale examines the extent to which the parent feels socially isolated as a result of being a parent. The Health subscale measures the impact of the parent's current physical health on his or her ability to parent. The final subscale, Role Restriction, addresses the impact of parenthood on the parent's personal freedom. This subscale measures the negative impact, loss, and sense of resentment associated with the parent's perceptions of loss of other important life roles.

Reliability for the PSI subscales is satisfactory. Abidin (1995) reported normative data for a sample of 2,633 parents. Internal consistency as measured by the Cronbach's alpha was $\alpha = .93$ for the Parent Domain. Within the EICS sample, internal consistency on the Parent Domain was $\alpha = .92$, $\alpha = .92$, $\alpha = .92$, and $\alpha = .93$ for mothers at T3, T5,

T10, and T15, respectively. For fathers, internal consistency on the Parent Domain was α = .93, α = .94, α = .91, and α = .93 at T3, T5, T10, and T15, respectively. Alphas for the Parent Domain subscales ranged from α = .70 for Health to α = .83 for Competence in Abidin's normative sample. Test-retest reliability was high ($r$ = .91) for a subsample of 30 participants tested one to three months apart. Validity of the PSI-Parent Domain was assessed through a factor analysis of scores from a sample of 534 mothers of children aged one month to 19 years. The pattern of factor loadings supported the author's notion that each subscale measures a distinct source of stress. Scores on the PSI have been found to correlate with other measures of stress among parents of children with developmental and behavioral issues, including the Family Impact Questionnaire (Donenberg & Baker, 1993) and the Inventory of Parent Experiences (Hanson & Hanline, 1990).

## Analytic Plan

**Missing data.** Prior to analysis, multiple imputation procedures were used to substitute missing values. Cases with missing data pose a challenge since most statistical techniques delete cases with missing values by default. When there is relatively little missing data (e.g., less than 5%) or the data are missing at random, a listwise deletion of cases with incomplete data poses few problems. A bias arises using listwise deletion, however, when cases with missing data differ in some way from cases without missing data (Schafer, 1997; Widaman, 2006). When missingness depends on other factors, estimates of population parameters based on a restricted sample with complete data will be biased. Listwise deletion also reduces the sample size, limiting statistical power. Lastly, if several analyses are performed, the sample may differ from one analysis to

another, which makes comparisons across analyses difficult to interpret. For these reasons, techniques have been developed to impute missing values.

There are several approaches to handling missing data (Widaman, 2006). Basic approaches include sample mean substitution, individual mean substitution, and regression techniques. These approaches rely on relatively little information to impute values, however. Single and multiple imputation techniques are preferable, especially when moderate to large amounts of data are missing (Widaman, 2006). Single imputation techniques produce a single data set with complete data for all observations based on a set of predictors, similar to a regression substitution, but in addition this approach adds a random variability component to mimic the variability in relations among variables within the complete data. In other words, if the relationship between the predictors and outcome within the sample with complete data has high variability, the random variability component added to the imputed value would also be large. If the predictors and outcome were closely related, on the other hand, the random variability component would be smaller. A concern with single imputation is the representativeness of the single data set, since the random component added to each imputed value would not be exactly the same if the imputation process were repeated. Multiple imputation techniques are preferable since they produce multiple data sets, each with differing random components added to each imputed value. Analyses can be conducted based on multiple imputed data sets to produce pooled results that are more generally more accurate than results based on a single imputed data set (Widaman, 2006).

Multiple imputation techniques are recommended for data sets with moderate to large amounts of missing data that are not missing at random (Widaman, 2006). Since this dissertation uses a longitudinal data set, there is missing data due to attrition. Attrition may be related to parent, child, and family factors that are measured at time points prior to the subjects dropping out of the study. Recent recommendations for handling missing data suggest that researchers perform initial descriptive analyses to identify the nature and extent of missing data (Widaman, 2006). A description of the percentage of missing mother and child data is presented in Table 3. A description of the percentage of missing family data is presented in Table 4. The sample was selected based on complete data on the Parenting Stress Index, both mothers and fathers therefore have complete data on the PSI and Negative Life Events measures at T3. At T3, missing data is relatively small, with the exception of parental social support for which 11.6% are missing for mothers and 10.9% are missing for fathers. At T5, between 11.6% and 23.8% of data are missing for mothers, with between 25.5% and 27.3% missing for fathers. At T10, between 19% and 31.3% of data are missing for mothers and between 37.3% and 39.1% of data are missing for fathers. At the final time point, missing data is the highest. For mothers, between 27.2% and 32.7% of data are missing across measures. For fathers, 38.2% of data are missing across measures. This pattern suggests that missing data is related to attrition. Missing data is lowest for child measures (adaptive behavior, behavior problems) and highest for father measures.

Multiple imputation for this dissertation was conducted using the Multiple Imputation add-on for SPSS version 19. Imputation was based on child, parent, and

family variables from T1 through T18 of the Early Intervention Collaborate Study (Table 5). Five data sets were generated and used for analyses, since between 5 and 10 data sets are recommendations for developmental scientists (Widaman, 2006). Prior experimentation with EICS data found that results averaged across 10 data sets were similar to results averaged across 4 data sets (Hauser-Cram et al., 2001). The multiple imputation function in HLM was used to analyze the five data sets to produce one averaged set of results. HLM software also factors in the variability in imputed values across data sets when estimating standard errors.

**Main analyses.** Hierarchical linear modeling (HLM) was used for this dissertation, using HLM software version 6 (Raudenbush, Bryk, & Congdon, 2008). Traditional regression approaches are inappropriate for the present analyses since observations of the same individual over time are necessarily dependent, violating the assumption of independence of ordinary least squares regression. Multilevel modeling approaches take into consideration the statistical dependence among observations. In the EICS data set, observations over time (level 1) are nested within individuals (level 2). Separate models will be conducted for mothers and fathers to maximize the sample size and include families with only one participating parent.

Multilevel modeling allows researchers to measure change over three or more waves of data collection. It also allows researchers to predict changes within individuals over time as well as differences between individuals. Hierarchical linear modeling can also be used to test hypotheses about moderators of development. Analyses for this dissertation proceeded in several steps. First, unconditional growth models will be

conducted to identify the basic shape of the trajectories of parenting stress for each parent. Within-person, level-1 models estimate trajectories for each individual based on repeated measurements of the outcome variable over time. Time will be measured in this dissertation as the child age in months. HLM requires that the data be centered at a specific time point. To center the data, a constant is subtracted from the time scale to make the point at which time equals zero substantively meaningful. Since children leave early intervention services at age 3, child age was centered at 36 months. The intercept will therefore represent the mean parenting stress for mothers and fathers when their child is three years old. There are four observation points for each individual over time, therefore a maximum of three parameters can shape the unconditional growth models (intercept, linear age term, quadratic age term).

Based on descriptive statistics, it appears that trajectories of parenting stress follow a curvilinear pattern for mothers and fathers, rising from T3 to T10 and subsequently falling from T10 to T15. Preliminary analyses using HLM supported this finding. Figures 4 and 5 show the unconditional trajectories for mothers and fathers, respectively. The linear and quadratic age terms were statistically significant ($p$ = .003 and $p$ < .001, respectively), with significant variability in the linear age term ($p$ < .001). The unconditional growth model is represented as follows:

$$Y_{ti} = \beta_{00} + \beta_{10}(AGE_{ti}) + \beta_{20}(AGESQ_{ti}) + r_{0i} + r_{1i}(AGE_{ti}) + e_{ti}$$

where Y is the outcome (parenting stress), $\beta_{00}$ is the intercept (initial status at age 3), $\beta_{10}$ is the rate of change in the linear age term, and $\beta_{20}$ is the rate of change in the quadratic age term.

Once the shape of the unconditional growth model was determined for each parent, negative life events was added as a time-varying covariate. Time-varying covariates are variables that are measured over the same time points as the outcome variable and are presumed to have a relationship with the outcome variable. In this case, negative life events were expected to impact parents' levels of stress. By including negative life events as a time-varying covariate, its impact on parenting stress is controlled. In other words, the impact of negative life events on parenting stress is partialed out so that the remaining variance can be predicted by the family variables of interest in this study. With negative life events added to the model group mean centered, the model would be as follows:

$$Y_{ti} = \beta_{00} + \beta_{10}(AGE_{ti}) + \beta_{20}(AGESQ_{ti}) + \beta_{30}(NLE_{ti} - \overline{NLE}_{\bullet j})_{ti} + r_{0i} + r_{1i}(AGE_{ti}) + e_{ti}$$

where $\beta_{30}$ is the coefficient for negative life events as a time-varying covariate. The unconditional growth model with negative life events as a time-varying covariate address research question 1 regarding the shape of parents' trajectories of parenting stress.

Next, predictors were added to the models to address the remaining research questions. A parallel set of level-2 predictors was added to predict the intercept (initial status at age 3) and the slope (rate of change from age 3 to age 15). Family demographics (family income, parental educational attainment) and child characteristics (behavior problems, adaptive behavior) were added to each model. Average family income and parental educational attainment across time points were entered as level 2 predictors (grand mean centered). Child behavior problems was entered as a level 1, time varying predictor (group mean centered). The mean level of child behavior problems across time

points was entered as a level 2 predictor (grand mean centered). Child behavior problems was entered at level 1 group mean centered to capture changes over time within individuals and entered at level 2 grand mean centered to capture differences in overall levels between individuals. The mean level of child adaptive behavior across time points was entered as a level 2 predictor (grand mean centered). Since the constructs for family resources and supports are somewhat related, each hypothesis was initially examined within a separate model above and beyond family demographics (family income, parental educational attainment) and child characteristics (behavior problems, adaptive behavior). In their respective models, coping strategies, social support, and family climate were entered as level 2 predictors (grand mean centered). Once each of the hypotheses regarding coping, social support, and family climate were tested, a final combined model was presented. To facilitate the interpretation of the results, trajectories of parenting stress were estimated for prototypical individuals.

Building off the unconditional growth model with negative life events as a time-varying covariate, the models for each hypothesis are as follows:

*Hypothesis 1:* Parenting stress is expected to increase from early to middle childhood then decrease from middle childhood to adolescence.

*Analysis.* Negative life events (NLE) will be added to the model as a time-varying covariate, grand mean centered.

$$Y_{ti} = \beta_{00} + \beta_{10}(NLE_{ti} - \overline{NLE}_{\bullet\bullet})_{ti} + \beta_{20}(AGE_{ti}) + \beta_{30}(AGESQ_{ti})_{ti} + r_{0i} + r_{2i}(AGE_{ti}) + e_{ti}$$

*Hypothesis 2a.* Changes in child behavior problems over time will predict changes in parenting stress for mothers and fathers. Specifically, increases in child behavior problems are expected to predict increases in parenting stress.

*Analysis.* Child behavior problems (CBC) will be added to the model at level 1 group mean centered.

$$Y_{ti} = \beta_{00} + \beta_{10}(NLE_{ti} - \overline{NLE}_{\bullet\bullet})_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}_{\bullet j})_{ti} + \beta_{30}(AGE_{ti}) + \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

*Hypothesis 2b.* Higher levels of child behavior problems are expected to predict higher levels of parenting stress among both mothers and fathers.

*Analysis.* Average CBC across time points (CBC2) will be added to the model at level 2 grand mean centered to predict the intercept and the linear age slope.

$$Y_{ti} = \beta_{00} + \beta_{01}(CBC2_i - \overline{CBC2}_{\bullet}) + \beta_{10}(NLE_{ti} - \overline{NLE}_{\bullet\bullet})_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}_{\bullet j})_{ti} + \beta_{30}(AGE_{ti}) + \beta_{31}(CBC2_{ti} - \overline{CBC2}_{\bullet})_{ti} * (AGE_{ti}) + \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

*Hypothesis 2c.* Lower levels of child adaptive behavior are expected to predict higher levels of parenting stress among both mothers and fathers.

*Analysis.* Average child adaptive behavior (VINE2) will be added to the model at level 2 grand mean centered to predict the intercept and the linear age slope.

$$Y_{ti} = \beta_{00} + \beta_{01}(VINE2_i - \overline{VINE2}_{\bullet}) + \beta_{02}(CBC2_i - \overline{CBC2}_{\bullet}) + \beta_{10}(NLE_{ti} - \overline{NLE}_{\bullet\bullet})_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}_{\bullet j})_{ti} + \beta_{30}(AGE_{ti}) + \beta_{31}(VINE2_{ti} - \overline{VINE2}_{\bullet})_{ti} * (AGE_{ti}) + \beta_{32}(CBC2_{ti} - \overline{CBC2}_{\bullet})_{ti} * (AGE_{ti}) + \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

*Hypothesis 3a.* Lower helpfulness of social support is expected to predict higher levels of parenting stress for both mothers and fathers.

*Analysis.* Social support (FSS) will be added to the model at level 2 grand mean centered to predict the intercept and the linear age slope.

$$Y_{ti} = \beta_{00} + \beta_{01}(FSS_i - FSS_\bullet) + \beta_{02}(VINE2_i - \overline{VINE2}_\bullet) + \beta_{03}(CBC2_i - \overline{CBC2}_\bullet)$$
$$+ \beta_{10}(NLE_{ti} - \overline{NLE}_{\bullet\bullet})_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}_{\bullet j})_{ti} + \beta_{30}(AGE_{ti})$$
$$+ \beta_{31}(FSS_{ti} - \overline{FSS}_\bullet)_{ti} * (AGE_{ti}) + \beta_{32}(VINE2_{ti} - \overline{VINE2}_\bullet)_{ti} * (AGE_{ti})$$
$$+ \beta_{33}(CBC2_{ti} - \overline{CBC2}_\bullet)_{ti} * (AGE_{ti}) + \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

*Hypothesis 3b.* Lower quality family climate is expected to predict higher levels of parenting stress for both mothers and fathers.

*Analysis.* Social support (FSS) will be removed from the model to avoid collinearity with family climate. Family climate (FES) will be added to the model at level 2 grand mean centered to predict the intercept and the linear age slope.

$$Y_{ti} = \beta_{00} + \beta_{01}(FES_i - FES_\bullet) + \beta_{02}(VINE2_i - \overline{VINE2}_\bullet) + \beta_{03}(CBC2_i - \overline{CBC2}_\bullet)$$
$$+ \beta_{10}(NLE_{ti} - \overline{NLE}_{\bullet\bullet})_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}_{\bullet j})_{ti} + \beta_{30}(AGE_{ti})$$
$$+ \beta_{31}(FES_{ti} - \overline{FES}_\bullet)_{ti} * (AGE_{ti}) + \beta_{32}(VINE2_{ti} - \overline{VINE2}_\bullet)_{ti} * (AGE_{ti})$$
$$+ \beta_{33}(CBC2_{ti} - \overline{CBC2}_\bullet)_{ti} * (AGE_{ti}) + \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

*Hypothesis 3c.* Higher use of distancing/avoidance and denial as coping strategies but lower use of confrontive/seeking social support and problem focused coping as coping strategies is expected to predict higher levels of parenting stress for both mothers and fathers.

*Analysis.* Family climate (FES) will be removed from the model to avoid collinearity with the coping variables. Distancing/avoidance (DISTANCE), confrontive/seeking social support (CONFRONT), problem focused coping (PFOCUS)

and denial (DENIAL) will be added to the model at level 2 grand mean centered to predict the intercept and the linear age slope.

$$Y_{ti} = \beta_{00} + \beta_{01}(DISTANCE_i - \overline{DISTANCE}\bullet) + \beta_{02}(CONFRONT_i - \overline{CONFRONT}\bullet)$$
$$+ \beta_{03}(PFOCUS_i - \overline{PFOCUS}\bullet) + \beta_{04}(DENIAL_i - \overline{DENIAL}\bullet) + \beta_{05}(VINE2_i - \overline{VINE2}\bullet)$$
$$+ \beta_{06}(CBC2_i - \overline{CBC2}\bullet) + \beta_{10}(NLE_{ti} - \overline{NLE}\bullet\bullet)_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}\bullet_j)_{ti} + \beta_{30}(AGE_{ti})$$
$$+ \beta_{31}(DISTANCE_i - \overline{DISTANCE}\bullet) * (AGE_{ti}) + \beta_{32}(CONFRONT_i - \overline{CONFRONT}\bullet) * (AGE_{ti})$$
$$+ \beta_{33}(PFOCUS_i - \overline{PFOCUS}\bullet) * (AGE_{ti}) + \beta_{34}(DENIAL_i - \overline{DENIAL}\bullet) * (AGE_{ti})$$
$$+ \beta_{35}(VINE2_{ti} - \overline{VINE2}\bullet)_{ti} * (AGE_{ti}) + \beta_{36}(CBC2_{ti} - \overline{CBC2}\bullet)_{ti} * (AGE_{ti})$$
$$+ \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

*Hypothesis 4a.* Social support will moderate the relationship between child behavior problems and parenting stress, such that higher social support will buffer the negative impact of child behavior problems on parenting stress.

*Analysis.* Building off the model for hypothesis 3a, social support (FSS) will be added at level 2 grand mean centered as a predictor of the child behavior problems (CBC) slope. Predictors of the linear age slope will be dropped to simplify the model.

$$Y_{ti} = \beta_{00} + \beta_{01}(FSS_i - FSS\bullet) + \beta_{02}(VINE2_i - \overline{VINE2}\bullet) + \beta_{03}(CBC2_i - \overline{CBC2}\bullet)$$
$$+ \beta_{10}(NLE_{ti} - \overline{NLE}\bullet\bullet)_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}\bullet_j)_{ti} + \beta_{21}(FSS_i - FSS\bullet) * (CBC_{ti} - \overline{CBC}\bullet_j)_{ti}$$
$$+ \beta_{30}(AGE_{ti}) + \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

An alternative approach was also used to test this moderating hypothesis, with the interaction of social support and child behavior problems entered as a level 2 predictor of the intercept and linear slope.

*Hypothesis 4b.* Family climate will moderate the relationship between child behavior problems and parenting stress, such that higher family climate will buffer the negative impact of child behavior problems on parenting stress.

*Analysis.* Building off the model for hypothesis 3b, family climate (FES) will be added at level 2 grand mean centered as a predictor of the child behavior problems (CBC) slope. Predictors of the linear age slope will be dropped to simplify the model.

$$Y_{ti} = \beta_{00} + \beta_{01}(FES_i - FES_\bullet) + \beta_{02}(VINE2_i - \overline{VINE2}_\bullet) + \beta_{03}(CBC2_i - \overline{CBC2}_\bullet)$$
$$+ \beta_{10}(NLE_{ti} - \overline{NLE}_{\bullet\bullet})_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}_{\bullet j})_{ti} + \beta_{21}(FES_i - FES_\bullet) * (CBC_{ti} - \overline{CBC}_{\bullet j})_{ti}$$
$$+ \beta_{30}(AGE_{ti}) + \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

An alternative approach was also used to test this moderating hypothesis, with the interaction of family climate and child behavior problems entered as a level 2 predictor of the intercept and linear slope.

*Hypothesis 4c.* Parents' use of coping strategies will moderate the relationship between child behavior problems and parenting stress, such that greater use of confrontive/seeking social support and problem focused coping but lower use of distancing/avoidance and denial as coping strategies is expected to buffer the negative impact of child behavior problems on parenting stress.

*Analysis.* Building off the model for hypothesis 3c, distancing/avoidance (DISTANCE), confrontive/seeking social support (CONFRONT), problem focused coping (PFOCUS) and denial (DENIAL) will be added at level 2 grand mean centered as predictors of the child behavior problems (CBC) slope. Predictors of the linear age slope will be dropped to simplify the model.

$$Y_{ti} = \beta_{00} + \beta_{01}(DISTANCE_i - \overline{DISTANCE}_{\bullet}) + \beta_{02}(CONFRONT_i - \overline{CONFRONT}_{\bullet})$$
$$+ \beta_{03}(PFOCUS_i - \overline{PFOCUS}_{\bullet}) + \beta_{04}(DENIAL_i - \overline{DENIAL}_{\bullet}) + \beta_{05}(VINE2_i - \overline{VINE2}_{\bullet})$$
$$+ \beta_{06}(CBC2_i - \overline{CBC2}_{\bullet}) + \beta_{10}(NLE_{ti} - \overline{NLE}_{\bullet\bullet})_{ti} + \beta_{20}(CBC_{ti} - \overline{CBC}_{\bullet j})_{ti}$$
$$+ \beta_{21}(DISTANCE_i - \overline{DISTANCE}_{\bullet}) * (CBC_{ti} - \overline{CBC}_{\bullet j})_{ti}$$
$$+ \beta_{22}(CONFRONT_i - \overline{CONFRONT}_{\bullet}) * (CBC_{ti} - \overline{CBC}_{\bullet j})_{ti}$$
$$+ \beta_{23}(PFOCUS_i - \overline{PFOCUS}_{\bullet}) * (CBC_{ti} - \overline{CBC}_{\bullet j})_{ti}$$
$$+ \beta_{24}(DENIAL_i - \overline{DENIAL}_{\bullet}) * (CBC_{ti} - \overline{CBC}_{\bullet j})_{ti}$$
$$+ \beta_{30}(AGE_{ti}) + \beta_{40}(AGESQ_{ti})_{ti} + r_{0i} + r_{3i}(AGE_{ti}) + e_{ti}$$

An alternative approach was also used to test this moderating hypothesis, with the interactions of child behavior problems and each coping strategy (e.g., CBC x Distancing/avoidance) entered as a level 2 predictor of the intercept and linear slope.

# Chapter 4: Results

Missing data were imputed using the Multiple Imputation add-on for SPSS version 19. Imputation was based on child, parent, and family variables from T1 through T18 of the Early Intervention Collaborate Study (Table 5). Five imputed data sets were generated for analysis. Data were imputed for 147 mothers and 110 fathers. Frequency distributions were examined for predictor and outcome variables. The distribution of Parenting Stress Index-Parent Domain scores was approximately normal for both mothers and fathers. Extreme high scores were top-coded and extreme low-scores were bottom-coded to preserve the relative ordering of the data but avoid violating the assumption of normality. This truncation method is recommended for univariate outliers since extreme values can have deleterious effects on power, accuracy, and error rates in regression based analyses (Osborne & Overbay, 2004). Descriptive statistics for predictor and outcome variables are provided in Table 6 for mothers (N=147) and Table 7 for fathers (N=110).

## Preliminary Analyses

**Clinical cutoffs.** The number of mothers scoring above the clinical cutoff (>153) on the Parenting Stress Index-Parent Domain was 12%, 8%, 8%, and 3% at age 3, 5, 10, and 15, respectively. The percentage of fathers scoring above the clinical cutoff (>153) on the Parenting Stress Index-Parent Domain was 9%, 10%, 6%, and 5% at age 3, 5, 10, and 15, respectively. On the Child Behavior Checklist, the percentage of children at risk for clinically significant behavior problems (>60) was 17% at age 3, 20% at age 5, 41% at age 10, and 36% at age 15. The percentage of children at high risk for clinically

significant behavior problems (>70) was 3% at ages 3 and 5, 10% at age 10, and 13% at age 15.

**Comparisons to normative data.** Scores in the EICS sample were compared to normative data reported in manuals for several measures. Normative data were available for the Parenting Stress Index, Child Behavior Checklist, and the Family Environment Scale. When possible, data were compared by parent gender, child gender, and child age.

*Parenting Stress Index-Parent Domain.* Parenting Stress Index-Parent Domain scores for this sample were compared to the normative data reported by Abidin (1995). For mothers, normative data was based on a sample of 2,633 mothers recruited from pediatric clinics, health programs, and public schools in Virginia, Massachusetts, New York City, North Carolina, Georgia, and Wisconsin. Mothers were primarily Caucasian (76%) and married (77%) with a wide range of family incomes and years of education. The focal children ranged in age from 1 month to 12 years (M = 4.9, SD = 3.1) for the normative sample. As seen in Table 8, scores on the PSI-Parent Domain did not significantly differ between mothers of 3-year-olds in the normative sample (M = 122) and mothers of 3-year-olds in the EICS sample (M = 121.86, SD = 24.28), $t(146) = -.07$, $p = .94$. Similarly, scores did not significantly differ between mothers of 5-year-olds in the normative sample (M = 123) and mothers of 5-year-olds in the EICS sample (M = 121.27, SD = 21.18), $t(146) = -1.04$, $p = .30$. Compared to mothers of children aged 9 through 12 years (M = 118), mothers in the EICS sample had higher Parent Domain scores when their children were age 10 (M = 122.08, SD = 19.98), $t(146) = 2.28$, $p = .02$. Comparison data were not available for mothers of 15-year-olds in the normative sample.

Normative data on the PSI were collected for a small sample of fathers (N = 200). Fathers were primarily Caucasian (95%) and employed full-time (88%) with a wide range of years of education. Means were reported for two groups of fathers, the first with children aged 6 months through 4 years and the second with children aged 4 years through 6 years. On Parent Domain scores, the mean for fathers in the EICS sample at age 3 (M = 119.20, SD = 24.42) was significantly higher than the mean for fathers of children aged 6 months through 4 years in the normative sample (M = 108.70), $t(109) = 4.51$, $p < .001$. At age 5, fathers in the EICS sample (M = 122.02, SD = 21.50) again scored higher on the Parent Domain than fathers of children aged 4 through 6 years in the normative sample (M = 112.60), $t(109) = 4.54$, $p < .001$. Comparison data were not available for fathers of 10-year-olds or 15-year-olds.

*Child Behavior Checklist.* Comparison data were available for children aged 4-11 and 12-18 on the Child Behavior Checklist (Achenbach & Edelbrock, 1983). Comparison data was not available for children aged 3 years. As seen in Table 9, the mean t-score for total behavior problems for boys aged 4 through 11 in the normative sample (M = 50.10) did not significantly differ from the mean for boys in the EICS sample at age 5 (M = 50.06, SD = 10.73), $t(82) = .10$, $p = .92$, but did significantly differ at age 10 (M = 57.65, SD = 9.18), $t(82) = 7.60$, $p < .001$. Similarly, the mean for boys in the EICS sample at age 15 (M = 55.62, SD = 9.21) was significantly higher than the mean for boys aged 12 through 18 in the normative sample (M = 50.00), $t(82) = 5.03$, $p < .001$. A similar pattern was found for girls. The mean t-score for total behavior problems for girls aged 4 through 11 in the normative sample (M =50.10) did not significantly differ from the mean for

girls in the EICS sample at age 5 (M = 50.02, SD = 10.55), $t(64) = .09$, $p = .93$, but did significantly differ at age 10 (M = 56.39, SD = 9.12), $t(64) = 5.94$, $p < .001$. At age 15, girls in the EICS sample had significantly higher total behavior problems scores (M = 56.62, SD = 10.98) than girls aged 12 through 18 in the normative sample (M = 50.00), $t(64) = 4.82$, $p < .001$.

*Family Environment Scale.* Normative data on the Family Environment Scales was reported for N=1125 normal families and N=500 distressed families in the FES manual (Moos & Moss, 1981). The subsample of normal families includes families from across the United States with a variety of family structures (e.g., single parent, multigenerational families), ethnic/racial backgrounds, and ages (e.g., newly married, married with school-aged children, retired adults). Data stratified by child age or parent gender were not available, therefore mother and father data in the EICS sample were compared to the overall mean for normal families. On levels of cohesion, mothers in the EICS sample (M = 7.47, SD = 1.64) scored significantly higher than families in the normative sample (M = 6.61), $t(146) = 6.30$, $p < .001$, as seen in Table 8. Fathers in the EICS sample (M = 7.40, SD = 1.49) also scored significantly higher than families in the normative sample on levels of cohesion, $t(109) = 5.51$, $p < .001$. On levels of expressiveness, mothers in the EICS sample (M = 6.24, SD = 1.71) scored significantly higher than families in the normative sample (M = 5.45), $t(146) = 5.60$, $p < .001$. Similarly, fathers in the EICS sample (M = 5.79, SD = 1.69) also scored significantly higher than the normative sample, $t(109) = 2.25$, $p = .03$. Lastly, on levels of conflict, mothers in the EICS sample (M = 2.43, SD = 1.74) scored significantly lower than

families in the normative sample (M = 3.31), $t(146) = -6.16$, $p < .001$. Fathers in the EICS sample (M = 2.64, SD = 1.88) also scored significantly lower than the normative sample, $t(109) = -3.50$, $p < .001$.

**Correlations.** Bivariate correlations among level 1 and level 2 predictors were examined to evaluate the magnitude of relationships among child characteristics and family resources and supports. Since many of these factors are theoretically related, the examination of these correlations informed the model building process. The intercorrelations among level 1 predictors for mothers and fathers are reported in Table 10. Negative Life Events and Child Behavior Checklist scores demonstrated moderate consistency over time. For both parents, negative life events at age 3 correlated with negative life events at ages 5, 10, and 15 although negative life events at ages 5, 10, and 15 were not correlated with each other. Child behavior problems at ages 3, 5, 10, and 15 were significantly correlated with one another for both mother and father reports. Level 1 predictors also correlated with each other at several time points. At ages 3 and 10, negative life events correlated with child behavior problems for both mothers and fathers. At ages 5 and 15, negative life events correlated with child behavior problems for fathers only.

Table 11 reports the intercorrelations among level 2 predictors for mothers and fathers. As expected, family income and years of education were moderately correlated with one another for mothers and fathers. Higher years of education also related to less use of distancing/avoidance and denial as coping strategies for mothers and fathers and greater perceived helpfulness of social support and a more positive family climate for

mothers. A similar pattern emerged for family income. Higher family income was associated with less use of distancing/avoidance and denial as coping strategies and a more positive family climate for mothers and fathers. In addition, higher family income related to lower child behavior problems for mothers and fathers.

Greater overall behavior problems related to greater use of distancing/avoidance and denial as coping strategies among mothers and fathers and greater use of confrontive/seeking social support among mothers. Greater child behavior problems also related to a less positive family climate for both parents. Higher levels of adaptive behavior were only associated with lower perceived helpfulness of social support among mothers and unrelated to the other predictors among fathers. Use of the four coping strategies was somewhat related to each other. For mothers and fathers, greater distancing/avoidance was associated with greater confrontive/seeking social support, problem-focused coping, and denial. Greater use of confrontive/seeking social support was related to greater problem focused coping for both parents and greater denial for fathers only. Problem focused coping was positively correlated with denial for both mothers and fathers. Lastly, Greater helpfulness of social support related to a more positive perception of family climate for mothers but not fathers.

Table 12 presents the correlations for parents' scores on the Parenting Stress Index-Parent Domain and each of the level 1 and level 2 predictors. Each of the level 1 predictors related to parenting stress, although not at every time point. Negative life events correlated with parenting stress cross-sectionally (i.e., negative life events at age 3 and parenting stress at age 3) at ages 3 and 10 for mothers and ages 3 and 5 for fathers.

Higher child behavior problems correlated with higher parenting stress cross-sectionally for mothers at each time point and for fathers at only ages 3, 5, and 15.

With respect to level 2 predictors, fathers' years of education related to fathers' parenting stress at ages 3, 5, and 15 but mothers' years of education were unrelated to mothers' parenting stress. Higher family income was associated with lower parenting stress for mothers at ages 3, 10, and 15 and for fathers at ages 3 and 5. Greater use of distancing/avoidance as a coping strategy correlated with greater stress for parents at each time point, with the exception of fathers' stress at age 5. For both mothers and fathers, use of confrontive/seeking social support was unrelated to parenting stress across ages 3 through 15. Problem focused coping related to only fathers' stress at age 5, with greater problem focused coping predicting lower parenting stress. Greater use of denial predicted greater stress for mothers at ages 3 and 5 and for fathers at ages 3 and 10. Higher perceived helpfulness of social support negatively correlated with parenting stress at ages 3, 5, and 10 for mothers and ages 3 and 10 for fathers. For both mothers and fathers, more positive perceptions of family climate were associated with lower stress at each time point.

**Comparison by gender.** An independent samples t-test was conducted to determine if parenting stress differed by child gender. Mothers' levels of parenting stress did not differ by child gender at age 3, $t(144) = .58$, $p = .57$, age 5, $t(144) = .84$, $p = .40$, age 10, $t(144) = .17$, $p = .86$, or age 15, $t(144) = 1.42$, $p = .16$. Fathers' levels of parenting stress did not differ by child gender at age 3, $t(107) = .58$, $p = .57$, age 5, $t(107) = .31$, $p = .76$, age 10, $t(107) = .71$, $p = .48$, or age 15, $t(107) = .27$, $p = .79$.

Child gender was therefore not included in the main analyses.

**Comparison by type of disability.** An independent samples t-test was conducted to determine if parenting stress differed by child type of disability. Parents of children with Down syndrome were compared to parents of children with other disabilities. This comparison was chosen because there is a literature to suggest that parenting a child with a known etiology, such as Down syndrome, may be less stressful than parenting a child with an unknown etiology (Cahill & Glidden, 1996). Mothers of children with Down syndrome did not differ in levels of parenting stress from mothers of children without Down syndrome at age 3, $t(144) = 1.26$, $p = .21$, age 5, $t(144) = .20$, $p = .84$, age 10, $t(144) = .86$, $p = .39$, or age 15, $t(144) = .14$, $p = .89$. Similarly, fathers of children with Down syndrome did not differ in levels of parenting stress from fathers of children without Down syndrome at age 3, $t(107) = .50$, $p = .62$, age 5, $t(107) = .04$, $p = .97$, age 10, $t(107) = .71$, $p = .48$, or age 15, $t(107) = -.36$, $p = .72$. Child type of disability was therefore not included in the main analyses.

**Unconditional Growth Model**

**Mothers.** An unconditional quadratic growth model was conducted to determine mothers' initial status, growth rate and acceleration rate in parenting stress. The intercept and the linear age term were permitted to vary randomly. The random component of the quadratic age term was fixed since there was no significant variability in its slope. The results of the unconditional growth model for mothers are presented in Table 13. The average level of parenting stress was 120.98 at age 3. On average, parenting stress increased 0.10 points per month (linear age term). The average acceleration of growth

rate (quadratic age term) was -0.001 per month. The intercept, linear age term and quadratic age term were statistically significant. There was significant variability in the intercept and the linear age term. The average predicted trajectory of parenting stress for mothers is presented in Figure 4.

The unconditional growth model allows us to calculate the unconditional interclass correlation coefficient (ICC). The ICC indicates the proportion of variability in the outcome variable between individuals. The proportion of variance at the individual level is 0.68. Approximately 68% of the variability in parenting stress lies between mothers. This nesting is statistically significant since $\tau_{00}$ is statistically significantly different from zero ($\chi^2 = 704.67$, $df = 146$, $p < .001$). There is a significant amount of variability in mothers' parenting stress that remains to be explained by between-person characteristics.

**Fathers.** An unconditional quadratic growth model was conducted to determine fathers' initial status, growth rate and acceleration rate in parenting stress. The intercept and the linear age term were permitted to vary randomly. The random component of the quadratic age term was fixed since there was no significant variability in its slope. The results of the unconditional growth model for fathers are presented in Table 14. The average level of parenting stress was 119.30 at age 3. On average, parenting stress increased 0.13 points per month (linear age term). The average acceleration of growth rate (quadratic age term) was -0.001 per month. The intercept, linear age term and quadratic age term were statistically significant. There was significant variability in the intercept and the linear age term. The average predicted trajectory of parenting stress for

fathers is presented in Figure 5. The interclass correlation coefficient (ICC) is 0.65. Approximately 65% of the variability in parenting stress lies between fathers. This nesting is statistically significant since $\tau_{00}$ is statistically significantly different from zero ($\chi^2 = 459.43$, $df = 109$, $p < .001$). There is a significant amount of variability in fathers' parenting stress that remains to be explained by between-person characteristics.

Findings for each of the research hypotheses are discussed in the following section. Results for mothers and fathers are discussed separately. Each hypothesis was examined individually since several of the child characteristics and resources and supports variables were related at the bivariate level. Examining each hypothesis individually also afforded greater power to observe relationships. Since parenting stress was found to follow a curvilinear pattern, predictors of the quadratic age term were also examined for each hypothesis. For hypotheses examining the buffering role of resources and supports two analytic approaches were used. First, these factors were entered at level 2 to predict the slope of child behavior problems as stated in the hypotheses. Second, the interaction of each family resource and support variable and overall level of child behavior problems was entered at level 2 to predict the intercept and linear slope. These methods reflect differing approaches to examining hypotheses of moderation in longitudinal designs.

Following the hypothesis testing, a combined model with the full set of predictors is presented for mothers and fathers. These models were reduced to only key control variables and statistically significant predictors to yield the most parsimonious models. Lastly, a final dyad model is presented, where a full set of predictors is examined for

mothers and fathers within parenting dyads. This model was reduced to include only key control variables and statistically significant predictors to yield the most parsimonious model. A summary of the hypotheses and findings can be found in Table 15.

**Hypothesis 1:**

*Parenting stress is expected to increase from early to middle childhood then decrease from middle childhood to adolescence.*

**Mothers.** Negative life events was added to the unconditional growth model as a time-varying covariate grand mean centered. The random component of negative life events was fixed since there was no significant variability in its slope ($\chi^2 = 144.19$, $df = 137$, $p = .32$). The results of the model for hypothesis 1 are presented in Table 16. The number of negative life events was a statistically significant covariate, with greater negative life events predicting higher parenting stress. The intercept, the linear age term and the quadratic age term remained statistically significant. Controlling for negative life events, parenting stress increased 0.10 points per month (linear age term). The average acceleration of growth rate (quadratic age term) was -0.001 per month.

Parenting stress was found to generally increase from early to middle childhood then decrease from middle childhood to adolescence for mothers, lending support to hypothesis 1. To more directly address this research question, however, a piecewise model was examined. A significant linear increase in parenting stress from age 3 to age 10 was already reported for mothers in the EICS sample in Hauser-Cram et al. (2001). The piecewise model was conducted to determine whether parenting stress in middle childhood (age 10) is significantly higher than parenting stress in adolescence (age 15). In

addition to the linear age term and negative life events, two dummy variables were entered at level 1 uncentered. The first dummy variable (dummy1) distinguished ages 3 and 5 from ages 10 and 15 (age 3=1, age 5=1, age 10=0, age 15=0). The second dummy variable (dummy2) distinguished age 10 from ages 3, 5, and 15 (age 3=0, age 5=0, age 10=1, age 5=0). With both dummy variables entered as level 1 predictors, a positive and significant coefficient for dummy2 would indicate that parenting stress was significantly higher at age 10 than at age 15. As seen in Table 17, this was found for mothers. The hypothesis that parenting stress would increase from early to middle childhood and subsequently decrease from middle childhood to adolescence was supported for mothers.

**Fathers.** Negative life events was added to the unconditional growth model as a time-varying covariate grand mean centered. The random component of negative life events was fixed since there was no significant variability in its slope ($\chi^2 = 126.04$, $df = 102$, $p = .053$). The results of the model for hypothesis 1 are presented in Table 16. The number of negative life events was significant at the trend level, with greater negative life events predicting higher parenting stress. The intercept, the linear age term and the quadratic age term remained statistically significant. Controlling for negative life events, parenting stress increased 0.14 points per month (linear age term). The average acceleration of growth rate (quadratic age term) was -0.001 per month.

Parenting stress was found to generally increase from early to middle childhood then decrease from middle childhood to adolescence for fathers, lending support to hypothesis 1. To more directly address this research question, a piecewise model was examined for fathers as well. A significant linear increase in parenting stress from age 3

to age 10 was already reported for fathers in the EICS sample in Hauser-Cram et al. (2001). As seen in Table 17, the coefficient for dummy2 was positive and significant for fathers, indicating that parenting stress was significantly higher at age 10 than at age 15. The hypothesis that parenting stress would increase from early to middle childhood and subsequently decrease from middle childhood to adolescence was supported for fathers.

**Hypothesis 2a.**

*Changes in child behavior problems over time will predict changes in parenting stress for mothers and fathers. More specifically, increases in child behavior problems will predict increases in parenting stress.*

**Mothers.** Child behavior problems was added to the model group mean centered at level 1. Socioeconomic status was added grand mean centered as a control variable predicting the intercept and linear slope. The random component of child behavior problems was fixed since there was no significant variability in its slope ($\chi^2 = 134.74$, $df = 143$, $p > .50$). The results of the model for hypothesis 2a are presented in Table 18. Socioeconomic status was a significant predictor of the intercept but not linear slope, with greater level of family income predicting lower levels of parenting stress at age 3. Level of child behavior problems was a statistically significant time-varying predictor, with increases in child behavior problems over time predicting increases in parenting stress. The slope of the linear age term became non-significant in this model. Hypothesis 2 was supported for mothers.

**Fathers.** Child behavior problems was added to the model group mean centered at level 1. Socioeconomic status was added grand mean centered as a control variable

predicting the intercept and linear slope. The random component of child behavior problems was fixed since there was no significant variability in its slope ($\chi^2$ = 122.82, *df* = 106, *p* = .13). The results of the model for hypothesis 2a are presented in Table 18. Socioeconomic status was a significant predictor of the intercept but not linear slope, with higher socioeconomic status predicting lower levels of parenting stress at age 3. Level of child behavior problems was a statistically significant time-varying predictor, with increases in child behavior problems over time predicting increases in parenting stress. Unlike mothers, fathers' linear age term remained significant in this model. Hypothesis was supported for fathers.

**Hypothesis 2b.**

*Higher levels of child behavior problems are expected to predict higher levels of parenting stress among both mothers and fathers.*

**Mothers.** Average child behavior problems across time points was added to the model at level 2 grand mean centered to predict the intercept and the linear age slope. The results of the model for hypothesis 2b are presented in Table 19. Average level of child behavior problems across time point was a significant predictor of the intercept but not the linear slope. Higher overall levels of behavior problems were associated with higher levels of parenting stress at age 3. The significance of negative life events as a time varying covariate dropped to trend level in this model. Socioeconomic status was no longer a significant predictor of the intercept in this model. Hypothesis 2b was supported for mothers. An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Socioeconomic status and average

level of child behavior problems were not significant predictors of the quadratic age slope ($p > .05$). Child behavior problems remained a statistically significant predictor of the intercept.

**Fathers.** Average child behavior problems across time points was added to the model at level 2 grand mean centered to predict the intercept and the linear age slope. The results of the model for hypothesis 2b are presented in Table 19. Average level of child behavior problems across time point was a significant predictor of the intercept and the linear slope. Higher overall levels of behavior problems were associated with higher levels of parenting stress at age 3 and greater linear increases in stress over time. Negative life events dropped from trend level significant to non-significant in this model. Socioeconomic status was no longer a significant predictor of the intercept in this model. Hypothesis 2b was supported for fathers. An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Socioeconomic status and average level of child behavior problems were not significant predictors of the quadratic age slope ($p > .10$). Child behavior problems remained a significant predictor of the intercept but became a non-significant predictor of the linear slope.

**Hypothesis 2c.**

*Lower levels of child adaptive behavior are expected to predict higher levels of parenting stress among both mothers and fathers.*

**Mothers.** Average child adaptive behavior across time points was added to the model at level 2 grand mean centered to predict the intercept and the linear age slope.

The results of the model for hypothesis 2c are presented in Table 20. Average level of child adaptive behavior across time points was a trend level predictor of the intercept, with higher levels of adaptive behavior associated with higher levels of parenting stress. Hypothesis 2c was not supported for mothers. An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Socioeconomic status, average level of child behavior problems, and average level of child adaptive behavior were not significant predictors of the quadratic age slope ($p >$ .05).

**Fathers.** Average child adaptive behavior across time points was added to the model at level 2 grand mean centered to predict the intercept and the linear age slope. The results of the model for hypothesis 2c are presented in Table 20. Average level of child adaptive behavior across time points was a trend level predictor of the intercept, with higher levels of adaptive behavior associated with higher levels of parenting stress. Hypothesis 2c was not supported for fathers. An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Socioeconomic status, average level of child behavior problems, and average level of child adaptive behavior were not significant predictors of the quadratic age slope ($p >$ .10).

**Hypothesis 3a.**

*Lower helpfulness of social support is expected to predict higher levels of parenting stress for both mothers and fathers.*

**Mothers.** Average social support across ages 3, 5, and 10 was added to the model

at level 2 grand mean centered to predict the intercept and the linear age slope. The results for hypothesis 3a are presented in Table 21. The perceived helpfulness of social support was a statistically significant predictor of the intercept but not the slope. Higher levels of social support predicted lower parenting stress at age 3. Hypothesis 3a was supported for mothers. An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Socioeconomic status, average level of child behavior problems, average level of child adaptive behavior, and average social support across ages 3, 5, and 10 were not significant predictors of the quadratic age slope ($p > .10$).

**Fathers.** Social support was added to the model at level 2 grand mean centered to predict the intercept and the linear age slope. The results for hypothesis 3a are presented in Table 21. The perceived helpfulness of social support was a statistically significant predictor of the intercept only, with higher levels of social support predicting lower parenting stress at age 3. Hypothesis 3a was supported for fathers. An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Socioeconomic status, average level of child behavior problems, average level of child adaptive behavior, and average social support across ages 3, 5, and 10 were not significant predictors of the quadratic age slope ($p > .05$).

**Hypothesis 3b.**

*Lower quality family climate is expected to predict higher levels of parenting stress for both mothers and fathers.*

**Mothers.** Social support was removed from the model and family climate was

added to the model at level 2 grand mean centered to predict the intercept and the linear age slope. The results for hypothesis 3b are presented in Table 22. Family climate was a statistically significant predictor of the intercept and linear slope. More positive perceptions of the family climate predicted lower parenting stress at age 3. Increases in family climate within individuals were associated with increases in parenting stress. Hypothesis 3a was partially supported for mothers, since lower family climate predicted higher levels of parenting stress at age 3. Contrary to expectations, however, increases in family climate were associated with increases in parenting stress. An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Socioeconomic status, average level of child behavior problems, average level of child adaptive behavior, and family climate were not significant predictors of the quadratic age slope ($p > .05$).

**Fathers.** Social support was removed from the model and family climate was added to the model at level 2 grand mean centered to predict the intercept and the linear age slope. The results for hypothesis 3b are presented in Table 22. Family climate was a statistically significant predictor of the intercept only, with more positive perceptions of the family climate associated with lower parenting stress at age 3. Hypothesis 3a was supported for fathers. An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Socioeconomic status, average level of child behavior problems, average level of child adaptive behavior, and family climate were not significant predictors of the quadratic age slope ($p > .10$).

**Hypothesis 3c.**

*Higher use of Distancing/avoidance and Denial as coping strategies but lower use of Confrontive/seeking social support and Problem focused coping as coping strategies is expected to predict higher levels of parenting stress for both mothers and fathers.*

**Mothers.** Family climate was removed from the model and Distancing/avoidance, Confrontive/seeking social support, Problem focused coping, and Denial were added to the model at level 2 grand mean centered to predict the intercept and the linear age slope. The results for hypothesis 3c are presented in Table 23. Distancing/avoidance was a statistically significant predictor of the intercept and a trend level predictor of the linear age slope. Greater use of distancing and avoidance as a coping strategy predicted higher parenting stress at age 3 and lower linear increases in parenting stress at trend level. Problem focused coping and Denial were statistically significant predictors of the intercept, with greater use of problem focused coping and lower use of Denial predicting lower parenting stress at age 3. Confrontive/seeking social support was not a predictor of the intercept or the slope. Hypothesis 3c was partially supported, since the roles of Distancing/avoidance, Denial, and Problem focused coping were consistent with the hypothesis but Confrontive/seeking social support was unrelated to parenting stress.

An additional model was conducted with a parallel set of predictors for the intercept, linear age slope, and quadratic age slope. Only Distancing/avoidance was a significant predictor of the quadratic age slope. Greater use of distancing and avoidance as a coping strategy predicted less negative acceleration in parenting stress. In other words, parents with high use of this strategy did not decrease in stress during their child's

adolescence as much as parents with low use of this strategy. Given this finding, Distancing/avoidance will be included as a predictor of the quadratic age slope in the combined model.

**Fathers.** Family climate was removed from the model and Distancing/avoidance, Confrontive/seeking social support, Problem focused coping, and Denial were added to the model at level 2 grand mean centered to predict the intercept and the linear age slope. The results for hypothesis 3c are presented in Table 23. Distancing/avoidance was a statistically significant predictor and Problem focused coping was a trend level predictor of the intercept only. Greater use of distancing and avoidance as a coping strategy predicted higher parenting stress at age 3. Greater use of Problem focused coping was associated with lower parenting stress at age 3 at trend level. Confrontive/seeking social support and Denial were not predictors of the intercept or the slope. Hypothesis 3c was partially supported, since the role of Distancing/avoidance was consistent with the hypothesis but the remaining coping strategies were not significantly related to parenting stress. Socioeconomic status, average level of child behavior problems, average level of child adaptive behavior, and the coping strategies were not significant predictors of the quadratic age slope ($p > .05$).

**Hypothesis 4a.**

*Social support will moderate the relationship between child behavior problems and parenting stress, such that higher social support will buffer the negative impact of child behavior problems on parenting stress.*

**Mothers.** Building off the model for hypothesis 3a, social support was added

grand mean centered as a predictor of the slope of child behavior problems. Predictors of the linear age slope were dropped to simplify the model. The results for hypothesis 4a are presented in Table 24. Hypothesis 4a was not supported for mothers, since social support was not a significant predictor of the slope of child behavior problems. Building off the model for hypothesis 3a, an additional model was conducted with average social support across ages 3, 5, and 10 and the interaction between average social support and average child behavior problems across time points added grand mean centered as predictors of the intercept and the linear age slope. As seen in Table 25, the interaction term was a significant predictor of the intercept ($p$ = .01), but not the linear age slope ($p$ = .69). For every one unit increase in social support, the impact of child behavior problems on parenting stress was reduced by 0.02 points. This alternative model supports hypothesis 4a since social support moderated the relationship between child behavior problems and parenting stress.

**Fathers.** Building off the model for hypothesis 3a, social support was added grand mean centered as a predictor of the slope of child behavior problems. Predictors of the linear age slope were dropped to simplify the model. The results for hypothesis 4a are presented in Table 24. Hypothesis 4a was not supported for fathers, since social support was not a significant predictor of the slope of child behavior problems. Again building off the model for hypothesis 3a, an additional model was conducted with average social support across ages 3, 5, and 10 and the interaction between average social support and average child behavior problems across time points added grand mean centered as predictors of the intercept and the linear age slope. As seen in Table 25, the interaction

term was a not a significant predictor of the intercept ($p$ = .27), but was a trend level predictor of the linear age slope ($p$ = .07). For every one unit increase in social support, the impact of child behavior problems on parenting stress was reduced by less than 0.001 points. This alternative model lends support to hypothesis 4a, but social support does not moderate the relationship between child behavior problems and parenting stress at the traditional level of significance.

**Hypothesis 4b.**

*Family climate will moderate the relationship between child behavior problems and parenting stress, such that higher family climate will buffer the negative impact of child behavior problems on parenting stress.*

**Mothers.** Building off the model for hypothesis 3b, family climate was added grand mean centered as a predictor of the slope of child behavior problems. Predictors of the linear age slope were dropped to simplify the model. The results for hypothesis 4b are presented in Table 26. Hypothesis 4b was not supported for mothers, since family climate was not a significant predictor of the slope of child behavior problems. Again building off the model for hypothesis 3b, an additional model was conducted with family climate and the interaction between family climate and average child behavior problems across time points added grand mean centered as predictors of the intercept and the linear age slope. As seen in Table 27, the interaction term was not a significant predictor of the intercept ($p$ = .16) or the linear age slope ($p$ = .52).

**Fathers.** Building off the model for hypothesis 3b, family climate was added grand mean centered as a predictor of the slope of child behavior problems. Predictors of

the linear age slope were dropped to simplify the model. The results for hypothesis 4b are presented in Table 26. Hypothesis 4b was not supported for fathers, since family climate was not a significant predictor of the slope of child behavior problems. Again building off the model for hypothesis 3b, an additional model was conducted with family climate and the interaction between family climate and average child behavior problems across time points added grand mean centered as predictors of the intercept and the linear age slope. As seen in Table 27, the interaction term was not a significant predictor of the intercept ($p$ = .13) or the linear age slope ($p$ = .65).

**Hypothesis 4c.**

*Parents' use of coping strategies will moderate the relationship between child behavior problems and parenting stress, such that greater use of Confrontive/seeking social support and Problem focused coping but lower use of Distancing/avoidance and Denial as coping strategies is expected to buffer the negative impact of child behavior problems on parenting stress.*

**Mothers.** Building off the model for hypothesis 3c, Distancing/avoidance, Confrontive/seeking social support, Problem focused coping, and Denial were added grand mean centered as predictors of the slope of child behavior problems. Predictors of the linear age slope were dropped to simplify the model. The results for hypothesis 4c are presented in Table 28. Hypothesis 4c was not supported for mothers, since none of the four coping strategies predicted the slope of child behavior problems. Again building off the model for hypothesis 3c, an additional model was conducted with the coping strategies and the interaction between each of the coping strategies and average child

behavior problems across time points added grand mean centered as predictors of the intercept and the linear age slope. As seen in Table 29, none of the interaction terms were significant predictors of the intercept ($p > .10$) or the linear age slope ($p > .10$).

**Fathers.** Building off the model for hypothesis 3c, Distancing/avoidance, Confrontive/seeking social support, Problem focused coping, and Denial were added grand mean centered as predictors of the slope of child behavior problems. Predictors of the linear age slope were dropped to simplify the model. The results for hypothesis 4c are presented in Table 28. Hypothesis 4c was not supported for fathers, since none of the four coping strategies predicted the slope of child behavior problems. Again building off the model for hypothesis 3c, an additional model was conducted with the coping strategies and the interaction between each of the coping strategies and average child behavior problems across time points added grand mean centered as predictors of the intercept and the linear age slope. As seen in Table 29, only the interaction between Confrontive/seeking social support and child behavior problems was a significant predictor of the intercept ($p = .01$). For every one unit increase in use of Confrontive/seeking social support, the impact of child behavior problems on parenting stress was reduced by 0.10 points. This interaction term was not a significant predictor of the linear age slope ($p = .40$). This alternative model partially supports hypothesis 4a since use of Confrontive/seeking social support moderated the relationship between child behavior problems and parenting stress. This alternative moderation analysis will be incorporated into the combined model.

**Combined model.**

**Mothers.** A combined model was conducted to evaluate the contribution of social support, family climate, and coping strategies to mothers' stress above and beyond family and child characteristics. Negative life events was not entered at level 1 since it was not a statistically significant covariate in the model for hypothesis 2c. Child behavior problems was entered group mean centered at level 1 to capture the impact of changes in problematic behavior on parenting stress within individuals. Socioeconomic status, child behavior problems, child adaptive behavior, social support, family climate, and the four coping strategies were entered grand mean centered at level 2 as predictors of the intercept, the linear age slope, and the quadratic age slope. In addition, the interactions of social support, family climate, and the four coping strategies with overall child behavior problems were entered grand mean centered at level 2 as predictors of the intercept, the linear age slope, and the quadratic age slope. For parsimony, the non-significant predictors were removed from the model. Confrontive/seeking social support, Denial, and the interaction terms were removed since they were not statistically significant predictors of the intercept, linear age slope, or quadratic age slope. Socioeconomic status and child adaptive behavior, although non-significant predictors, were kept in the model as control variables.

The final combined model is presented in Table 30. The intercept and quadratic age term were statistically significant. The average parenting stress score for mothers was 122.86 at age 3. The average acceleration of growth rate (quadratic age term) was less than -0.001 per month. There was significant variability in the intercept and the linear age

term. Increases in child behavior problems over time were associated with increases in parenting stress within mothers. The size of this effect according to Cohen's D statistic was 0.04. Greater overall problematic behavior was associated with greater parenting stress at age 3 between mothers, but was unrelated to linear or quadratic changes in parenting stress. The size of the effect of overall child behavior problems on the intercept according to Cohen's D statistic was 0.14. Child behavior problems therefore exerted a greater impact between persons than within persons. Perceptions of greater helpfulness of social support and more positive perceptions of the family climate were associated with lower parenting stress at age 3. Greater use of Problem focused coping and lower use of Distancing/avoidance as coping strategies were associated with lower parenting stress at age 3. In addition, greater use of Problem focused coping was associated with greater linear increases at trend level and more negative acceleration in parenting stress. Greater use of Distancing/avoidance was associated with lower linear increases and less negative acceleration in parenting stress.

**Fathers.** A combined model was conducted to evaluate the contribution of social support, family climate, and coping strategies to fathers' stress above and beyond family and child characteristics. Negative life events was not entered at level 1 since it was not a statistically significant covariate in the model for hypothesis 2c. Child behavior problems was entered group mean centered at level 1 to capture the impact of changes in problematic behavior on parenting stress within individuals. Socioeconomic status, child behavior problems, child adaptive behavior, social support, family climate, and the four coping strategies were entered grand mean centered at level 2 as predictors of the

intercept, the linear age slope, and the quadratic age slope. In addition, the interactions of social support, family climate, and the four coping strategies with overall child behavior problems were entered grand mean centered at level 2 as predictors of the intercept, the linear age slope, and the quadratic age slope. There were no statistically significant predictors of the quadratic age slope, therefore predictors of the quadratic age slope were dropped. For parsimony, the non-significant predictors of the intercept and the linear age slope were removed from the model. In line with the combined model for mothers, Confrontive/seeking social support, Denial, and the interaction terms were removed since they were not statistically significant predictors of the intercept or linear age slope. Socioeconomic status, although a non-significant predictor, was kept in the model as a control variable.

The final combined model is presented in Table 30. The intercept and quadratic age term were statistically significant with the linear age term significant at the trend level. The average parenting stress score for fathers was 120.43 at age 3. The average linear growth rate in parenting stress was 0.05 per month at trend level. The average acceleration of growth rate (quadratic age term) was less than -0.001 per month. There was significant variability in the intercept and the linear age term. Increases in child behavior problems over time were associated with increases in parenting stress within fathers. The size of this effect according to Cohen's D statistic was 0.03. Greater overall problematic behavior was associated with greater parenting stress at age 3 between fathers and lower linear increases at trend level, but was unrelated to quadratic changes in parenting stress. The size of the effect of overall child behavior problems on the intercept

according to Cohen's D statistic was 0.11. Child behavior problems therefore exerted a greater impact between persons than within persons. Higher child adaptive behavior was associated with lower parenting stress at age 3. Perceptions of greater helpfulness of social support and more positive perceptions of the family climate were associated with lower parenting stress at age 3. Greater use of Problem focused coping and lower use of Distancing/avoidance as coping strategies were associated with lower parenting stress at age 3.

**Prototypical trajectories.** To facilitate interpretation of the results of the combined models, trajectories were graphed for prototypical individuals with values one standard deviation above and one standard deviation below the mean on key level 2 predictor variables. Since mothers and fathers were analyzed in separate models, the means and standard deviations used to create the prototypical cases were based on the descriptive statistics for their respective gender. Figure 6 displays the parenting stress trajectories for parents of children with low (one standard deviation below the mean) vs. high (one standard deviation above the mean) levels of child behavior problems. Both mothers and fathers of children with fewer behavior problems have lower parenting stress over time than mothers and fathers of children with greater behavior problems. Figure 7 displays the parenting stress trajectories for parents of children with low vs. high levels of child adaptive behavior. Fathers of children with low levels of adaptive behavior have higher overall parenting stress over time than fathers of children with high levels of adaptive behavior and mothers. Mothers' stress trajectories were unaffected by their child's level of adaptive behavior.

To illustrate the impact of social support on parenting stress, Figure 8 displays the parenting stress trajectories for parents with low vs. high levels of social support. Both mothers and fathers with low levels of social support in early childhood have greater parenting stress over time than mothers and fathers of children with high levels of social support. A similar pattern was found for family climate. Figure 9 displays the parenting stress trajectories for parents with low vs. high ratings of the family emotional climate. Parents with perceptions of lower quality family climate in early childhood have higher stress over time than parents of children with perceptions of higher quality family climate.

Figure 10 displays the parenting stress trajectories for parents with low vs. high use of Distancing/avoidance as a coping strategy. Parents with high use of this strategy had greater levels of parenting stress over time. By adolescence, however, mothers who used high levels of Distancing/avoidance had stress levels similar to parents who used low levels of Distancing/avoidance, whereas fathers who used high levels of this strategy continued to have higher stress. Figure 11 displays the parenting stress trajectories for parents with low vs. high use of Problem focused coping. An inverse pattern to Distancing/avoidance is observed, with parents with high use of Problem focused coping having lower overall levels of parenting stress over time.

**Dyadic model.**

To directly compare trajectories of parenting stress among mothers and fathers, a combined dyad model was conducted using a modified hierarchical linear modeling approach developed by Raudenbush, Brennen, and Barnett (1995). This approach takes

into account the dependency that arises because of the nesting of individuals within parenting dyads. This set of analyses will focus on a subset of 108 dyads jointly raising their child with a disability. Ninety-two percent of these dyads were married at the first time point in this dissertation. At age 3, 95% of children were living with both parents. In this section, the dyad sample will first be compared to the full sample of 147 mothers and 110 fathers. Next, means on predictor and outcome variables will be compared for mothers and fathers within the 108 dyads using a series of paired-samples t-tests. Lastly, the unconditional growth model and explanatory model for parent dyads will be presented using the modified hierarchical linear modeling approach.

**Comparison of full and dyad samples.** Compared to mothers with a father reporter (N=108), mothers with no father reporter (N=39) had higher parenting stress at age 3, $t(145) = 2.06$, $p = .04$, fewer years of education, $t(145) = -2.4$, $p = .02$, lower family income, $t(145) = -4.7$, $p < .001$, higher negative life events at age 3, $t(145) = 3.8$, $p < .001$, and children with higher adaptive behavior, $t(145) = 2.8$, $p < .01$. In comparison to the full sample of mothers (N=147), mothers in the dyad sample (N=108) had higher family income, $t(107) = 3.03$, $p < .01$ and fewer negative life events at age 3, $t(107) = -2.25$, $p = .03$. It was not possible to compare fathers with a mother reporter (N=108) to fathers with no mother reporter (N=2) due to unequal sample sizes. Means for the predictor and outcome variables did not significantly differ between fathers in the full sample (N=110) and fathers in the dyad sample (N=108).

**Comparison of mothers and fathers.** Table 31 presents the results of a paired samples t-test comparing mothers and fathers on predictor and outcome variables. Mother

and father scores were strongly correlated on all outcome variables and most predictors, lending further support to the use of a modified dyadic approach. Use of Confrontive/seeking social support, Problem-focused coping, and Denial were not correlated for mothers and fathers. Fathers reported significantly higher parenting stress when their adolescents were age 15. With respect to use of coping strategies, mothers report using Confrontive/seeking social support more than fathers but Denial less than fathers. Mothers reported higher perceived helpfulness of social support and more positive perceptions of the family climate.

**Unconditional growth model.** Using the modified hierarchical linear modeling approach developed by Raudenbush et al. (1995), change within dyads is modeled at level 1. At level 2, the parameters of the within-dyad model are viewed as varying randomly across a population of dyads. An unconditional growth model was first examined to determine the shape of the trajectories for the subsample of 108 dyads. The unconditional growth model combines the longitudinal model for individuals with the cross-sectional model for matched pairs, yielding separate parameters for mothers and fathers within dyads. *Mother* is an indicator variable taking on the value of 1 for mothers and 0 were fathers and *father* is an indicator variable taking the value of 1 for fathers and 0 for mothers. The brackets indicate that the coefficients are multiplied by the respective indicator variable. Therefore, the first set of brackets contains the parameters characterizing the trajectory for mothers and the second set of brackets contains the parameters characterizing the trajectory for fathers. Similar to the separate mother and father models, trajectories followed a curvilinear pattern for parents within the dyad

sample:

$$Y_{ti} = (mother)_{ti}[\beta_{1i} + \beta_{2i}(AGE_{ti}) + \beta_{3i}(AGESQ_{ti})] + (father)[\beta_{4i} + \beta_{5i}(AGE_{ti}) + \beta_{6i}(AGESQ_{ti})] + r_{0i} + r_{2i}(AGE_{ti}) + r_{5i}(AGE_{ti}) + e_{ti}$$

where Y is the outcome (parenting stress), $\beta_{1i}$ is the intercept (initial status at age 3) for mothers, $\beta_{4i}$ is the intercept (initial status at age 3) for fathers, $\beta_{2i}$ is the rate of change in the linear age term for mothers, $\beta_{5i}$ is the rate of change in the linear age term for fathers, $\beta_{3i}$ is the rate of change in the quadratic age term for mothers, and $\beta_{6i}$ is the rate of change in the quadratic age term for fathers. The linear age terms were permitted to vary randomly for mothers and fathers. The random components of the intercepts and quadratic age terms were fixed since the model would not converge if they were permitted to vary.

The results of the unconditional growth model for dyads are presented in Table 32. The average level of parenting stress at age 3 was 119.08 for mothers and 119.39 for fathers. On average, parenting stress increased 0.12 points per month for mothers and 0.13 points per month for fathers (linear age term). The average acceleration of growth rate (quadratic age term) was -0.001 per month. The intercepts, linear age terms and quadratic age terms for mothers and fathers were statistically significant. There was significant variability in the linear age terms for mothers and fathers. To directly compare parents' trajectories, the hypothesis testing procedure in the HLM program was used to test whether the intercepts, linear age slopes, or quadratic age slopes significantly differed for mothers and fathers. There were no significant differences in the intercepts ($\chi^2 = 0.03$, $df = 1$, $p > .50$), linear age slopes ($\chi^2 = 0.03$, $df = 1$, $p > .50$), or quadratic age slopes ($\chi^2 =$

0.15, $df = 1$, $p > .50$). The variances around the linear age slope were similar for mothers and familiar (0.01). The correlation between rates of linear change for dyads was $r = 0.08$. Figure 12 displays the average trajectories for mothers and fathers within dyads.

The dyad unconditional growth model also allows us to calculate the unconditional interclass correlation coefficient (ICC) for dyads. This ICC indicates the proportion of variability in the outcome variable between dyads. The proportion of variance at the dyad level is 0.57. Approximately 57% of the variability in parenting stress lies between dyads. This nesting is statistically significant since $\tau_{00}$ is statistically significantly different from zero ($\chi^2 = 597.64$, $df = 109$, $p < .001$). There is more variability between dyads than within dyads.

**Final model.** A final model was conducted with the dyad sample to mirror the combined mother and father models described in the previous section. The dyad model includes variables with common values for both members of the dyad (e.g., child behavior problems, child adaptive behavior) and variables with values unique to each parent (e.g., social support, family climate). Child behavior problems were entered group mean centered at level 1 to capture the impact of changes in problematic behavior on parenting stress within dyads. Average child behavior problems and average child adaptive behavior were entered grand mean centered as predictors of mothers' and fathers' intercepts and linear age slopes. Mothers' social support, family climate, Distancing/avoidance, and Problem focused coping were entered grand mean centered to predict mothers' intercept and linear age slope. Similarly, fathers' values on these variables were entered grand mean centered to predict fathers' intercept and linear age

slope. Predictors of the quadratic age slope were not included in the final model to conserve power. The model with predictors of the quadratic age slope was not a significant improvement over the model without predictors of the quadratic age slope ($\chi^2$ = 226.98, $p > .50$).

The final dyad model is presented in Table 33. The average parenting stress score at age 3 was 120.74 for mothers and 121.10 for fathers. The average acceleration of growth rate (quadratic age term) was less than -0.001 per month for both parents. The intercepts and quadratic age terms, but not the linear age terms, were statistically significant for mothers and fathers. There was significant variability in the linear age terms of both parents. Increases in child behavior problems over time were associated with increases in parenting stress within dyads. The size of this effect according to Cohen's D statistic was 0.03.

Socioeconomic status was unrelated to the intercept or linear slope for both parents. Greater overall problematic behavior was associated with greater parenting stress at age 3 for mothers and fathers and with lower linear increases at trend level for fathers. The effect size of overall problematic behavior on mothers' intercept was 0.05 and fathers' intercept was 0.04. Multivariate hypothesis testing revealed significant differences in the overall impact of child behavior problems on mothers' and fathers' stress trajectories ($\chi^2 = 4.59$, $df = 2$, $p = .02$), but not in its impact on the intercepts ($\chi^2$ = .61, $df = 1$, $p > .50$) or slopes ($\chi^2 = 1.99$, $df = 1$, $p = .15$) individually. In other words, the omnibus test for the impact of child behavior problems was significant, but the individual comparisons of mother-father intercepts and mother-father slopes did not reach statistical

significance. Higher levels of overall child adaptive behavior related to higher levels of stress for fathers but not mothers at age 3. Univariate hypothesis testing indicated significant differences in the impact of child adaptive behavior on mothers' and fathers' stress at age 3 ($\chi^2 = 13.45$, $df = 1$, $p < .001$), with the impact being stronger for fathers than mothers.

With respect to parent resources and supports, perceptions of greater helpfulness of social support predicted lower stress for both parents at age 3. The effect of social support did not differ by parent gender ($\chi^2 = 0.06$, $df = 2$, $p > .50$). For mothers, more positive perceptions of the family climate were associated with lower parenting stress at age 3 but greater linear increases in stress. The overall impact of family climate on stress was significantly different for mothers and fathers ($\chi^2 = 7.48$, $df = 2$, $p = .02$). Follow up univariate hypothesis testing revealed significant differences in the impact of family climate on the intercepts ($\chi^2 = 7.17$, $df = 1$, $p < .01$) but not slopes ($\chi^2 = 1.60$, $df = 1$, $p = .20$). Greater use of Distancing/avoidance as a coping strategy predicted greater initial stress for fathers. Greater use of Problem focused coping predictor lower initial stress for both parents. Multivariate hypothesis testing revealed no significant parent differences in the impact of Distancing/avoidance ($\chi^2 = 1.37$, $df = 2$, $p > .50$) or Problem focused coping ($\chi^2 = 0.19$, $df = 2$, $p > .50$) on parenting stress.

**Prototypical trajectories.** To facilitate interpretation of the results of the final dyad model, trajectories were graphed for prototypical individuals with values one standard deviation above and one standard deviation below the mean on key level 2 predictor variables. The means and standard deviations used to create the prototypical

cases were based on the descriptive statistics for their respective gender within dyads. Figure 13 displays the parenting stress trajectories for parents of children with low vs. high levels of child behavior problems. Both mothers and fathers of children with fewer behavior problems have lower parenting stress over time than mothers and fathers of children with greater behavior problems. Figure 14 displays the parenting stress trajectories for parents of children with low vs. high levels of child adaptive behavior. Fathers of children with low levels of adaptive behavior have higher overall parenting stress over time than fathers of children with high levels of adaptive behavior. Mothers' stress trajectories were unaffected by their child's level of adaptive behavior.

To illustrate the impact of social support on parenting stress, Figure 15 displays the parenting stress trajectories for parents with low vs. high levels of social support. Both mothers and fathers with low levels of social support in early childhood have greater parenting stress over time than mothers and fathers of children with high levels of social support. Figure 9 displays the parenting stress trajectories for parents with low vs. high ratings of the family emotional climate. Mothers with perceptions of lower quality family climate in early childhood have higher stress over time than mothers of children with perceptions of higher quality family climate. Fathers' stress trajectories were unaffected by their perception of the quality of the family climate.

Figure 17 displays the parenting stress trajectories for parents with low vs. high use of Distancing/avoidance as a coping strategy. Fathers with high use of this strategy had greater levels of parenting stress over time than fathers with low use of this strategy. Mothers' stress trajectories were unaffected by their use of Distancing/avoidance. Figure

18 displays the parenting stress trajectories for parents with low vs. high use of Problem focused coping. An inverse pattern to Distancing/avoidance is observed, with both mothers' and fathers' use of Problem focused coping predicting lower overall levels of parenting stress over time.

## Chapter 5: Discussion

The goal of this dissertation was to describe and predict trajectories of parenting stress among mothers and fathers of children with disabilities, from their child's early years (age 3) through adolescence (age 15). In this section, I will first review the theoretical orientation and specific aims of this dissertation. Next, I will summarize the findings and discuss their relation to previous literature. I will conclude with a discussion of the study's limitations and the implications of the findings for research and practice involving families of children with developmental disabilities.

This dissertation was guided by several theoretical perspectives. Family systems theory, which emphasizes the centrality of the family unit as a critical context of development, serves as the overarching theoretical orientation for this dissertation. Family systems theory highlights the ability of the family system to maintain equilibrium in the face of everyday challenges as well as adapt to heightened demands and developmental transitions encountered across the family life cycle (Minuchin, 1985). These concepts are echoed in McCubbin and Patterson's (1983) Double ABCX Model of Adjustment and Adaptation, which identifies key resources and cognitions that serve as both protective and resiliency factors within families. Perry (2004) expands upon McCubbin and Patterson's notion of family resources and delineates specific aspects of individual and family level resources and supports that explain the relationship between stressors and outcomes within families of children with DD. The conceptual model for this dissertation incorporated elements of each of these theories to understand the relationship between changes in parenting stress and child characteristics and family

resources and supports (Figure 1).

Stress is an inherent part of the parenting experience. Some level of parenting stress and daily hassles is considered normal (Deater-Deckard & Scarr, 1996), but parents of children with disabilities tend to report greater than average levels of stress (Baker et al., 2003; Emerson, 2003). High levels of stress have been found to remain stable (Baker et al., 2003) or to increase over time (Hauser-Cram et al., 2001) within this population. Most studies of stress among parents of children with DD have relied on cross-sectional designs; however longitudinal designs permit exploration of differences between individuals as well as changes within individuals over time. The few existing longitudinal studies on stress among parents of children with DD have focused on the early childhood period of development (e.g., Baker et al., 2003; Hanson & Hanline, 1990), with Hauser-Cram et al. (2001) as an exception. The first aim of this dissertation was to address this gap in the literature by examining changes in stress among parents of children with DD, from their child's early years (age 3) through adolescence (age 15). Trajectories of stress were examined for both mothers and fathers. There is growing evidence that fathers of children with DD experience levels of parenting stress similar to mothers (Dyson, 1997; Roach, Orsmond, & Barratt, 1999), although their stress may relate to different child and family factors (Krauss, 1993). Fathers have historically been neglected in research on the adjustment of parents to raising a child with a disability; this dissertation aimed to address this omission.

The second aim of this dissertation was to examine the contribution of the characteristics of the child with a disability to parents' experience of stress. Children with

disabilities tend to display heightened levels of problematic behavior (Fombonne et al., 2001; Totsika et al., 2011) that persist over time (Baker et al., 2003). Given the prevalence and stability of behavior problems, it is not surprising that problem behavior is often cited as the most salient child characteristic to parents of children with DD (e.g., Beck et al., 2004). Internalizing behaviors, such as anxiety or social withdrawal, and externalizing problems, such as hyperactivity and aggression, have been consistently associated with parental stress among families of children with varying disability diagnoses (Fidler et al., 2000; Spratt et al., 2007). Few studies have examined the impact of changes in problematic behavior, however. This dissertation evaluated the contribution of overall level and changes in child behavior problems to changes in parenting stress over time.

An additional child characteristic of relevance to parent well-being is the child's level of adaptive behavior. Unlike intelligence scores, measures of adaptive behavior capture the child's skills in communication, socialization and daily living in everyday activities. The contribution of adaptive behavior to parenting stress over time is unclear; while several studies find lower adaptive behavior to predict higher parenting stress (e.g., Hanson & Hanline, Smith et al., 1999), others find no effect once behavior problems are accounted for (e.g., Baker et al., 2002; Sloper et al., 1991). This dissertation aimed to clarify the relationship between child adaptive behavior and stress and to expand the existing literature by examining this construct within a longitudinal framework.

Although problematic behavior and limitations in adaptive skills can pose a variety of challenges to family functioning, many families successfully adapt to

caregiving demands. A goal of recent research has been to explain the variability in parents' adjustment to raising a child with a disability (Neece & Baker, 2008). The third aim of this dissertation focuses on the role of social support, coping strategies, and the family emotional climate as potential strengths. Social support is a resource that has received considerable attention in research on families of children with DD (Hauser-Cram et al., in press). Research within this population has generally supported the importance of parents' satisfaction with the helpfulness of their social support networks in predicting well-being (Crnic & Stormshak, 1997). Coping skills represent another set of resources that individuals bring the parenting experience. Parents' cognitive and behavioral efforts to manage demands have been found to relate to their well-being (Smith et al., 2008). In line with recent recommendations to explore coping as a multidimensional construct (Skinner et al., 2003), this dissertation examined the role of four distinct coping strategies. The family emotional climate is a family level resource that may protect parents of children with DD from experiencing heightened levels of stress. The relational aspects of the family environment, including the connectedness, expressiveness, and degree of conflict among family members, have been found to impact various aspects of well-being among parents of children with DD (e.g., Cassidy et al., 1992; Hauser-Cram et al., 2001). This dissertation aimed to extend current understanding of the impact of social support, coping strategies, and family climate on parenting stress by examining these constructs within a longitudinal framework. The final aim of this dissertation was to examine the role of family resources and supports as buffers of the impact of child behavior problems on parental stress. Research on the

moderating role of these resources and supports could point to a specific subgroup of parents in need of intervention.

In sum, the aim of this dissertation was to describe the shape of trajectories of parenting stress among mothers and fathers of children with DD and the role of child characteristics (behavior problems, adaptive behavior) and family resources and supports (social support, coping, family climate) as predictors of parenting stress over time. I will now summarize the findings for each research question.

**Parenting Stress.**

The first research question asked how parenting stress changes over time for mothers and fathers of children with developmental disabilities, from early childhood (age 3) through adolescence (age 15). Parenting stress represents one dimension of parent well-being of interest to the theoretical models guiding this dissertation, although these theories define parent and family well-being more broadly. Family systems theory views patterns of interaction within the family as a critical outcome variable (Minuchin, 1985). If families are unable to self-regulate and reorganize in the face of demands, then dysfunctional relationships may occur. Elements of this view are incorporated into Abidin's (1976) model of dysfunctional parenting, which served as the basis for the Parenting Stress Index (Abidin, 1983, 1990, 1995). The parent-related stress domain of the PSI captures the level of dysfunction in the parent-child system related to the parent's functioning in particular (Abidin, 1995).

McCubbin and Patterson (1983) extended Hill's (1949) definition of the outcome component of the ABCX model from family distress to family adaptation along a

continuum from maladaptation to bonadaptation. Similarly, the outcome component of Perry's (2004) model includes both positive and negative dimensions of parent well-being. A limitation of this dissertation is its exclusive focus on a negative outcome. As noted by McCubbin and Patterson (1983) and Perry (2004), it is possible for families to simultaneously experience positive and negative effects. Moreover, the absence of pathology is not necessarily indicative of positive adjustment. Nevertheless, parenting stress represents a critical dimension of well-being that is relevant other aspects of parent, child, and family well-being. The following section will describe the findings for the first research question regarding parenting stress, including comparisons of stress in the EICS sample to normative data, developmental changes, and differences by parent gender.

**Comparison to other parents.** Parents of children with developmental disabilities tend to report greater than average levels of stress (Baker et al., 2003; Emerson, 2003; Fidler et al., 2000; Orr et al., 1993). Group differences in stress have been found within samples of parents of children in their infancy (Scott, Atkinson, Minton, & Bowman, 1997), early childhood (e.g., Baker et al., 2002, 2003), middle childhood (Sanders & Morgan, 1997), and adolescence (Emerson, 2003). Findings differed depending on the measure of stress used, however. Among studies using the Parenting Stress Index, several found parents of children with disabilities to report significantly higher child-related or total stress (Britner et al., 2003; Cameron et al., 1991; Innocenti et al., 1993; Roach et al., 1999). The results are mixed for group differences in parent-related stress, however, with some studies reporting higher levels for parents of children with disabilities (Roach et al., 1991) and other studies reporting no group

differences (Cameron et al., 1991).

Mothers in the present sample reported levels of parenting stress similar to comparison mothers when their children were 3 and 5 years of age. This finding is consistent with Cameron et al. (1991), who found mothers of pre-school children with and without developmental delays to report similar levels of parent-related stress. Innocenti et al. (1993) also found parents of young children with diverse disabilities to report levels of parent-related stress similar to comparison parents. In that study, however, they found parents of 3-year-old children to report significantly higher parent-related and child-related stress than comparison parents, which counters the present finding for mothers in the EICS sample. Roach et al. (1999) also found higher levels of parent-related stress among parents of young children with Down syndrome than comparison parents, which is again inconsistent with the present findings for mothers' stress in early childhood. This contradiction may be due in part to the fact that mothers and fathers were combined in Innocenti et al.'s (1993) and Roach et al.'s (1991) studies. Fathers in the EICS sample reported significantly higher parenting stress than comparison fathers when their children were 3 and 5 years of age. This finding may explain in part why Innocenti et al. (1993) and Roach et al. (1991) found elevated stress for parents of toddlers with DD. It is possible that fathers of children with disabilities take on greater caregiving responsibilities in the household than other fathers. Alternatively, the parental identity may be more salient to these fathers. Simon (1992) found that, although fathers identified with the parental identity to a lesser extent than mothers, those that did identify strongly with the parental identity were more vulnerable to parental role strains.

When their children were 10 years of age, mothers in the EICS sample had significantly higher levels of parenting stress than comparison mothers. Few studies have compared stress among parents of school-aged children with and without disabilities. Sanders and Morgan (1997) found parents of school-aged children with Down syndrome to report higher levels of stress than parents of typically developing children, as measured by the Questionnaire on Resources and Stress. Specifically, parents of children with Down syndrome reported higher pessimism about their child's future and more negative child characteristics. In this sample, children's problematic behavior peaked at age 10, potentially contributing to mothers' elevated levels of stress. Comparison data on parenting stress were not available for fathers of school-aged children or parents of adolescents. Little is known about how the parenting experience differs for parents of children with and without disabilities during their child's adolescent period. Future research should address this gap in the literature.

Parents in this sample, particularly fathers, reported heightened levels of stress at some time points, highlighting the need for researchers and practitioners to address potentially high levels of stress among parents of children with disabilities. There is considerable variability in the extent of stress experienced by parents within this sample, however, and comparisons to parents of typically developing children fail to address critical within group differences. Similar to the findings of Innocenti et al. (1993), the majority of parents in this sample did not report clinically significant levels of stress. For mothers, the percentage of individuals above the clinical cutoff decreased over time, from 12% at age 3 to 3% at age 15. A similar pattern was found for fathers, with 9% reporting

scores above the clinical cutoff at age 3 to 5% at age 15. Taken together, these comparisons to normative data support the notion that parents of children with disabilities may experience greater stress than other parents, but only a minority experience clinically significant stress. Nevertheless, it is important to examine predictors of stress within this population to identify potential points of intervention for those with high levels of stress.

**Developmental changes.** Few studies have examined longitudinal changes in stress among parents of children with disabilities, with the majority of these studies focusing on the early childhood period. Findings regarding changes in parenting stress as children with DD develop are mixed. Stress has been found to remain stable (e.g., Baker et al., 2003; Hanson & Hanline, 1990) or to increase (e.g., Hauser-Cram et al., 2001) within longitudinal studies. Among cross-sectional studies, parent-related stress has been found to be similar across parents of children with DD of different ages (Innocenti et al., 1993) or to be highest among parents of school-aged children with DD (Orr et al., 1993).

In the present study, parenting stress was found to increase from early to middle childhood then subsequently decrease from middle childhood to adolescence for both mothers and fathers. This was found for mothers and fathers individually as well as within dyads. Mothers and fathers within dyads did not differ in their initial level of parenting stress in early childhood or in their rates of linear increase or acceleration. Few studies have examined changes in parenting stress beyond early childhood. As an exception, using the EICS sample Hauser-Cram et al. (2001) explored changes in parent-related and child-related stress among mothers and fathers of children with DD, from age 3 to age 10. They reported a linear increase in parent-related stress for both parents across

that time period. This dissertation replicates Hauser-Cram et al.'s (2001) study and extends the findings for the EICS sample through adolescence.

The curvilinear pattern found in this study is similar to the one reported in Orr et al. (1993). In their cross-sectional study, Orr and colleagues compared child-related, parent-related and total stress scores on the Parenting Stress Index among mothers of children with disabilities in their early childhood, middle childhood, or adolescence. Stress in each domain was found to be highest within the middle childhood group. The authors attributed the decrease in stress from middle childhood to adolescence to families' adjustment to the daily demands of caring for a child with a disability. Few predictors of the acceleration rate in stress were found in this dissertation. Future research is needed to clarify why parenting stress peaks in middle childhood and why it decreases from middle childhood through adolescence.

**Parent gender.** Research on parenting stress has focused almost exclusively on mothers, but there is growing evidence that mothers and fathers may differ in their parenting experience. Similar to the literature on parents of typically developing children, findings on differences in stress by parent gender are mixed within the literature on parents of children with DD. Some studies have reported higher stress for mothers (e.g., Beckman, 1991; Oelofson & Richardson, 2006) while others have reported higher stress for fathers (e.g., Krauss, 1993). Levels of parenting stress were compared for mothers and fathers within dyads in the present study. Mothers and fathers reported similar levels of stress when their child was aged 3, 5, and 10, but fathers reported significantly higher parenting stress than mothers when their child was 15 years old. As previously noted, the

shape of the stress trajectories did not significantly differ for mothers and fathers within dyads.

This finding highlights the similarities, rather than differences, in the parenting experience for mothers and fathers. These results counter the expectations of several theoretical perspectives on sex differences in parenting stress. The sex role hypothesis, for instance, would expect mothers to report greater stress since women are generally more likely to report depression and distress more generally than are men (Scott et al., 1997). The social role hypothesis would also expect higher stress for mothers due to differences in the social roles of men and women in the household. This hypothesis argues that women are more likely to be exposed to strain-inducing experiences because they spend more time in child care and household chores. An additional perspective regarding parental identity would also expect greater stress for mothers (Simon, 1992). Since women are more likely to identify with the parental role, they may be more vulnerable to parental role strain, following this view. Yet mothers and fathers in the EICS sample were found to report similar levels of stress during their child's early though middle childhood, which runs counter to these theoretical perspectives. Instead, the findings of this dissertation are consistent with the Gender Similarities Hypothesis (Hyde, 2005). This perspective holds that males and females are similar on most, but not all, psychological variables.

When their child was fifteen years old, fathers reported significantly higher stress than mothers in the EICS sample. Several studies have found fathers to report elevated stress related to their child's temperament (Goldberg et al., 1986; Krauss, 1993; Noh et

al., 1989), communication difficulties (Frey et al., 1989), and feelings of attachment to the child (Beckman, 1991; Keller & Honig, 2004; Krauss, 1993). Higher parent-related stress among fathers has not been reported in the literature. Future research is needed to explore factors that contribute to elevated stress among fathers during their child's adolescence. Overall, these gender comparisons support the notion that fathers of children with disabilities experience similar, if not higher, levels of parenting stress than mothers. These findings highlight the need to consider the parenting experience of both fathers and fathers of children with DD. Differences in predictors of parenting stress for mothers and fathers will be explored in later sections.

**Child Characteristics.**

The second research question asked how the characteristics of the child with a disability contribute to parenting stress over time for mothers and fathers, controlling for negative life events. Each of the theories guiding this dissertation incorporates stressors into their explanatory frameworks. According to family systems theory, internal or external demands prompt processes of self-regulation or reorganization within the family system (Minuchin, 1985). Since family members are viewed as concurrently and constantly interacting, the child's behavior plays a key role in determining parent well-being according to this view. McCubbin and Patterson (1983) more specifically define demands in their model of family stress as stressor events and associated hardships. In line with family systems theory, the birth of a child with a disability and the associated caregiving challenges prompt families to utilize existing resources and mobilize new resources to resist disruption and maintain stability in this view. Perry's (2004) model of

stress further delineates stressors as life stressors unrelated to the child with a disability (e.g., negative life events) and the characteristics of the child with a disability (e.g., cognitive level, gender). Findings related to the second research question regarding the role of child characteristics, including child behavior problems and child adaptive behavior, are discussed in the following section.

**Behavior problems.** Parenting stress has been found to relate to a number of child characteristics, but child behavior problems have been found to contribute to stress above and beyond type of disability, cognitive skills, and socioeconomic status (Quine & Pahl, 1991; Sloper et al., 1991). Of particular concern, children with disabilities tend to display high levels of behavior problems (Fombonne et al., 2001) that persist over time (Baker et al., 2003; Enfield et al., 2006; Totsika & Hastings, 2009). Compared to other children of the same age, the children in the EICS sample had significantly higher levels of problematic behavior at age 10 and 15. The percentage of children at risk for clinically significant behavior problems (t-score greater than 60) was also very high, with approximately 40% of the sample at risk in middle childhood and adolescence. This finding is consistent with existing literature on the prevalence and stability of behavior problems among children with DD (e.g., Totsika & Hastings, 2009).

Findings from the present study add to extant literature on the impact of problematic behavior on parenting stress. The level of the child's overall behavior problems was a strong predictor of parents' initial levels of stress when their child was three years old. Problematic behavior remained a significant predictor with the effects of child adaptive behavior, socioeconomic status, and parental social support, family

climate, and coping strategies were controlled. This finding is consistent with previous research that found child behavior problems to exert an impact on parenting stress above and beyond disability diagnosis, delay status, cognitive skills, and social skills (Baker et al., 2002, 2003; Neece & Baker, 2008).

This dissertation extends existing literature by examining the impact of changes in problematic behavior within children on their parents' stress over time. Increases in behavior problems were found to have strong and consistent negative effects on parenting stress for both mothers and fathers. This was found for parents individually as well as within dyads. Not only did overall level of behavior problems explain differences in parenting stress between families, but increases in behavior problems explained changes in parenting stress within families. These findings speak to the salience of behavior problems to parent well-being.

Mothers and fathers were both impacted by their child's behavior. Indeed, there were no significant gender differences in the size of the effect of problematic behavior on initial levels of parenting stress. This finding runs counter to existing arguments that attributes of the child are more likely to impact mothers' than fathers' stress (Morgan et al., 2002; Stoneman et al., 1989). Several empirical studies with parents of children with disabilities have supported this argument. The problematic behavior of children with pervasive developmental delay (Herring et al., 2006), neural tube defects (Spratt et al., 2007), and developmental delays (Spratt et al., 2007) were reported to impact mothers', but not fathers', stress. Other studies have reported no difference in the impact of problematic behavior by parent gender, however (e.g., Baker et al., 2002). This

dissertation supports the findings of such studies, as both parents were impacted by the level of their child's problematic behavior.

**Adaptive behavior.** Lower adaptive behavior, particularly socialization skills, has been associated with higher stress among parents of children with DD (Frey et al., 1989; Gallagher et al., 1983; Hanson & Hanline, 1990). Other studies have found no effect of adaptive skills on parenting stress, however (Baker et al., 2002; Hodapp et al., 1997; Sloper et al., 1991). In this study, child adaptive behavior was associated with parenting stress for fathers, but not for mothers. Parenting a child with a higher overall level of adaptive behavior, which includes communication, socialization, and daily living skills, predicted lower initial stress for fathers when the child was three years old. This was found for fathers individually as well as within dyads. Adaptive behavior remained a significant predictor once the effects of child behavior problems, socioeconomic status and parental social support, family climate, and coping strategies were controlled. It is unclear why fathers' but not mothers' stress would be impacted by their child's level of adaptive behavior. This runs counter to arguments that attributes of the child are more likely to impact mothers' than fathers' stress (Morgan et al., 2002; Stoneman et al., 1989). It is possible that fathers are less involved in early intervention services and feel less prepared to handle their child's limitations in functional skills. Additional research is needed to understand why adaptive behavior impacts fathers exclusively.

Even at the bivariate level, child adaptive behavior at each time point was uncorrelated with mothers' parenting stress. This is particularly surprising given the fact that the measure, the Vineland Adaptive Behavior Scales, was mother report. It might be

expected that shared variance alone would contribute to at least a weak bivariate relationship, but this was not the case in this study. Other studies have reported similar null findings, even at the bivariate level (Hassall et al., 2005; Herring et al., 2006; Skok et al., 2006). For instance, scores on the Vineland Adaptive Behavior Scales were unrelated to child-related, parent-related, or total stress scores among mothers of children with intellectual disability (Hassall et al., 2005). The findings for mothers underscore the salience of behavior problems rather than functional skills to parenting stress.

**Resources and Supports**

The remaining research questions focused on the role of family resources and supports in predicting parental stress. The third research question asked how social support, family climate, and coping strategies (distancing/avoidance, denial, confrontive/seeking social support, problem focused coping) relate to parenting stress over time for mothers and fathers. Parent and family strengths play a critical role in the theoretical models relevant to this dissertation. The processes through which families manage to self-regulate and reorganize in the face of demands are the focus of much research guided by family systems theory. In line with this perspective, McCubbin and Patterson's (1983) model emphasizes the role of family processes of adaptation and adjustment to everyday challenges and major life changes. The impact of stressors on family adaptation is explained by parent and family level resources and appraisals. Perry's (2004) model of stress in families of children with DD further defines resources as personal (e.g., coping strategies, beliefs) and family (e.g., family functioning, demographic variables) level resources. Family supports are also included in this model,

which incorporates both informal (e.g., family, neighbors) and formal (e.g., parent support group, respite care) sources of support. The conceptual model for this dissertation draws from these theories and explores the role of parental perceptions of social support and use of coping strategies as well as perceptions of the quality of the family emotional climate. Supports and resources consisted of both individual level and family level constructs, following Perry (2004).

The final research question asked whether family resources and supports moderated the relationship between child behavior problems and parenting stress for mothers and fathers. Only Perry's (2004) model explicitly discusses the potential moderating role of resources and supports. She emphasizes that future research should clarify "whether these resources function in an additive way, whether they mediate stress or interact with the level of stressor in a moderating effect pattern, or operate in some other way(s)" (Perry, 2004, p. 7). Based on existing empirical work, this dissertation sought to examine the moderating role of family resources and supports. A moderator variable qualifies the association between the independent and dependent variable. Analyzing moderating variables allows developmental researchers to examine the ways in which processes amplify or diminish the influences of other processes (Dearing & Hamilton, 2006). In this dissertation, it was expected that greater social support, higher quality family climate, greater use of confrontive/seeking social support and problem focused coping but lower use of distancing/avoidance and denial would buffer (lessen) the impact of child behavior problems on parenting stress. Findings regarding the main effects and moderating effects of coping strategies, social support, and family climate

within mother and father models will be discussed in the following sections. A final section will discuss the differences in the role of resources and supports for mothers and fathers individually versus within dyads.

**Coping.** One set of resources that individuals bring to the parenting experience is their skill in coping with caregiving challenges. Coping refers to any cognitive or behavioral effort to manage demands, thus coping efforts may include adaptive or maladaptive strategies. Four coping strategies were selected for examination in this dissertation based on their established associations with the well-being of parents of children with DD in the literature. Above and beyond socioeconomic status, child behavior problems and child adaptive behavior, several strategies emerged as predictors of initial levels of parenting stress. Once the effects of social support and family climate were controlled, however, only distancing/avoidance and problem focused coping remained statistically significant predictors of parents' stress.

Greater use of distancing/avoidance but lower use of problem focused coping predicted higher initial stress for both parents when their children were three years old. Mothers who used distancing/avoidance as a strategy when their child was young experienced less increase in stress from early to middle childhood but also less decrease in stress from middle childhood to adolescence. The opposite pattern emerged for mothers' use of problem focused coping, where mothers who used this strategy to a greater extent experienced greater increases in stress from early to middle childhood but greater decreases in stress from middle childhood to adolescence. The shape of mothers' stress trajectories was altered depending on their reported use of distancing/avoidance

and problem focused coping when their child was three years old.

The role of distancing/avoidance as a coping strategy is consistent with previous research involving families of children with DD. Among parents of children with autism, avoidance strategies were associated with greater anxiety, depression, and stress (Hastings et al., 2005). Similarly, escape and avoidance strategies predicted greater depression, social isolation, and spousal relationship problems among parents of children with autism (Dunn et al., 2001). Escape and avoidance efforts predicted higher depressive symptoms and lower subjective well-being among parents of children with DD (Glidden et al., 2006; Glidden & Natcher, 2009). Findings from the present study underscore the negative consequences of using distancing/avoidance as a coping strategy for parents' stress. This study extends the existing literature by revealing long-term associations between mothers' early use of distancing/avoidance and later experiences of stress.

The associations between problem focused coping and parenting stress found within this dissertation are also consistent with existing literature. Problem focused coping refers to deliberate and analytic efforts to remedy a stressful situation. Such active and planful coping efforts have been associated with greater feelings of personal growth among mothers of toddlers and adolescents with autism (Smith et al., 2008) and lower depression among mothers of adults with intellectual disabilities (Seltzer et al., 1995). Among fathers of children with DD, planful problem solving efforts have been associated with greater subjective well-being related to the child with a disability (Glidden et al., 2006). Parents' initial levels of stress in their child's early years were significantly associated with their use of problem focused coping. This study extends this literature

base by exploring the associations between early use of problem focused coping and long term experiences of parenting stress. Use of this strategy defined stress trajectories for mothers, but not fathers.

Confrontive/social support seeking and denial were unrelated to parents' stress once other child and family factors were controlled. Even at the bivariate level, use of confrontive/social support seeking coping was uncorrelated with parents' stress at each time point. This is inconsistent with previous literature demonstrating a link between confrontive strategies and greater subjective well-being (Glidden & Natcher, 2009) and lower depression (Glidden et al., 2006) among mothers of children with DD. Seeking social support has also been found to relate to family strengths, including confidence, challenge, and commitment (Judge, 1998). It is possible that measurement issues contributed to the null finding in this dissertation, since confrontive and social support seeking behaviors were combined in Parker et al.'s (1993) construction of the confrontive/seeking social support scale. Previous work had separated these constructs.

Denial was a significant predictor of mothers' initial stress at age 3, but was no longer significant once family climate and social support were included in the model. Use of denial as a coping strategy was significantly correlated at the bivariate level with mothers' reports of stress at age 3 and 5 and fathers' reports of stress at age 3 and 10, with greater use of denial associated with greater stress. This basic relationship is consistent with previous literature showing associations between denial and symptoms of depression and anxiety among parents of school-aged children with autism (Hastings et al., 2005). Denial has also been found to contribute to depressive symptoms among

mothers of adults with intellectual disabilities (Seltzer et al., 1995). Denial was significantly correlated with family climate within the EICS sample, with greater use of denial correlated with perceptions of lower quality family climates for both mothers and fathers. This correlation may explain in part why denial became a non-significant predictor of mothers' stress in the final combined model. Denial may not explain any additional variance in parenting stress above and beyond perceptions of family climate.

In sum, several coping strategies emerged as significant predictors of parents' stress. The cognitive and behavioral strategies that parents used to manage demands when their children were young had immediate and long term associations with their stress levels. Beyond a main effect, only one coping strategy was found to moderate the relationship between child behavior problems and parenting stress. As fathers' use of confrontive/seeking social support increased, the impact of child behavior problems on initial status of parenting stress decreased. This finding suggests that efforts to obtain informational, tangible, and emotional support may be particularly beneficial to fathers of children with high levels of behavior problems. Other studies have reported similar findings for planful and problem focused coping efforts more generally. Use of planning buffered the negative impact of heightened caregiving demands on mothers' depressive symptoms, for instance (Seltzer et al., 1995). Similarly, use of problem-focused strategies was found to buffer the impact of child functional limitations on depressive symptoms and pessimism among mothers of adults with intellectual disabilities (Essex et al., 1999). This dissertation extends those findings to fathers and their levels of parenting stress. The interaction of confrontive/seeking social support and child behavior problems was not a

significant predictor of fathers' stress once other family factors were added to the model, perhaps due to a lack of power.

**Social support.** In addition to coping strategies, social support is a resource that has received considerable attention in research on families of children with DD (Floyd & Gallagher, 1997; Hauser-Cram et al., in press). For parents of children with DD, social networks may consist of formal supports, such as professionals or service providers, and informal supports, such as friends and neighbors (Hauser-Cram & Howell, 2003). Research on families of children with DD has generally supported the importance of parents' satisfaction with the helpfulness of their social support networks. The results from this dissertation support this assertion. Perceptions of greater helpfulness of social support predicted lower initial levels of stress for both mothers and fathers.

These findings are consistent with a large body of literature demonstrating relationships between social support and parent well-being. Perceived helpfulness of social support has been associated with marital quality, satisfaction with parenting, and general life satisfaction among parents of children with DD (Hauser-Cram & Howell, 2003). With respect to parenting stress, satisfaction with social support has been associated with lower levels of stress among parents of children with intellectual disabilities (Feldman et al., 2002), cerebral palsy (Wanamaker & Glenwick, 1998), autism (Sharpley et al., 1997) and special health care needs (Spratt et al., 2007). This dissertation supports the importance of social support networks to mothers and fathers of children with varying disability diagnoses. Above and beyond child characteristics and other parent resources, social support remained a significant predictor of parents' stress.

This finding has strong implications for intervention since social support is a potential point of intervention for some families (Dunst et al., 1997).

Social support was also found to moderate the relationship between child behavior problems and parenting stress for mothers, but not fathers. As perceptions of the helpfulness of their social support networks increased, the impact of child behavior problems on mothers' stress decreased. In other words, social support buffered the otherwise negative impacts of problematic behavior. This finding is consistent with previous research. Social support was found to moderate the relationship between stressors and social isolation for parents of children with autism, such that higher social support corresponded with a decreased likelihood that stressors would impact parents' feelings of isolation (Dunn et al., 2001). Support from family, friends, and professionals was found to buffer the impact of the level of the child's disability and behavior problems on caregiving stress among mothers of pre-school aged children with DD (Plant & Sanders, 2007). These findings suggest that social support may be particularly important to mothers of children with higher levels of behavior problems. The interaction of social support and child behavior problems was no longer a significant predictor of mothers' stress once other family factors were included in the model, however. These findings should not be overstated, but they do have potential implications for targeting intervention to a specific subgroup of mothers.

**Family climate.** The family emotional climate is a family level resource that may protect parents of children with DD from experiencing heightened levels of stress. The quality of the relational aspects of the family, including the connectedness,

expressiveness, and degree of conflict among members of the family unit, has been found to impact various aspects of parent well-being and child development (e.g., Cassidy et al., 1992; Hauser-Cram et al., 2001; Hoffman et al., 1995; Morris et al., 1997).

Some studies suggest that families with a child with a disability have less supportive family relationships (e.g., Margalit & Ankonina, 1991), but the findings from this dissertation suggest otherwise. Compared to normative data reported in the Family Environment Scale manual (Moos & Moos, 1981), families in the EICS sample reported higher levels of cohesion and expressiveness and lower levels of conflict. These findings may reflect differences in the range of family types, ethnic/racial backgrounds, and ages represented in the normative families as compared to the EICS families. It is possible that EICS families include a greater proportion of double-parent households with middle to upper class backgrounds than comparison families.

Alternatively, the results of these comparisons may be interpreted to suggest that families of children with DD experience similar, if not higher quality, relationships than families of children without DD. Rodrigue and colleagues (1992) found mothers of autistic children to report more family cohesion than did mothers of children with no disability. Perry and colleagues (2004) found mothers and fathers of children with diverse developmental disabilities to resemble the normative profile to a greater extent than the distressed profile across all scales of the Family Environment Scales. The comparison of EICS families to other families supports the normality perspective, which argues that families of children with and without DD are more alike than different in terms of the family environment (Perry et al., 2004).

Within families of children with DD, aspects of the family climate have been found to relate to parenting stress (Boyce & Behl, 1991; Margalit & Kleitman, 2006; Warfield et al., 1999). Ratings of higher quality family climate predicted lower initial levels of parenting stress for both mothers and fathers in this dissertation. This effect remained above and beyond child characteristics and parental coping and social support. Consistent with these findings, Warfield et al. (1999) and Margalit and Kleitman (2006) found perceptions of family cohesion to predict later parenting stress among mothers of toddlers receiving early intervention services. Similar findings have been reported for older children with DD. Above and beyond IQ and behavior problems, parents' perceptions of the level of cohesion within the family predicted stress related to parenting among mothers and fathers of children with Fragile X (Johnston et al., 2003). Taken together, this dissertation underlines the role of a positive family climate in parents' experience of stress.

For mothers, family climate was also found to predict changes in stress over time. Although perceptions of a higher quality family climate predicted lower initial levels of stress, these perceptions also predicted greater linear increases in stress over time for mothers. Few studies have examined family climate as a predictor of changes in parenting stress, so little is known about aspects of the emotional climate during early childhood impact later stress. It is possible that mothers with positive family climates started with lower initial stress and therefore had more room to increase in stress within the normal range across their child's early and middle childhood. Family climate was no longer a significant predictor of mothers' linear increases in stress once other family

factors were controlled, therefore this finding may not be robust.

Family climate was not found to buffer the impact of child behavior problems in this study. Perceptions of higher quality family climate predicted lower stress for mothers and fathers regardless of the level of their child's behavior problems. Very few studies have examined family climate as a moderator of the relationship between child stressors and parent well-being. As an exception, Keller (1999) found family harmony to buffer the impact of child behavioral characteristics on stress among parents of school-aged children with disabilities. It is possible that the individual components of family climate measured in this dissertation, including cohesion, expressiveness, and conflict, may individually buffer child behavior problems. Future research should address the limited body of literature on family climate as a buffer of child-related stressors on parent well-being. In this dissertation, family climate was found to have only a main effect on parents' initial levels of stress.

**Resources and supports within dyads.** In addition to examining predictors of mothers' and fathers' stress individually, this dissertation addressed predictors of parental stress within dyads. Parenting stress was found to be only moderately correlated within dyads, speaking to the importance of examining stress as an individual rather than family level constructs. Years of education, negative life events, social support, and family climate were correlated for mothers and fathers within dyads. Parents within dyads have similar educational backgrounds, encounter similar life events, and likely have similar sources of support. Perceptions of the quality of the family climate were only moderately correlated, highlighting the importance of considering individual parent appraisals. It

should be noted, however, that not all parenting dyads were married or living within the same household, so some mothers and fathers within dyads may be rating the quality of different family climates. Mothers and fathers were correlated on only one of the coping strategies, distancing/avoidance. Essex et al. (1999) also found use of problem-focused coping to be uncorrelated for mothers and fathers of adults with intellectual disabilities. They reported trend level correlations in use emotion-focused coping, consistent with the present findings for use of distancing/avoidance.

Mean levels difference by parent gender on several resources and supports. The literature on sex differences in coping suggests that men are more likely to exhibit problem-confronting behavior and to deny or avoid the stressor (Tamres, Janicki, & Helgeson, 2002). Indeed, fathers used denial as a coping strategy to a greater extent than mothers in this sample. There were no gender differences found in use of distancing/avoidance and problem focused coping, contrary to expectations. Previous literature also suggests that women are more likely than men to cope with emotion-oriented behaviors and to seek social support (Folkman & Lazarus, 1980; Pearlin & Schooler, 1978). Mothers in this dissertation were found to use confrontive/seeking social support as a coping strategy more often than fathers, consistent with these expectations. Mothers also reported higher levels of social support and more positive family climates than fathers. Generally speaking, men may be more likely to show an independent sense of self whereas women are more likely to show a relational self (Cross & Madson, 1997). Mothers in this sample may be more likely than fathers to define themselves in terms of interpersonal relationships and close ties with others, which may in part explain why they

report greater helpfulness of social support and higher quality perceptions of the family climate.

A modified hierarchical linear modeling approach was used to account for the dependency of mothers and fathers within dyads. Values on most predictor and outcome variables were correlated for mothers and fathers, underlining the importance of accounting for statistical dependency within dyads. Results of the combined model for dyads differed somewhat from the results of the combined model for mothers and fathers separately. In the dyad model, use of distancing/avoidance as a coping strategy was no longer a predictor of mothers' initial levels of parenting stress. Family climate became a nonsignificant predictor of fathers' initial levels of parenting stress in the dyad model. These changes may be due in part to the moderate correlations in distancing/avoidance and family climate observed between mothers and fathers within dyads. Alternatively, these findings may suggest that family climate is a more relevant factor for mothers' stress while use of distancing/avoidance plays a greater role in predicting fathers' stress. In the dyad model, use of coping strategies no longer defined the shape of mothers' growth curves; instead, perceptions of higher quality family environments in early childhood predicted greater linear increases but lower initial levels of stress for mothers.

**Limitations**

This dissertation contributes to our understanding of the role of child characteristics and parent resources and supports to the experience of parenting stress over time. This study is not without its limitations, however. As with any study employing a correlational design, causal effects cannot be determined. Additional

variables may also explain variance in both family resources and supports as well as parenting stress. For instance, personality, neuroticism in particular, was found to predict coping strategy use among mothers and fathers raising children with DD (Glidden et al., 2006). It is possible that dispositional characteristics such as personality explain parents' use of coping strategies and subjective evaluations of stress.

Increases in child behavior problems were found to predict increases in parenting stress in this study, however the reverse direction of effects is also possible. Systems approaches to studying family functioning view the family as a complex and dynamic system of individuals and interactions (Britner et al., 2003). In this view, parents and children are constantly and concurrently interacting. Patterns of interactions between family members are viewed as circular, rather than linear. Child behaviors may drive feelings of stress and strain among parents, which may cause parents to be more irritated and harsh in their interactions with their child. Parent attitudes and behaviors may have dysregulating effects on their children that spur behavior problems (Cole, Michel, & Teti, 1994). Indeed, Lecavalier et al. (2006) found the behavior problems of children with autism and maternal stress to be mutually influential, indicating a possible transactional relationship between these constructs. Other studies have only found support for a child-driven model, however (e.g., Keogh, Garnier, Bernheimer, & Gallimore, 2000).

Similarly, family resources and supports were conceptualized as having an impact on parenting stress, but the reverse direction of effects is possible. Mothers who are more stressed may use less adaptive coping strategies and be less likely to reach out to their social support networks for help. In addition, experiencing higher stress may bias

appraisals of child characteristics and resources and supports more negatively. For instance, parents with higher stress may perceive their sources of social support as less helpful and their family environments as less positive. The reliance on self-report measures is a limitation of this dissertation.

Stressed parents may also assess their child's behavior more negatively. Some studies suggest that mothers experiencing high negative life stress perceive their children's behavior as more deviant than do low stress mothers (Pett, Vaughncole, & Wamplod, 1994). When the child's behavior is ambiguous, situational stress skews parental perceptions of child behavior more negative (Crnic & Low, 2002). Child characteristics related to fathers' as well as mothers' stress, however, despite the fact that measures of child adaptive behavior and behavior problems were mother report. It is therefore unlikely that findings related to the role of child characteristics can be entirely explained by shared variance issues.

The limited sample size may have resulted in power issues. That is, the present analyses may not have been able to detect relationships between variables where relationships indeed existed. This was particularly an issue in the combined models where child characteristics and parent resources and support were simultaneously entered as predictors of stress, particularly since these variables were correlated. Interaction terms are uniquely underpowered, which implies that certain resources and supports may operate as buffers of child behavior problems but the present analyses were unable to detect these effects. Future studies with larger samples should replicate and extend the analyses conducted in this dissertation.

The sample used for this study reflected the ethnic and racial composition of Massachusetts and New Hampshire at the time when the study began, but it may no longer reflect the demographics of this region today. The sample was primarily Euro-American, thus the findings may not be relevant for a wide range of ethnic and cultural groups. The meaning of disability varies across ethnic and cultural groups (Garcia-Coll & Magnuson, 2000). The range of disabilities represented in this sample may not reflect the distribution of disabilities served by Early Intervention in Massachusetts and New Hampshire today. The inclusion criteria and available services for children with disabilities shift depending on the political landscape and available resources. Findings from this dissertation may not extend to children with all types of disabilities.

**Implications**

Despite its limitations, the findings from this dissertation have implications for research and practice involving children with DD and their families. Following these results, interventions should aim to both reduce child-related stressors such as behavior problems and to promote family strengths such as coping skills, social support, and family climate. Interventions targeting one or more of these factors may reduce parenting stress among mothers and fathers of children with DD.

Several interventions for child behavior problems have been empirically supported (Sanders & Markie-Dadds, 2002). Many of these interventions take a family systems approach and require participation of both children and parents to optimize long-term outcomes. Parent management training and behavioral family interventions (BFI), for instance, train parents to contingently respond to their child's behavior and plan

activities to minimize opportunities for disruptive behavior (Roberts, Mazzacchelli, Studman, & Sanders, 2006). Randomized control trials with young children have reported reductions in child behavior problems, harsh parenting, and parental stress following intervention (Bryant, Vizzard, Willoughby, & Kupersmidt, 1999; Webster-Stratton, Reid, & Hammond, 2004). Similar interventions have been shown to be effective for children with disabilities as well (Gavidia-Payne & Hudson, 2002; Roberts et al., 2003). One such intervention, Stepping Stones Triple P, was found to reduce child behavior problems and parental stress and to improve parenting style among preschoolers with developmental and behavioral problems (Roberts et al., 2006). Interventions that target the problematic behavior of children with DD may improve child behavior and reduce levels of parenting stress.

The findings from this dissertation suggest that coping skills, social support, and family climate may be potential points of intervention for families of children with DD. Singer and colleagues underline the importance of examining family resilience factors: "efforts to support and assist families should be designed to foster attitudes, skills, and resources that not only reduce distress but also buffer it as well, augment resilience, and promote positive outcomes" (2007, p. 357). Group interventions to improve the coping skills of parents of children with DD often employ elements of cognitive behavioral techniques (CBT), including problem solving, cognitive restructuring, and monitoring thoughts and feelings. A review of interventions for parents of children with DD found reasonable empirical support for the use of CBT techniques in improving aspects of parent well-being, including depression, anxiety, and stress (Hastings & Beck, 2004).

Gammon & Rose (1991), for instance, reported improvements in problem solving and interpersonal communication skills as well as significant reductions in stress for mothers of children with DD following 10 weekly group sessions focused on cognitive restructuring and enhancing problem-solving skills. The efficacy of such interventions for fathers of children with disabilities has received insufficient attention, although preliminary findings suggest these interventions are equally effective for both mothers and fathers (Vadasy, Fewell, Meyer, & Greenberg, 1985).

Interventions aiming to improve parents' social support networks may also function to reduce parenting stress. The format and goals of social support interventions vary widely, but they have generally been found to be effective (Hogan, Linden, & Najarian, 2002). Some interventions provide direct emotional, informational, and instrumental support to the individual. This type of support is believed to render positive feelings of being supported and ultimately lead to a reduction in psychological symptoms (Lakey & Lutz, 1996). Other interventions aim to help the individual gain support from naturally occurring sources (Hogan et al., 2002). Such interventions target improvement in the individual's social skills so that support is increased in the natural environment or implement strategies to improve the individual's perceptions of the helpfulness of their existing social support network. Early intervention services provide professional support (e.g., respite, therapy) while also mobilizing support from informal network members (Dunst, 2000).

Social support interventions have been found to be effective in reducing stress within families of children with DD (Singer, Ethridge, & Aldana, 2007). One such

intervention, Programme d'Intervention Familiale, aimed to improve spousal support and help parents maintain significant relationships with others among families of children with Down syndrome and cleft lip/palate (Pelchat, Bisson, Ricard, Perreault, & Bouchard, 1999). Participation in the intervention was associated longitudinally with increased confidence in their own resources and the help they could receive from others as well as decreases in emotional distress, anxiety and depression. Participating families also perceived more emotional support from their spouse. Other studies have documented improvements in parent outcomes following social skills training (Kirkham, 1993) and parent support groups (Salt et al., 2002; Schultz, Schultz, Bruce, & Smyrnios, 1993). An additional social support intervention model that has seen success is the parent-to-parent model, in which parents of children with disabilities receive training in support techniques in order to provide support for other parents of (younger) children with disabilities (Singer et al., 1999).

Dimensions of the family emotional climate have also been targeted for intervention. For instance, Pelchat and colleagues (1999) targeted changes at family level. Their intervention, Programme d'Intervention Familiale, aimed to foster exchanges within the family concerning the perception of the situation. Participating families were also encouraged to acknowledge the role of each family member in the adaptation process. Parents who participated in the intervention displayed better adaptation to their child's disability within the first 18 months of their life than parents who did not receive the intervention. Parents in the intervention group were also more likely to be in harmony with themselves and to have better relationships with their child, their spouse, and other

people. Similar interventions for parents of children with DD have focused on improving parents' ability to manage the home environment (Bristol, Gallagher, & Holt, 1993), promoting perceptions of the family "as a team" (Hudson et al., 2003), and improving communication and conflict-resolution skills within the family (Schultz et al., 1993). Such interventions that focus on improving aspects of the family emotional climate may be effective in reducing parents' experience of stress (Singer et al., 2007).

**Conclusions**

This dissertation aimed to extend previous knowledge about changes in the experience of stress over time among parents of children with disabilities. Stress was found to increase from early to middle childhood and subsequently decrease from middle childhood to adolescence, pointing to middle childhood as a particularly stressful period of development for these parents. Future research should explore factors underlying this period of heightened stress. Stress trajectories were explored for both mothers and fathers, which contributes to the limited literature on fathers' adjustment to the demands of raising children with disabilities.

As expected, parents in this sample were impacted by the characteristics of their children with DD, most notably the level of their behavior problems. Increases in behavior problem were associated with increases in parenting stress, pointing to the salience of child behavior to parent well-being. Beyond child behavior, however, critical family resources and supports explained variability in parents' stress. Greater perceptions of social support, use of adaptive coping strategies, and higher quality family climates predicted lower stress for parents. These family strengths represent potential points of

intervention in families experiencing heightened stress. Overall, the findings support the notion that although parents of children with DD face greater caregiving challenges, many are able to successfully adapt to heightened demands.

References

Abbeduto, L., Seltzer, M. M., Shattuck, P., Krauss, M. W., Orsmond, G., & Murphy, M. M. (2004). Psychological well-being and coping in mothers of youths with autism, Down syndrome, or fragile X syndrome. *American Journal on Mental Retardation, 109*(3), 237-254.

Abidin, R. R. (1976). *A model of parenting stress.* Unpublished manuscript, University of Virginia, Charlottesville.

Abidin, R. R. (1983). *Parenting Stress Index: Manual, administration booklet, and research update*. Charlottesville, VA: Pediatric Psychology Press.

Abidin, R. R. (1990). *Parenting Stress Index manual* (2nd ed.). Charlottesville, VA: Pediatric Psychology Press.

Abidin, R. R. (1995). *Parenting Stress Index manual* (3rd ed.). Odessa, FL: Psychological Assessment Resources.

Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4-18 and 1991 Profile.* Burlington, VT: University of Vermont Department of Psychiatry.

Achenbach, T. M. (1992). *Manual for the Child Behavior Checklist /2-3 and 1992 Profile.* Burlington, VT: University of Vermont Department of Psychiatry.

Achenbach, T. M., & Edelbrock, C. S. (1981). Behavioral problems and competencies reported by parents of normal and disturbed children aged four through sixteen. *Society for Research in Child Development Monographs, 46,* 1-82.

Achenbach, T. M., & Edelbrock, C. S. (1983). *Manual for the Child Behavior Checklist and Revised Child Behavior Profile.* Burlington, VT: University of Vermont, Department of Psychiatry.

Achenbach, T. M., Edelbrock, C., & Howell, C. T. (1987). Empirically based assessment of the behavioral/emotional problems of 2-3-year-old children. *Journal of Abnormal Child Psychology, 15,* 629-650.

Adamakos, H., Ryan, K., Ullman, D. G., Pascoe, J., Diaz, R., & Chessare, J. (1986). Maternal social support as a predictor of mother-child stress and stimulation. *Child Abuse and Neglect, 10,* 463-470.

Alston, R. J., McCowan, C. J. (1994). Family functioning as a correlate of disability adjustment for African Americans. *Rehabilitation Counseling Bulletin, 37*(4), 277-290.

Baker, B. L., Blacher, J., Crnic, K. A., & Edelbrock, C. (2002). Behavior problems and parenting stress in families of three-year-old children with and without developmental delays. *American Journal on Mental Retardation, 107*(6), 433-444.

Baker, B. L., Blacher, J., & Olsson, M. B. (2005). Preschool children with and without developmental delay: Behaviour problems, parents' optimism and well-being. *Journal of Intellectual Disability Research, 49*(8), 575-590. doi:10.1111/j.1365-2788.2005.00691.x

Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Pre-school children with and without developmental delay: Behaviour problems

and parenting stress over time. *Journal of Intellectual Disability Research: Special Issue on Family Research, 47*(4-5), 217-230. doi:10.1046/j.1365-2788.2003.00484.x

Bayley, N. (1969). *The Scales of Infant Development.* New York: Psychological Corp.

Beck, A., Hastings, R. P., Daley, D., & Stevenson, J. (2004). Pro-social behaviour and behaviour problems independently predict maternal stress. *Journal of Intellectual and Developmental Disability, 29*(4), 339-349. doi:10.1080/13668250400014509

Beckman, P. J. (1991). Comparison of mothers' and fathers' perceptions of the effect of young children with and without disabilities. *American Journal on Mental Retardation, 95,* 585-595.

Beckman, P. J. (1983). Characteristics of handicapped infants: A study of the relationship between child characteristics and stress as reported by mothers. *American Journal of Mental Deficiency, 88,* 150-156.

Behr, S. K., & Murphy, D. L. (1993). Research progress and promise: The role of perceptions in cognitive adaptation to disability. In A. P. Turnbull, J. M. Patterson, S. K. Behr, D. L. Murphy, J. G. Marquis, & M. J. Blue-Banning (Eds.), *Cognitive coping, families, and disability* (pp. 151-163). Baltimore, MD: Paul H. Brookes Publishing.

Belsky, J., Woodworth, S., & Crnic, K. (1996). Trouble in the second year: Three questions about family interaction. *Child Development, 67,* 556-578.

Benson, P. R., & Karlof, K. L. (2009). Anger, stress proliferation, and depressed mood among parents of children with ASD: A longitudinal replication. *Journal of Autism and Developmental Disorders, 39*(2), 350-362.

Blacher, J., & McIntyre, L. L. (2006). Syndrome specificity and behavioural disorders in young adults with intellectual disability: Cultural differences in family impact. *Journal of Intellectual Disability Research, 50*(3), 184-198. doi:10.1111/j.1365-2788.2005.00768.x

Bolger, N., DeLongis, A., Kessler, R. C., & Schilling, E. A. (1989). Effects of daily stress on negative mood. *Journal of Personality and Social Psychology, 57,* 808-818.

Boyce, G. C., Behl, D., Mortensen, L., & Akers, J. (1991). Child characteristics, family demographics and family processes: Their effects on the stress experienced by families of children with disabilities. *Counseling Psychology Quarterly, 4*, 273-288. doi:10.1080/09515079108254436

Bristol, M. M. (1987). Mothers of children with autism or communication disorders: Successful adaptation and the double ABCX model. *Journal of Autism and Developmental Disorders, 17*(4), 469-486. doi:10.1007/BF01486964

Bristol, M. M., Gallagher, J. J., & Schopler, E. (1988). Mothers and fathers of young developmentally disabled and nondisabled boys: Adaptation and spousal support. *Developmental Psychology, 24*(3), 441-451. doi:10.1037/0012-1649.24.3.441

Bristol, M. M., Gallagher, J. J., & Holt, K. D. (1993). Maternal depressive symptoms in autism: Response to Psychoeducational intervention. *Rehabilitation Psychology, 38,* 3-10.

Britner, P. A., Morog, M. C., Pianta, R. C., & Marvin, R. S. (2003). Stress and coping: A comparison of self-report measures of functioning in families of young children with cerebral palsy or no medical diagnosis. *Journal of Child and Family Studies, 12*(3), 335-348. doi:10.1023/A:1023943928358

Bromley, J., Hare, D. J., Davison, K., & Emerson, E. (2004). Mothers supporting children with autistic spectrum disorders: Social support, mental health status and satisfaction with services. *Autism, 8*(4), 409-423. doi:10.1177/1362361304047224

Bryant, D., Vizzard, L. H., Willoughby, M., & Kupersmidt, J. (1999). A review of interventions for pre-schoolers with aggressive and disruptive behavior. *Early Education and Development, 10,* 47-68.

Cahill, B. M., & Glidden, L. M. (1996). Influence of child diagnosis on family and parental functioning: Down syndrome versus other disabilities. *American Journal on Mental Retardation, 101*(2), 149-160.

Cameron, S. J., Dobson, L. A., & Day, D. M. (1991). Stress in parents of developmentally delayed and non-delayed preschool children. *Canada's Mental Health, 39*(1), 13-17.

Campbell, S. B. (2002). *Behavior problems in preschool children: Clinical and developmental issues* (2nd ed.). New York: Guilford Press.

Carpenter, B., & Towers, C. (2008). Recognising fathers: The needs of fathers of children with disabilities. *Support for Learning, 23*(3), 118-125.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267-283.

Cassidy, J., Parke, R. D., Butkovsky, L., & Braungart, J. M. (1992). Family-peer connections: The roles of emotional expressiveness within the family and children's understanding of emotions. *Child Development, 63*(3), 603-618. doi:10.2307/1131349

Chan, Y. (1994). Parenting stress and social support of mothers who physically abuse their children in Hong Kong. *Child Abuse and Neglect, 18,* 261-269.

Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine, 38*(5), 300-314.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310-357. doi:10.1037/0033-2909.98.2.310

Cole, P. M., Michel, M., & Teti, L. (1994). The development of emotion regulation and dysregulation: A clinical perspective. In N. Fox (Ed.), *The Development of Emotion Regulation: Biological and Behavioral Considerations.* Monographs for the Society for Child Development (2-3, Serial No. 240), 73-102.

Conger, R., Patterson, G. R., & Ge, X. (1995). It takes two to replicate: A meditational model for the impact of parents' stress on adolescent adjustment. *Child Development, 66,* 80-97.

Cook, E. T., Greenberg, M. T., & Kusche, C. A. (1994). The relations between emotional understanding, intellectual functioning, and disruptive behavior problems in

elementary-school-aged children. *Journal of Abnormal Child Psychology, 22*(2), 205-219. doi:10.1007/BF02167900

Cooper, S.-A., Smiley, E., Allan, L. M., Jackson, A., Finlayson, J., Mantry, D., & Morrison, J. (2009). Adults with intellectual disabilities: Prevalence, incidence and remission of self-injurious behaviour, and related factors. *Journal of Intellectual Disability Research, 53*(3), 200-216. doi:10.1111/j.1365-2788.2008.01060.x

Creasey, G., & Reese, M. (1996). Mothers' and fathers' perceptions of parenting hassles: Associations with psychological symptoms, nonparenting hassles, and child behavior. *Journal of Applied Developmental Psychology, 17,* 393-406.

Crnic, K. A, & Booth, C. L. (1991). Mothers' and fathers' perceptions of daily hassles of parenting across early childhood. *Journal of Marriage and Family, 53,* 1042-1050.

Crnic, K. A., Friedrich, W. N., & Greenberg, M. T. (1983). Adaptation of families with mentally retarded children: A model of stress, coping, and family ecology. *American Journal of Mental Deficiency, 88*(2), 125-138.

Crnic, K. A., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: Relations to maternal parenting and child behaviour at age 5. *Infant and Child Development, 14*(2), 117-132. doi:10.1002/icd.384

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

Crnic, K., & Low, C. (2002). Everyday stresses and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting, vol. 5: Practical issues in parenting* (2nd ed., pp. 243-267). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Crnic K., & Stormshak, E. (1997). The effectiveness of providing social support for families of children at risk. In M. J. Guralnick (Ed.), *The effectiveness of early intervention* (pp. 209-225). Baltimore: Paul H. Brookes.

Cross, S. E., & Madson, L. (1997). Models of the self: Self-construals and gender. *Psychological Bulletin, 122*(1), 5-37.

Cummings, E. M., Davies, P. T., & Campbell, S. B. (2000). *Developmental Psychopathology and Family Process.* New York: Guilford.

Davis, N. O., & Carter, A. S. (2008). Parenting stress in mothers and fathers of toddlers with autism spectrum disorders: Associations with child characteristics. *Journal of Autism and Developmental Disorders, 38*(7), 1278-1291. doi:10.1007/s10803-007-0512-z

de Bildt, A., Sytema, S., Kraijer, D., Sparrow, S., & Minderaa, R. (2005). Adaptive functioning and behaviour problems in relation to level of education in children and adolescents with intellectual disability. *Journal of Intellectual Disability Research, 49*(9), 572-681. doi:10.1111/j.1365-2788.2005.00711.x

de Ruiter, K. P., Dekker, M. C., Verhulst, F. C., & Koot, H. M. (2007). Developmental course of psychopathology in youths with and without intellectual disabilities. *Journal of Child Psychology and Psychiatry, 48*(5), 498-507. doi:10.1111/j.1469-7610.2006.01712.x

Deater-Deckard, K. (1998). Parenting stress and child adjustment: Some old hypotheses and new questions. *Clinical Psychology: Science and Practice, 5*, 314-332.

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

Dearing, E., & Hamilton, L. (2006). Contemporary approaches and classic advice for analyzing mediating and moderating variables. *Monographs of the Society for Research in Child Development, 71*, 88-104.

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

Duhig, A. M., Renk, K., Epstein, M. K., & Phares, V. (2000). Interparental agreement on internalizing, externalizing, and total behavior problems: A meta-analysis. *Clinical Psychology: Science and Practice, 7*(4), 435-453.

Duis, S. S., Summers, M., & Summers, C. R. (1997). Parent versus child stress in diverse family types: An ecological approach. *Topics in Early Childhood Special Education, 17*, 53-73. doi:10.1177/027112149701700107

Dunn, M. E., Burbine, T., Bowers, C. A., & Tantleff-Dunn, S. (2001). Moderators of stress in parents of children with autism. *Community Mental Health Journal, 37*(1), 39-52.

Dunst, C. J. (2000). Revisiting "Rethinking Early Intervention". *Topics in Early Childhood Special Education, 20*(2), 95-104.

Dunst, C. J., Trivette, C. M., & Cross, A. H. (1986). Mediating influences of social support: Personal, family, and child outcomes. *American Journal of Mental Deficiency, 90*(4), 403-417.

Dunst, C. J., Trivette, C. M., & Deal, A. (1988). *Enabling and empowering families: Principles and guidelines for practice.* Cambridge, MA: Brookline Books.

Dunst, C. J., Trivette, C. M., & Hamby, D. W. (1994). Measuring social support in families with young children with disabilities. In C. J. Dunst, C. M. Trivette, & A. G. Deal (Eds.), *Supporting and strengthening families, vol. 1: Methods, strategies, and practices.* Cambridge, MA: Brookline Books.

Dunst, C. J., Trivette, C. M., & Jodry, W. (1997). Influences of social support on children with disabilities and their families. In M. Guralnick (Ed.), *The effectiveness of early intervention* (pp. 499-522). Baltimore: Paul H. Brookes.

Dyson, L. L. (1997). Fathers and mothers of school-age children with developmental disabilities: Parental stress, family functioning, and social support. *American Journal on Mental Retardation, 102*(3), 267-279. doi:10.1352/0895-8017(1997)102<0267:FAMOSC>2.0.CO;2

Dyson, L. L. (1993). Response to the presence of a child with disabilities: Parental stress and family functioning over time. *American Journal on Mental Retardation, 98,* 207-218.

Dyson, L. L. (1991). Families of young children with handicaps: Parental stress and family functioning. *American Journal on Mental Retardation, 95,* 623-629.

Edwards, J. R., & O'Neill, R. M. (1998). The construct validity of scores on the ways of coping questionnaire: Confirmatory analysis of alternative factor structures. *Educational and Psychological Measurement, 58*(6), 955-983. doi:10.1177/0013164498058006007

Einfeld, S. L., Piccinin, A. M., Mackinnon, A., Hofer, S. M., Taffe, J., Gray, K. M., . . .Tonge, B. J. (2006). Psychopathology in young people with intellectual disability. *JAMA: Journal of the American Medical Association, 296*(16), 1981-1989. doi:10.1001/jama.296.16.1981

Emerson, E. (2003). Mothers of children and adolescents with intellectual disability: Social and economic situation, mental health status, and the self-assessed social and psychological impact of the child's difficulties. *Journal of Intellectual Disability research: Special Issue on Family Research, 47,* 385-399.

Essex, E. L., Seltzer, M. M., & Krauss, M. W. (1999). Differences in coping effectiveness and well-being among aging mothers and fathers of adults with mental retardation. *American Journal on Mental Retardation, 104*(6), 545-563.

Feldman, M. A., Hancock, C. L., Reilly, N., Minnes, P., & Cairns, C. (2000). Behavior problems in young children with or at risk for developmental delay. *Journal of Child and Family Studies, 9*(2), 247-261. doi:10.1023/A:1009427306953

Feldman, M. A., Varghese, J., Ramsay, J., & Rajska, D. (2002). Relationships between social support, stress and mother-child interactions in mothers with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities, 15*(4), 314-323. doi:10.1046/j.1468-3148.2002.00132.x

Fidler, D. J., Hodapp, R. M., Dykens, E. M. (2000). Stress in families of young children with Down syndrome, Williams syndrome, and Smith-Magenis syndrome. *Early Education and Development, 11,* 395-406.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21,* 219-239.

Folkman, S., & Lazarus, R. S. (1988). *Manual for the Ways of Coping Questionnaire*. Palo Alto, CA: Consulting Psychologists Press.

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. (1986). The dynamics of a stressful encounter: Cognitive appraisal, coping and encounter outcomes. *Journal of Personality and Social Psychology, 50,* 992-1003.

Floyd, F. J., & Gallagher, E. M. (1997). Parental stress, care demands, and use of support services for school-age children with disabilities and behavior problems. *Family Relations, 46,* 359-371.

Fombonne, E., Simmons, H., Ford, T., Meltzer, H., & Goodman, R. (2001). Prevalence of pervasive developmental disorders in the British nationwide survey of child mental health. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(7), 820-827. doi:10.1097/00004583-200107000-00017

Frank, S. J., Olmstead, C. L., Wagner, A. E., Laub, C. C., Freeark, K., Breitzer, G. M., & Peters, J. M. (1991). Child illness, the parenting alliance, and parenting stress. *Journal of Pediatric Psychology, 16,* 361-371.

Frey, K. S., Greenberg, M. T., & Fewell, R. R. (1989). Stress and coping among parents of handicapped children: A multidimensional approach. *American Journal on Mental Retardation, Special Issue: Research on Families, 94*(3), 240-249.

Gallagher, J. J., Beckman, P., & Cross, A. H. (1983). Families of handicapped children: Sources of stress and its amelioration. *Exceptional Children, 50*(1), 10-19.

Garcia-Coll, C., & Magnusson, K. (2000). Cultural differences as sources of developmental vulnerabilities and resources. In J. P. Shonkoff & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (2nd ed., pp. 94-114). New York: Cambridge University Press.

Gavidia-Payne, S., & Hudson, A. (2002). Behavioral supports for parents of children with an intellectual disability and problem behaviors: An overview of the literature. *Journal of Intellectual and Developmental Disability, 27,* 31–55.

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

Glenn, S., Cunningham, C., Poole, H., Reeves, D., & Weindling, M. (2008). Maternal parenting stress and its correlates in families with a young child with cerebral palsy. *Child: Care, Health, and Development, 35*(1), 71-78.

Glidden, L. M. (in press). Family well-being and children with intellectual disability. In J. H. Burack & E. Zigler (Eds.), *Handbook of Mental Retardation and Development* (2nd ed.). Oxford University Press.

Glidden, L. M., Billings, F. J., & Jobe, B. M. (2006). Personality, coping style and well-being of parents rearing children with developmental disabilities. *Journal of Intellectual Disability Research, 50*(12), 949-962.

Glidden, L. M., & Natcher, A. L. (2009). Coping strategy use, personality, and adjustment of parents rearing children with developmental disabilities. *Journal of Intellectual Disability Research, 53*(12), 998-1013. doi:10.1111/j.1365-2788.2009.01217.x

Goldberg, S., Marcovitch, S., MacGregor, D., & Lojkasek, M. (1986). Family responses to developmentally delayed preschoolers: Etiology and the father's role. *American Journal of Mental Deficiency, 90*(6), 610-617.

Griffith, G. M., Hastings, R. P., Nash, S., & Hill, C. (2010). Using matched groups to explore child behavior problems and maternal well-being in children with Down syndrome and autism. *Journal of Autism and Developmental Disorders, 40*(5), 610-619. doi:10.1007/s10803-009-0906-1

Guralnick, M. J. (2006). Peer relationships and the mental health of young children with intellectual delays. *Journal of Policy and Practice in Intellectual Disabilities, 3*(1), 49-56. doi:10.1111/j.1741-1130.2006.00052.x

Hadadian, A. (1994). Stress and social support in fathers and mothers of young children with and without disabilities. *Early Education and Development, 5*(3), 226-235. doi:10.1207/s15566935eed0503_4

Hanson, M. J., & Hanline, M. F. (1990). Parenting a child with a disability: A longitudinal study of parental stress and adaptation. *Journal of Early Intervention: Special Issue: Families, 14*(3), 234-248. doi:10.1177/105381519001400305

Harrison, P. L., & Boan, C. H. (2000). Assessment of adaptive behavior. In B. A. Bracken (Ed.) *Psychoeducational Assessment of Preschool Children* (pp.124-144). Needham Heights, MA: Allyn & Bacon.

Hassall, R., Rose, J., & McDonald, J. (2005). Parenting stress in mothers of children with an intellectual disability: The effects of parental cognitions in relation to child characteristics and family support. *Journal of Intellectual Disability Research, 49*(6), 405-418. doi:10.1111/j.1365-2788.2005.00673.x

Hastings, R. P. (2003). Child behavior problems and partner mental health as correlates of stress in mothers and fathers of children with autism. *Journal of Intellectual Disability Research, 47*, 231-237.

Hastings, R. P. and Beck, A. (2004). Practitioner review: Stress intervention for parents of children with intellectual disabilities. *Journal of Child Psychology and Psychiatry, 45,* 1338–1349. doi: 10.1111/j.1469-7610.2004.00357.x

Hastings, R. P., & Johnson, E. (2001). Stress in UK families conducting intensive home-based behavioral intervention for their young child with autism. *Journal of Autism and Developmental Disorders, 31*(3), 327-336. doi:10.1023/A:1010799320795

Hastings, R. P., Kovshoff, H., Ward, N. J., degli Espinosa, F., Brown, T., & Remington, B. (2005). Systems analysis of stress and positive perceptions in mothers and

fathers of pre-school children with autism. *Journal of Autism and Developmental Disorders, 35*(5), 635-644. doi:10.1007/s10803-005-0007-8

Hauser-Cram, P., & Howell, A. (2003). Disabilities and development. In R. M. Lerner, M. A. Easterbrooks, & J. Mistry (Eds.), *Handbook of psychology: Developmental psychology* (Vol. 6, pp. 513-533). Hoboken, NJ: John Wiley & Sons, Inc.

Hauser-Cram, P., Cannarella, A., Tillinger, M., & Woodman, A. C. (in press). Disabilities and development. In R. M. Lerner, A. Easterbrooks, & J. Mistry (Eds.), *Handbook of Psychology, Vol. 6: Developmental Psychology* (2nd ed.).

Hauser-Cram, P., Warfield, M. E., Shonkoff, J. P., & Krauss, M. W. (2001). Children with disabilities: A longitudinal study of child development and parent well-being. *Monographs of the Society for Research in Child Development, 66*(3), 1-131.

Heller, T., Hsieh, K., & Rowitz, L. (1997). Maternal and paternal caregiving of persons with mental retardation across the lifespan. *Family Relations: An Interdisciplinary Journal of Applied Family Studies, 46*(4), 407-415. doi:10.2307/585100

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

Hill, R. (1949). *Families under stress: Adjustment to the crises of war separation and return*. Oxford, England: Harper.

Hill, C., & Rose, J. (2010). Parenting stress models and their application to parents of adults with intellectual disabilities. *British Journal of Developmental Disabilities, 56*(110, Pt1), 19-37.

Hoffman, R. G., Rodrigue, J. R., Andres, J. M., & Novak, D. A. (1995). Moderating effects of family functioning on the social adjustment of children with liver disease. *Children's Health Care, 24*(2), 107-117.

Hodapp, R. M., Dykens, E. M., & Masino, L. L. (1997). Families of children with Prader-Willi syndrome: Stress-support and relations to child characteristics. *Journal of Autism and Developmental Disorders, 27*(1), 11-24. doi:10.1023/A:1025865004299

Hogan, B. E., Linden, W., & Najarian, B. (2002). Social support interventions: Do they work? *Clinical Psychology Review, 22*, 381-440.

Holden, E. W., & Banez, G. A. (1996). Child abuse potential and parenting stress within maltreating parents. *Journal of Clinical Child Psychology, 19,* 356-364.

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research, 11*, 213-218. doi:10.1016/0022-3999(67)90010-4

Hornby, G. H. (1995). Effects on fathers of children with Down syndrome. *Journal of Child and Family Studies, 4*(2), 239-255.

Hudson, A. M., Matthews, J. M., Gavidia-Payne, S. T., Cameron, C. A., Mildon, R. L., Radler, G. A., & Nankervis, K. L. (2003). Evaluation of an intervention system for parents of children with intellectual disability and challenging behaviour. *Journal of Intellectual Disability Research, 47,* 238-249.

Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist, 60*(6), 581-592. doi: 10.1037/0003-066X.60.6.581

Innocenti, M. S., Huh, K., & Boyce, G. C. (1993). Families of children with disabilities: Normative data and other considerations on parenting stress. *Topics in Early Childhood Special Education, 12*(3), 403-427. doi:10.1177/027112149201200310

Jarvis, P. A., & Creasey, G. L. (1991). Parental stress, coping, and attachment in families with an 18-month-old infant. *Infant Behavior and Development, 14,* 383-395.

Johnston, C., Hessl, D., Blasey, C., Eliez, S., Erba, H…, & Reiss, A. (2003). Factors associated with parenting stress in mothers of children with Fragile X syndrome. *Developmental and Behavioral Pediatrics, 24*(4), 267-275.

Jones, J., & Passey, J. (2004). Family adaptation, coping and resources: Parents of children with developmental disabilities and behaviour problems. *Journal on Developmental Disabilities, 11*, 31-46.

Judge, S. L. (1998). Parental coping strategies and strengths in families of young children with disabilities. *Family Relations, 47*(3), 263-268.

Kanner, A. D., Coyne, J. C., Schaefer, C., & Lazarus, R. S. (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine, 4*, 1-39. doi:10.1007/BF00844845

Keith, T. Z., Fehrmann, P. G., Harrison, P. L., & Pottebaum, S. M. (1987). The relation between adaptive behavior and intelligence: Testing alternative explanations. *Journal of School Psychology, 25,* 31-43.

Keller, D. W. (1999). Dimensions of parenting stress of mothers and fathers of a school aged child with a disability. Unpublished doctoral dissertation, Syracuse University, Syracuse, NY.

Keller, D., & Honig, A. S. (2004). Maternal and paternal stress in families with school-aged children with disabilities. *American Journal of Orthopsychiatry, 74*(3), 337-348.

Keogh, B. K., Garnier, H. E., Bernheimer, L. P., & Gallimore, R. (2000). Models of child-family interactions for children with developmental delays: Child-driven or transactional? *American Journal on Mental Retardation, 105,* 32-46.

Ketelaar, M., Volman, M. J. M., Gorter, J. W., & Vermeer, A. (2008). Stress in parents of children with cerebral palsy: What sources of stress are we talking about? *Child Care, Health and Development, 34*(6), 85-829.

King, G. A., Zwaigenbaum, L., King, S., Baxter, D., Rosenbaum, P., & Bates, A. (2006). A qualitative investigation of changes in the belief systems of families of children with autism or Down syndrome. *Child: Care, Health and Development, 32*(3), 353-369. doi:10.1111/j.1365-2214.2006.00571.x

Kirkham, M. A. (1993). Two-year follow-up of skills training with mothers of children with disabilities. *American Journal of Mental Retardation, 97,* 509-520.

Krauss, M. W. (1993). Child-related and parenting stress: Similarities and differences between mothers and fathers of children with disabilities. *American Journal on Mental Retardation, 97*(4), 393-404.

Lakey, B., & Lutz, C. J. (1996). Social support and preventive and therapeutic interventions. In G. R. Pierce, B. R. Sarason, & I. G. Sarason (Eds.), *Handbook of social support and the family* (pp. 435–465). New York: Plenum.

Lamb, M. E. (2000). The history of research on father involvement. *Marriage & Family, 29*(2), 23-42.

Lamb, M. E., & Billings, L. A. (1997). Fathers of children with special needs. In M. E. Lamb (Ed.), *The role of the father in child development* (3rd ed., pp. 179-190). Hoboken, NJ: John Wiley & Sons Inc.

Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.

Lazarus, R. S. (1996). The role of coping in the emotions and how coping changes over the life course. In C. Maletesta-Magni & S. H. McFadden (Eds.), *Handbook of emotion, adult development, and aging* (pp. 289-306). New York: Academic Press.

Lazarus, R. S. (1984). On the primacy of cognition. *American Psychologist, 39*(2), 124-129. doi:10.1037/0003-066X.39.2.124

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

Lecavalier, L., Leone, S., & Wiltz, J. (2006). The impact of behaviour problems on caregiver stress in young people with autism spectrum disorders. *Journal of Intellectual Disability Research, 50*(3), 172-183. doi:10.1111/j.1365-2788.2005.00732.x

Lopez, V., Clifford, T., Minnes, P., & Ouellette-Kuntz, H. (2008). Parental stress and coping in families of children with and without developmental delays. *Journal on Developmental Disabilities, 14*, 99-104.

Neece, C., & Baker, B. (2008). Predicting maternal parenting stress in middle childhood: the roles of child intellectual status, behavior problems and social skills. *Journal of Intellectual Disability Research, 52,* 1114-1128.

Margalit, M., & Ankonina, D. B. (1991). Positive and negative affect in parenting disabled children. *Counseling Psychology Quarterly, 4*, 289-299. doi:10.1080/09515079108254437

Margalit, M., & Kleitman, T. (2006). Mothers' stress, resilience and early intervention. *European Journal of Special Needs Education, 21*(3), 269-283. doi:10.1080/08856250600810682

McBride, B. A., & Mills, G. (1994). A comparison of mother and father involvement with their preschool age children. *Early Childhood Research Quarterly, 8,* 457-477.

McCarthy, D. (1972). *McCarthy Scales of Children's Abilities.* New York: Psychological Corp.

McCubbin, H. I., Olson, D. H., & Patterson, J. M. (1983). Beyond family crisis: Family adaptation. In J. Trost (Ed.), *Families in disaster.* Sweden: International Library.

McCubbin, H. I., & Patterson, J. M. (1982). Family adaptation in crisis. In H. McCubbin, A. Cauble, & J. Patterson (Eds.), *Family stress, coping, and social support*. Springfield, IL: Charles C. Thomas.

McCubbin, H. I., & Patterson, J. M. (1983). The family stress process: The double ABCX Model of family adjustment and adaptation. *Marriage and Family Review, 6,* 7-37.

McKinney, B., & Peterson, R. A. (1984). Parenting stress index. In D. J. Keyser & R. C. Sweetland (Eds.), *Test critiques* (pp. 504-510). Kansas City, MO: Test Corporation of America.

Middleton, H. A., Keene, R. G., & Brown, G. W. (1990). Convergent and discriminant validities of the Scale of Independent Behavior and the revised Vineland Adaptive Behavior Scales. *American Journal on Mental Retardation, 94*(6), 669-673.

Miller, C. A., Gordon, R. M., Daniele, R. J., & Diller, L. (1992). Stress, appraisal, and coping in mothers of disabled and nondisabled children. *Journal of Pediatric Psychology: Special Issue: Theory-driven research in pediatric psychology, 17,* 587-605.

Minnes, P. M. (1988). Family stress associated with a developmentally handicapped child. *International Review of Research on Mental Retardation, 15,* 195-226.

Minnes, P., Woodford, L., & Passey, J. (2007). Mediators of well-being in ageing family carers of adults with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities, 20*(6), 539-552. doi:10.1111/j.1468-3148.2007.00364.x

Minuchin, P. (1985). Families and individual development: Provocations from the field of family therapy. *Child Development, 56*(2), 289-302. doi:10.2307/1129720

Mitchell, R. E., & Trickett, E. J. (1980). Task force report: Social networks as mediators of social support: An analysis of the effects and determinants of social networks. *Community Mental Health Journal, 16*, 27-44. doi:10.1007/BF00780665

Moes, D., Koegel, R. L., Schreibman, L., & Loos, L. M. (1992). Stress profiles for mothers and fathers of children with autism. *Psychological Reports, 71*(3), 1272-1274. doi:10.2466/PR0.71.8.1272-1274

Moos, R. H. (1974). Determinants of physiological responses to symbolic stimuli: The role of the social environment. *International Journal of Psychiatry in Medicine, 5*, 389-399.

Moos, R. H., & Moos, B. S. (1986). *Family environment scale manual* (2nd Ed.). Palo Alto, CA: Consulting Psychologists Press.

Moos, R. H., & Moos, B. S. (1981). *Family environment scale manual*. Palo Alto, CA: Consulting Psychologists Press.

Morgan, J., Robinson, D., & Aldridge, J. (2002). Parenting stress and externalizing child behaviour. *Child & Family Social Work, 7*(3), 219-225. doi:10.1046/j.1365-2206.2002.00242.x

Morris, J. A. B., Blount, R. L., Cohen, L. C., Frank, N. C., Madan-Swain, A., & Brown, R. T. (1997). Family functioning and behavioral adjustment in children with leukemia and their healthy peers. *Children's Health Care, 26*, 61-75. doi:10.1207/s15326888chc2602_1

Most, D. E., Fidler, D. J., Laforce-Booth, C., & Kelly, J. (2006). Stress trajectories in mothers of young children with Down syndrome. *Journal of Intellectual Disability Research, 50*(7), 501-514. doi:10.1111/j.1365-2788.2006.00796.x

Nachshen, J. S., Garcin, N., & Minnes, P. (2005). Problem behavior in children with intellectual disabilities: Parenting stress, empowerment and school services. *Mental Health Aspects of Developmental Disabilities, 8*(4), 105-114.

Neece, C., & Baker, B. (2008). Predicting maternal parenting stress in middle childhood: The roles of child intellectual status, behaviour problems and social skills. *Journal of Intellectual Disability Research, 52*(12), 1114-1128. doi:10.1111/j.1365-2788.2008.01071.x

Noh, S., Dumas, J. E., Wolf, L. C., & Fisman, S. N. (1989). Delineating sources of stress in parents of exceptional children. *Family Relations: An Interdisciplinary Journal of Applied Family Studies, 38*(4), 456-461. doi:10.2307/585753

Oelofsen, N., & Richardson, P. (2006). Sense of coherence and parenting stress in mothers and fathers of preschool children with developmental disability. *Journal of Intellectual and Developmental Disability, 31*(1), 1-12.

Olsson, M. B., & Hwang, C. P. (2001). Depression in mothers and fathers of children with intellectual disability. *Journal of Intellectual Disability Research: Special Issue: Mental Health and Intellectual Disability, 45*(6), 535-543. doi:10.1046/j.1365-2788.2001.00372.x

Osborne, J. W. & Overbay, A. (2004). The power of outliers (and why researchers should always check for them). [online] Available at: http://PAREonline.net/getvn.asp?v=9&n=6 [Accessed 10 Mar 2011]

Orr, R. R., Cameron, S. J., Dobson, L. A., & Day, D. M. (1993). Age related changes in stress experiences by families with a child who has developmental delays. *Mental Retardation, 31,* 171-176.

Parker, J. D., Endler, N. S., & Bagby, R. M. (1993). If it changes, it might be unstable: Examining the factor structure of the ways of coping questionnaire. *Psychological Assessment, 5*(3), 361-368. doi:10.1037/1040-3590.5.3.361

Paskiewicz (2009). A comparison of adaptive behavior skills and IQ in three populations: Children with learning disabilities, mental retardation, and autism. Unpublished doctoral dissertation, Temple University, Philadelphia, PA.

Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *Antisocial boys.* Eugene, OR: Castalia.

Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19,* 2-21.

Pelchat, D., Bisson, J., Ricard, N., Perreault, M., & Bouchard, J.-M. (1999). Longitudinal effects of an early family intervention programme on the adaptation of parents of children with a disability. *International Journal of Nursing Studies, 36,* 465-477.

Perry, A. (2004). A model of stress in families of children with developmental disabilities: Clinical and research applications. *Journal on Developmental Disabilities, 11*, 1-16.

Perry, A., & Condillac, R. A. (2010). The TRE-ADD preschool parent training program: Program evaluation of an innovative service delivery model. *Journal on Developmental Disabilities, 16*, 8-16.

Perry, A., Harris, K., & Minnes, P. (2004). Family environments and family harmony: An exploration across severity, age, and type of DD. *Journal on Developmental Disabilities, 11*, 17-29.

Perry, A., & Factor, D. C. (1989). Psychometric validity and clinical usefulness of the Vineland Adaptive Behavior Scales and the AAMD Adaptive Behavior Scale for an autistic sample. *Journal of Autism and Developmental Disorders, 19*(1), 41-55.

Pett, M. A., Vaughncole, B., & Wamplod, B. E. (1994). Maternal employment and perceived stress: Their impact of children's adjustment and mother-child interaction in young divorced and married families. *Family Relations, 43,* 51-158.

Plant, K. M., & Sanders, M. R. (2007). Predictors of care-giver stress in families of preschool-aged children with developmental disabilities. *Journal of Intellectual Disability Research, 51*(2), 109-124. doi:10.1111/j.1365-2788.2006.00829.x

Platt, L. O., Kamphaus, R. W., Cole, R. W., & Smith, C. L. (1991). Relationship between adaptive behavior and intelligence: Additional evidence. *Psychological Reports, 68,* 139-145.

Quine, L., & Pahl, J. (1991). Stress and coping in mothers caring for a child with severe learning difficulties: A test of Lazarus' transactional model of coping. *Journal of Community & Applied Social Psychology, 1*(1), 57-70. doi:10.1002/casp.2450010109

Raudenbush, S., Bryk, A. & Congdon, R. (2008). HLM (Version 6). Lincolnwood, IL: Scientific Software International.

Reddon, J. E., McDonald, L., & Kysela, G. M. (1992). Parental coping and family stress: I. resources for and functioning of families with a preschool child having a developmental disability. *Early Child Development and Care, 83*, 1-26. doi:10.1080/0300443920830101

Reiss, S. (1990). Prevalence of dual diagnosis in community-based day programs in the Chicago metropolitan area. *American Journal of Mental Retardation, 84,* 578-585.

Roach, M. A., Orsmond, G. I., & Barratt, M. S. (1999). Mothers and fathers of children with Down syndrome: Parental stress and involvement in childcare. *American Journal on Mental Retardation, 104*(5), 422-436. doi:10.1352/0895-8017(1999)104<0422:MAFOCW>2.0.CO;2

Roberts, C., Mazzucchelli, T., Studman, L., & Sanders, M. R. (2006). Behavioral family intervention for children with developmental disabilities and behavioral problems. *Journal of Clinical Child and Adolescent Psychology, 35*(2), 180-193.

Roberts, C. M., Mazzucchelli, T., Taylor, K., & Reid, R. (2003). Early intervention for children with challenging behavior and developmental disabilities. *International Journal of Disability, Development and Education, 50,* 275–292.

Rodrigue, J. R., Morgan, S. B., & Geffken, G. R. (1992). Psychosocial adaptation of fathers of children with autism, Down syndrome, and normal development.

*Journal of Autism and Developmental Disorders, 22*(2), 249-263. doi:10.1007/BF01058154

Roszkowski, M. J., & Bean, A. G. (1980). The Adaptive Behavior Scale (ABS) and IQ: How much unshared variance is there? *Psychology in the Schools, 17,* 452-459.

Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin, 116,* 55-74.

Salt, J., Shemilt, J., Sellars, V., Boyd, S., Coulson, T., & McCool, S. (2002). The Scottish Centre for Autism Preschool Treatment Programme, II: The results of a controlled treatment outcome study. *Autism, 6,* 33-46.

Sanders, M. R., & Markie-Dadds, C. (2002). Behavioral family interventions with children. In F. W. Kaslow & T. Patterson (Eds.), *Comprehensive handbook of psychotherapy, Vol. 2: Cognitive-behavioral approaches* (pp. 3-30). Hoboken, NJ: John Wiley & Sons Inc.

Sanders, J. L., & Morgan, S. B. (1997). Family stress and adjustment as perceived by parents of children with autism or Down syndrome: Implications for intervention. *Child & Family Behavior Therapy, 19,* 15-32. doi:10.1300/J019v19n04_02

Sanford, K., Bingham, C. R., & Zucker, R. A. (1999). Validity issues with the Family Environment Scale: Psychometric resolution and research application with alcoholic families. *Psychological Assessment, 11*(3), 315-325.

Sameroff, A., & Chandler, M. (1975). Reproductive risk and the continuum of caretaking casualty. In F. Horowitz (Ed.), *Review of child development research* (Vol. 4, pp. 187-243). Chicago: University of Chicago Press.

Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the life experiences survey. *Journal of Consulting and Clinical Psychology, 46*(5), 932-946. doi:10.1037/0022-006X.46.5.932

Schafer, J. L. (1997). *Analysis of incomplete multivariate data.* New York: Chapman and Hall.

Schultz, C. L., Schultz, N. C., Bruce, E. J., & Smyrnios, K. X. (1993). Psychoeducational support for parents of children with intellectual disability: An outcome study. *International Journal of Disability, Development and Education, 40*(3), 205-216.

Scott, J., & Alwin, D. F. (1989). Gender differences in parental strain: Parental role or gender role? *Journal of Family Issues, 10,* 482-503.

Scott, B. S., Atkinson, L., Minton, H. L., & Bowman, T. (1997). Psychological distress of parents of infants with Down syndrome. *American Journal on Mental Retardation, 102*(2), 161-171. doi:10.1352/0895-8017(1997)102<0161:PDOPOI>2.0.CO;2

Shonkoff, J. P., Hauser-Cram, P., Krauss, M. W., & Upshur, C. C. (1992). Development of infants with disabilities and their families: Implications for theory and service delivery. *Monographs of the Society for Research in Child Development, 57*, v-153. doi:10.2307/1166087

Seltzer, M. M., Greenberg, J. S., & Krauss, M. W. (1995). A comparison of coping strategies of aging mothers of adults with mental illness or mental retardation. *Psychology and Aging, 10*(1), 64-75.

Selye, H. (1980). The stress concept today. In I. Kutash & L. B. Schlesingerand Associates (Eds.), *Handbook on stress and anxiety: Contemporary knowledge, theory and treatment* (pp. 127-144). San Francisco: Jossey-Bass.

Sharpley, C. F., Bitsika, V., & Efremidis, B. (1997). Influence of gender, parental health, and perceived expertise of assistance upon stress, anxiety, and depression among parents of children with autism. *Journal of Intellectual and Developmental Disability, 22*(1), 19-28. doi:10.1080/13668259700033261

Shonkoff, J. P., Hauser-Cram, P., Krauss, M. W., & Upshur, C. C. (1992). Development of infants with disabilities and their families: Implications for theory and service delivery. *Monographs of the Society for Research in Child Development, 57(6)[230]*, 5-153.

Simon, R. W. (1992). Parental role strains, salience of parental identity and gender differences in psychological distress. *Journal of Health and Social Behavior, 33*(1), 25-35. doi:10.2307/2136855

Singer, G. H. S., Ethridge, B. L., & Aldana, S. I. (2007). Primary and secondary effects of parenting and stress management interventions for parents of children with developmental disabilities: A meta-analysis. *Mental Retardation and Developmental Disabilities Research Reviews, 13,* 357-369.

Singer, G. H. S., Marquis, J., Powers, L. K., Blanchard, L., Divenere, N., Santelli, B., Ainbinder, J. G., & Sharp, M. (1999). A multi-site evaluation of parent to parent programs for parents of children with disabilities. *Journal of Early Intervention, 22,* 217–229.

Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin, 129*(2), 216-269.

Skok, A., Harvey, D., & Reddihough, D. (2006). Perceived stress, perceived social support, and wellbeing among mothers of school-aged children with cerebral palsy. *Journal of Intellectual and Developmental Disability, 31*(1), 53-57. doi:10.1080/13668250600561929

Sloper, P., Knussen, C., Turner, S., & Cunningham, C. C. (1991). Factors related to stress and satisfaction with life in families of children with Down's syndrome. *Journal of Child Psychology and Psychiatry, 32*(4), 655-676. doi:10.1111/j.1469-7610.1991.tb00342.x

Smith, T. B., Innocenti, M. S., Boyce, G. C., & Smith, C. S. (1993). Depressive symptomatology and interaction behaviors of mothers having a child with disabilities. *Psychological Reports, 73,* 1184-1186.

Smith, T. B., Oliver, M. N. I., & Innocenti, M. A. (1999). Parenting stress in families of children with disabilities. *American Journal of Orthopsychiatry, 71*(2), 257-261.

Smith, L. E., Seltzer, M. M., Tager-Flusberg, H., Greenberg, J. S., & Carter, A. S. (2008). A comparative analysis of well-being and coping among mothers of toddlers and

mothers of adolescents with ASD. *Journal of Autism and Developmental Disorders, 38*(5), 876-889.

Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (1984). *The Vineland Adaptive Behavior Scales-Interview form.* Circle Pines, MN: American Guidance Service.

Spratt, E. G., Saylor, C. F., & Macias, M. M. (2007). Assessing parenting stress in multiple samples of children with special needs (CSN). *Families, Schools, & Health, 25*(4), 435-449.

Stoneman, Z., Brody, G. H., & Burke, M. (1989). Marital quality, depression, and inconsistent parenting: Relationship with observed mother-child conflict. *American Journal of Orthopsychiatry, 59*(1), 105-117.

Tamres, L. K., Janicki, D., & Helgeson, V. S. (2002). Sex differences in coping behavior: A meta-analytic review and an examination of relative coping. *Personality and Social Psychology Review, 6*(1), 2-30.

Taylor, R. D., Roberts, D., & Jacobson, L. (1997). Stressful life events, psychological well-being and parenting in African-American mothers. *Journal of Family Psychology, 11, 436-446.*

Thompson, R. O., Goldstein, R. F., Oehler, J. M., Gustafsm, K. E., Catlett, A. T., & Brazy, J. E. (1994). Developmental outcome of very low birthweight infants as a function of biological risk and psychosocial risk. *Journal of developmental and Behavioral Pediatrics, 15,* 232-238.

Thorndike, R., Hagen, E., & Sattler, J. (1986). *Stanford-Binet Intelligence Scale, fourth edition.* Chicago: The Riverside Publishing Company.

Tonge, B. J., & Einfeld, S. L. (2000). The trajectory of psychiatric disorders in young people with intellectual disabilities. *Australian and New Zealand Journal of Psychiatry, 34,* 80-84.

Tonge, B. J., & Einfeld, S. L. (2003). Psychopathology and intellectual disability: the Australian child to adult longitudinal study. *International Review of Research in Developmental Disabilities, 26,* 61-91.

Totsika, V., & Hastings, R. P. (2009). Persistent challenging behaviour in people with an intellectual disability. *Current Opinion in Psychiatry, 22,* 437-441.

Totsika, V., Hastings, R. P., Emerson, E., Lancaster, G. A., & Berridge, D. M. (2011). A population-based investigation of behavioural and emotional problems and maternal mental health: Associations with autism spectrum disorder and intellectual disability. *Journal of Child Psychology and Psychiatry, 52*(1), 91-99. doi:10.1111/j.1469-7610.2010.02295.x

Trute, B., & Hiebert-Murphy, D. (2002). Family adjustment to childhood developmental disability: A measure of parent appraisal of family impacts. *Journal of Pediatric Psychology, 27*(3), 271-280. doi:10.1093/jpepsy/27.3.271

U.S. bureau of the Census. (1992). *Survey of income and program participation 1991 panel: Technical documentation* (June 1992 revision). Washington, DC: U.S. Department of Commerce.

Vadasy, P.F., Fewell, R.R., Meyer, D.J., & Greenberg, M.T. (1985). Supporting fathers of handicapped young children: Preliminary findings of program effects. *Analysis and Intervention in Developmental Disabilities, 5,* 151–163.

Wanamaker, C. E., & Glenwick, D. S. (1998). Stress, coping, and perceptions of child behavior in parents of preschoolers with cerebral palsy. *Rehabilitation Psychology, 43*, 297-312. doi:10.1037/0090-5550.43.4.297

Warfield, M. E., Krauss, M. W., Hauser-Cram, P., Upshur, C. C., & Shonkoff, J. P. (1999). Adaptation during early childhood among mothers of children with disabilities. *Journal of Developmental and Behavioral Pediatrics, 20*(1), 9-16. doi:10.1097/00004703-199902000-00002

Webster-Stratton, C., Reid, M. J., & Hammond, M. (2004). Treating children with early-onset conduct problems: Intervention outcomes for parent, child and teacher training. *Journal of Clinical Child and Adolescent Psychology, 33,* 105–124.

Widaman, K. F. (2006). Best practices in quantitative methods for developmentalists: Missing data: What to do with or without them. *Monographs of the Society for Research in Child Development, 71*(3), 42-64. doi:10.1111/j.1540-5834.2006.00404.x

# Appendix

Figure 1

*Conceptual Model*

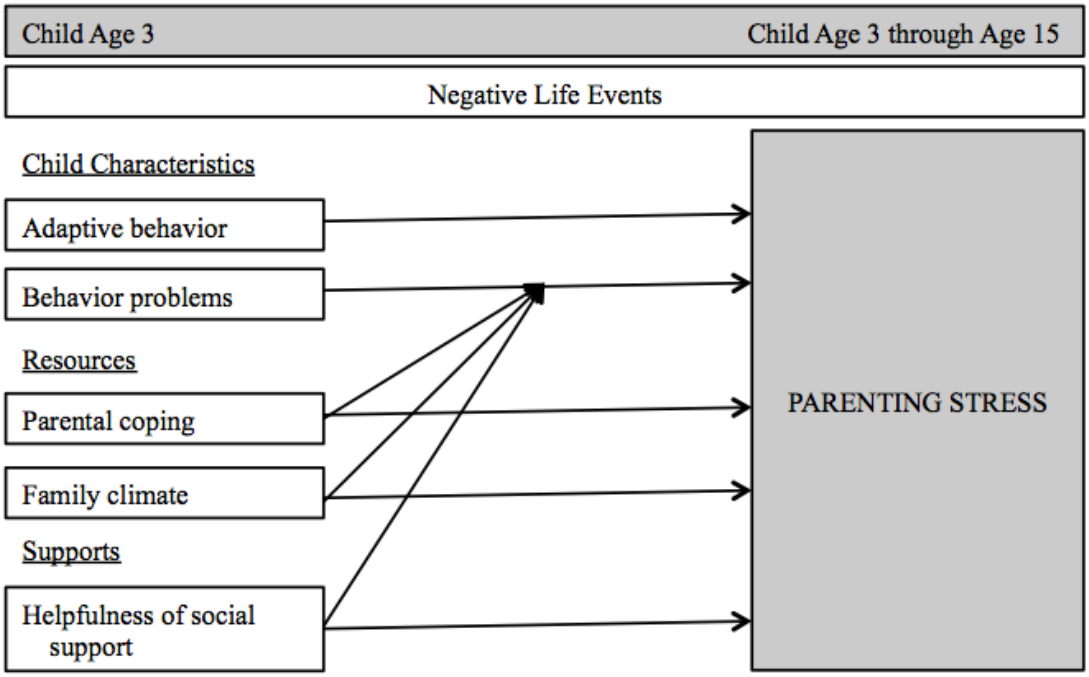

Figure 2

*McCubbin & Patterson's (1983) Double ABCX Model of Adjustment and Adaptation*

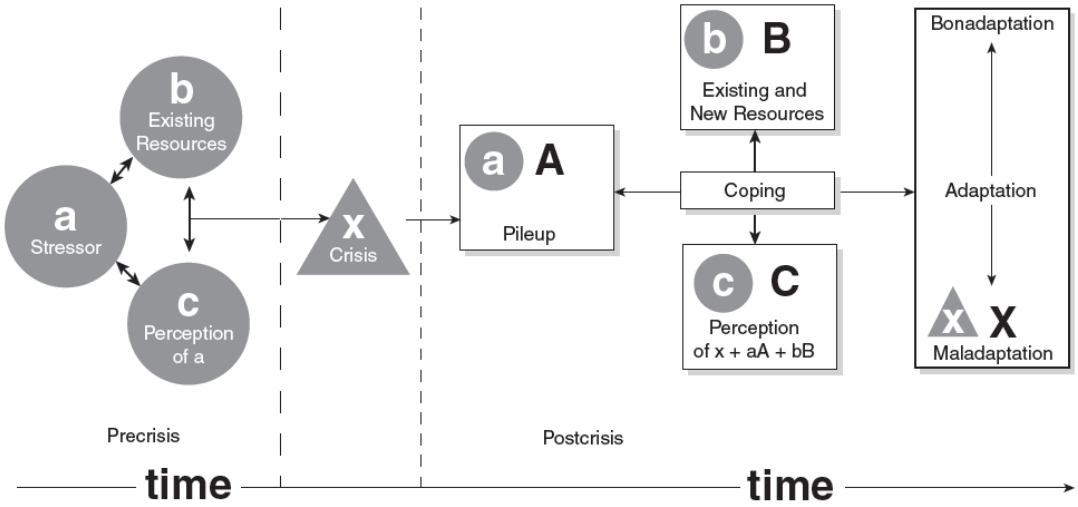


Figure 3

*Perry's Model of Stress in Families of Children with Developmental Disabilities*

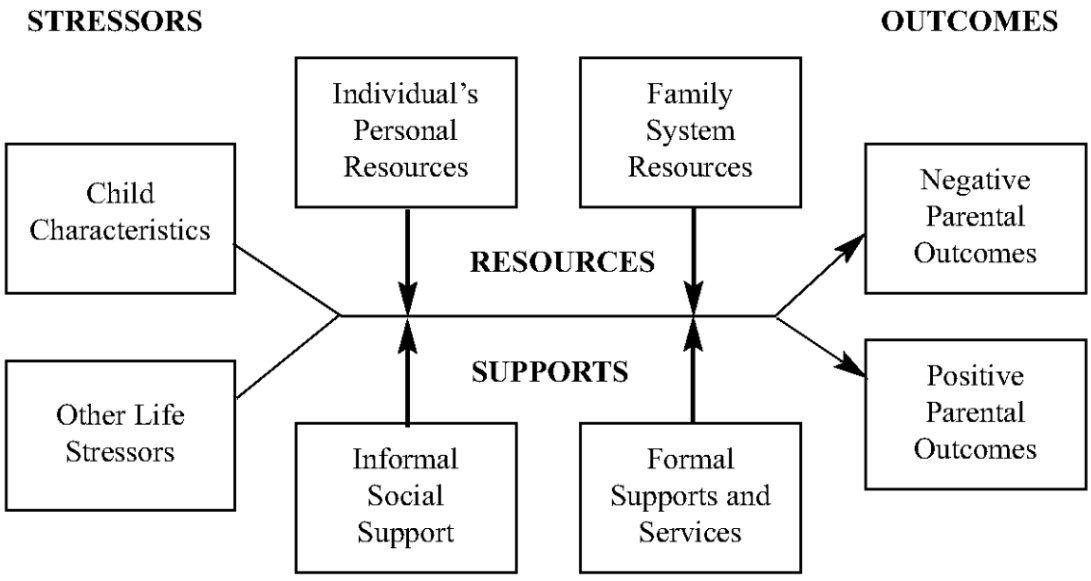

Table 1

*Demographic Characteristics of Participants at T3 (N=159 families)*

| | % | Mean (SD) |
|---|---|---|
| Child | | |
| Type of disability | | |
| Down syndrome | 30% | |
| Motor impairment | 39% | |
| Developmental delay of unknown etiology | 32% | |
| Gender | | |
| Male | 56% | |
| Racial/ethnic origin | | |
| European American | 90% | |
| African American | 2% | |
| Hispanic | 4% | |
| Mixed race/other | 4% | |
| Lives with both parents | 83% | |
| First born | 42% | |
| Family | | |
| Income (1989-1991) | | |
| Less than 10K | 15% | |
| Between 10K and 20K | 10% | |
| Between 20K and 30K | 22% | |
| More than 30K | 54% | |
| Number of children | | 2.23 (1.01) |
| Mother | | |
| Marital status (married) | 82% | |
| Employed (employed) | 47% | |
| Education (years) | | 13.98 (2.38) |
| Age (years) | | 31.70 (4.87) |
| Father | | |
| Marital status (married) | 84% | |
| Employed (employed) | 93% | |
| Education (years) | | 13.96 (3.13) |
| Age (years) | | 33.85 (5.64) |

Table 2

*List of Measures*

| Construct | Measure | Reporter | Time Points | Cronbach's Alpha |
|---|---|---|---|---|
| Parent educational attainment | Demographic questionnaire | Mother, father | 5, 10, 15 | n/a |
| Family income | Demographic questionnaire | Mother | 3, 5, 10, 15 | n/a |
| Negative life events | Life Events Scale (Abidin, 1995) | Mother, father | 3, 5, 10, 15 | n/a |
| Child adaptive behavior | Vineland Adaptive Behavior Scales-Interview Form (VABS; Sparrow, Balla, & Cicchetti, 1984) | Mother | 3, 5, 10, 15 | .97 - .99 |
| Child behavior problems | Child Behavior Checklist (Abidin, 1987) | Mother | 3, 5, 10, 15 | .93 - .99 |
| Parental coping | Ways of Coping Checklist (Lazarus & Folkman, 1988) | Mother, father | 3 | .69 - .83 |
| Parental social support | Family Support Scale (FSS; Dunst, Jenkins, & Trivette, 1984) | Mother, father | 3 | .89 - .93 |
| Family climate | Family Environment Scale-Relationship Domain (FES; Moos & Moos, 1986) | Mother, father | 3 | .69 - .70 |
| Parenting stress | Parenting Stress Index-Parent Domain (Abidin, 1995) | Mother, father | 3, 5, 10, 15 | .91 - .94 |

Table 3

*Percentage of Missing Data for Mother and Child Data at each Time Point (N=147 at T3)*

| Construct | T3 | T5 | T10 | T15 |
|---|---|---|---|---|
| Family income | 3.4% | 13.6% | 21.8% | 32.7% |
| Negative life events | 0% | 23.1% | 21.8% | 30.6% |
| Child adaptive behavior | 0.7% | 11.6% | 19.0% | 27.2% |
| Child behavior problems | 0.7% | 13.6% | 19.7% | 28.6% |
| Parental coping | 2.0% | -- | -- | -- |
| Parental social support | 11.6% | -- | -- | -- |
| Family climate | 1.4% | -- | -- | -- |
| Parenting stress | 0% | 23.8% | 31.3% | 31.3% |

Table 4

*Percentage of Missing Data for Father Data at each Time Point (N=110 at T3)*

| Construct | T3 | T5 | T10 | T15 |
|---|---|---|---|---|
| Negative life events | 0% | 25.5% | 37.3% | 38.2% |
| Parental coping | 3.6% | -- | -- | -- |
| Parental social support | 10.9% | -- | -- | -- |
| Family climate | 2.7% | -- | -- | -- |
| Parenting stress | 0% | 27.3% | 39.1% | 38.2% |

Table 5

*Measures used for Multiple Imputation*

| Construct | Measure | Reporter | Time Points |
|---|---|---|---|
| Parent educational attainment | Demographic questionnaire | Mother, father | 1, 3, 10, 15, 18 |
| Family income | Demographic questionnaire | Mother | 1, 2, 3, 5, 10, 15, 18 |
| Negative life events | Life Events Scale (Abidin, 1995) | Mother, father | 3, 5, 10, 15 |
| Child adaptive behavior | Vineland Adaptive Behavior Scales-Interview Form (VABS; Sparrow, Balla, & Cicchetti, 1984) | Mother | 1, 2, 3, 5, 10, 15, 18 |
| Child behavior problems | Child Behavior Checklist (Abidin, 1987) | Mother | 2, 3, 5, 10, 15, 18 |
| Child cognitive skills | Bayley Scales of Infant Development (Bayley, 1969); McCarthy Scales of Children's Abilities (McCarthy, 1972); Stanford-Binet Intelligence Scale (Thorndike, Hagen, & Sattler, 1986) | Child assessment | 1, 2, 3, 5, 10, 15, 18 |
| Parental coping | Ways of Coping Checklist (Lazarus & Folkman, 1988) | Mother, father | 3 |
| Parental social support | Family Support Scale (FSS; Dunst, Jenkins, & Trivette, 1984) | Mother, father | 1, 2, 3, 5 |
| Family climate | Family Environment Scale-Relationship Domain (FES; Moos & Moos, 1986) | Mother, father | 3 |
| Parenting stress | Parenting Stress Index-Parent Domain (Abidin, 1995) | Mother, father | 1, 2, 3, 5, 10, 15 |

Table 6

*Descriptive Statistics for Predictor and Outcome Variables – Mothers (N=147)*

| | M | SD | Min | Max |
|---|---|---|---|---|
| Parenting Stress Index-Parent Domain | | | | |
| Age 3 | 121.86 | 24.28 | 69.00 | 183.00 |
| Age 5 | 121.27 | 21.22 | 71.00 | 169.00 |
| Age 10 | 122.08 | 20.34 | 71.00 | 177.00 |
| Age 15 | 111.08 | 21.50 | 65.00 | 173.00 |
| Years of Education | 14.13 | 2.38 | 9.00 | 21.00 |
| Family Income | 0.00 | 0.95 | -2.17 | 0.99 |
| Negative Life Events | | | | |
| Age 3 | 1.05 | 1.40 | 0.00 | 7.00 |
| Age 5 | 1.26 | 2.36 | 0.00 | 6.00 |
| Age 10 | 1.26 | 2.06 | 0.00 | 6.00 |
| Age 15 | 1.72 | 1.60 | 0.00 | 7.00 |
| Child Behavior Checklist | | | | |
| Age 3 | 50.32 | 9.45 | 28.00 | 79.00 |
| Age 5 | 50.08 | 11.43 | 28.00 | 81.00 |
| Age 10 | 57.15 | 10.43 | 34.00 | 84.00 |
| Age 15 | 56.00 | 11.24 | 32.00 | 82.00 |
| Vineland Adaptive Behavior Scales-Adaptive Behavior Composite | | | | |
| Age 3 | 65.61 | 13.41 | 41.00 | 106.00 |
| Age 5 | 59.67 | 16.03 | 30.00 | 104.0 |
| Age 10 | 51.56 | 19.76 | 19.00 | 96.00 |
| Age 15 | 48.70 | 23.05 | 19.00 | 115.00 |
| Ways of Coping Questionnaire | | | | |
| Distancing/avoidance | 11.25 | 6.60 | 0.00 | 31.00 |
| Confrontive/seeking social support | 14.17 | 3.93 | 6.00 | 23.00 |
| Problem-focused coping | 15.04 | 5.05 | 5.00 | 27.00 |
| Denial | 4.03 | 2.43 | 0.00 | 10.00 |
| Family Support Scale | 23.03 | 8.21 | 6.00 | 44.00 |
| Family Environment Scale-Relationship Dimension | 11.29 | 3.66 | 0.00 | 17.00 |

Table 7

*Descriptive Statistics for Predictor and Outcome Variables – Fathers (N=110)*

| | M | SD | Min | Max |
|---|---|---|---|---|
| Parenting Stress Index-Parent Domain | | | | |
| Age 3 | 119.20 | 24.42 | 72.00 | 170.00 |
| Age 5 | 122.02 | 21.54 | 77.00 | 179.00 |
| Age 10 | 122.87 | 17.83 | 80.00 | 171.00 |
| Age 15 | 116.21 | 19.89 | 67.00 | 177.00 |
| Years of Education | 14.19 | 3.22 | 8.00 | 23.00 |
| Family Income | 0.19 | 0.80 | -2.17 | 0.99 |
| Negative Life Events | | | | |
| Age 3 | 0.87 | 1.24 | 0.00 | 6.00 |
| Age 5 | 0.76 | 1.04 | 0.00 | 4.00 |
| Age 10 | 0.93 | 1.38 | 0.00 | 9.00 |
| Age 15 | 1.67 | 1.63 | 0.00 | 7.00 |
| Child Behavior Checklist | | | | |
| Age 3 | 50.36 | 9.94 | 28.00 | 79.00 |
| Age 5 | 50.56 | 11.30 | 28.00 | 81.00 |
| Age 10 | 57.31 | 10.06 | 34.00 | 84.00 |
| Age 15 | 56.03 | 11.51 | 32.00 | 82.00 |
| Vineland Adaptive Behavior Scales-Adaptive Behavior Composite | | | | |
| Age 3 | 64.41 | 13.80 | 41.00 | 106.00 |
| Age 5 | 57.61 | 15.80 | 30.00 | 104.00 |
| Age 10 | 48.83 | 19.34 | 19.00 | 96.00 |
| Age 15 | 45.85 | 22.21 | 19.00 | 114.00 |
| Ways of Coping Questionnaire | | | | |
| Distancing/avoidance | 9.95 | 6.37 | 0.00 | 27.00 |
| Confrontive/seeking social support | 12.00 | 4.48 | 3.00 | 22.00 |
| Problem-focused coping | 14.61 | 5.04 | 3.00 | 27.00 |
| Denial | 4.82 | 2.60 | 0.00 | 13.00 |
| Family Support Scale | 21.70 | 8.79 | 0.00 | 44.00 |
| Family Environment Scale-Relationship Dimension | 10.56 | 3.76 | -1.00 | 17.00 |

Table 8

*Comparison of Mothers and Fathers in the EICS Sample to Normative Data on Select Variables*

| | EICS Mothers | | Comparison Mothers | t-test | EICS Fathers | | Comparison Fathers | t-test |
|---|---|---|---|---|---|---|---|---|
| | M | SD | M | *t* | M | SD | M | *t* |
| Parenting Stress Index-Parent Domain | | | | | | | | |
| Age 3 | 121.86 | 24.28 | 122.00 | -.07 | 119.20 | 24.42 | 108.70 | 4.51*** |
| Age 5 | 121.27 | 21.22 | 123.00 | -1.04 | 122.02 | 21.54 | 112.60 | 4.54*** |
| Age 10 | 122.08 | 20.34 | 118.00 | 2.28* | 122.87 | 17.83 | -- | -- |
| Age 15 | 111.08 | 21.50 | -- | -- | 116.21 | 19.89 | -- | -- |
| Family Environment Scale | | | | | | | | |
| Cohesion | 7.47 | 1.64 | 6.61 | 6.30*** | 7.40 | 1.49 | 6.61 | 5.51*** |
| Expressiveness | 6.24 | 1.71 | 5.54 | 5.60*** | 5.79 | 1.69 | 5.54 | 2.25* |
| Conflict | 2.43 | 1.74 | 3.31 | -6.16*** | 2.64 | 1.88 | 3.31 | -3.50*** |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 9

*Comparison of Boys and Girls in the EICS Sample to Normative Data on the Child Behavior Checklist*

| | EICS Boys | | Comparison Boys | t-test | EICS Girls | | Comparison Girls | t-test |
|---|---|---|---|---|---|---|---|---|
| | M | SD | M | *t* | M | SD | M | *t* |
| Child Behavior Checklist | | | | | | | | |
| Age 3 | -- | -- | -- | -- | -- | -- | -- | -- |
| Age 5 | 50.06 | 10.73 | 50.10 | .10 | 50.02 | 10.55 | 50.10 | .09 |
| Age 10 | 57.65 | 9.18 | 50.06 | 7.60*** | 56.39 | 9.12 | 50.10 | 5.94*** |
| Age 15 | 55.62 | 9.21 | 50.00 | 5.03*** | 56.62 | 10.98 | 50.00 | 4.82*** |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 10

*Intercorrelations among Level 1 Predictors for Mothers (N=147) above the diagonal and Fathers (N=110) below the diagonal*

| Predictor | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. Negative Life Events (age 3) | -- | .19$^{*}$ | .22$^{*}$ | .25$^{**}$ | .34$^{**}$ | .28$^{**}$ | .27$^{**}$ | .23$^{*}$ |
| 2. Negative Life Events (age 5) | .23$^{*}$ | -- | .15 | .12 | .19 | .10 | .11 | .11 |
| 3. Negative Life Events (age 10) | .37$^{**}$ | .10 | -- | .13 | .24$^{*}$ | .29$^{**}$ | .30$^{**}$ | .16 |
| 4. Negative Life Events (age 15) | .31$^{**}$ | .05 | .25 | -- | .08 | .02 | .12 | .11 |
| 5. Child Behavior Checklist (age 3) | .38$^{**}$ | .22 | .25$^{*}$ | .19 | -- | .54$^{**}$ | .52$^{**}$ | .50$^{**}$ |
| 6. Child Behavior Checklist (age 5) | .30$^{**}$ | .27$^{*}$ | .33$^{**}$ | .19 | .55$^{**}$ | -- | .60$^{**}$ | .49$^{**}$ |
| 7. Child Behavior Checklist (age 10) | .29$^{**}$ | .23$^{*}$ | .31$^{**}$ | .26$^{*}$ | .55$^{**}$ | .60$^{**}$ | -- | .65$^{**}$ |
| 8. Child Behavior Checklist (age 15) | .26$^{*}$ | .24$^{*}$ | .23$^{*}$ | .26$^{*}$ | .53$^{**}$ | .52$^{**}$ | .67$^{**}$ | -- |

*$^{t}$ p < .10, * p < .05, ** p < .01, *** p < .001*

Table 11

*Intercorrelations among Level 2 Predictors for Mothers (N=147) above the diagonal and Fathers (N=110) below the diagonal*

| Predictor | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Years of Education | -- | .56** | -.13 | -.02 | -.19* | .15 | .05 | -.19* | .17* | .18* |
| 2. Family Income | .60** | -- | -.22** | -.15 | -.33** | .07 | .01 | -.26** | .16 | .25** |
| 3. Child Behavior Checklist (ages 3-15) | -.17 | -.22* | -- | -.16 | .31** | .28** | .12 | .17* | .01 | -.33** |
| 4. Vineland Adaptive Behavior Scales (ages 3-15) | -.05 | -.06 | -.14 | -- | .04 | -.15 | -.06 | .05 | -.17* | .04 |
| 5. WOC-Distancing/avoidance (age 3) | -.25** | -.29** | .24* | .07 | -- | .25** | .29** | .36** | -.06 | -.36** |
| 6. WOC-Confrontive/seeking social support (age 3) | .01 | -.15 | -.02 | .16 | .56** | -- | .62** | .01 | .31** | .03 |
| 7. WOC-Problem focused coping (age 3) | .08 | .05 | -.08 | .03 | .41** | .62** | -- | .17* | .21* | .09 |
| 8. WOC-Denial (age 3) | -.30** | -.30** | .19* | .05 | .51** | .29** | .27** | -- | -.13 | -.25** |
| 9. Family Support Scale (age 3) | .08 | .15 | -.06 | .01 | -.01 | .09 | .08 | -.11 | -- | .26** |
| 10. FES-Relationship Dimension (age 3) | .17 | .22* | -.21* | -.03 | -.37** | -.10 | .01 | -.32** | .18 | -- |

*WOC = Ways of Coping Questionnaire, FES = Family Environment Scale-Relationship Dimension*

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 12

*Correlations for Parenting Stress Index-Parent Domain Scores and Predictors for Mothers (N=147) and Fathers (N=110)*

| Predictor | PSI-Parent Domain - Mothers | | | | PSI-Parent Domain - Fathers | | | |
|---|---|---|---|---|---|---|---|---|
| | Age 3 | Age 5 | Age 10 | Age 15 | Age 3 | Age 5 | Age 10 | Age 15 |
| *Level 1* | | | | | | | | |
| Negative Life Events (age 3) | .33** | .24** | .29** | .31** | .19* | .12 | .14 | .17 |
| Negative Life Events (age 5) | .19 | .16 | .17 | .10 | .16 | .19* | .14 | .17 |
| Negative Life Events (age 10) | .23* | .16 | .29** | .21* | .13 | .05 | .16 | .13 |
| Negative Life Events (age 15) | .07 | .03 | .07 | .10 | .08 | .05 | .07 | .12 |
| Child Behavior Checklist (age 3) | .52** | .40** | .35** | .34** | .36** | .23* | .11 | .08 |
| Child Behavior Checklist (age 5) | .35** | .42** | .45** | .41** | .38** | .42** | .36** | .29** |
| Child Behavior Checklist (age 10) | .31** | .23** | .41** | .40** | .23* | .24* | .13 | .21* |
| Child Behavior Checklist (age 15) | .21 | .13 | .26* | .35** | .23 | .18 | .15 | .21* |

| Predictor | PSI-Parent Domain - Mothers | | | | PSI-Parent Domain - Fathers | | | |
|---|---|---|---|---|---|---|---|---|
| | Age 3 | Age 5 | Age 10 | Age 15 | Age 3 | Age 5 | Age 10 | Age 15 |
| *Level 2* | | | | | | | | |
| Years of Education | -.15 | -.05 | -.12 | -.15 | -.20* | -.19* | -.14 | -.22* |
| Family Income | -.29** | -.15 | -.17* | -.26** | -.21* | -.21* | -.02 | -.17 |
| Child Behavior Checklist (ages 3 – 15) | .42** | .37** | .45** | .46** | .37** | .33** | .24** | .24** |
| Vineland Adaptive Behavior Scales (ages 3 – 15) | .07 | .03 | .02 | -.02 | -.21* | -.19* | -.13 | -.21* |
| WOC-Distancing/avoidance (age 3) | .43** | .30** | .18* | .26* | .31** | .16 | .28** | .22* |
| WOC-Confrontive/seeking social support (age 3) | .01 | -.03 | .12 | .11 | -.01 | -.17 | -.10 | -.08 |
| WOC-Problem focused coping (age 3) | -.14 | -.09 | -.12 | -.09 | -.07 | -.22* | -.15 | -.09 |
| WOC-Denial (age 3) | .30** | .19* | .16 | .09 | .23* | .17 | .19* | .13 |
| Family Support Scale (age 3) | -.32** | -.22** | -.23** | -.14 | -.23* | -.17 | -.26** | -.10 |
| FES-Relationship Dimension (age 3) | -.54** | -.41** | -.37** | -.22** | -.41** | -.32** | -.29** | -.26** |

*PSI = Parenting Stress Index, WOC = Ways of Coping Questionnaire, FES = Family Environment Scale-Relationship Dimension; t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 13

*Unconditional Growth Model of Mothers' (N=147) Parenting Stress*

| *Fixed Effects* | Coefficient | S.E. |
|---|---|---|
| Intercept | 120.98 | 1.91*** |
| Age of child (linear term) | 0.10 | 0.04** |
| Age of child$^2$ (quadratic term) | -0.001 | <0.001*** |
| *Random Effects* | Variance Component | S.D. |
| Intercept (U0) | 354.22 | 18.82*** |
| Age of child (linear term) slope (U1) | 0.10 | 0.01*** |
| Level-1 (R) | 163.02 | 12.77 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Figure 4

*Average Trajectory of Parenting Stress for Mothers (N=147)*

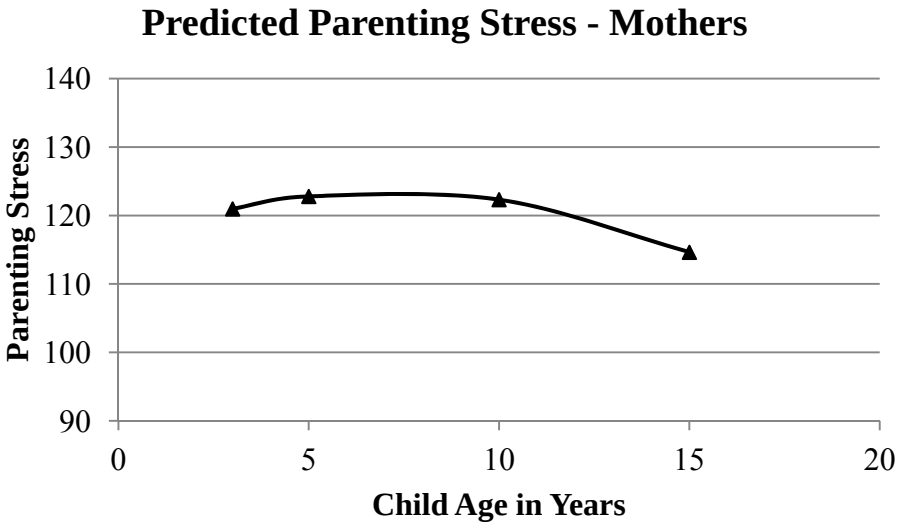

Table 14

*Unconditional Growth Model of Fathers' (N=110) Parenting Stress*

| *Fixed Effects* | Coefficient | S.E. |
|---|---|---|
| Intercept | 119.30 | 2.26*** |
| Age of child (linear term) | 0.13 | 0.05* |
| Age of child$^2$ (quadratic term) | -0.001 | <0.001** |
| *Random Effects* | Variance Component | S.D. |
| Intercept (U0) | 338.01 | 18.39*** |
| Age of child (linear term) slope (U1) | 0.004 | 0.06* |
| Level-1 (R) | 185.91 | 13.63 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Figure 5

*Average Trajectory of Parenting Stress for Fathers (N=110)*

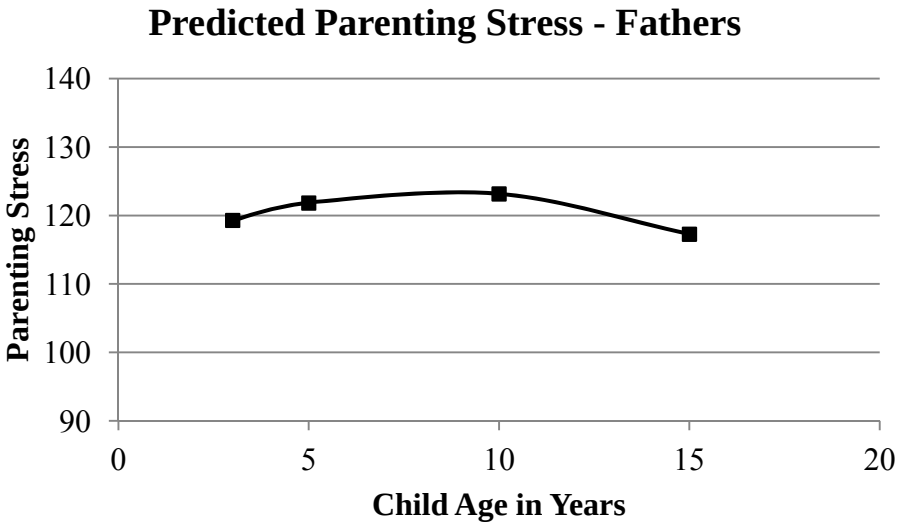

Table 15

*List of Research Hypotheses and Findings*

| Research hypothesis | Individual Parent Models | Dyad Model |
|---|---|---|
| *Hypothesis 1:* Parenting stress is expected to increase from early to middle childhood then decrease from middle childhood to adolescence. | *Mothers:* supported<br>*Fathers:* supported | *Mothers:* supported<br>*Fathers:* supported |
| *Hypothesis 2a.* Changes in child behavior problems over time will predict changes in parenting stress for mothers and fathers. More specifically, increases in child behavior problems will predict increases in parenting stress. | *Mothers:* supported<br>*Fathers:* supported | *Mothers:* supported<br>*Fathers:* supported |
| *Hypothesis 2b.* Higher levels of child behavior problems are expected to predict higher levels of parenting stress among both mothers and fathers. | *Mothers:* supported<br>*Fathers:* supported | *Mothers:* supported<br>*Fathers:* supported |
| *Hypothesis 2c.* Lower levels of child adaptive behavior are expected to predict higher levels of parenting stress among both mothers and fathers. | *Mothers:* not supported<br>*Fathers:* not supported[a] | *Mothers:* not supported<br>*Fathers:* supported |
| *Hypothesis 3a.* Lower helpfulness of social support is expected to predict higher levels of parenting stress for both mothers and fathers. | *Mothers:* supported<br>*Fathers:* supported | *Mothers:* supported<br>*Fathers:* supported |

| Research hypothesis | Individual Parent Models | Dyad Model |
|---|---|---|
| *Hypothesis 3b.* Lower quality family climate is expected to predict higher levels of parenting stress for both mothers and fathers. | *Mothers:* supported<br>*Fathers:* supported | *Mothers:* supported<br>*Fathers:* not supported |
| *Hypothesis 3c.* Higher use of Distancing/avoidance and Denial as coping strategies but lower use of Confrontive/seeking social support and Problem focused coping as coping strategies is expected to predict higher levels of parenting stress for both mothers and fathers. | *Mothers:* partially supported (supported for Distancing/avoidance, Problem focused coping, Denial)[a]<br>*Fathers:* partially supported (supported for Distancing/avoidance)[a] | *Mothers:* partially supported (supported for Problem focused coping)[b]<br>*Fathers:* partially supported (supported for Problem focused coping, Distancing/avoidance)[b] |
| *Hypothesis 4a.* Social support will moderate the relationship between child behavior problems and parenting stress, such that higher social support will buffer the negative impact of child behavior problems on parenting stress. | *Mothers:* supported[a]<br>*Fathers:* not supported | *Mothers:* not supported[c]<br>*Fathers:* not supported[c] |
| *Hypothesis 4b.* Family climate will moderate the relationship between child behavior problems and parenting stress, such that higher family climate will buffer the negative impact of child behavior problems on parenting stress. | *Mothers:* not supported<br>*Fathers:* not supported | *Mothers:* not supported[c]<br>*Fathers:* not supported[c] |

| Research hypothesis | Individual Parent Models | Dyad Model |
|---|---|---|
| *Hypothesis 4c.* Parents' use of coping strategies will moderate the relationship between child behavior problems and parenting stress, such that greater use of Confrontive/seeking social support and Problem focused coping but lower use of Distancing/avoidance and Denial as coping strategies is expected to buffer the negative impact of child behavior problems on parenting stress. | *Mothers:* not supported<br>*Fathers:* partially supported (supported for Confrontive/seeking social support)[a] | *Mothers:* not supported[c]<br>*Fathers:* not supported[c] |

[a] Results differ for combined model

[b] Confrontive/seeking social support and Denial were not included in the model

[c] Variables were not significant predictors and were therefore not included in the model

Table 16

*Model for Hypothesis 1 for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 121.23 | 1.86*** | 119.58 | 2.23*** |
| Age of child (linear term) | 0.10 | 0.04** | 0.144 | 0.05** |
| Age of child$^2$ (quadratic term) | -0.001 | <0.001*** | -0.001 | <0.001*** |
| Negative life events | 1.23 | 0.54* | 1.50 | 0.81t |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 334.05 | 18.28*** | 327.90 | 18.11*** |
| Age of child (linear term) slope (U1) | 0.009 | 0.10*** | 0.003 | 0.06* |
| Level-1 (R) | 163.21 | 12.78 | 184.79 | 13.59 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 17

*Piecewise Models for Hypothesis 1 for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 115.19 | 9.56*** | 99.45 | 11.00*** |
| Age of child (linear term) | -0.03 | 0.07 | 0.11 | 0.07 |
| Negative life events | 1.29 | 0.52* | 1.49 | 0.81t |
| Dummy1 | 6.97 | 8.55 | 12.21 | 9.89* |
| Dummy2 | 9.73 | 3.91* | 14.14 | 4.92** |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 335.04 | 18.30*** | 327.88 | 18.11*** |
| Age of child (linear term) slope (U1) | 0.01 | 0.10*** | 0.004 | 0.06* |
| Level-1 (R) | 16.77 | 12.68 | 185.97 | 13.64 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 18

*Models for Hypothesis 2a for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.22 | 1.90*** | 120.63 | 2.18*** |
| Socioeconomic status | -4.07 | 1.67* | -5.01 | 2.02* |
| Age of child (linear term) | 0.04 | 0.04 | 0.11 | 0.05* |
| Socioeconomic status | -0.004 | 0.01 | 0.01 | 0.02 |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | <-0.001 | <0.001*** |
| Negative life events | 1.09 | 0.53* | 1.22 | 0.80 |
| Child behavior problems | 0.48 | 0.12*** | 0.26 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 305.96 | 17.49*** | 304.63 | 17.45*** |
| Age of child slope (U1) | 0.008 | 0.09*** | 0.003 | 0.05t |
| Level-1 (R) | 156.65 | 12.52 | 185.16 | 13.61 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 19

*Models for Hypothesis 2b for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.16 | 1.76*** | 120.62 | 2.05*** |
| Socioeconomic status | -2.30 | 1.62 | 0.005 | 0.02 |
| Child behavior problems (ave) | 1.03 | 0.18*** | -0.003 | 0.002*** |
| Age of child (linear term) | 0.04 | 0.04 | 0.10 | 0.05* |
| Socioeconomic status | -0.003 | 0.01 | 0.005 | 0.02 |
| Child behavior problems (ave) | <0.001 | 0.002 | -0.004 | 0.002* |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | -0.001 | <0.001** |
| Negative life events | 0.91 | 0.50t | 0.93 | 0.80 |
| Child behavior problems | 0.48 | 0.12*** | 0.27 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 244.53 | 15.64*** | 260.34 | 16.14*** |
| Age of child slope (U1) | 0.009 | 0.09*** | 0.002 | 0.05 |
| Level-1 (R) | 156.41 | 12.51 | 185.03 | 13.60 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 20

*Models for Hypothesis 2c for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.16 | 1.76*** | 120.62 | 2.02*** |
| Socioeconomic status | -1.93 | 1.63 | -3.71 | 2.09t |
| Child behavior problems (ave) | 1.08 | 0.19*** | 0.79 | 0.23*** |
| Child adaptive behavior (ave) | 0.15 | 0.08t | -0.22 | 0.12t |
| Age of child (linear term) | 0.04 | 0.04 | 0.10 | 0.05* |
| Socioeconomic status | -0.005 | 0.01 | 0.005 | 0.02 |
| Child behavior problems (ave) | <0.001 | 0.002 | -0.003 | 0.002* |
| Child adaptive behavior (ave) | <-0.001 | <0.001 | <0.001 | <0.001 |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | <-0.001 | <0.001** |
| Negative life events | 0.90 | 0.50t | 0.97 | 0.81 |
| Child behavior problems | 0.48 | 0.12*** | 0.27 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 240.81 | 15.52*** | 251.83 | 15.87*** |
| Age of child slope (U1) | 0.009 | 0.09*** | 0.002 | 0.05 |
| Level-1 (R) | 156.46 | 12.51 | 185.07 | 13.60 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 21

*Models for Hypothesis 3a for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.18 | 1.69*** | 120.60 | 1.99*** |
| Socioeconomic status | -0.72 | 1.55 | -3.15 | 2.03 |
| Child behavior problems (ave) | 1.09 | 0.20*** | 0.77 | 0.22*** |
| Child adaptive behavior (ave) | 0.10 | 0.08 | -.22 | 0.12t |
| Social support | -0.74 | 0.17*** | -0.47 | 0.20* |
| Age of child (linear term) | 0.04 | 0.04 | 0.11 | 0.05* |
| Socioeconomic status | -0.009 | 0.01 | 0.003 | 0.02 |
| Child behavior problems (ave) | <0.001 | 0.001 | -0.003 | 0.002* |
| Child adaptive behavior (ave) | <-0.001 | <0.001 | <0.001 | <0.001 |
| Social support | 0.003 | 0.001t | 0.002 | 0.002 |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | -0.001 | <0.001** |
| Negative life events | 0.95 | 0.49t | 0.98 | 0.83 |
| Child behavior problems | 0.48 | 1.12*** | 0.27 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 207.35 | 14.40*** | 237.45 | 15.41*** |
| Age of child slope (U1) | 0.008 | 0.09*** | 0.002 | 0.05 |
| Level-1 (R) | 156.53 | 12.51 | 185.37 | 13.61 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 22

*Models for Hypothesis 3b for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.02 | 1.59*** | 120.57 | 1.90*** |
| Socioeconomic status | -0.11 | 1.59 | -2.38 | 1.93 |
| Child behavior problems (ave) | 0.77 | 0.19*** | 0.65 | 0.22** |
| Child adaptive behavior (ave) | 0.16 | 0.08t | -0.24 | 0.10* |
| Family climate | -2.42 | 0.38*** | -1.84 | 0.61** |
| Age of child (linear term) | 0.05 | 0.04 | 0.10 | 0.05 |
| Socioeconomic status | -0.01 | 0.01 | 0.001 | 0.02 |
| Child behavior problems (ave) | 0.002 | 0.002 | -0.003 | 0.002t |
| Child adaptive behavior (ave) | <-0.001 | <0.001 | <0.001 | <0.001 |
| Family climate | 0.01 | 0.003*** | 0.006 | 0.004 |
| Age of child$^2$ (quadratic term) | <0.001 | <0.001*** | <0.001 | <0.001** |
| Negative life events | 0.87 | 0.49t | 0.82 | 0.80 |
| Child behavior problems | 0.45 | 0.12*** | 0.27 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 175.89 | 13.26*** | 209.98 | 14.49*** |
| Age of child slope (U1) | 0.007 | 0.08*** | 0.002 | 0.04 |
| Level-1 (R) | 156.30 | 12.50 | 185.07 | 13.60 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 23

*Models for Hypothesis 3c for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.04 | 1.57*** | 120.59 | 1.95*** |
| Socioeconomic status | 0.91 | 1.63 | -1.01 | 2.43 |
| Child behavior problems (ave) | 0.91 | 0.20*** | 0.56 | 0.22* |
| Child adaptive behavior (ave) | 0.10 | 0.08 | -0.22 | 0.12t |
| Distancing/avoidance | 0.99 | 0.24*** | 1.05 | 0.36** |
| Confrontive/seeking social support | -0.05 | 0.56 | -0.69 | 0.57 |
| Problem focused | -1.10 | 0.32*** | -0.83 | 0.45t |
| Denial | 1.22 | 0.61* | 0.87 | 0.71 |
| Age of child (linear term) | 0.05 | 0.04 | 0.11 | 0.05* |
| Socioeconomic status | -0.02 | 0.01t | <-0.001 | 0.02 |
| Child behavior problems (ave) | <0.001 | 0.002 | -0.003 | 0.002 |
| Child adaptive behavior (ave) | <-0.001 | <0.001 | <0.001 | 0.001 |
| Distancing/avoidance | -0.005 | 0.003t | <-0.001 | 0.002 |
| Confrontive/seeking social support | 0.007 | 0.004 | <0.001 | 0.004 |
| Problem focused | -0.001 | 0.003 | 0.002 | 0.004 |
| Denial | -0.007 | 0.01 | -0.005 | 0.005 |
| Age of child$^2$ (quadratic term) | <0.001 | <0.001*** | -0.001 | <0.001** |
| Negative life events | 0.90 | 0.53t | 0.99 | 0.77 |
| Child behavior problems | 0.45 | 0.12** | 0.26 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 189.47 | 13.76*** | 221.60 | 14.89*** |
| Age of child slope (U1) | 0.007 | 0.09*** | 0.003 | 0.05 |
| Level-1 (R) | 156.28 | 12.50 | 185.41 | 13.62 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 24

*Models for Hypothesis 4a for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.25 | 1.69*** | 120.66 | 2.01*** |
| Socioeconomic status | -1.33 | 1.37 | -3.17 | 2.03 |
| Child behavior problems (ave) | 1.10 | 0.17*** | 0.77 | 0.22*** |
| Child adaptive behavior (ave) | 0.06 | 0.07 | -0.22 | 0.12t |
| Social support | -0.56 | 0.16*** | -0.45 | 0.20* |
| Age of child (linear term) | 0.04 | 0.04 | 0.10 | 0.05* |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | -0.001 | <0.001** |
| Negative life events | 0.93 | 0.50t | 0.99 | 0.83 |
| Child behavior problems | 0.50 | 0.12*** | 0.27 | 0.12* |
| Social support | 0.01 | 0.01 | 0.007 | 0.02 |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 206.97 | 14.38*** | 236.38 | 15.37*** |
| Age of child slope (U1) | 0.008 | 0.09*** | 0.002 | 0.05 |
| Level-1 (R) | 157.00 | 12.53 | 185.46 | 13.62 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 25

*Alternative Models for Hypothesis 4a for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.17 | 1.68*** | 120.67 | 1.97*** |
| Socioeconomic status | -1.41 | 1.56 | -3.34 | 2.06 |
| Child behavior problems (ave) | 1.05 | 0.18*** | 0.75 | 0.21*** |
| Child adaptive behavior (ave) | 0.10 | 0.08 | -0.22 | 0.12t |
| Social support | -0.27 | 0.07*** | -0.28 | 0.10** |
| Social support X Child behavior | -0.02 | 0.01** | 0.01 | 0.01 |
| Age of child (linear term) | 0.04 | 0.04 | 0.10 | 0.05* |
| Socioeconomic status | -0.01 | 0.01 | 0.01 | 0.02 |
| Child behavior problems (ave) | <0.001 | 0.002 | -0.003 | 0.002* |
| Child adaptive behavior (ave) | <-0.001 | 0.001 | <0.001 | <0.001 |
| Social support | <0.001 | <0.001 | <0.001 | <0.001 |
| Social support X Child behavior | <-0.001 | <0.001 | <-0.001 | <0.001t |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | -0.001 | <0.001** |
| Negative life events | 0.89 | 0.49t | 1.05 | 0.83 |
| Child behavior problems | 0.48 | 0.12*** | 0.28 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 206.04 | 14.35*** | 227.89 | 15.10** |
| Age of child slope (U1) | 0.008 | 0.09*** | 0.002 | 0.04 |
| Level-1 (R) | 156.45 | 12.51 | 184.82 | 13.59 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 26

*Models for Hypothesis 4b for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.13 | 1.58*** | 120.62 | 1.90*** |
| Socioeconomic status | -0.98 | 1.40 | -2.34 | 1.94 |
| Child behavior problems (ave) | 0.88 | 0.17*** | 0.66 | 0.22** |
| Child adaptive behavior (ave) | 0.11 | 0.07 | -0.24 | 0.10* |
| Family climate | -1.65 | 0.33*** | -1.80 | 0.57** |
| Age of child (linear term) | 0.04 | 0.04 | 0.10 | 0.05 |
| Age of child$^2$ (quadratic term) | -0.001 | <0.001*** | <-0.001 | <0.001** |
| Negative life events | 0.85 | 0.51t | 0.83 | 0.80 |
| Child behavior problems | 0.50 | 0.12*** | 0.27 | 0.12* |
| Family climate | -0.02 | 0.02 | 0.01 | 0.04 |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 181.23 | 13.46*** | 208.44 | 14.44*** |
| Age of child slope (U1) | 0.009 | 0.09*** | 0.002 | 0.04 |
| Level-1 (R) | 155.70 | 12.48 | 185.40 | 13.62 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 27

*Alternative Models for Hypothesis 4b for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.04 | 1.58*** | 120.59 | 1.88*** |
| Socioeconomic status | -0.38 | 1.60 | -1.93 | 2.00 |
| Child behavior problems (ave) | 0.76 | 0.19*** | 0.66 | 0.21** |
| Child adaptive behavior (ave) | 0.16 | 0.08t | -0.26 | 0.10* |
| Family climate | -2.39 | 0.36*** | -2.06 | 0.63** |
| Family climate X Child behavior | -0.06 | 0.04 | 0.09 | 0.56 |
| Age of child (linear term) | 0.05 | 0.04 | 0.10 | 0.05* |
| Socioeconomic status | -0.02 | 0.01 | <-0.001 | 0.02 |
| Child behavior problems (ave) | 0.002 | 0.002 | -0.003 | 0.002t |
| Child adaptive behavior (ave) | <-0.001 | <0.001 | <0.001 | <0.001 |
| Family climate | 0.01 | 0.003*** | 0.01 | 0.01 |
| Family climate X Child behavior | <-0.001 | <0.001 | <-0.001 | 0.001 |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | <-0.001 | <0.001** |
| Negative life events | 0.89 | 0.50t | 0.84 | 0.81 |
| Child behavior problems | 0.45 | 0.12*** | 0.27 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 173.85 | 13.19*** | 204.20 | 14.29*** |
| Age of child slope (U1) | 0.007 | 0.08*** | 0.002 | 0.05 |
| Level-1 (R) | 156.39 | 12.51 | 185.17 | 13.61 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 28

*Models for Hypothesis 4c for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.23 | 1.60*** | 120.55 | 1.96*** |
| Socioeconomic status | -0.58 | 1.41 | -0.84 | 2.47 |
| Child behavior problems (ave) | 0.94 | 0.17*** | 0.57 | 0.22* |
| Child adaptive behavior (ave) | 0.08 | 0.07 | -0.22 | 0.12t |
| Distancing/avoidance | 0.68 | 0.17*** | 1.01 | 0.39* |
| Confrontive/seeking social support | 0.39 | 0.49 | -0.60 | 0.60 |
| Problem focused | -1.14 | 0.28*** | -0.93 | 0.49t |
| Denial | 0.76 | 0.51 | 0.70 | 0.74 |
| Age of child (linear term) | 0.04 | 0.04 | 0.11 | 0.05* |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | <-0.001 | <0.001 |
| Negative life events | 0.86 | 0.54 | 0.99 | 0.77 |
| Child behavior problems | 0.49 | 0.12*** | 0.25 | 0.13* |
| Distancing/avoidance | 0.007 | 0.01 | -0.01 | 0.03 |
| Confrontive/seeking social support | 0.04 | 0.03 | 0.04 | 0.04 |
| Problem focused | -0.009 | 0.03 | -0.03 | 0.04 |
| Denial | -0.01 | 0.04 | -0.07 | 0.06 |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 194.00 | 13.93*** | 224.25 | 14.98*** |
| Age of child slope (U1) | 0.008 | 0.09*** | 0.002 | 0.05 |
| Level-1 (R) | 156.40 | 12.51 | 183.59 | 13.55 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 29

*Alternative Models for Hypothesis 4c for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 123.05 | 1.54*** | 120.52 | 1.95*** |
| Socioeconomic status | 0.55 | 1.59 | -2.04 | 2.47 |
| Child behavior problems (ave) | 0.98 | 0.20*** | 0.49 | 0.22* |
| Child adaptive behavior (ave) | 0.12 | 0.08 | -0.24 | 0.11* |
| Distancing/avoidance | 0.93 | 0.25*** | 0.93 | 0.36* |
| Confrontive/seeking social support | 0.06 | 0.54 | -0.80 | 0.50 |
| Problem focused | -1.02 | 0.32** | -0.58 | 0.47 |
| Denial | 1.28 | 0.60* | 0.94 | 0.71 |
| Distancing/avoidance x Child behavior | 0.01 | 0.03 | 0.03 | 0.03 |
| Confrontive/seeking social support x Child behavior | -0.07 | 0.05 | -0.10 | 0.04* |
| Problem focused x Child behavior | -0.03 | 0.04 | 0.05 | 0.03 |
| Denial x Child behavior | -0.09 | 0.07 | -0.09 | 0.08 |
| Age of child (linear term) | 0.05 | 0.04 | 0.11 | 0.05* |
| Socioeconomic status | -0.02 | 0.01 | 0.001 | 0.02 |
| Child behavior problems (ave) | <0.001 | 0.002 | -0.003 | 0.002t |
| Child adaptive behavior (ave) | <-0.001 | <0.001 | <0.001 | <0.001 |
| Distancing/avoidance | -0.005 | 0.002t | <-0.001 | 0.002 |
| Confrontive/seeking social support | 0.01 | 0.004 | <0.001 | 0.004 |
| Problem focused | -0.001 | 0.003 | -0.005 | 0.006 |

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Denial | -0.01 | 0.01 | <0.001 | <0.001 |
| Distancing/avoidance x Child behavior | <0.001 | <0.001 | <0.001 | <0.001 |
| Confrontive/seeking social support x Child behavior | <0.001 | <0.001 | <0.001 | <0.001 |
| Problem focused x Child behavior | <0.001 | <0.001 | <-0.001 | <0.001 |
| Denial x Child behavior | <0.001 | <0.001 | <-0.001 | <0.001 |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | -0.001 | <0.001** |
| Negative life events | 0.93 | 0.52t | 0.91 | 0.79 |
| Child behavior problems | 0.45 | 0.12*** | 0.25 | 0.12* |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 187.65 | 13.70*** | 219.48 | 14.81*** |
| Age of child slope (U1) | 0.007 | 0.09*** | 0.003 | 0.06t |
| Level-1 (R) | 156.27 | 12.50 | 185.40 | 13.62 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 30

*Combined models for Mothers (N=147) and Fathers (N=110)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 122.86 | 1.47*** | 120.43 | 1.85*** |
| Socioeconomic status | 0.83 | 1.64 | -0.94 | 2.09 |
| Child behavior problems (ave) | 0.84 | 0.20*** | 0.57 | 0.20** |
| Child adaptive behavior (ave) | 0.09 | 0.09 | -0.26 | 0.10* |
| Social support | -0.49 | 0.17** | -0.37 | 0.19* |
| Family climate | -1.55 | 0.47** | -1.42 | 0.61* |
| Distancing/avoidance | 1.05 | 0.24*** | 0.68 | 0.31* |
| Problem focused | -0.85 | 0.29** | -0.82 | 0.36* |
| Age of child (linear term) | 0.05 | 0.04 | 0.10 | 0.05t |
| Socioeconomic status | 0.16 | 0.04 | <0.001 | 0.02 |
| Child behavior problems (ave) | -0.001 | 0.01 | -0.002 | 0.002t |
| Child adaptive behavior (ave) | <0.001 | 0.002 | <0.001 | <0.001 |
| Social support | 0.004 | 0.004 | 0.001 | 0.002 |
| Family climate | -0.001 | 0.01 | 0.01 | 0.005 |
| Distancing/avoidance | -0.02 | 0.007*** | <0.001 | 0.002 |
| Problem focused | 0.01 | 0.01t | <0.001 | 0.003 |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | <-0.001 | <0.001** |
| Socioeconomic status | <-0.001 | <0.001 | -- | -- |
| Child behavior problems (ave) | <0.001 | <0.001 | -- | -- |
| Child adaptive behavior (ave) | <-0.001 | <0.001 | -- | -- |
| Social support | <-0.001 | <0.001 | -- | -- |
| Family climate | <0.001 | <0.001 | -- | -- |
| Distancing/avoidance | <0.001 | <0.001*** | -- | -- |
| Problem focused | <-0.001 | <0.001* | -- | -- |
| Child behavior problems | 0.46 | 0.12*** | 0.27 | 0.12* |

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Intercept (U0) | 150.78 | 12.28*** | 187.79 | 13.70*** |
| Age of child slope (U1) | 0.007 | 0.08*** | 0.002 | 0.04 |
| *Random Effects* | Variance Component | S.D. | Variance Component | S.D. |
| Level-1 (R) | 151.59 | 12.31 | 186.19 | 13.65 |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Figure 6

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Child Behavior Problems*

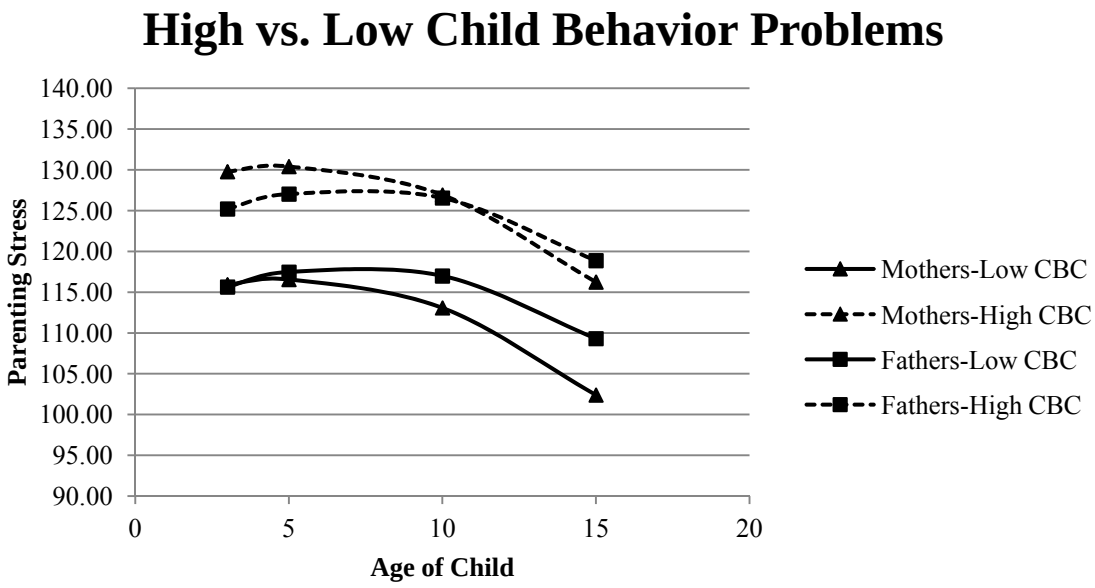

Figure 7

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Child Adaptive Behavior*

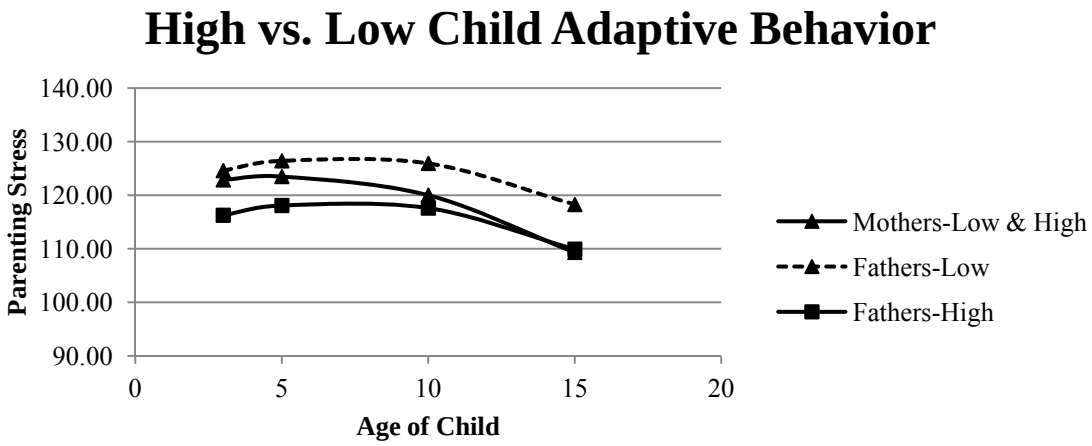

Figure 8

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Social Support*

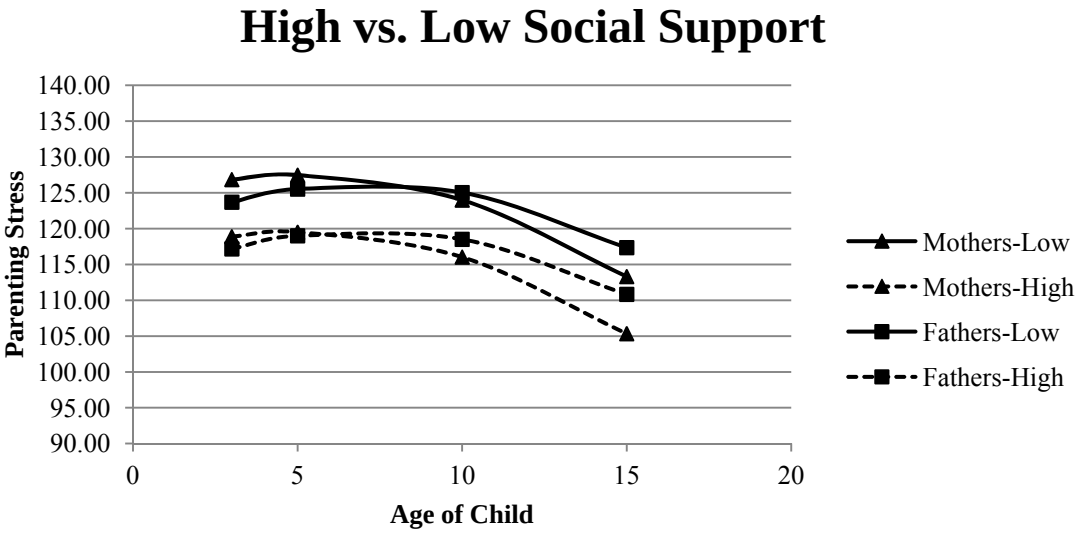

Figure 9

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Family Climate*

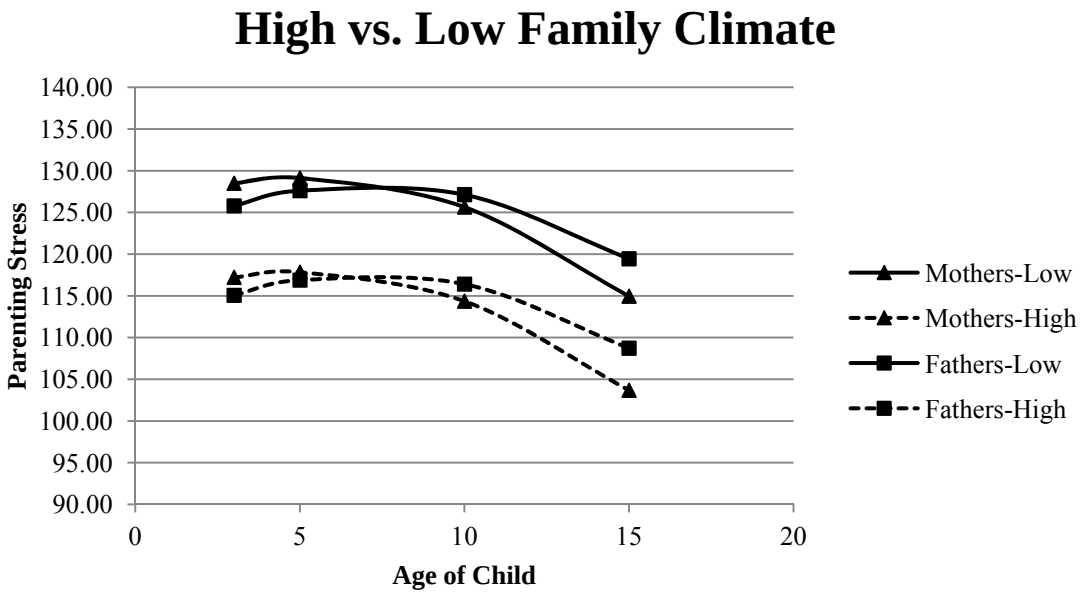

Figure 10

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Use of Distancing/Avoidance*

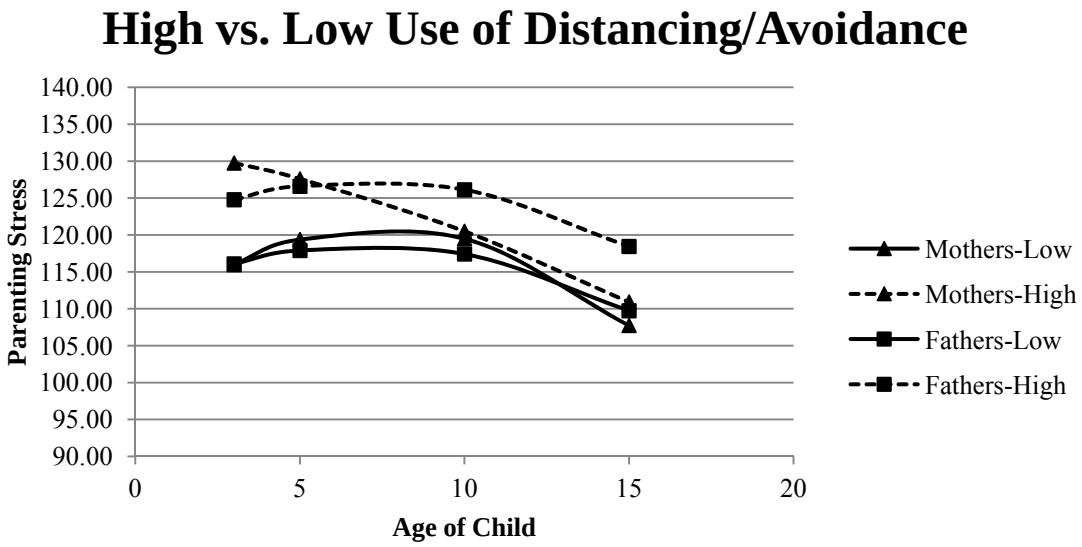

Figure 11

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Use of Problem Focused Coping*

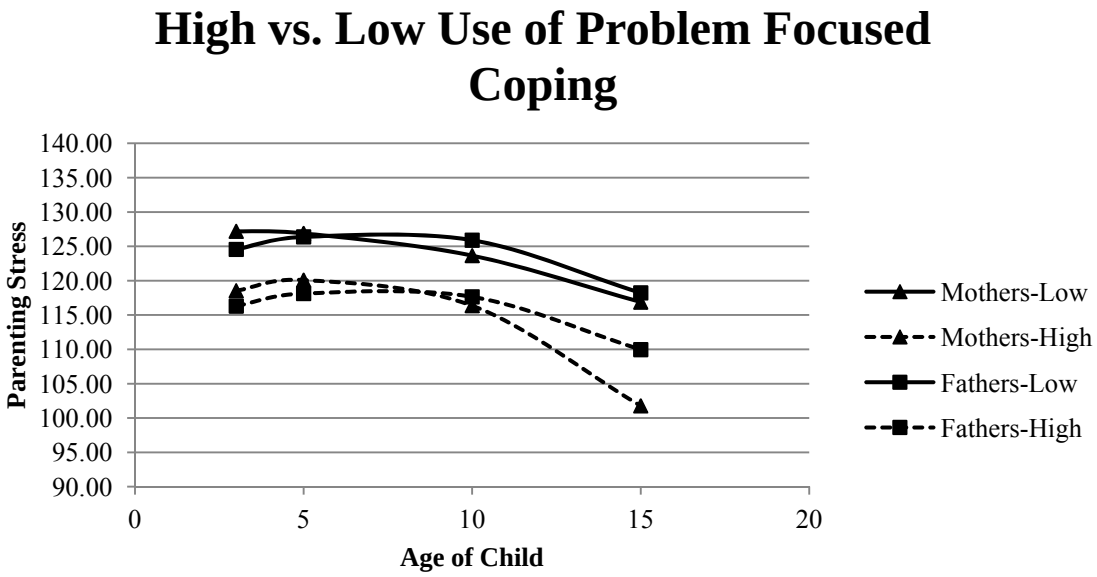

Table 31

*Comparison of Mothers and Fathers on Predictor and Outcome Variables (N=108 dyads)*

| | Mothers | | Fathers | | | |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | *r* | *t* |
| Parenting Stress Index-Parent Domain | | | | | | |
| Age 3 | 119.40 | 24.60 | 119.28 | 24.56 | 0.45*** | 0.05 |
| Age 5 | 120.73 | 22.56 | 122.12 | 21.72 | 0.38*** | -0.58 |
| Age 10 | 120.45 | 20.56 | 122.97 | 17.82 | 0.31*** | -1.11 |
| Age 15 | 110.17 | 20.99 | 116.27 | 20.00 | 0.33*** | -2.68** |
| Years of Education | 14.40 | 2.46 | 14.21 | 3.25 | 0.62*** | 0.76 |
| Negative Life Events | | | | | | |
| Age 3 | 0.80 | 1.17 | 0.87 | 1.24 | 0.69*** | -0.77 |
| Age 5 | 1.11 | 2.59 | 0.78 | 1.05 | 0.27* | 1.35 |
| Age 10 | 1.22 | 1.97 | 0.92 | 1.37 | 0.38*** | 1.36 |
| Age 15 | 1.59 | 1.56 | 1.65 | 1.60 | 0.31** | -0.33 |
| Ways of Coping Questionnaire | | | | | | |
| Distancing/avoidance | 10.83 | 6.50 | 9.83 | 6.20 | 0.25** | 1.33 |
| Confrontive/seeking social support | 14.19 | 3.94 | 11.94 | 4.47 | -0.04 | 3.83*** |
| Problem-focused coping | 15.05 | 5.12 | 14.56 | 5.06 | 0.06 | 0.73 |
| Denial | 3.99 | 2.35 | 4.74 | 2.50 | 0.15 | -2.47* |
| Family Support Scale | 23.69 | 8.04 | 21.80 | 8.84 | 0.38*** | 2.09* |
| Family Environment Scale-Relationship Dimension | 11.60 | 3.44 | 10.60 | 3.71 | 0.33*** | 2.50* |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Table 32

*Unconditional Growth Model for Mothers and Fathers within Dyads (N=108)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 119.08 | 2.28*** | 119.39 | 2.29*** |
| Age of child (linear term) | 0.12 | 0.04** | 0.13 | 0.05* |
| Age of child$^2$ (quadratic term) | -0.001 | <0.001*** | -0.001 | <0.001** |
| *Random Effects* | Variance Component | | S.D. | |
| Intercept (U0) | 284.35 | | 16.86*** | |
| Age of child slope – mother (U3) | 0.01 | | 0.09*** | |
| Age of child slope – father (U4) | 0.01 | | 0.09*** | |
| Level-1 (R) | 218.79 | | 14.79 | |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Figure 12

*Average Trajectory of Parenting Stress for Mothers and Fathers within Dyads (N=108)*

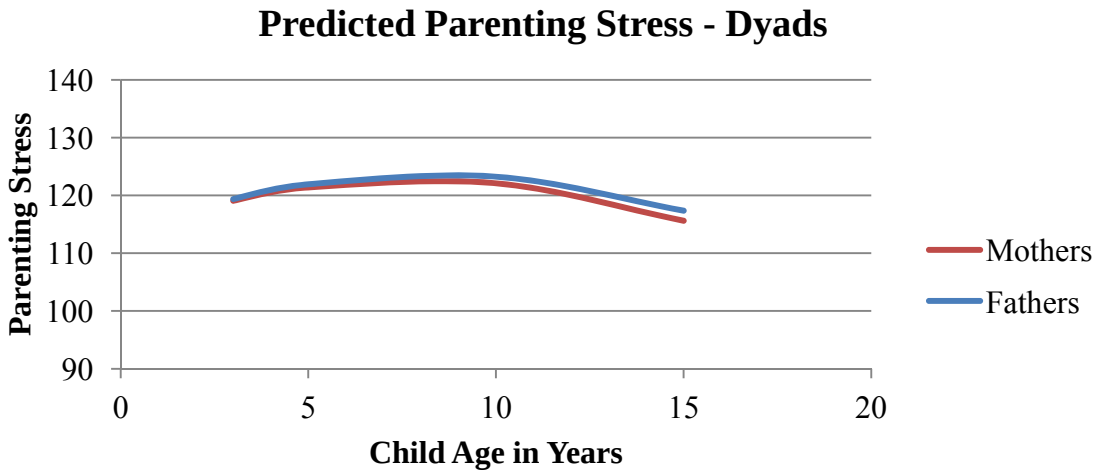

Table 33

*Final Model for Mothers and Fathers within Dyads (N=108)*

| | Mothers | | Fathers | |
|---|---|---|---|---|
| *Fixed Effects* | Coefficient | S.E. | Coefficient | S.E. |
| Intercept | 120.74 | 1.68*** | 121.10 | 1.86*** |
| Socioeconomic status | 1.18 | 1.93 | -1.03 | 1.95 |
| Child behavior problems (ave) | 0.78 | 0.24*** | 0.59 | 0.21** |
| Child adaptive behavior (ave) | 0.11 | 0.09 | -0.25 | 0.10* |
| Social support | -0.36 | 0.18* | -0.40 | 0.17* |
| Family climate | -2.49 | 0.50*** | -0.99 | 0.64 |
| Distancing/avoidance | 0.45 | 0.28 | 0.74 | 0.32* |
| Problem focused | -0.80 | 0.33* | -0.79 | 0.37* |
| Age of child (linear term) | 0.07 | 0.04t | 0.08 | 0.05 |
| Socioeconomic status | -0.02 | 0.02 | <0.001 | 0.02 |
| Child behavior problems (ave) | 0.001 | 0.002 | -0.003 | 0.002t |
| Child adaptive behavior (ave) | <0.001 | <0.001 | <0.001 | <0.001 |
| Social support | 0.004 | 0.002 | 0.001 | 0.002 |
| Family climate | 0.01 | 0.004** | 0.004 | 0.01 |
| Distancing/avoidance | <-0.001 | 0.003 | <-0.001 | 0.002 |
| Problem focused | <-0.001 | 0.003 | <0.001 | 0.003 |
| Age of child$^2$ (quadratic term) | <-0.001 | <0.001*** | <-0.001 | <0.001* |
| Child behavior problems | 0.42 | 0.10*** | 0.42 | 0.10*** |
| *Random Effects* | Variance Component | | S.D. | |
| Intercept (U0) | 119.98 | | 10.95*** | |
| Age of child slope – mother (U3) | 0.01 | | 0.08*** | |
| Age of child slope – father (U4) | 0.01 | | 0.07*** | |
| Level-1 (R) | 195.32 | | 13.98 | |

*t p < .10, * p < .05, ** p < .01, *** p < .001*

Figure 13

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Child Behavior Problems within Dyads*

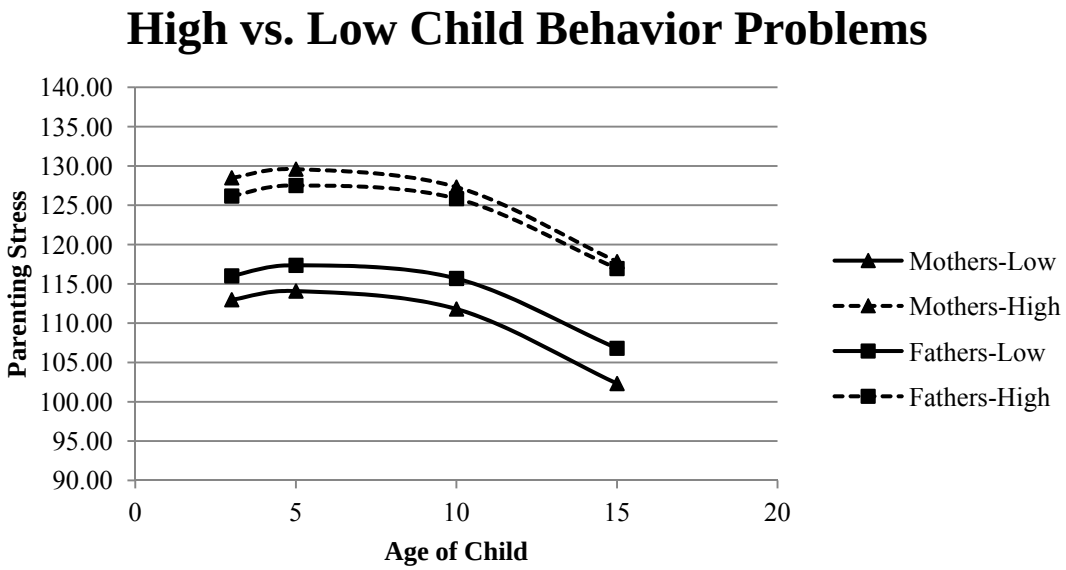

Figure 14

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Child Adaptive Behavior within Dyads*

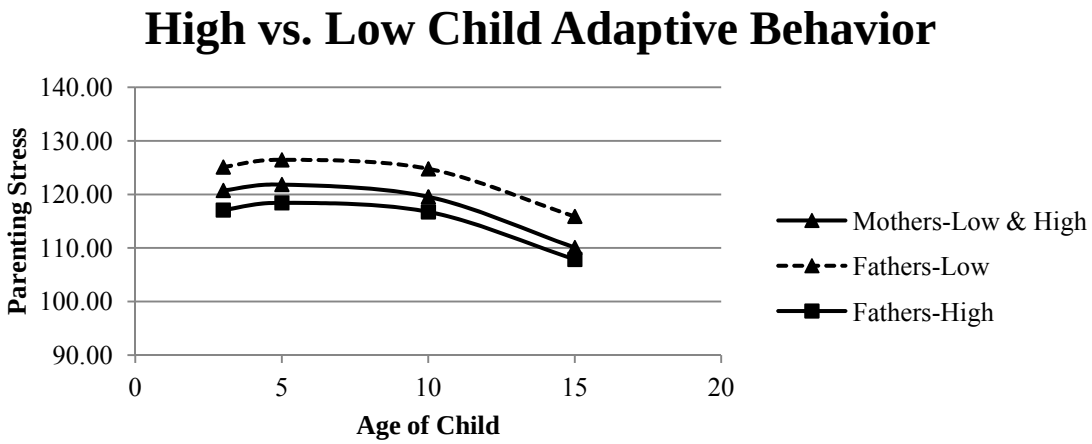

Figure 15

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Social Support within Dyads*

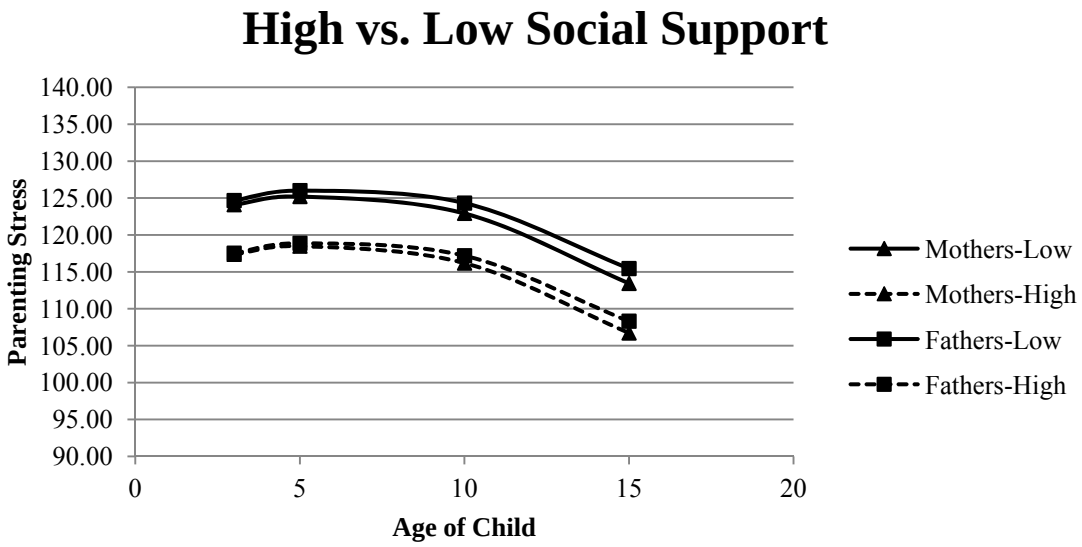

Figure 16

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Family Climate within Dyads*

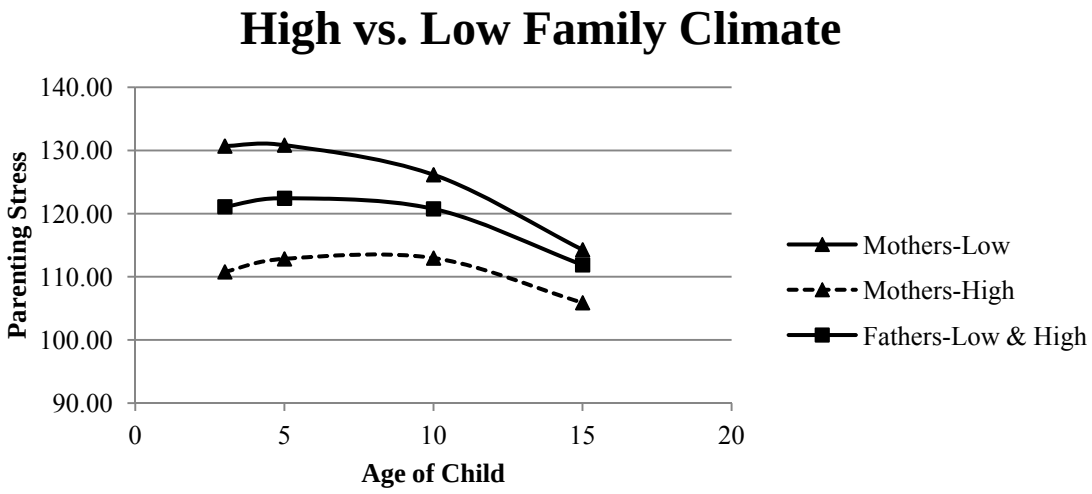

Figure 17

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Use of Distancing/Avoidance within Dyads*

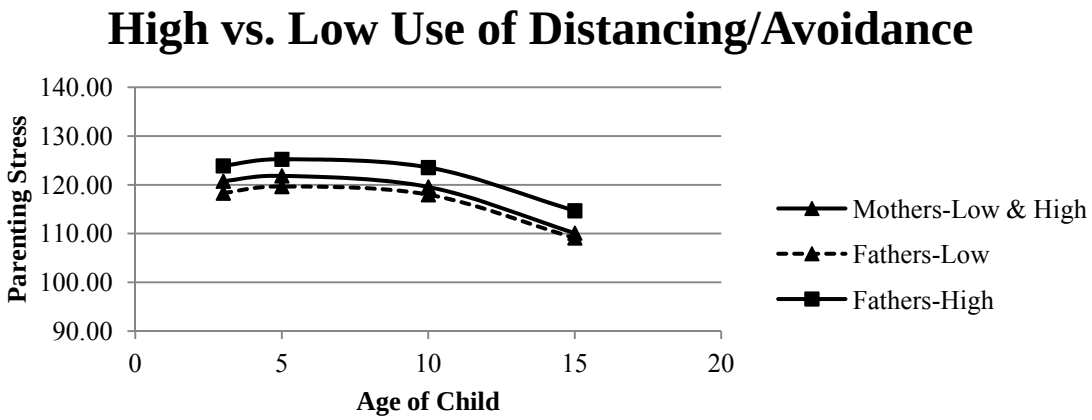

Figure 18

*Prototypical Trajectories for Mothers and Fathers of Children with Low (SD below Mean) and High (SD above Mean) Use of Problem Focused Coping within Dyads*