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PARENTAL EFFICACY, ATTACHMENT, AND CHILD SELF-CONTROL: A COMPARISON OF PROCESSES AMONG DEMOGRAPHIC GROUPS

By

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ABSTRACT

PARENTAL EFFICACY, ATTACHMENT, AND CHILD SELF-CONTROL:
A COMPARISON OF PROCESSES AMONG DEMOGRAPHIC GROUPS

By

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According to Bandura's (1982) self-efficacy theory, parents who feel competent and effective, or who have high levels of parental efficacy, are more likely to invest time and energy in parenting. In fact, parental efficacy appears to be related to parental resources and practices; fewer studies have examined the relation between parental efficacy and children's development (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Brazelton, 1983; Bugental & Shenum, 1984; Teti & Gelfand, 1991). This dissertation examined linkages between parental efficacy, parenting, attachment security, and child self-control.

The effects of parental efficacy and parenting may be different in various environments. Bronfenbrenner (2000) theorized that the effects of parenting are dependent on risks inherent within a child's environment, such as poverty or racism. In fact, research indicates that effects of parental efficacy vary by socioeconomic status, race, and marital quality (Ardelt & Eccles, 2001; Corapci & Wachs, 2002; Machida, Taylor, & Kim, 2002).

Using data from the National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network, this dissertation empirically described family processes related to parental efficacy within low-income and middle-income families and within African American and Caucasian families. Structural equation

models indicated that parental efficacy and parental practices are predictive of attachment security and children's self-control. Linkages between parenting and child outcomes were generally stronger among low-income groups than middle-income groups, suggesting that proximal processes have a greater effect among children living in disadvantaged families than among children with more resources.

Distinct effects were found within African American and Caucasian groups. Different dimensions of parental efficacy, perceived competence and perceived control, produced different effects on parenting style and child outcomes within demographic groups. Marital conflict appeared to have a greater effect on boys than girls; other gender differences raised interesting questions that warrant further investigation. In sum, this dissertation added to our understanding of parental efficacy and its relation to various aspects of children's environments, attachment security, and child self-control within diverse demographic groups.

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CHAPTER 1

INTRODUCTION

The type of environment that parents provide for their children may be influenced by their beliefs. Some parents may believe that they are effective teachers for their children, although others do not. Their perception of their own effectiveness is defined as parental efficacy (Bandura, 1982; Coleman & Karraker, 1997). Theoretically, parents who feel that they are important and effective in their role will spend more time and effort with their children. Research indicates that parental efficacy is related to parental resources and practices, such as poverty, maternal depression, and harsh discipline, and child characteristics such as temperament and attachment (Brazelton, 1983; Bugental & Shenum, 1984; Nievar & Brophy-Herb, 2003; Luster & Kain, 1987; Teti & Gelfand, 1991). Experimental studies aimed at improving the home environment for young children through parent education show related improvements among parental efficacy, parenting, and child outcome (Hastings & Brown, 2002; Hoath & Sanders, 2002; Sofronoff & Farbotko, 2002).

The effects of parental efficacy and parenting may be different in various environments. Bronfenbrenner (2000) theorized that the effects of parenting are dependent on risks inherent within a child's environment, such as poverty or racism. In fact, research indicates that effects of parental efficacy vary by socioeconomic status, race, and marital quality (Ardelt & Eccles, 2001; Corapci & Wachs, 2002; Machida, Taylor, & Kim, 2002).

Developmental processes related to parental practices may also vary due to cultural differences (Johnson et al., 2003; McLoyd, Cauce, Takeuchi, & Wilson, 2000). Cultural requirements may affect the way that parents think about parenting, and in turn affect parenting practices (Ogbu, 1985). For example, certain cultures emphasize children's self-control more than others. Thus, parents in these cultures may provide more opportunities for a child to learn to regulate their emotions.

Although ways of parenting may differ by culture, processes leading to child outcome may be more universal. For example, power-assertive discipline appears to inhibit the development of secure attachment and self-control (Davies, Harold, Goeke-Morey, & Cummings, 2002; Kochanska & Knaack, 2003). Children's attachment security is related to their self-control as well as to the type of parenting they receive (Londerville & Main, 1981; Braungart-Rieker, Garwood, Powers, & Wang, 2001; Cummings & Davies, 1996; Cassidy, 1994). Parents who are insensitive and unresponsive to their child's signals are more likely to have children who have difficulty controlling their emotions or behavior (Rothbart & Bates, 1998). Parents who are insensitive and unresponsive are also less likely to have children who develop secure attachment relationships (De Wolff & van IJzendoorn, 1997).

Although relations between sensitivity, attachment, and self-control have been researched, the study of parental efficacy and attachment is a relatively new area. A search of the literature revealed no studies of parental efficacy and children's self-control. Literature that exists on parental efficacy, parenting, and attachment reports inconsistent findings, particularly in the area of perceived parental competence (del Carmen, Pedersen, Huffman & Bryan, 1993; Spieker & Booth, 1988; Teti & Gelfand, 1991).

Discrepancies in the literature may be the result of a misconception that a strong sense of competence is always preferred. Some experimental work suggests that overly confident parents who have a strong sense of competence may not be as sensitive as those who have a more moderate perception of their abilities (Donovan & Leavitt, 1989; Donovan, Leavitt, & Walsh, 1997; Donovan, Leavitt, & Walsh, 2000). Descriptive studies indicate that clinically depressed mothers who have a weak sense of competence are more likely to have problems with parenting their children effectively (Teti, O'Connell, & Reiner, 1996). Thus, high levels of perceived competence and low levels of perceived competence may both be related to inadequate parenting; however, most measures are based on a linear scale that assumes high levels of competence to be optimal. A second explanation for discrepant findings may be the way that parental efficacy is conceptualized. Parental efficacy is composed of multiple dimensions, including perceived control over situations and perception of personal competence. Perceived competence and perceived control may represent two separate belief systems that have different effects on parenting and child outcomes.

Purpose of the Study

This dissertation focused on parental efficacy and its relation to parenting and mother-child attachment, particularly among low-income families. Separate analyses investigated the process of attachment within two periods of development: (a) in infancy, and (b) in early childhood. Correspondence between parental efficacy, family processes in infancy, and attachment classification at 15 months was analyzed. Pathways between

study variables, attachment security at 24 months, and children's self-control in early childhood were also examined.

An examination of attachment quality at 15 months tests the hypothesis that parental efficacy is related to parenting and attachment in predictable ways. Because parental beliefs vary among demographic groups, dimensions of parental efficacy were studied among low-income and middle-to-high income families and African American and Caucasian families. Separate analyses for other ethnic or racial groups are not included due to the limited number of Latinos, Native Americans, and Asians in the study.

Second, a longitudinal model was used to test the pathways between parental efficacy in infancy, parenting behavior, children's attachment security at 24 months, and children's self-control in early childhood. Other factors that may affect child outcome, such as marital conflict, are taken into account. Child outcome is measured by the security of children's attachment to their mother and performance on a self-control task.

Models compare processes between low-income and high-to-middle income families only. The use of structural equation modeling requires a minimum sample size of at least 150 families. Although the NICHD Study of Early Child Care began with 176 African American families, there were only 119 African American children who participated in the procedure measuring child self-control at 36 months. This sample size does not allow for separate models comparing developmental processes as stated above between African American and Caucasian children.

General Research Questions

Attachment in Infancy

1. Can counterintuitive findings from earlier studies of the relation between parental efficacy and attachment security be explained by reexamining dimensions of parental efficacy, i.e., competence and control?
2. Does parental efficacy have different effects on parenting and attachment among different demographic groups, specifically, low-income and middle-to-high income families and African American and Caucasian families?
3. Does child care quality moderate the effects of maternal depression and parenting practices on mother-child attachment as shown in Figure 1?

Social-emotional Development in Early Childhood

4. Are the data from the National Institute of Child Health and Development Study of Early Child Care consistent with the model linking parental efficacy, parenting practice, and children's social-emotional outcomes as shown in Figure 2?
5. Does the model fit vary as a function of demographic status? For example, do the relations among the variables differ for low-income and middle-to-high income families?

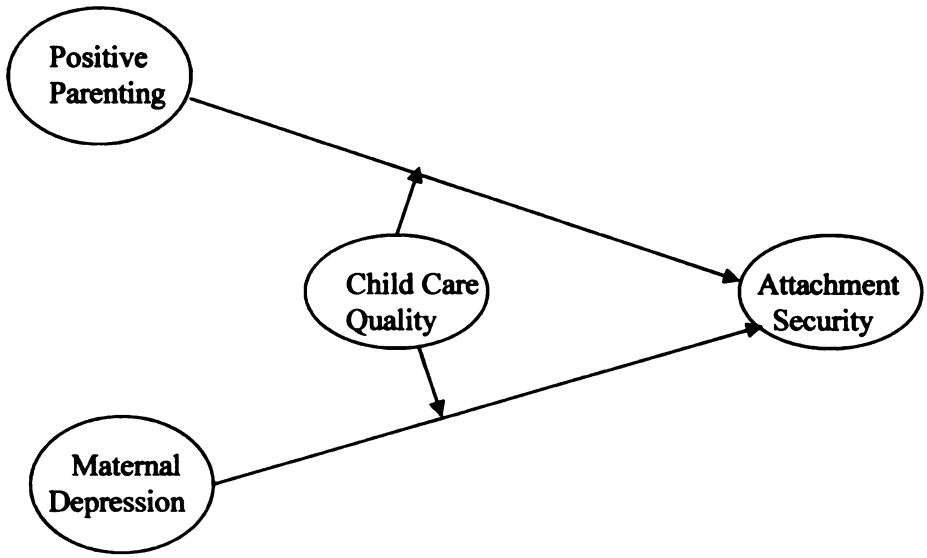

Figure 1. Hypothesized model of interactions with child care quality predicting attachment security.

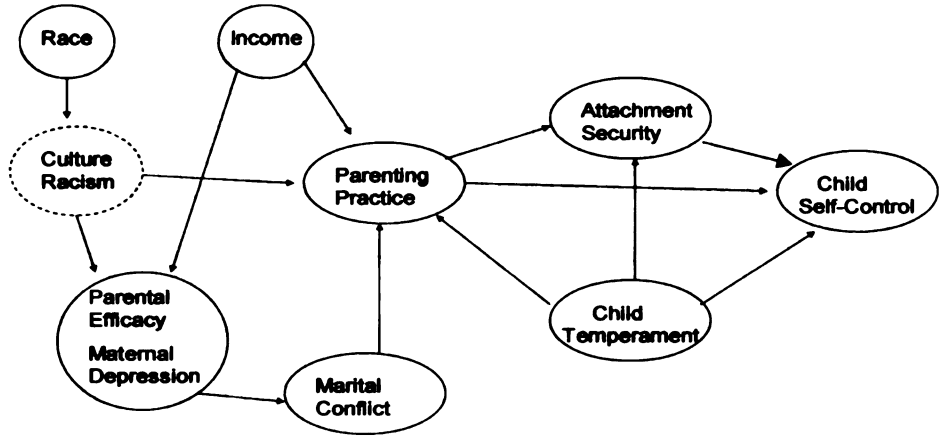

Figure 2. Hypothesized model of pathways leading to child outcomes: self-control and attachment security.

Research Assumptions

Importance of Parenting

Parenting practices are central to children's developing competencies in many different areas (Bornstein, 2002). In recent years, there has been some debate over the relative importance of parenting practices in comparison to inborn traits and peer influences (Harris, 2002; Scarr, 1998). Some child characteristics, such as various dimensions of temperament, have shown heritability; however, secure attachment to parental figures, an important factor in early personality development, has not shown significant heritability (Vaughn & Bost, 1999). Thus, in the development of mother-child attachment, nurture or parenting is more essential than genetic endowment.

Influence of Parental Beliefs

In addition to parenting practices, it is also important to consider parental beliefs about parenting. There has been some debate concerning differences between beliefs and behavior. In both psychology and anthropology, some have argued that the relationship between beliefs and behavior is difficult to detect (Harkness & Super, 1992). A relation between cultural group values and beliefs is not disputed; however, individual variation in practice within cultures may result from either selective attention to societal norms, personal practices that differ from publicly expressed values, or outright nonconformist behavior (Gjerde, 2001; Grusec, Hastings, & Mammone, 1994). However, the assumption that parenting practices are influenced by beliefs about what constitutes acceptable behavior is generally upheld (Sigel, McGillicuddy-DeLisi, & Goodnow, 1992). It is of particular interest that varying parental beliefs within cultural groups often

explain differences in parenting behavior, which may, in turn, improve the prediction of children's developmental outcomes (Harkness & Super, 1992).

Ecological Perspective

Other factors besides parenting also influence children's development. Systems theory suggests that children are affected by multiple experiences and settings, directly and indirectly. Emotional regulation, fathering, marital conflict, and the physical environment have been associated with children's attachment behavior in recent empirical research (Braungart-Rieker, Garwood, Powers, & Wang, 2001; Davies, Harold, Goeke-Morey, & Cummings, 2002; Diener, Nievar, & Wright, 2003). From a broader perspective, the National Research Council's report on early childhood noted that multiple factors--including parents' psychological adjustment, marital relationships, the child care environment, neighborhood, and culture--affect parenting, parent-child interactions, and child development (Shonkoff & Phillips, 2000).

Justification of the Research

The relation between parenting behavior, the parent-child attachment relationship, and child behavior has been previously researched. A meta-analysis of 66 studies from diverse cultures indicated that maternal behavior styles influence the quality of parent-child attachment relationships (De Wolff & van IJzendoorn, 1997). The quality of the attachment relationship, in turn, is related to children's emotional regulation, an important factor in developing social skills (Calkins, 1994).

Although parenting behavior, attachment, and children's self-control have been researched, fewer studies have looked at how parental beliefs, such as parental efficacy, relate to child outcomes. Among studies relating parental efficacy to attachment, results are inconsistent (e.g., del Carmen, Pedersen, Huffman, & Bryan, 1993; Spieker & Booth, 1988; Teti & Gelfand, 1991). High parental efficacy is related to several parenting activities, ranging from improving parenting skills through self-education (Spoth & Conroy, 1993) to teaching children injury protection (Peterson, Farmer, & Kashani, 1990); however, some studies of parental efficacy and parenting behavior have produced unexpected results and noted confounding effects (del Carmen, Pedersen, Huffman & Bryan, 1993; Luster & Rhoades, 1989; Mash & Johnston, 1983; Spieker & Booth, 1988). An overly strong perception of self-competence and a weak sense of self-competence may both be related to suboptimal parenting behavior. However, a curvilinear relation between perceived competence and parenting behavior has not been specifically tested.

Bandura (1982, 1986, 1994) has led the field in investigations of efficacy. His early work acknowledged multiple facets of self-efficacy beliefs, differentiating between perceived competence and control over outcomes, while acknowledging that they were interwoven (Bandura, 1982; Ozer & Bandura, 1990). Applying these principles to the domain of parenting, a self-perceived efficacious parent would need to believe: (a) in their personal competence and knowledge about parenting, and (b) that parenting makes a positive difference in children's outcomes. Differentiation between perceived competence and perceived control might also clarify inconsistent findings in the research literature.

This dissertation investigates the mediators and moderators of the theoretical process represented pictorially in Figure 2. Distal factors, such as the quality of marital relationships, may affect attachment and children's subsequent adjustment, through pathways such as parenting behavior (Davies, Harold, Goeke-Morey, & Cummings, 2002). Other research groups have investigated the development of parental efficacy, attachment, and child behavior; however, typically such research has used smaller samples and focused on a small number of variables. Hence, fewer studies examine interactions and mediational processes.

A notable exception is Teti and colleagues' work with high-risk families. In this series of studies, spousal support and child temperament moderated the relation between parent-child characteristics and parental efficacy, and parental efficacy mediated the relation between maternal depression and sensitivity (Teti, O'Connell, & Reiner, 1996). A model using a larger and more heterogeneous group of participants may extend these findings, allowing for the examination of processes among low-risk as well as high-risk groups.

Additional research is needed to further define parental efficacy and explore its relation to parenting practice and child outcomes. In particular, research is necessary to untangle differences in developmental processes across diverse groups (Bronfenbrenner, 1999). What is normative in one cultural group or sub-group may not be appropriate in another. Cultures differ in some of their core beliefs, making certain types of parenting beliefs and behavior and certain types of child behavior more acceptable in some groups than in others. A scarcity of resources may also make certain types of behavior more acceptable or useful; some researchers have theorized that certain parenting behavior,

such as strict discipline, is adaptive for parents and children in African American families (Deater-Deckard, Dodge, Bates, & Pettit 1996; Gonzales, Cauce, Friedman, & Mason, 1996). Alternatively, this effect may be accounted for by socioeconomic status (Polaha, 1999). Yet other processes in child development are theorized to be constant across cultures or settings.

In order to investigate diverse perspectives in parenting, it is important to have a sample that is similar to the population of interest. Although some research has been done on parenting processes among African Americans in the United States, most of this research has been among low-income inner-city families involved in intervention programs (Mcloyd, Cauce, Takeuchi, & Wilson, 2000). Although studies of prevention programs can teach us much about a subgroup of the population, it is important to recognize that an over-generalization of such research may create confusion. Research on single-parent African American families has been particularly emphasized in the last decade, with two-parent families simply used as a comparison. Furthermore, studies of parenting in Caucasian families often focus on middle-class samples that are also unrepresentative.

The sample of participants in this dissertation reflects the population to a greater extent than studies using local convenience samples. Specifically, data were collected from families who participated in the NICHD Study of Child Care. The demographics of these participants reflect national income levels and racial proportions (NICHD, 1999a). Thus, descriptions of family processes should be more representative of American families than most previous work.

In addition, varied environmental conditions may create circumstances wherein certain parenting practices are important for children's well-being. Given that a family's available resources influence child development (Shonkoff & Phillips, 2000), this dissertation will examine both low-income and middle-to-high income families. Given that racism and ethnic differences in parenting behavior may influence family processes (McLoyd, Cauce, Takeuchi, & Wilson, 2000), a model evaluating the influence of parental efficacy on attachment security will contrast African American and Caucasian groups. An ecological perspective assumes that factors such as ethnicity, neighborhood quality, and marital quality may influence child characteristics (Bronfenbrenner, 1992). Thus, distal factors, such as family income, and proximal factors, such as parenting practices and child characteristics, may alter the strength of the relation between parental efficacy and child outcome.

In sum, this research will add to our current understanding of attachment relationships within diverse environments. Its emphasis on parental efficacy may explain the motivation behind parents' actions and the connection of parents' cognitions to parenting practice and child behavior. From an applied perspective, findings may assist in the development of culturally appropriate parent education curriculum or home visiting programs.

Overview of the Dissertation

Chapter 1 has presented a brief description of the research questions and the significance of this research. The following chapter presents a literature review describing the theoretical and empirical basis for this research. A discussion of

ecological theory provides a framework for understanding social cognitive theory and attachment theory. Applications of these theories as found in the empirical research literature are discussed. Group differences and similarities are also reviewed.

Chapter 3 presents the methods and measures used to test the research questions described in Chapter 1. Chapter 4 presents empirical results, including frequencies, correlations, analyses of variance, logistic regressions, and structural equation models. Finally, Chapter 5 discusses these results, describes limitations, and suggests future research directions.

CHAPTER 2

LITERATURE REVIEW

This dissertation draws on three areas of social science literature as a basis for its model: (a) ecological theory, (b) social cognitive theory, and (c) attachment theory. A description of these three theories and pertinent literature is followed by a review of literature on the correlates of attachment, including characteristics of the individual child, the home environment, the child care environment, and distal factors. Literature discussing the process of children's social-emotional development within diverse cultures is also presented.

Ecological Theory

Bronfenbrenner's (1979) early ecological model focused on the environment and its effect on the developing individual. Historically, psychologists in the 1960s and 1970s spent more time in laboratory settings than in natural environments. In fact, clinical and research psychologists tended to discount effects of the total family, working conditions, and neighborhoods, focusing on individual perceptions apart from their environment. In contrast, Bronfenbrenner's ecological model emphasized total environmental effects.

Bronfenbrenner designated various levels of a child's total environment as interactive systems, including the microsystem, mesosystem, exosystem, and macrosystem (Hamilton & Luster, 2003). The system likely to have the greatest effect on

a child was named the microsystem. By definition, the microsystem included the individual child. The home environment is a microsystem with parents, siblings, toys, and the individual child. Issues involving the home as a microsystem include home safety and parent-child interaction. The child care environment or the neighborhood play group are other microsystems that include the child at different times.

Intersections between microsystems were designated as the mesosystem. Connections between home and school or school and child care are important to the developing child. For example, a parent who has difficulties communicating with a caregiver may miss important information that would help them as parents in their child's home environment.

The exosystem includes areas affecting the child indirectly. For example, parental work demands may affect their volunteer work at their children's preschool, thus affecting the child. The microsystem, or the environment in contact with the child, is affected by the mesosystem, which in turn is affected by the exosystem. The macrosystem includes broader attitudes and ideologies, i.e., culture, socioeconomic status, values, and government. In the previous example, the parent may be reluctant to quit a demanding job because of a desire to maintain the family's socioeconomic status. The macrosystem may influence this parent's beliefs to value spending time developing their career over spending time volunteering in their child's preschool.

Bronfenbrenner's (1992, p. 197) later "person-process-context model" emphasized the dynamic nature of development through interaction between people and their environments. It is recognized that the environment affects children; however, children make changes in their environment also. A more sociable child is more likely to

attract attention from teachers and peers. Researchers were encouraged to include both the environment and the individual in their work, rather than focusing solely on the influence of settings or the attributes of people.

Bronfenbrenner's (2000, p. 129) current model, termed the "bioecological model" accounts for heritable traits and the effect of the environment on the individual over time. The environment may include objects, symbols, and people; it may be in proximal contact with the individual as in the microsystem of the ecological model or it may be more remote, such as the neighborhood or the government. The individual develops in the context of the environment through proximal processes that vary as a function of the person, the nature of developmental outcomes, and the continuities and discontinuities that occur over time, i.e., process-person-context-time.

Furthermore, developmental processes are enhanced when they involve another individual who has developed a close relationship with the child. Thus, this dissertation will focus more on parent-child relationships and the home environment than child care provider-child relationships and the child care environment. Family resources, child temperament, and other characteristics of the person and environment will be included.

Although Bronfenbrenner's (1979) emphasis on the study of development in context was followed by his colleagues, he found that his overemphasis on the environment as a context for development created a new problem, "a surfeit of studies on context without development." (Bronfenbrenner & Morris, 1998, p. 994). Thus, this dissertation examines not only the context and the process of parenting but the development of children. In particular, a focus on social-emotional development includes attachment security and child self-control as outcome measures.

Ecological theory provides a framework for this dissertation; attachment theory and social cognitive theory provide a basis for investigation. Attachment theory attempts to explain the relation between the child's environment, parental behavior, and child behavior (Cassidy & Shaver, 1999); social cognitive theory suggests that parental efficacy mediates between the environment and parental behavior or between the environment and attachment (Bandura, 1995; Donovan & Leavitt, 1989; Gondoli & Silverberg, 1997; Luster & Rhoades, 1989; Teti & Gelfand, 1991). The following section discusses social cognitive theory and attachment theory as a basis for this research.

Social Cognitive Theory

Rotter, an early leader in the study of efficacy, developed the idea of a locus of control (1990). An internal locus of control was defined as the perception that a person's behavior affected his environment. An external locus of control was defined as the perception that luck, chance, or external forces beyond personal control affected a person's environment.

Instead of using the language of locus of control, Bandura (1982) explained personal control, or the perception of a connection between efforts and outcomes, as self-efficacy. A major tenet of Bandura's social cognitive theory is that learning occurs by observing modeled behavior; certainly observation of other individuals' effectiveness relates to self-motivation and efficacy. However, personal experiences of success or failure are more relevant to motivation. According to Bandura, individuals' beliefs about the connection between their efforts and the desired outcomes affect their motivation to act. Theoretically, those who have higher levels of self-efficacy are more likely to be

motivated to succeed at a given task. For example, parents who believe that they can affect their children's actions by their efforts (e.g., help them learn to talk by talking to them) are more likely to spend time and effort in parenting. A second dimension of self-efficacy, also discussed by Bandura (1982, 1989), involves perceived competence. For example, parents who felt that they were skilled and capable in handling their children are more apt to spend time engaged with their children because of the personal satisfaction they receive.

In his later work, Bandura cited attribution theory to differentiate the relation between perceived control and perceived competence: "Self-efficacy beliefs [perceived competence] influence causal attributions [perceived control]. People who regard themselves as highly efficacious attribute their failures to insufficient effort, those who regard themselves as inefficacious attribute their failures to low ability" (Bandura, 1994). Although Bandura has redefined the relation between perceived competence and perceived control, research continues to use varied conceptualizations of efficacy and its dimensions.

In addition to problematic conceptualizations within the field, a debate about the boundaries of self-efficacy exists (Coleman & Karraker, 1997). Is self-efficacy a personality trait, or is it a state that varies over time? Self-efficacy theory developed by Bandura describes efficacy as a domain-specific construct; Harter (1978) prefers a global orientation. According to Bandura (1989), efficacy in one area does not apply to efficacy in another; however, a multi-faceted approach to efficacy measurement may improve measurement capabilities. In a previous study, a latent construct of multiple measures of child efficacy was a significant predictor in structural equation modeling, although the

measures of efficacy were not intercorrelated (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). Individuals may feel competent in one area but may feel deficient in another; similarly they may feel that they have control in some situations but not in others. Bandura has suggested that measures be constructed from task-specific items, such as "I feel capable of soothing my child when he/she is upset," rather than global items, such as "I feel like I am a good mother."

Parental Efficacy

Self-efficacy that encompasses parenting is defined here as parental efficacy. Parental efficacy, or the belief in one's ability to parent effectively, is composed of various domains. Bandura and colleagues have noted that efficacy may be divided into multiple domains, such as motivation, cognitive resources, and the exercise of control over events (Ozer & Bandura, 1990). This review of parental efficacy is largely concerned with perceived control and perceived competence.

Although conceptualizations and specificity vary between studies, the literature suggests that parental efficacy is related to parenting and child outcome. Early research found that low parental efficacy was related to children's difficult temperament (Bugental & Shennum, 1984). A review of research noted that parental self-efficacy has emerged as a powerful correlate of parenting skills and a mediator of the effects of varied constructs related to child outcome, including maternal depression, child temperament, social support, and poverty (Coleman & Karraker, 1997). Applied research has also underlined the importance of parental efficacy. Recent interventions with clinical populations of young children (e.g., ADHD, autism, Asperger's syndrome)

have noted associated improvements among parental efficacy, parenting, and child outcome (Hastings & Brown, 2002; Hoath & Sanders, 2002; Sofronoff & Farbotko, 2002).

Although developmental research continues to show a trend toward examining parental beliefs as well as parental behavior (Smetana, 1994), research on parental beliefs is still an emerging field. As such, varied definitions and operationalizations of parental efficacy exist (Lovejoy, Verday & Hays, 1997). The construct of parental efficacy has been alternatively described as parent attributions (Bugental, Blue, & Cruzcosa, 1989; Deutsch, Ruble, Fleming, Brooks-Gunn, & Stangor, 1988), parental locus of control (Campis, Lyman, & Prentice-Dunn, 1986; del Carmen, Pedersen, Huffman, & Bryan, 1993), parental sense of competency (Abidin, 1986; Johnston & Mash, 1989), and parenting self-agency (Dumka, Stoerzinger, Jackson, & Roosa, 1996).

From Bandura's perspective on perceived competence, it may be hypothesized that parents who feel competent in specific tasks are more likely to derive satisfaction from parenting. Thus, they may have a higher level of motivation than those parents who do not feel competent. This motivation is assumed to improve their parenting abilities. Parents' perceived control over child outcomes, their expectations for themselves as parents, and prior experiences in teaching their children all affect personal perceptions regarding competence.

Yet, parents who feel competent in their roles as mothers may not actually behave in a sensitive and responsive manner to their children's needs (Luster & Rhoades, 1989). In this study, adolescent mothers who rated themselves highly on parental competency actually provided a less positive environment for their children

than mothers who viewed themselves as less competent parents. Those who felt less competent, according to the researchers, may have had a greater understanding of the difficulty in providing a nurturing environment as a young single parent.

Diversity and Parental Efficacy

Stresses that occur in the daily life of parents who are unsuccessful in providing subsistence to their families are likely to affect their expectations and their sense of efficacy. Low-income parents may have low self-efficacy because of adverse environmental conditions or depression (Olds, 1997). Previous efforts to change their behaviors or circumstances may have met with resistance, thus teaching them low self-efficacy by experience. In fact, parents are more likely to have negative beliefs about parental involvement and efficacy in lower socioeconomic classes (Luster & Kain, 1987).

Parental efficacy may also be a stronger correlate of parenting and child outcome in less advantaged families. Theoretically, parental efficacy may make more of a difference among children who experience risks or disadvantages. Risk could come through multiple routes, either through the macrosystem (e.g., racism, socioeconomic status), the exosystem (e.g., dangerous neighborhoods) or through the microsystem (e.g., witnessing marital conflict). Strong parental efficacy, or the associated responsive parenting, may then act as a protective factor against risk for some children.

Bronfenbrenner (2000) noted that proximal processes have differential effects dependent on the level of risk in the environment. He also theorized that parental attention related to developmental dysfunction would be greater in deprived

environments, assuming that parents are less vigilant in low-risk environments, where the probability of poor child outcome is lower. Although the reasons for this effect have not been established, differential effects of parental efficacy within varied contexts have been researched.

A few recent studies support the relative importance of parental efficacy. A study of parental efficacy among middle-class families showed no relation between efficacy and parenting practices (Corapci & Wachs, 2002). Among Head Start families, parental efficacy mediated the relation between children's difficult temperament and home learning activities (Machida, Taylor, & Kim, 2002). In a study of families living in inner-city neighborhoods, parental efficacy was a predictor of positive parenting among African American families; however, there was no relation between parental efficacy and parenting among Caucasian families (Ardelt & Eccles, 2001). It was noted that within this disadvantaged group, African American families tended to live in more dangerous neighborhoods than Caucasian families. In addition, parental efficacy was a stronger correlate of academic success in African American single-parent families and married families reporting husband-wife conflict than in Caucasian families and African American families who reported having a compatible marriage relationship. In the study of parental efficacy, it may be important to view processes separately within socioeconomic and cultural groups in order to fully understand parental belief systems, parenting, and children's social-emotional development.

Attachment Theory

Attachment theory provides a framework for understanding children's social-emotional development in the context of the parent-child relationship. Bowlby's attachment theory proposed that children use their caregivers as a secure base that provides comfort in times of stress (Bowlby, 1969). From an evolutionary perspective, children who remained close in proximity to their parents were more likely to be protected from danger. A strong emotional attachment with the caregiver developed as a means of protecting the infant, and attachment behavior is organized around this parent-child relationship.

Two measures of attachment security are presumed to be valid determinants of attachment security (De Wolff & van IJzendoorn, 1997; Vaughn et al., 1992). First, the strange situation classifies different types of attachment: 1) secure, 2) insecure-resistant, and 3) insecure-avoidant. In later years, a disorganized classification has been included in some studies (Main & Solomon, 1990). The strange situation is a scripted laboratory procedure that induces mild stress for the infant; subsequent child behavior in the presence of the caregiver, most often the mother, is observed and classified (Ainsworth, Blehar, Waters, & Wall, 1978). To support of the validity of the strange situation, qualitative differences in maternal behavior are related to strange situation classifications (Isabella, Belsky, & von Eye, 1989). Specifically, mothers with insecure-avoidant children tended to be more intrusive than mothers with secure children or mothers with insecure-resistant children. Mothers with insecure-resistant children tended to be emotionally or physically unavailable. Mothers with secure children are

more sensitively responsive; however, these mothers have less frequent interaction with their children than mothers with insecure-avoidant children.

The second attachment measure, the Attachment Q-Set, has more recently been established as a valid measure of attachment security (Solomon & George, 1999). This measure rates secure behavior on a continuous scale; qualitative differences between insecure attachment types are not measured (Waters, 1995). The validity of mother ratings of her own child has been questioned; however, trained observer ratings of attachment security are considered to measure the same construct as the Strange Situation (De Wolff & van IJzendoorn, 1997).

It is important to note that both measures assess child behavior. Although attachment is theoretically based on the mother-child relationship, these measures assess child behavior with respect to that relationship. Hence, the child's security is measured separately from the mother's input to the relationship.

Although research has largely verified the theoretical relationship between parenting and attachment security, ongoing debate regarding the scope of attachment theory has raised interesting questions. Some researchers have viewed attachment as a process rather than a state; qualities of attachment and attachment behavior may change over time. Others have suggested that infant-attachment security is not a child outcome because children may have more than one attachment relationship with multiple caregivers; for example, a child may be insecurely attached to the mother and securely attached to the father or child care provider (Sagi et al., 1986; Sroufe, 1985).

Insecure attachment styles were often viewed as dysfunctional; however, later research included a disorganized attachment designation. With the development of a

disorganized attachment class, it was noted that when attachment strategies exist, whether secure or insecure, they provide a way of organizing behavior that allows for a functional relationship. Alternatively, disorganized attachment is theorized to be maladaptive; it is associated with parental depression, infant maltreatment, and later hostile and aggressive behavior in preschoolers (Lyons-Ruth, 1996; Main & Solomon, 1990; Teti, Gelfand, Messinger, & Isabella, 1995).

Preferred attachment strategies may differ between cultures; in fact, some researchers believe that insecure-resistant attachment may be more adaptive than secure attachment among other cultures (Crittenden, 2000; Hinde & Stevenson-Hinde, 1990; Kondo-Ikemura, 2001). It is important to note, however, that insecure attachment is often associated with child behavior problems in studies of children in Western cultures. One such study found that pathways between insecure attachment and externalizing and internalizing behavior problems showed a strong effect of attachment, even when controlling for parenting processes and marital conflict (Davies, Harold, Goeke-Morey, & Cummings, 2002).

Correlates of Attachment

Over the past fifty years, researchers have elaborated on Bowlby's initial work on attachment correlating anti-social adolescent behavior and maternal separation. This literature review discusses research on correlates of attachment, beginning with child characteristics, including temperament and self-control, and parental factors, including beliefs, practices, and parental psychopathology. More distal elements of the

environment, including marital relationships, culture or race, and socioeconomic class are also considered.

Temperament. Some aspects of children's behavior may be based on their temperament, which includes traits such as negative mood, fearfulness, emotionality, proneness-to-distress, and sociability (Goldsmith et al., 1987). Thomas and Chess (1977) define temperament as behavioral style. Temperamental qualities they studied include rhythmicity, activity level, attention span-persistence, distractibility, adaptability, approach-withdrawal, threshold, intensity of reaction, and mood. In addition, they equate temperament with the style of behavior, or the "how" something is done. One enduring portion of their temperament theory is the goodness-of-fit model (French, Rodgers, & Cobb, 1974). In this model, positive child outcomes occur when the temperament of a child is consonant with the demands of the environment.

Empirical studies of the direct relationship between infant temperament and attachment result in mixed findings (Bretherton, 1985). Two studies indicated that the relationship between attachment and some aspects of temperament was stronger than the relationship between attachment and maternal sensitivity (Seifer, Schiller, Sameroff, Resnick & Riordan, 1996; Teti, Nakagawa, Das, & Wirth, 1991). Seifer et al. (1996) used mother reports and observational measures of infant temperament. Observation measures of negative mood and total difficulty were both associated with low scores on the Attachment Q-set (AQS), indicating insecure attachment. Other aspects of temperament such as approach, activity and intensity were not significantly related to attachment.

In a meta-analysis of 18 temperament and attachment studies, proneness-to-distress was significantly related to insecure-resistant attachment, but not to insecure-avoidant attachment (Goldsmith & Alansky, 1987). The authors theorized that infant proneness-to-distress (e.g. fussiness, crying) could be a reflection of maternal behavior. Caregiving practices may modify the behavioral expression of traits such as proneness-to-distress or negative mood. Other contextual factors, such as infant health, are likely to influence this aspect of temperament. Some studies reviewed found significant relationships between attachment security and other aspects of temperament, such as fearfulness (e.g., Thompson & Lamb, 1983). Theoretically, a fearful child may be less likely to explore the surroundings, thus interfering with secure base behavior.

Teti et al. (1991) used scales on the Parenting Stress Index to assess various aspects of child temperament. High scores on the child domain were strongly related to low security as measured by the Attachment Q-Set. Related subscales measuring various aspects of temperament include adaptability, demandingness, mood, and distractibility. High scores in these areas, indicating low adaptability, demanding infants, negative mood, and distractible or hyperactive infants, predicted low attachment security. An additional study found a significant relationship between attachment type determined by the Strange Situation and a combination of mother and observer reports of temperament measuring sadness, anger, and negative emotionality (Izard, Haynes, Chisholm, & Baak, 1991). Thus, some studies indicate a relationship between temperament and attachment quality.

The previously discussed goodness-of-fit model can be applied to the relationship between temperament and attachment. Two studies found that the

interaction between an inadequate environment and infant irritability related to insecure infant attachment (Crockenberg, 1981; Mangelsdorf et al., 1990). The earlier study found that low social support combined with high newborn irritability was significantly related to insecure attachment (Crockenberg, 1981). Yet, temperament alone was not significantly related to security of attachment. A second empirical test of the goodness-of-fit model showed that the interaction between maternal personality, representing part of the infant's social environment, and infant proneness-to-distress temperament was associated with security of attachment (Mangelsdorf et al., 1990). The correlation between infant temperament and attachment quality without the addition of maternal personality was not significant.

Other studies also found that temperament determined the type of attachment classification rather than security of attachment (Braungart & Stifter, 1991; Calkins & Fox, 1992; Kochanska, 1998; Susman-Stillman et al., 1996). Susman-Stillman et al. (1996) used path analysis in their study of 267 dyads. Infant sociability tended to predict insecure-avoidant attachment. There was a trend for infant irritability to predict insecure-resistant attachment. Mediator and moderator models indicated a complex relationship between temperament and attachment. Maternal sensitivity mediated the effects of infant irritability in this study. In addition, an interaction between irritability and maternal sensitivity at 3 months was significantly related to security of attachment at 12 months. Theoretically, sensitive mothering would assist in the infant's regulation of temperamental extremes. Without a sensitive, responsive mother, proneness-to-distress temperament may interfere with mother-child interactions.

Interestingly, alternative pathways to the development of conscience were found to involve temperament as a moderator (Fowles & Kochanska, 2000). Fearful children were found to develop conscience through discipline; fearless children may develop conscience through an alternate pathway of attachment. Later anti-social behavior may be related to a fearless temperament combined with poor attachment relationships in early childhood.

Some aspects of the relationship between temperament and attachment remain unresolved. Yet, researchers have found direct and indirect relationships between various attachment measures and negative mood, fearfulness, emotionality, proneness-to-distress, and sociability. A growing consensus has developed that both caregiver influences and child temperament are expressed in children's behavior (Kochanska, 1998). Although some behavioral tendencies may represent relatively stable traits, children's behavior is presumed to be changeable over time and influenced by environmental characteristics.

Self-control. One behavioral characteristic that may be influenced by the environment is self-control. In the rubric of temperament, self-control may be designated as a component of self-regulation; however, it is often not considered to be temperament (Rothbart & Bates, 1998). Some cultures value self-regulation more than others. Emotional regulation is important to social competence in the United States; other societies are more open about the expression of feelings (Rothbaum, Pott, Azuma, Miyake, & Weisz, 2000). It is of interest to note that fathers may fulfill an important role in the development of children's emotional regulation in Western cultures (Braungart-Rieker, Garwood, Powers, & Notaro, 1998; Parke, 2002).

Researchers have identified two components to self-control: (a) passive self-control associated with temperamental traits, e.g., fearfulness, inhibition, or caution, and (b) active or effortful control associated with the development of conscience (Kagan, 1998; Kochanska, Murray, & Harlan, 2000). Parental discipline styles may be related to the development of self-control. For example, maternal power assertion, such as physical punishment or restriction, inhibited the development of effortful control in one longitudinal study (Kochanska & Knaack, 2003).

Numerous other studies have used laboratory tests measuring self-control, emotional regulation, impulsivity, or behavioral regulation by presenting the child with an attractive stimulus, e.g., a toy, and subsequently asking the child to avoid or delay interaction with the stimulus (for review, see Kochanska et al., 2000). Such studies often report associations between performance on self-control tasks in early childhood and later social-emotional behavior, including adjustment and attentiveness (Rothbart & Bates, 1998).

Self-control in various forms has been associated with attachment security. Early research linked secure attachment to greater compliance with maternal requests (Londerville & Main, 1981). More recently, emotional regulation has been found to be associated with attachment (Braungart-Rieker, Garwood, Powers, & Wang, 2001; Cummings & Davies, 1996; Cassidy, 1994). In a longitudinal study of 94 families, Braungart-Rieker and colleagues (2001) found that affect regulation discriminated between types of insecure attachment classification. Infants with avoidant attachment showed more affect regulation; infants with resistant attachment showed less affect

regulation. In addition, infant affect regulation mediated the association between maternal sensitivity and attachment security.

Parental efficacy. Insecure attachment quality has been found to have a counter-intuitive relation to parental efficacy when it is measured as self-perceived competence at parenting tasks. In one study, parents who felt extremely competent were more likely to have an insecurely attached child (del Carmen, Pedersen, Huffman & Bryan, 1993). Parental self-efficacy predicted the type of insecure attachment in an at-risk sample of low-income families with mothers of insecure-avoidant children and disorganized children having the most perceived competence (Spieker & Booth, 1988). Mothers whose children were classified as insecure-resistant had less perceived competence, as did mothers whose children were securely attached.

Among a sample of mostly clinically depressed mothers, the expected relation between less perceived competence and attachment insecurity existed (Teti & Gelfand, 1991). This sample would have included few mothers who were intrusive; in fact, most mothers would have been withdrawn. Those who felt least competent in this sample would be more likely to be depressed and have lower self-efficacy rather than to have externalizing problems coupled with dismissing questions of self-competence. The fact that the counterintuitive relation between attachment and parental beliefs did not exist in this sample supports the hypothesis that differences in perceived competence may distinguish between two styles of parenting. In fact, differences in perceived competence may differentiate between mothers of insecure-avoidant or disorganized children and mothers of insecure-resistant children. Interestingly, when parental

efficacy was defined as perceived control, a stronger sense of parental efficacy was related to secure attachment (Casady, Diener, Isabella, & Wright, 2001).

Sensitivity. One correlate of attachment that received the most attention during the early years of attachment research is the construct of sensitivity (De Wolff & van IJzendoorn, 1997). The sensitive mother is defined as being attuned to her child's behavior, allowing her to accurately interpret, and respond appropriately to her child's signals (Bowlby, 1988). The sensitive mother is also able to observe the effect of her behavior on her child and modify her actions to fit the child's needs. For example, the infant touches the mother's hand, and she extends a finger. The infant curls his hand around the finger, and the mother moves her finger up and down. Another factor in the construct of sensitivity involves the timing of response to the infant. Sensitive maternal behavior has been compared to a dance. If the mother responds too quickly, she may startle the infant. If she responds too slowly, the dance is interrupted. As in any social interaction, the synchrony of social cues such as smiling or touch make a difference in the amount of pleasure experienced. The same interaction could be viewed as either playful or intrusive, depending on the continuity or discontinuity of the dyadic behavior.

Ainsworth, a leading figure in early attachment research, found a strong association between maternal sensitivity and secure attachment (Ainsworth, Blehar, Waters, & Wall, 1978). Meta-analyses have confirmed that sensitivity is related to attachment; however, the grand mean correlations are in the small effect size range (De Wolff & van IJzendoorn, 1997; Goldsmith and Alansky, 1987). The relative effect of sensitivity may depend upon the method of measuring maternal behavior. Two studies using home observation and measurements of maternal sensitivity that reflected

reciprocal and synchronous responsive behavior found a strong association between sensitivity and attachment (Isabella, 1993; Pederson & Moran, 1996). Correlations between maternal sensitivity and attachment in these studies were equal to or greater than .50. Results from a group of longitudinal studies emphasized the importance of measuring the appropriateness of maternal behavior rather than simple frequency of response (Belsky, 1999). In addition, the strength of correlations between sensitivity and attachment may depend on the context or culture.

Recently, questions have been raised about the appropriateness of the theoretical sensitivity-attachment relation in non-Western cultures (Rothbaum, Weisz, Pott, Miyake, & Morelli, 2000). This article, however, did not present empirical evidence; Rothbaum et al.'s hypothesis was contradicted in a later empirical test comparing middle-class Columbian families and middle-class families from the United States (Posada et al., 2002). A meta-analysis of 15 studies from countries other than the United States found that sensitivity was related to attachment security regardless of the culture (van IJzendoorn & Sagi, 1999). Yet, additional tests of the cross-cultural generalizability of the theoretical link between sensitivity and attachment may add to the literature.

Discipline. Generally, physical punishment has been associated with negative outcomes. However, a study of families living in poverty suggests that African American parents who engage in corporal punishment do not negatively impact their children's behavior (Deater-Deckard, Dodge, Bates, & Pettit, 1996). It is possible that a child's view of his parent's behavior may make a difference in his outcome. A recent article discussing the ecology of attachment suggests that different family members view

discipline and attachment-related issues in different ways (Hill, Fonagy, Saffier, & Sargent, 2003). Some may see controlling behavior as frightening or playful, dependent on the context as well as their own individual perspective. However, overtly harsh and unpredictable discipline has been associated with poor child self-control and attachment disorders, particularly disorganized attachment (Karr-Morse & Wiley, 1997; Gauthier, 2003).

Parental psychopathology. Clinical depression, particularly severe depression, has been found to be associated with insecure attachment (Teti, Gelfand, Messinger & Isabella, 1995). A recent meta-analysis of seven studies from European American families confirmed this association (Martins & Gaffan, 2000). Overall, infants of depressed mothers showed a reduced likelihood of secure attachment and a higher likelihood of disorganized attachment.

One study found an interesting relation between depression, maternal behavior, and child attachment security. Depressed and nondepressed mothers with infants who were securely attached had similar emotional expression patterns in the dyadic relationship (Radke-Yarrow, 1991). Thus, depressed mothers with securely attached children appear to limit their expression of depression within the mother-child relationship. In contrast, mothers with unipolar depression whose children were insecurely attached exhibited high frequencies of anxiety, sadness, and downcast mood when observed with their children. Their emotions were significantly different from emotions of mothers in the control group who had insecurely attached children.

Another study measuring mother-child interaction among 70 depressed mothers found that children with disorganized attachments were more frequently ignored by their

mothers than any other attachment group (Teti et al., 1995). Depressed mothers of children with resistant attachments were more likely to blame their children for misbehavior than depressed mothers of securely attached children. Mothers who self-reported depressive symptoms in addition to having a psychiatric diagnosis were more likely to show negative affect with their infants (Cohn & Campbell, 1992). There was no significant relationship between attachment security and maternal depression when mothers recovered from postpartum depression within 4 months. Yet, there was a tendency toward attachment insecurity when mothers experienced longer lasting clinical depression.

A major longitudinal study linking maternal depression and insecure attachment was conducted through the Harvard Family Support Project (Lyons-Ruth, 1992a). This project began as a study of risk factors for low-income families. Later, it was discovered that 74% of the high-risk mothers referred to the intervention and 27% of the control group met criteria for a diagnosis of clinical depression (DSM-III-R). Security of attachment at 18 months was associated with lower scores on the Center for Epidemiological Studies Depression Scale (CES-D). Home observations at 12 and 18 months indicated that increased hostile and intrusive behavior towards the infant was related to maternal depression.

It is apparent that various types of maternal depression tend to be related to insecure attachment; however, depression does not always have the same effect on the mother-child attachment. Maternal behavior appears to be a mechanism that impacts the dyadic relationship. The chronicity, severity, and type of depression may also affect attachment quality. In addition, maternal depressive symptoms, such as negative affect,

combined with stressful situations are more likely to result in insecure attachment than an actual diagnosis of an affective disorder (Lyons-Ruth, 1992a). Lyons-Ruth (1992b) suggests that stress may activate maternal depression as a manner of coping with adverse situations. Stress and depression may also relate to feelings of hopelessness and a lack of self-efficacy.

Marital Quality. Several studies have found a positive association between attachment security and marital quality (Belsky & Isabella, 1988; Crnic, Greenberg, & Slough, 1986; Goldberg & Easterbrooks, 1984; Spieker & Booth, 1988; Teti et al., 1991). Interactions with marital quality and other factors may also be important. For example, maternal depression combined with a lack of spousal support is more likely to result in child psychopathology than maternal depression combined with a supportive spouse (Cicchetti & Toth, 1990).

The presence of a supportive spouse may be less important to children's security in cultures that place less emphasis on marital happiness (McLoyd, Cauce, Takeuchi, & Wilson, 2000). Yet, it is well established that in Western cultures, conflict between the father and mother, or even the absence of a father, is often related to children's behavior problems possibly due to an increase in maternal stress (Davies, Harold, Goeke-Morey, & Cummings, 2002). Involved fathers may also add unique methods of interacting with children to the family environment.

Shared caregiving. The process of mother-child attachment may differ according to cultural practices of the family. For example, some cultures practice shared caregiving. In these cultures, the mother may not be the person most easily available to the child. Among the Dogon of Mali, children are rarely left alone; however, multiple

caregiving arrangements exist (True, Pisani, & Oumar, 2001). Traditionally, the grandmother rather than the mother cares for first-born sons. In this study, about half of the infants were considered to be cared for primarily by their mother. The Strange Situation assessment indicated that no Dogon infants had avoidant attachment styles with their mother; however, 13% of children had resistant attachment to their biological mother ($n = 47$). As mentioned previously, resistant attachment is associated with maternal unavailability. These children may have developed secure attachment to their grandmother or another primary caregiver while developing resistant attachment to their mother who was less frequently available to them.

Despite the issue of shared caregiving, a significantly higher proportion of the infants in this study were secure when compared with the distribution of infant security in a meta-analysis of studies from multiple countries and cultures (van IJzendoorn & Kroonenberg, 1988). This may be due to an emphasis on frequent human contact and instant response to distress among caregivers, an emphasis that is shared by other African tribes (Levine et al., 1994; Tronick, Morelli, & Ivey, 1992).

Although parallels may exist, findings from African studies are not directly applicable to African Americans. Historically, African American mothers shared caregiving with family and friends; they are still more likely to turn to family and friendship networks for child care than Whites (Johnson et al., 2003). Yet, it is evident that society in the United States places demands on mothers and children that differ from African culture. However, it is important to note that shared caregiving does not appear to relate to attachment disorders within the African culture; this suggests that shared caregiving in and of itself does not lead to insecure attachment.

Shared caregiving in the United States is also experienced by children in child care. Quality of child care may also be associated with attachment; however, the complexity of the child's total environment must be reviewed. Time in child care and the quality of child care may be dependent on parents' attitudes shaped by their culture. In addition, the amount and quality of child care may impact mother-child attachment security or children's behavior, particularly when risk factors, such as insensitive maternal behavior or low socioeconomic status are present (NICHD, 1997; Ritter & Moyi, 2003). Child care appears to be more stressful for young children with a fearful temperament than children with an easy-going temperament (Watamura, Donzella, Alwin, & Gunnar, 2003). Characteristics of children, parents, and the child care setting all contribute to the effects of child care on child development.

Culture, ethnicity and race. Some cultures have different approaches to raising children. For example, German families emphasize early independence. In a study of German families, a higher proportion of German children displayed avoidant attachment when compared to other cultural groups (Grossman et al., 1985). Japanese families emphasize community and interdependence. A meta-analysis comparing proportions of insecure-resistant children indicated higher percentages of resistant attachment among studies of children in Japan than studies of Caucasian American children (van IJzendoorn & Sagi, 1999). The literature suggests that certain parenting styles are related to children's attachment behavior; hence, cultures that emphasize different parenting styles may have children who respond differentially within caring relationships.

Although multiple pathways to the development of close relationships may exist based on cultural differences, the process of attachment, including proximity seeking, maintaining contact, and separation discomfort is theorized to be universal and based on biological needs (Crittenden, 2000; Rothbaum, Pott, Azuma, Miyake, & Weisz, 2000; Rothbaum et al., 2001; van IJzendoorn & Sagi, 1999). A cross-cultural comparison of hypothetical ideal secure behavior used reports from child experts in seven countries (Posada et al., 1995). Results indicated that the concept of attachment behavior is similar across cultures. However, subtle differences may exist. For instance, comparison of correlates of attachment in Colombia and the United States found that mothers of secure Colombian infants were more likely to be concerned with their child's physical appearance; mothers of secure American infants were more likely to be concerned with creating an interesting environment (Posada et al., 2002). Proportions of attachment classifications may also vary between cultures and subcultures, and certainly, the strength of correlation between certain constructs and attachment security may vary between cultures and socioeconomic groups.

Socioeconomic status. In some cultures, certain aspects of the family ecology may be important to attachment quality; these same conditions may be irrelevant to attachment in other cultures. In the aforementioned study of Dogon families, income was not related to attachment quality (True, Pisani, & Oumar, 2001). Studies of families within the United States suggest that a greater proportion of insecurely attached dyads exists in low-income neighborhoods than in middle class neighborhoods; however, resources available to the securely attached Dogon children were fewer than the amount of resources available to average low-income families in the United States.

Conclusion

Many domains of children's environments may differ according to cultural or socioeconomic orientation. Definitions of appropriate parenting styles, preferred attachment styles, and the number of involved caregivers may vary; however, some processes of development are theorized to remain consistent across groups.

In sum, parental efficacy, parenting strategies, and children's social-emotional development are reciprocal processes embedded within the context of the total environment. Social cognitive theory suggests that caregivers who perceive that they are in control of how their children turn out would be more motivated to be responsive to their children. Attachment theory suggests that sensitive, appropriate responsiveness on the part of the caregiver would be related to secure attachment. Insecure attachment may relate to difficulties in self-control. Marital conflict, child care quality, and child temperament may all relate to children's development, which will be operationalized as home and laboratory measures of observed behavior. The following chapter will describe measurement of factors related to the attachment process, including parental beliefs, practices, and environmental context within the United States.

CHAPTER 3

METHOD

This chapter discusses the methods used to test an ecological model of parent-child attachment through secondary data analysis. First, specific hypotheses are presented in two sections: a) hypotheses related to dimensions of parental efficacy, and b) hypotheses related to the ecological model. A description of the sample is presented followed by a description of the instruments used in this particular dissertation.

Hypotheses

Dimensions of Parental Efficacy and Attachment in Infancy

In reviewing the literature, it appeared that two dimensions of parental efficacy—perceived control and perceived competence--were related to parenting behavior and attachment. In addition, it is possible that the different dimensions of efficacy that have been used as a basis for past research are responsible for the mixed results found among previous tests of parental self-efficacy theory. Tests of the following hypotheses will attempt to clarify these dimensions and to examine correlates of perceived control and perceived competence, particularly parenting practices, which in turn may lead to attachment security and children's self-control.

Hypothesis 1a: Parents with higher levels of perceived control are less likely to exhibit detached or intrusive behavior.

Hypothesis 1b: Parents with higher levels of perceived control are more likely than other parents to have infants rated as securely attached.

Hypothesis 1c: The relation between perceived control and secure attachment will be stronger among low-income families than middle-to-high income families.

Hypothesis 1d: The relation between perceived control and attachment security will be stronger among African American families than Caucasian families.

Hypothesis 2: Perceived competence and parenting style will be related to attachment classification.

Hypothesis 2a: Children displaying an insecure-avoidant attachment are likely to have mothers with high levels of perceived competence.

Hypothesis 2b: Children displaying an insecure-resistant attachment are likely to have mothers with low levels of perceived competence.

Hypothesis 2c: Children displaying a secure attachment are likely to have mothers with an average level of perceived competence, greater than that of mothers in insecure-resistant dyads and less than that of mothers in insecure-avoidant dyads.

Hypothesis 2d: Children displaying insecure attachment styles are likely to have mothers who are less sensitive.

Hypothesis 2e: Relations between parental efficacy, parenting style, and attachment vary between demographic groups.

For further clarification of Hypothesis 2, a model of parental competency perceptions, parental behavior, and attachment classification is displayed in Figure 3.

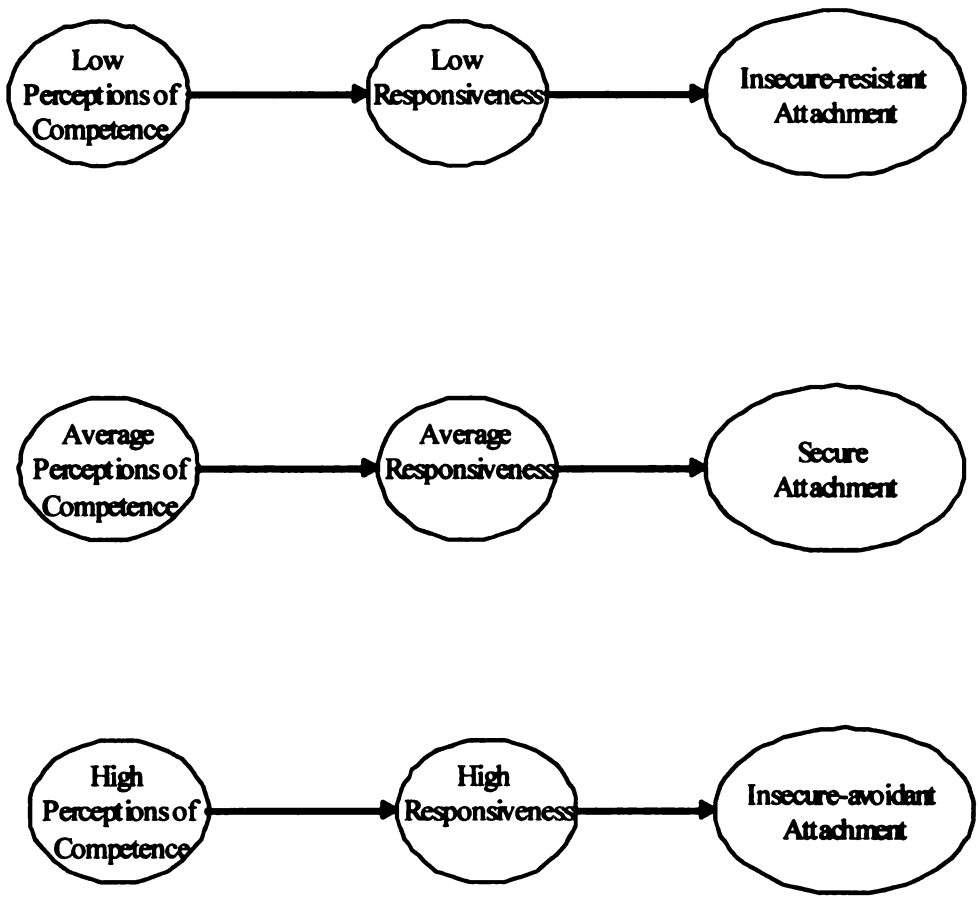

Figure 3. Hypothesized model of perceived competence, responsive parenting, and attachment classifications.

Hypothesis 3: For children in child care, child care quality may moderate the effect of other variables on attachment.

Hypothesis 3a: The quality of child care may buffer the likelihood of insecure attachment for depressed mothers.

Hypothesis 3b: The quality of child care may buffer the likelihood of insecure attachment for mothers with insensitive parenting.

Ecological Model

Next, the model of parental efficacy, parenting, child self-control, and mother-child attachment will be tested. Specific measures used to test this model (Figure 2) will be determined by the results of preliminary variable tests. Different subsamples, such as families with two parents, low-income families, and middle-to-high income families, will also be tested to compare processes within diverse demographic groups.

Hypothesis 4: The model describing the development of mother-child attachment and child self-control as displayed in Figure 2 will fit the data.

Hypothesis 4a-1: Mothers who have higher perceived control are more likely to display positive parenting practices.

Hypothesis 4a-2: Mothers who have higher perceived control are less likely to be depressed.

Hypothesis 4b: Mothers who are less depressed are more likely to display positive parenting practices.

Hypothesis 4c: Families who experience less marital conflict are more likely to have positive parenting practices.

Hypothesis 4d-1: Parents who display positive parenting practices (e.g., sensitivity) are more likely to have children with secure attachments.

Hypothesis 4d-2: Parents who display positive parenting practices are likely to have children with greater self-control.

Hypothesis 4e-1: Children who are more securely attached are likely to display greater self-control.

Hypothesis 4e-2: Children who have easier temperaments are likely to display greater self-control.

Hypothesis 4f: Relations between parenting practices, attachment, and self-control may vary between demographic groups.

Sample

The sample in this dissertation comes from the National Institute of Child Health and Development's Study of Early Child Care and Youth Development, commonly referred to as the NICHD Study of Early Child Care. This longitudinal study was developed to answer questions about child care experiences for young children. A scientific review began in 1989 to establish a team of researchers from diverse areas of expertise. Domains of study included children's health, language, cognitive growth and social-emotional development. Family environments and parental attitudes were also part of the research design. In 1991, participants were enrolled at 10 sites throughout the United States, including the University of Washington, the University of California, Irvine, the University of Kansas, the University of Arkansas at Little Rock, the University

of Wisconsin, the University of Pittsburgh, the Western Carolina Center, the University of Virginia, Temple University, and Wellesley College.

Although this is not a nationally representative sample, demographic status of participants is roughly comparable to that of the nation as a whole. Yet, during sample selection, mothers living in neighborhoods considered to be dangerous were excluded from the study. Teen mothers were excluded, and families with children born with a serious disability were excluded. Therefore, the sample is probably lower-risk than a truly random sample of families.

Of the 1364 children in the database, 13% were African American and 80% were Caucasian. The remaining 7% of the parents identified their children as belonging to other racial groups. Of the total sample, only 6% reported Hispanic ethnicity. The 1097 Caucasians consisted of 1042 non-Hispanic whites and 75 Hispanic whites; 3 of 176 African Americans reported Hispanic ethnicity. Children of Hispanic ethnicity were removed from the database for analyses using Caucasians and African Americans only.

The sample consisted of 705 boys and 659 girls; 45% of the children were first-born. Mother's age ranged from 18 to 46, with an average age of 28 (SD = 5.63). During the first month after the child's birth, 85% of the fathers lived with the family. Other adult relatives in addition to the mother and father lived in 14% of the homes. There were no missing data in the above demographic information. Less than 1% of the data were missing for marital status and mother's education. Regarding marital status, 77% of the mothers were married and 9% were living with a partner. Mothers reported a 10% high school dropout rate; 31% of the total group completed high school but received no additional education beyond high school; 35% had completed four or more

years of additional education. Of the 92% of partners reporting education levels, 8% were high school dropouts; 31% completed high school but received no further education; 18% had completed four or more years of additional education.

Of the 93% of families reporting income information for the first month, 24% were living in poverty based on an income-to-needs ratio; 11% of the families reported no income. The percentage of families in poverty decreased over time; only 15% of the families reported poverty-level incomes when the participating child was 3 years old. This may be related to increased attrition among families in poverty as discussed below. Income-to-needs ratios, the continuous measure used in this dissertation, represent total income divided by the poverty level based on individual family size. Average ratios and related statistics by time of data collection are displayed in Table 1.

Table 1

Income-to-needs ratios by time of data collection

Timepoint	Mean	Standard deviation	Median	Range	Sample size
1 month	2.76	2.66	2.17	0 – 25.08	1274
6 months	3.53	3.19	2.88	0 – 27.89	1271
15 months	3.60	3.29	2.84	0 – 35.64	1234
24 months	3.62	3.11	3.01	0 – 27.30	1190
36 months	3.52	3.12	2.93	0 – 28.50	1208

The first wave of data was used for this dissertation, including multiple data collection points occurring from the time of the child's birth to 36 months. Table 2 provides descriptive statistics for selected measures administered during the first wave of data collection. Permission to complete a secondary data analysis was obtained through the Research Triangle Institute, which handles data access and dissemination for the NICHD Study of Early Child Care. The Institute of Children, Youth, and Families at Michigan State University under the direction of Dr. Marguerite Barratt had previously purchased access to the data; however, additional permission to ensure confidentiality of the participants was necessary for this dissertation.

Table 2

Descriptive statistics of study variables

Measure	Mean	*SD*	Range	*n*
Parental Locus of Control	3.36	.49	1.64 – 5.00	1363
Sense of Competence	4.00	.53	1.89 – 5.00	1363
CES-Depression				
1-6 months	11.26	9.02	0 – 53	1363
15 months	9.05	8.18	0 – 54	1241
Global sensitivity	9.21	1.78	3 – 12	1272
Global stimulation	2.59	.66	1 – 4	1272
HOME				
Enrichment	6.91	1.45	0 – 8	1234
Positive parenting	5.53	.89	0 – 6	1234
Lack of negativity	5.04	1.11	0 – 6	1234
Marital conflict (mean item score)	2.32	.93	1 – 6.78	1271
Average of child care quality assessments	22.12	4.81	8 – 37.5	773
Strange Situation Procedure	62.4% secure			1190
Attachment Q-Set	.29	.21	-.49 – .75	1197
Self Control Procedure (composite z-score)	0	.74	-1.11 – 2.62	1093
Temperament				
Caregiver global	2.39	.60	1 – 3	504
Caregiver mean	3.29	.46	1.81- 4.67	397
Maternal global	2.35	.56	1 – 3	1362
Maternal mean	3.31	.65	1.00 – 5.36	1364

Attrition

Analyses of the data were divided into two major sets. The first part focuses on measures in infancy. The final timepoint in the first set of longitudinal analyses is 15 months, when the Strange Situation Procedure was used to assess attachment classification. A comparison of statistics pertaining to children participating in this assessment (n = 174) and children not participating (n = 1190) yielded few results. Of all study variables used for analyses in infancy, including income, maternal education, parental efficacy measures, maternal depression, maternal sensitivity, positive parenting, and child care quality, only income and education were significantly different for families not participating at 15 months. Families not participating had lower income-to-needs ratios (M = 2.21) than families participating (M = 3.42). Families not participating had less education (M = 13.17 years) than families participating (M = 14.39 years). Attrition was significantly higher for African Americans (21%) than Caucasians (11%).

For the second set of longitudinal analyses, only children participating in the 24-month attachment assessment or the 36-month self-control procedure were included. Attrition within this sample (9.9%) was smaller than attrition at the 15-month assessment (12.8%). Tests of all study variables, including income, maternal education, parental efficacy measures, maternal depression, maternal sensitivity, positive/negative parenting, enrichment, attachment at 24 months, and child self-control at 36 months, produced significant differences between participants and non-participants on parenting and enrichment scales. However, these differences were based on a small sample of families (n = 34) who participated in 15-month assessment but did not participate in 24-month or 36-month assessments. These differences may not be representative of the total number

of non-participants in the later assessments (n = 162).

All other measures except for income and education were not significantly different. Families not participating had lower income-to-needs ratios (M = 2.35) and less education (M = 13.40 years) than families participating (income-to-needs ratios, M = 3.37; education, M = 14.33 years). Attrition was significantly higher for African Americans (17.0%) than Caucasians (8.6%).

Measurement

The measures in this dissertation were selected by investigators of the NICHD Study of Early Child Care. The Research Triangle Institute (RTI) is acting as data managers for NICHD. Easily available data consist of constructed variables; however, files of raw data at the item level were accessible through use of a codebook. Measures were collected at multiple timepoints; more than one measure may be used for each construct. For clarification, Table 3 lists the name of measure, related construct, and the age(s) of children at the time of administration.

Table 3

Measures, constructs, and age of child at administration

Measure	Construct	Age of child in months				
Parental Locus of Control	perceived control	1				
Parenting Stress Index, Sense of Competence scale	perceived competence	1				
CES-D	depression	1	6	15		
Mother-child interaction ratings	sensitivity		6			
HOME	enrichment, positive/negative parenting			15		
Love and Relationships	marital quality	1				
Family Finances	income-to-needs	1	6	15	24	36
Assessment Profile for Early Childhood Program	child care quality		6	15		
Assessment Profile for Family Day Care	child care quality		6	15		
Strange Situation Procedure	attachment quality			15		
Attachment Q-Set	attachment security				24	
Self Control Procedure	child self-control					36

Perceived control. The Parental Locus of Control scale, a measure of perceived control, was administered to mothers when children were 1 month old. A factor analysis of the original 47-item scale indicated five factors (parental efficacy, parental responsibility, child control of parent's life, parental belief in fate/chance, and parental control of the child's behavior). Mothers rated statements, such as, "I have often found that when it comes to my child, what is going to happen, will happen," and, "I feel like what happens in my life is mostly determined by my baby," on a 5-point Likert scale. The 20 items included in the NICHD data set were the four items that loaded highest on each of the five factors. Cronbach's alpha for the shortened 20-item version of the Parental Locus of Control scale was .62.

For this dissertation, a subscale was created focusing on factors of parental belief in fate/chance, child control of parent's life, and parental efficacy. Items related to parental responsibility and control of child's behavior, such as "Parents who can't get their children to listen to them don't understand how to get along with children," were not included. These items had a secondary focus of parental attitudes toward discipline; in addition, they appeared to evaluate the parent's stance on the nature vs. nurture issue. Thus, they were not considered wholly appropriate for defining the locus of control concept. Appendix A lists the items included in this subscale. A high score on this subscale represented an internal locus of control or high levels of parental efficacy on the dimension of perceived control. Cronbach's alpha for the 14-item subscale was .69.

Perceived competence. Parenting Stress Index (PSI), a well-established measure of parenting-related stress, contains a subscale named *Sense of Competence* (Abidin,

1986). The Sense of Competence subscale consists of nine items measuring parental efficacy as perceived competence. Cronbach's alpha was .76 at 1 month and .71 at 6 months. The 1-month data were used in this dissertation in order to accurately compare this measure to the Parental Locus of Control scale, which was completed at the 1-month collection time only. Mothers rated items such as "Being a parent is harder than I thought it would be" on a 5-point Likert scale (See Appendix A for additional items). Items were reverse scored so that a high score reflected a positive sense of competence. These two measures, Parental Locus of Control and the PSI, will allow for comparisons of two types of efficacy, perceived control and perceived competence, and their relation to other constructs.

Parental Characteristics

Maternal depression. The Center for for Epidemiological Studies Depression Scale (CES-D) is used to measure maternal depression. The CES-D is a widely-used measure of depression in non-clinical samples. The NICHD Study of Early Child Care repeated this measure at all timepoints. In this dissertation, two measures of depression were used. First, an average of the 1-month and 6-month score was tested in relation to attachment quality at 15-months. Second, the 15-month score was tested in relation to attachment security at 24 months.

Maternal depression is measured by self-report of the occurrence of 20 symptoms over the past week. Sample items are: "I felt sad" and "I was bothered by things that usually don't bother me." Additional items are included in Appendix A. Points of the item scale included 0 (*rarely or none of the time--less than 1 day*), 1 (*some or a little of*

the time—1 - 2 days), 2 (*occasionally or a moderate amount of time—3 - 4 days*), and 3 (*most or all of the time—5 - 7 days*). A total score is computed by summing individual item responses. Cronbach's alpha was .85 in the general population (Radloff, 1977, Roberts, 1980). No group differences in internal reliability or factor structure were found in scales completed by African Americans and Caucasians (Roberts, 1980).

Sensitive maternal behavior. For this dissertation, sensitive maternal behavior in infancy was measured with global ratings of maternal behavior. Trained observers completed ratings from videotapes of two semi-structured play activities. The first activity was filmed in the laboratory at 6 months; a similar assessment was made during a home visit at 15 months. Global 4-point rating scales devised by Owen and Vandell were adapted to children at different ages (NICHD, 1999b). Scales were reduced to two binary measures of negative parenting and detachment, as well as two continuous ratings of sensitivity and stimulation. Sensitivity was a composite based on 4-point ratings of sensitivity to nondistress, positive regard, and intrusiveness (reverse scored). Stimulation was a global 4-point measure. High scores indicated more sensitive behavior and more maternal stimulation. Ratings of negative parenting, detachment, sensitivity, and stimulation at 6 months of age were used for preliminary analyses.

Parenting. The Home Observation for Measurement of the Environment (HOME) inventory measures parenting practices, such as child discipline (Caldwell & Bradley, 2000). The infant-toddler version given at 15 months was used to represent parenting in the model describing the development of self-control and attachment in early childhood. The HOME, a combination of observation and self-report survey items, is one of the most widely used measures of the home environment. It is composed of 45 items

clustered into six subscales, including Parental Responsivity, Acceptance of Child, Organization of the Environment, Learning Materials, Parental Involvement, and Variety in Experience. Cronbach's alpha for these subscales ranged from .38 to .89.

The Research Triangle Institute created three subscales from the HOME to enhance reliability, including Home Enrichment, Positive Parenting, and Lack of Negativity (NICHD, 1999a). These three subscales were used to represent different aspects of the home environment. Each item is scored in binary fashion (yes/no). Examples of items from the Positive Parenting scale include, "Parent's voice conveys positive feelings toward child," and, "Parent responds to child's vocalizations." Cronbach's alpha was .56. Items from the Lack of Negativity scale include, "Parent does not shout at child," and "Parent is not hostile." Cronbach's alpha was .54. A high score reflects a more enriched home environment; Cronbach's alpha was .69.

Contextual Characteristics

Marital conflict. The Love and Relationships questionnaire is a self-report measure assessing marital quality and conflict (Braiker & Kelley, 1979). A 25-item questionnaire consists of four subscales, including love, maintenance, ambivalence, and marital conflict. Sample items include "To what extent do you have a sense of 'belonging' with your partner?" and "How often do you and your partner argue?" This questionnaire was administered to mothers and fathers when their child was 1 month old. In a previous study, internal reliability for the four subscales averaged .76 (Belsky, Lang, & Rovine, 1985). Questions are anchored on a 9-point scale, ranging from *very little or not at all* to *very much or extremely.* Both fathers and mothers completed this measure.

A subscale reflecting marital conflict was computed for this dissertation. The 9 items in this subscale included such questions as, "How often do you feel angry or resentful toward your partner?" (See Appendix A for all subscale items.) A high score reflected higher levels of marital conflict. Cronbach's alpha was .82 for mothers and .80 for fathers. Partners did not have to be married to complete this measure.

Family income. The Family Finances measure is a self-report measure created for this study. This measure includes questions about income that may not always be reported, such as public assistance and total family income. Based on four questions, NICHD calculated poverty income-to-needs ratios for all five data collection timepoints. For some analyses, two samples were compared consisting of low-income and middle-to-high income families. An average income-to-needs ratio across timepoints was used to construct these two groups. In previous research, low-income has been defined as 150% or even 200% of poverty (e.g., Hofferth, Smith, McLoyd, & Finkelstein, 2000). This dissertation used a more conservative figure of 150% of poverty ($n = 358$). Middle-to-high income was defined as more than 300% of poverty ($n = 600$).

Child care. The Assessment Profile for Early Childhood Program and The Assessment Profile for Family Day Care, measurements of child care quality, were administered when children were 6 and 15 months of age. Programs were observed only if the target child was in care for an average of at least 10 hours a week. High scores indicate good quality of care.

The Assessment Profile for Early Childhood Program (APECP) uses observation, documentation, and child care provider reports to assess center quality (Abbott-Shim & Sibley, 1992). Multiple dimensions, such as the dimension of Safety and Health, are

rated on a series of specific items coded as present or absent. For the NICHD Study of Early Child Care, the number of dimensions on the standard APECP was reduced to three (Safety and Health, Learning Environment, and Individualizing) for the 6 and 15-month assessments. These measures have been used in multiple studies of child care center quality. In standardizing the measure, only items with part-whole correlations of at least .40 were retained, reducing the number of items to 41.

The Assessment Profile for Family Day Care (APFDC) is the counterpart to the APECP for children in home-based child care. This measure was also shortened by matching its items to similar or identical items on the shortened version of the APECP. For this study, an average of the 6-month and 15-month assessments was used to represent quality of early care. Because of the similarity of measures, family child care scores and center child care scores on quality assessments were used interchangeably.

Child characteristics

Temperament. Temperament measurement consists of two parent/caregiver self-report measures. These include the Early Infancy Temperament Questionnaire (Medoff-Cooper, Carey, & McDevitt, 1993) and the Infant Temperament Questionnaire Revised (Carey & McDevitt, 1978). The Early Infancy Temperament Questionnaire was in the process of development when the measures were being selected for this study. It is similar in construction and reliability to the more widely used Infant Temperament Questionnaire. A test of 40 1-month-old infants indicated the following reliabilities for the dimensions of the Early Infancy Temperament Questionnaire as measured by Cronbach's alpha: activity (.48), approach (.44), adaptability (.65), intensity (.43), and mood (.70). Parents completed a shortened version of the Early Infancy Temperament

Questionnaire (39 items) when their child was 1 and 6 months old; child care providers completed a shortened version of the Infant Temperament Questionnaire Revised (43 items) when the child was 6 months old.

Attachment quality in infancy. Mother-child attachment was measured using the Strange Situation Procedure at 15 months (Ainsworth, Blehar, Waters, & Wall, 1978). This procedure consists of a series of 3-minute episodes involving the mother, child, and a person unfamiliar to the child. In the first two episodes the mother and child enter the playroom and explore the toys. In the third episode a stranger is introduced into the playroom. The mother leaves the child alone with the stranger for three minutes. If the child is distressed when the mother returns, the procedure is discontinued. Three minutes later the mother leaves again, and the child is left completely alone for three minutes. Finally, the child is reunited with the mother. Trained coders rated videotapes of the procedure. Based largely on the child's behavior at reunion with the mother, attachment classifications were assigned as insecure-avoidant, secure, or insecure-resistant. Disorganized behaviors were also coded; children with scores greater than 6 were classified as disorganized.

Attachment security in early childhood. The Attachment Behavior Q-Set (Waters & Deane, 1985) measured attachment security at 24 months. This instrument includes 90 items that are used to assess the quality of the mother-child relationship. Sample items include: "When child is near mother and sees something he wants to play with, he fusses or tries to drag mother over to it," and "Child readily shares with mother or lets her hold things if she asks to." During a 2-hour home visit, trained observers made notes on child behavior viewed in naturally occurring or semi-structured situations. Semi-

structured activities included a small book with surprise windows, a snack, and a hide-and-seek game.

Immediately following the observation, observers divided the 90 items on cards into nine piles with a fixed distribution. The placement of the pile indicated which items were least like the child, somewhat like the child, and most like the child, representing a nine-point Likert scale. Items that were most like the child were scored as 9. To obtain a total score, the placement of each item by the observer was correlated with a criterion sort consisting of expert opinion of an ideal sort of the "most secure child." Developmental psychologists provided ideal security sorts for children. If the subject was more similar to the hypothetical "most secure child," the mean of the correlations between items was higher. The resulting number ranges from –1 to +1, with +1 representing the most secure attachment possible.

Self-control. Self-control was measured as a laboratory assessment at 36 months. Researchers videotaped and coded children's performance on a self-control task that has been used in previous research. In this task, a researcher asks a child to delay handling an attractive toy while the mother is present. Behaviors that were coded included (a) the length of time the child refrains from touching the toy following initial instructions from the experimenter, (b) the amount of time the child spends actively playing with the toy after being asked not to touch it, (c) the amount of time the child spends tentatively and/or furtively touching the toy, and (d) the child's focus of attention (social, elsewhere) when not touching the toy (NICHD, 1999a). A composite measure was created averaging z-scores of time engaged in various behaviors, including latency to first active engagement, total away time, focus on toy, social focus, and a reverse-scored measure of

time spent actively playing with the toy. This five-item measure had internal reliability of .79.

Data Analysis

The objective of this dissertation was to examine relations between parental efficacy, child environment, and children's social-emotional development. Preliminary analyses determined demographic characteristics of the sample, the amount of data available, and the reliability of certain measures. Chi-square tests, MANOVAs, and correlations among variables tested some preliminary hypotheses. A multinomial logistic regression examined the relation between dimensions of parental efficacy and attachment quality. Finally, structural equation modeling tested the model depicting precursors of social-emotional development, using a latent construct of children's self-control and a continuous measure of early childhood attachment behavior as outcomes. The next chapter presents the results of these analyses. Applications are made for each of the previously presented hypotheses.

CHAPTER 4

RESULTS

The results of statistical analyses are presented in three sections. First, preliminary analyses include bivariate tests of relations between measures. Second, multivariate analyses for the total sample and subgroups are presented. Finally, a series of structural equation models tested the hypothesized model of social-emotional development.

Preliminary Analyses

Univariate Analyses

Before proceeding with other analyses, the distribution and number of missing data were examined for individual variables. The amount of missing data was problematic for father assessments and child temperament. A description of missing data for these variables and a discussion of corrections made in order to approximate the normal distribution for additional variables follow.

Temperament. Missing data on child temperament assessments by child care workers were problematic. Numbers of caregiver global and mean temperament assessments for low-income families and African American families ranged from 43 to 70. In comparison, child care quality was assessed for 82 African American children (47% of the total African Americans in the study) and 140 children from low-income families (39% of the total low-income families in the study). Because more than half of

the caregiver temperament assessments were not present and the present data were insufficient to allow for imputation with traditional means, caregiver assessments of temperament will not be used in further analyses.

Father data. A preliminary assessment of the Love and Relationships Questionnaire indicated that 1271 mothers had reported their level of conflict with their husband or partner; 446 fathers (35% of fathers) reported their level of conflict with their wife or partner. Further investigation indicated that this measure was only collected at 6 out of 10 possible sites. Of these 6 sites, data were present for 60% of fathers. Preliminary tests indicated that father data were not missing at random.

Specifically, families with fathers who responded and families with fathers who did not respond were examined for group differences in mother's marital conflict, child care quality, income-to-needs ratio, mother-child attachment, total HOME scores, and maternal belief/psychological measures (locus of control, depression, sense of competence). T-tests showed no differences on the 3 maternal belief/psychological measures at one month. However, mothers whose partners did not participate reported significantly higher marital conflict at one month ($p = .002$). The HOME scores for families whose fathers did not participate were significantly lower at 36 months ($p < .001$). The attachment q-sort scores for children whose fathers did not participate were significantly lower at 36 months ($p = .001$). Trends indicated a tendency for lower child care quality (6-15 months) and lower income (1 month) among those families who did not have a father participating in the study. In sum, father data was not randomly missing and thus not representative of the total sample. For this dissertation, only maternal reports of marital conflict will be used.

Normality of distribution. Extreme values often alter the covariance matrix (Schumaker & Lomax, 1996). Thus, the distribution of the observed variables and tests for skewness and kurtosis was performed before proceeding with analyses. Income-to-needs ratios and depression scales were significantly skewed. Trimming the right tail of both sets of variables for statistical analyses improved the normality of the distributions. Income was trimmed at 7 times the level of poverty. The CES-Depression measure has a clinical cut-off point of 16 with higher scores representing more depression; this measure was trimmed at 25 to decrease the impact of outliers.

Bivariate Analyses

Odds ratios, correlations, and ANOVAs were used as preliminary tests of the hypotheses. Bivariate comparative tests also assisted in determining controls used in the multinomial regression. Racial comparisons in test scores along with validity testing examined the possibility of culturally biased measures. Income group comparisons were also performed, with low-income defined as less than 150% of the poverty level (n = 358) and middle-to-high income defined as over 300% of the poverty level (n = 600).

Before proceeding, the power of the test was examined to minimize Type II error rate (false negative statistical inference). In general, bivariate tests of the total sample had sufficient power to detect small effect sizes (r = .10 - .30) at a p-value of .01. For example, correlations required a sample size of 1,163 to detect these effect sizes at a power of .80 (Cohen, 1992). Correlations with self-control had a slightly lower range of participants (1061 – 1093); however, this was still more than sufficient to detect small

effects at the .05 significance level. Power is somewhat more limited within analyses of the African American sample. The sample size required to detect medium effect sizes (r = .30 - .50) at a significance level of .05 requires 177 participants; data were only collected for 173 African Americans.

Odds ratios. Odds ratios compared dichotomous mother-child interaction variables (detachment, negative parenting) by demographic groups. Odds ratios are a common measure of effect size. For additional information, frequencies are displayed in Table 4.

The odds of observing negative parenting were 3.16 times greater among low-income families than among middle-to-high income families (z = 4.71, n = 888). Low-income mothers were 3.54 times more likely to be rated as detached than middle-to-high income mothers (z = 5.33, n = 888). African Americans were 3.39 times more likely to be rated as detached than Caucasians (z = 5.15, n = 1137). African Americans were 2.89 times more likely to be rated as displaying negative parenting than Caucasians (z = 4.09, n = 1137).

Odds ratios of dichotomous study variables with dichotomized attachment security (secure and insecure) were also performed. Disorganized attachment relationships were classified as insecure. Caucasians were 1.50 times more likely to be rated as securely attached than African Americans (z = 2.21, n = 1061). Children from middle-to-high income families were 1.57 times more likely to be securely attached than children from low-income families (z = 3.03, n = 832). It is of interest that observer ratings of detached and negative parenting were unrelated to attachment security. Tests

of gender differences of dichotomous study variables (detachment, negative parenting, security) were not significant.

Table 4

Frequencies of dichotomous study variables by demographic groups

Variable	*Low-income*	*Mid/high Income*	*African American*	*Caucasian*
Detached	52	32	31	68
Not observed	253	551	123	915
Negative	46	31	24	59
Not observed	259	552	130	924
Secure	146	355	74	590
Insecure	130	201	63	334

Correlations. In addition to correlations for the total sample, separate correlations were performed by demographic variables, race, economic status, and child gender. Correlations tested for significant relations among continuous variables in the study, including perceived control, perceived competence, depression, stimulation, sensitivity, positive parenting, lack of negativity, marital conflict, child care quality, attachment security, and self-control. Correlations for the total sample are presented first in Table 5. Correlations for African Americans and Caucasians are presented in Table 6.

Similar tables by economic groups and gender groups are displayed in Table 7 and Table 8, respectively.

Correlations of study variables were consistent with expectations. Medium sized effects were found in inter-correlations among perceived competence, perceived control, and less maternal depression (CES-D, 1 – 6 mo.); the following effect sizes of significant correlations were small. Perceived control was positively related to maternal sensitivity and home enrichment. Perceived control and perceived competence were positively related to children's attachment security and self-control. Parenting measures, including stimulation, sensitivity, and subscales of the HOME, were also predictive of children's attachment security and self-control in the expected directions.

Generally, correlations between parenting and child outcomes were stronger for African Americans than for Caucasians. The link between negative parenting and child self-control, however, was significant only among Caucasians. Correlations between parenting and child outcomes were also generally stronger within the sample of low-income families than among middle-to-high income families. Correlations of perceived control and perceived competence with attachment security are reviewed as tests of hypotheses later in this chapter.

Table 5

Correlations between study variables for the total sample

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Income	-													
2. Perceived control	.12*	-												
3. Perceived competence	.04	.38*	-											
4. CES-D 1-6 mo.	-.37*	-.31*	-.42*	-										
5. CES-D 15 mo.	-.27*	-.22*	-.24*	.59*	-									
6. Stimulation	.28*	.04	.03	-.18*	-.11*	-								
7. Sensitivity	.36*	.09*	.05	-.18*	-.13*	.44*	-							
8. Enrichment	.40*	.10*	.05	-.24*	-.22*	.25*	.31*	-						
9. Positive parenting	.27*	.02	.04	-.15*	-.12*	.13*	.21*	.38*	-					
10. Lack of negativity	.27*	.06	.07	-.16*	-.17*	.14*	.22*	.26*	.19*	-				
11. Marital conflict	-.24*	-.25*	-.23*	.46*	.33*	-.13*	-.16*	-.22*	-.12*	-.12*	-			
12. Child care	.32*	.03	-.01	-.17*	-.07	.11*	.21*	.34*	.20*	.16*	-.07	-		
13. Attachment	.18*	.11*	.11*	-.16*	-.15*	.11*	.19*	.22*	.18*	.18*	-.13*	.12*	-	
14. Self-control	.21*	.07*	.07*	-.16*	-.08*	.09*	.17*	.21*	.13*	.13*	-.11*	.11*	.16*	-

*$p < .05$

Table 6

Correlations for African American and Caucasian families

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Income	-	.12*	.06	-.27*	-.22*	.27*	.32*	.29*	.21*	.25*	-.19*	.26*	.14*	.16*
2. Perceived control	.14	-	.41*	-.31*	-.20*	.04	.07*	.09	.03	.04	-.22*	.03	.06	.07*
3. Perceived competence	.03	.40*	-	-.45*	-.24*	.01	.05	.06	.03	.09*	-.20*	-.01*	.08*	.05
4. CES-D 1-6 mo.	-.16*	-.24*	-.37*	-	.59*	-.15*	-.12*	-.18*	-.10*	-.14*	.42*	-.07	-.12*	-.10*
5. CES-D 15 mo.	-.20*	-.34*	-.32*	.41*	-	-.07*	-.09*	-.17*	-.09*	-.14*	.32*	-.02	-.11*	-.04
6. Stimulation	.24*	.13	.05	-.15	-.10	-	.42*	.20*	.13*	.15*	-.10*	.07	.08*	.04
7. Sensitivity	.21*	.19*	.11	-.18*	-.08	.39*	-	.21*	.16*	.20*	-.06	.12*	.15*	.10
8. Enrichment	.36*	.22*	.04	-.17*	-.17*	.21*	.20*	-	.34*	.20*	-.13*	.23*	.16	.14
9. Positive parenting	.21*	.04	.10*	-.12	-.08	.06	.21*	.26*	-	.15	-.08*	.17*	.15*	.09*
10. Lack of negativity	.11*	.15	-.08	-.05	-.16	-.04	.04	.23*	.20*	-	-.11*	.13*	.16*	.11*
11. Marital conflict	-.08	-.38*	-.45*	.44*	.21*	-.11	-.23*	-.19*	-.05	.06	-	-.01	-.07*	-.06
12. Child care	.23*	-.07	.03	-.02	.05	.09	.16	.32*	.18	.08	.15	-	.11*	.09*
13. Attachment	.13	.26*	.24*	-.17*	-.21*	.07	.14	.26*	.29*	.16	-.22*	.09	-	.11*
14. Self-control	.10	.11	.16	-.25*	-.12	.17	.16	.19*	.12	.01	-.16	.06	.09	-

Note. Correlations for Caucasians are above diagonal; correlations for African Americans are below diagonal. *$p < .05$

Table 7

Correlations for low-income and middle-to-high income families

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Perceived control	-	.37*	-.25*	-.11*	-.02	.03	.09*	.02	-.05	-.19*	.03	.10*	.02
2. Perceived competence	.42	-	-.45*	-.17*	-.05	.01	-.03	.04	.05	-.19*	-.04	.08	.04
3. CES-D 1-6 mo.	-.32*	-.44*	-	.52*	-.04	-.01	-.07	-.07	-.08	.40*	-.01	-.10*	-.05
4. CES-D 15 mo.	-.26*	-.31*	-.52*	-	.03	.01	-.08	.00	-.06	.26*	.01	-.06	.01
5. Stimulation	.08	.08	-.10	-.10	-	.35*	.13*	.07	.08*	-.03	.00	.05	.07
6. Sensitivity	-.17*	.10	-.16*	-.06	.45*	-	.13*	.09*	.09*	-.02	.03	.15*	.13*
7. Enrichment	.08	.10	.08	-.09	.21*	.26*	-	.26*	.15*	-.07	.16*	.11*	.12*
8. Positive parenting	-.01	.04	.00	-.02	.12*	.21*	.33*	-	.09*	-.03	.04	.06	.05
9. Lack of negativity	.04	.02	-.08	-.16*	.07	.21*	.16*	.17*	-	-.07	.07	.13*	.11*
10. Marital conflict	-.33*	-.31*	.44*	.31*	-.07	-.20*	-.14*	-.04	-.08	-	.02	-.01	-.02
11. Child care	-.07	-.06	.05	.08	.14	.21*	.33*	.26*	.18*	-.09	-	.08	.04
12. Attachment	.11	.17*	-.15*	-.13*	.09	.19*	.23*	.28*	.20*	-.18*	.13	-	.10*
13. Self-control	.06	.10	-.13*	-.02	.03	.18*	.13*	.15*	.09	-.10	.08	.13*	-

Note. Correlations for middle-to-high income families are above diagonal; correlations for low-income families are below diagonal. *$p < .05$

Table 8

Correlations for study variables by child gender

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Perceived control	-	.37*	-.25*	-.11*	-.02	.03	.09*	.02	-.05	-.19*	.03	.10*	.02
2. Perceived competence	.40*	-	-.45*	-.17*	-.05	.01	-.03	.04	.05	-.19*	-.04	.08	.04
3. CESD 1-6 mo.	-.34*	-.43*	-	.52*	-.04	-.01	-.07	-.07	-.08	.40*	-.01	-.10*	-.05
4. CESD 15 mo.	-.27*	-.26*	.59*	-	.03	.01	-.08*	-.00	-.06	.26*	.01	-.06	.01
5. Stimulation	.07	.04	-.18*	-.13*	-	.35*	.13*	.07	.08*	-.03	.00	.05	.07
6. Sensitivity	.12*	.02	-.20*	-.17*	.46*	-	.13*	.09*	.09*	-.02	.03	.15*	.13*
7. Enrichment	.11*	.07	-.24*	-.27*	.22*	.27*	-	.26*	.15*	-.07	.16*	.11*	.12*
8. Positive parenting	.07	.04	-.15	-.13	.07	.18*	.41*	-	.09*	-.03	.04	.06	.05
9. Lack of negativity	.12*	.10*	-.16*	-.14*	.14*	.20*	.27*	.17*	-	-.07	.07	.13*	.11*
10. Marital conflict	-.27*	-.28*	.48*	.37*	-.14*	-.20*	-.20*	-.09*	-.12*	-	.02	-.01	-.02
11. Child care	.00	.03	-.16*	-.13*	.12*	.24*	.38*	.23*	.16*	-.05	-	.08	.04
12. Attachment	.13*	.08*	-.18*	-.16*	.12*	.18*	.26*	.20*	.20*	-.13*	.09	-	.10
13. Self-control	.09*	.09*	-.17*	-.11*	.09*	.18*	.20*	.13*	.10*	-.10*	.15*	.19*	-

Note. Correlations for females are above diagonal; correlations males are below diagonal. *$p < .05$

Analyses of variance. Analyses of variance tested relations between demographic groups and continuous variables. These tests were used as preliminary contrasts of processes. Multiple comparison procedures, such as MANOVAs, were not used in these preliminary analyses. Multiple comparison procedures followed by post-hoc tests delete participant information that is incomplete. These procedures may result in false negatives; therefore, some statisticians recommend such methods only for determining sets of variables, i.e., with multiple regression (Ludbrook, 1998). Although Type I errors may result from multiple comparisons, my goal is not solely to determine significance but rather to perform preliminary tests of effects.

Comparisons of study variables between African Americans and Caucasians are displayed in Table 9. In order to ensure that differences in process were not due to unequal variances within groups, Levene's test of equality of variance was included in this table. Comparisons by economic groups are displayed in Table 10. (See Appendix B for comparisons by race and income.) Tests of gender differences are included in Table 11. Parent characteristics, including parental perceived control, perceived competence, maternal depression, ratings of mother-child interaction, parenting as measured by subscales of the HOME, and marital quality were tested for significant differences between groups. Child-related variables, including child care quality, 36-month attachment, and self-control, were also tested for differences.

Table 9

Tests for equality of means and equality of variances between African American and Caucasian groups

Variable	*n*	*M*	*SD*	Equality of Means *t*-value	Sig.	Equality of variances *F*-value	Sig.
Income:							
African American	173	1.18	1.32	-18.49	***	51.06	***
Caucasian	1034	3.37	2.01				
Perceived control:							
African American	172	3.79	.55	.09	.93	8.25	***
Caucasian	1042	3.79	.48				
Perceived competence:							
African American	172	4.02	.53	.21	.84	.14	.71
Caucasian	1042	4.01	.53				
CES-D 1-6 mos.:							
African American	173	12.83	7.04	6.21	***	5.73	.02
Caucasian	1041	9.27	6.57				
CES-D 15 mos.:							
African American	146	10.90	7.32	4.69	***	3.01	.08
Caucasian	960	9.03	6.83				
Stimulation:							
African American	154	2.33	.66	-5.66	***	.48	.49
Caucasian	983	2.65	.65				
Sensitivity:							
African American	154	8.11	1.82	-9.06	***	2.59	.11
Caucasian	983	9.45	1.70				

*** $p < .001$.

Table 9 (cont'd)

Variable	*n*	*M*	*SD*	Equality of Means *t*-value	Sig.	Equality of Variances *F*-value	Sig.
Enrichment:							
African American	143	5.23	2.00	-11.44	***	130.42	***
Caucasian	956	7.19	1.12				
Positive parenting:							
African American	143	4.95	1.31	-5.90	***	48.89	***
Caucasian	956	5.61	.79				
Lack of negativity:							
African American	143	4.52	1.29	-5.12	***	13.05	***
Caucasian	956	5.10	1.07				
Marital conflict:							
African American	143	2.86	1.13	6.68	***	33.42	***
Caucasian	993	2.21	.85				
Child care quality:							
African American	82	19.14	4.86	-6.69	***	.97	.33
Caucasian	603	22.77	4.58				
Attachment:							
African American	141	.20	.19	-5.67	***	.36	.55
Caucasian	930	.31	.20				
Self-control:							
African American	119	-.37	.65	-5.93	***	.47	.49
Caucasian	863	.05	.73				

*** $p < .001$.

Table 10

Study variables by economic group

Variable	*n*	*M*	*SD*	*t-value*	*Sig.*
Perceived control:					
Low-income	357	3.68	.55	-4.40	***
Middle income	600	3.83	.47		
Perceived competence:					
Low-income	357	3.95	.52	-1.96	.05
Middle income	600	4.02	.53		
CES-D 1-6 mo.:					
Low-income	357	13.74	7.31	13.60	***
Middle income	600	7.97	5.70		
CES-D 15 mo.:					
Low-income	292	12.20	7.76	10.22	***
Middle income	573	6.91	5.96		
Stimulation:					
Low-income	305	2.33	.62	-9.74	***
Middle income	583	2.77	.64		
Sensitivity:					
Low-income	305	8.25	1.75	-12.90	***
Middle income	583	9.80	1.59		
Enrichment:					
Low-income	288	5.82	1.97	-13.11	***
Middle income	573	7.42	.87		
Positive parenting:					
Low-income	288	5.10	1.21	-8.61	***
Middle income	573	5.75	.57		
Lack of negativity:					
Low-income	288	4.56	1.33	-8.81	***
Middle income	573	5.32	.91		
Marital conflict:					
Low-income	288	2.70	1.13	7.71	***
Middle income	595	2.13	.75		

*** $p < .001$.

Table 10 (cont'd)

Variable	*n*	*M*	*SD*	t-value	Sig.
Child care quality:					
Low-income	140	18.91	5.27	-8.92	***
Middle income	399	23.35	4.44		
Attachment:					
Low-income	277	.22	.20	-6.77	***
Middle income	555	.32	.20		
Self-control:					
Low-income	251	-.25	.71	-6.93	***
Middle income	506	.13	.71		

*** $p < .001$.

Table 11

Study variables by gender

Variable	*n*	*M*	*SD*	*t-value*	*Sig.*
Perceived control:					
Male	704	3.79	.49	1.23	.22
Female	659	3.76	.50		
Perceived competence:					
Male	704	3.99	.55	-1.00	.32
Female	659	4.02	.52		
CES-D 1-6 mo.:					
Male	705	10.02	6.83	.22	.83
Female	658	9.94	6.78		
CES-D 15 mo.:					
Male	637	8.52	7.10	-.72	.47
Female	604	8.81	7.06		
Stimulation:					
Male	658	9.15	1.81	-1.25	.21
Female	614	9.28	1.75		
Sensitivity:					
Male	658	2.55	.65	-2.37	.02
Female	614	2.64	.66		
Enrichment:					
Male	633	6.87	1.41	-.96	.34
Female	601	6.95	1.49		
Positive parenting:					
Male	633	5.47	.98	-2.66	.01
Female	601	5.60	.77		
Lack of negativity:					
Male	633	4.91	1.17	-4.45	***
Female	601	5.19	1.03		

***$p < .001$.

Table 11 (cont'd)

Variable	*n*	*M*	*SD*	*t-value*	*Sig.*
Marital conflict:					
Male	658	2.29	.89	-1.34	.18
Female	613	2.36	.97		
Child care quality:					
Male	404	22.12	4.98	-.04	.97
Female	369	22.13	4.62		
Attachment:					
Male	614	.27	.21	-4.50	***
Female	583	.32	.20		
Self-control:					
Male	564	-.06	.79	-2.97	***
Female	529	.07	.67		

*** $p < .001$.

Results indicated that African American mothers experienced more depression and marital conflict. African American families displayed less sensitive mother-child interaction and had lower HOME scores. There were no differences between racial groups on the parental efficacy measures of perceived control and perceived competence. However, low-income mothers had lower scores on both dimensions of parental efficacy than middle-to-high income mothers. Low-income mothers were also significantly more depressed, less sensitive, and stimulating with their children. There were significant differences in the expected direction between economic groups on all other study variables (HOME scores, marital conflict, child care quality, 24-month attachment security, and self-control).

Tests of gender differences indicated that boys received more positive parenting and negative parenting (i.e., more positive attention and negative attention) than girls. Mothers behaved more sensitively toward girls than boys during videotaped mother-child interaction. Girls were more securely attached than boys and exhibited more self-control.

Attachment Security. One-way analyses of variance with quality of attachment (avoidant, secure, resistant) as the factor were conducted for continuous variables. Only variables measured in infancy (either concurrent with or previous to strange situation measurement) were included in these analyses of variance. These include parental perceived control, perceived competence, global ratings of sensitivity and stimulation, depression, marital quality, and child care quality. Results are presented in Table 12. T-tests were completed for attachment as a 2-way factor (security/insecurity). For these comparisons, disorganized attachment was included in the insecure group. Relations between study variables and attachment security follow in Table 13.

Table 12

Means of study variables by attachment classification with one-way analyses of variance

Variable	A	B	C	*F*	Contrasts
Income	2.48 (195)	3.12 (817)	3.30 (175)	9.32*	A < B, A < C
Perceived control	3.97 (195)	4.01 (819)	3.94 (176)	.10	
Perceived competence	3.97 (195)	4.01 (819)	3.95 (176)	1.33	
CESD 1-6 mo.	10.34 (195)	9.67 (819)	10.47 (176)	1.53	
Stimulation	2.50 (189)	2.62 (808)	2.66 (173)	3.21*	
Sensitivity	8.90 (189)	9.26 (808)	9.50 (173)	5.52*	A < B, A < C
Enrichment	6.65 (193)	6.95 (813)	7.04 (174)	4.13*	A < B, A < C
Positive parenting	5.34 (193)	5.59 (813)	5.51 (174)	6.58*	A < B
Lack of negativity	4.80 (193)	5.11 (813)	5.13 (174)	6.74*	A < B, A < C
Marital conflict	2.43 (174)	2.29 (780)	2.30 (168)	1.71	
Child care	20.68 (130)	22.63 (483)	21.90 (102)	9.04*	A < B

Notes: *N*s are in parentheses. * $p < .05$. A = avoidant, B = secure, C = resistant.

Table 13

Study variables by attachment security

Variable	*n*	*M*	*SD*	*t-value*	*Sig.*
Perceived control:					
Secure	742	3.78	.50	-.05	.96
Insecure	448	3.78	.47		
Perceived competence:					
Secure	742	3.78	.52	1.76	.08
Insecure	448	3.96	.55		
CES-D 1-6 mo.:					
Secure	742	9.63	6.59	-1.73	.08
Insecure	448	10.34	6.97		
CES-D 15 mo.:					
Secure	738	8.71	7.07	.11	.91
Insecure	448	8.66	7.08		
Stimulation:					
Secure	732	9.30	1.74	1.55	.12
Insecure	438	9.13	1.81		
Sensitivity:					
Secure	732	2.62	.64	1.21	.23
Insecure	438	2.58	.67		
Enrichment:					
Secure	736	6.99	1.39	2.26	.02
Insecure	444	6.79	1.53		
Positive parenting:					
Secure	736	5.60	.78	3.20	***
Insecure	444	5.42	1.02		
Lack of negativity:					
Secure	736	5.13	1.04	2.51	.01
Insecure	444	4.95	1.19		

*** $p < .001$.

Table 13 (cont'd)

Variable	*n*	*M*	*SD*	*t-value*	*Sig.*
Marital conflict:					
Secure	707	2.26	.87	-2.44	.02
Insecure	415	2.40	.99		
Childcare:					
Secure	437	22.79	4.66	4.48	***
Insecure	278	21.19	4.70		
Attachment:					
Secure	711	.30	.20	2.13	.03
Insecure	431	.28	.21		
Self-control:					
Secure	657	.03	.72	1.12	.26
Insecure	384	-.03	.76		

*** $p < .001$.

Analyses with study variables and attachment by classification and by a dichotomous test of security/insecurity yielded interesting results. First, one-way analyses of variance indicated that income, all parenting variables, and child care quality were related to attachment classification. Insecure-avoidant children came from families with lower income, received less sensitive and positive parenting but more negative parenting, had less enriched home environments, and received lower quality child care than securely attached children. Children classified as insecure-resistant received more sensitive parenting, less negative parenting, and had more enriched home environments than insecure-avoidant children, but there were no differences in mother-child interaction or other study variables between insecure-resistant children and secure children.

The second set of analyses (secure/insecure attachment) indicated that home enrichment, positive parenting, and quality child care were associated with secure attachment. Negative parenting and marital conflict were associated with insecure attachment. Children who were securely attached at 15 months had significantly higher scores on the Attachment Q-Set at 24 months.

Sensitivity. Preliminary tests of mother-child interaction ratings indicated some interesting differences between demographic groups. To review the statistical differences, African American mothers were 3 times more likely to be rated as detached or as displaying negative parenting than Caucasians. Low-income mothers were 3 times more likely to be classified as detached and 4 times more likely to be rated as displaying negative parenting than middle-to-high income mothers. Neither rating was significantly related to a dichotomized measure of attachment security measured at 15 months; however, both ratings were significantly related to attachment security at 24 months.

Sensitivity and stimulation were related to attachment classification within the Caucasian group but not within the African American group. African Americans received significantly lower ratings than Caucasians on stimulation and on the composite measure of sensitivity (See Table 9).

The HOME inventory subscales also measured parent-child interaction. It is possible that the Positive Parenting subscale provides a more effective alternative to the global sensitivity rating. The two measures have only a small association (r = .21). The Positive Parenting subscale was significantly associated with the Attachment Q-Set in the expected direction for both African Americans and Caucasians. The two measures approach the concept of sensitivity from different perspectives (NICHD, 1997); therefore, global sensitivity and the Positive Parenting subscale are both used in subsequent analyses.

Temperament. Maternal assessments of temperament using the Early Infancy Temperament Questionnaire were initially included in the correlation matrix; however, these tests indicated that the measures were problematic. Correlations with self-control ranged from .03 to .06. The correlation between global and mean assessments was -.30 ($p < .01$). Documentation noted that the Early Infancy Temperament Questionnaire had not been previously validated (NICHD, 1999a). Although initial plans called for use of the Infant Temperament Questionnaire, a more established measure, at the 6-month assessment, maternal assessments of child temperament were discontinued after the 1-month data collection. The Infant Temperament Questionnaire was not used at the 1-month timepoint because it was considered to be developmentally inappropriate for 1-month-old infants. Conceptually, a measure of temperament would have been useful in

evaluating these data; however, the existing measure proved to be inadequate and was not used in this dissertation.

Tests of Hypotheses

Hypotheses are grouped in four major areas. First, tests of hypotheses related to perceived control are displayed in Table 14. Results are then discussed. Second, tests of hypotheses related to perceived competence as presented in Table 15 are discussed. Third, results of the logistic regressions are reviewed (Hypothesis 2 – 3). Fourth, results of the structural equation models are reviewed.

Table 14

Hypotheses and tests related to perceived control

Hypothesis	Empirical Test
1a: Parents with higher levels of perceived control are more likely to exhibit sensitive behavior.	Significant correlations between Parental Locus of Control and global ratings of mother-child interaction
1b: Parents with higher levels of perceived control are more likely to have infants rated as securely attached.	Analysis of variance on Parental Locus of Control with attachment security/insecurity as the factor
1c: The relation between perceived control and secure attachment will be stronger among low-income families than middle-to-high income families.	Contrast analysis comparing effects between low-income families and middle-to-high income families; z-score significance test.
1d: The relation between perceived control and attachment security will be stronger among African American families than Caucasian families.	Contrast analysis comparing effects between African American and Caucasian families; z-score significance test.

Perceived control. For the total sample, maternal sensitivity at six months was significantly correlated to perceived control at one month ($p = .001$, $n = 1272$). However, this relation bordered on a small effect size ($r = .09$). Cohen's (1988) convention for correlational effect sizes indicates the range for small effect sizes as .10 to .30. Although it is possible to reject the null hypothesis for Hypothesis 1a as stated, the practical significance may be overestimated because of the large sample size. Tests using a large sample size may infer a significant effect that is only trivial. Among African Americans, maternal perceived control showed a more substantial relation to maternal sensitivity ($r = .19, p = .016, n = 154$). The relation between perceived control and sensitivity was not significant among Caucasians. Among low-income families, maternal perceived control was also related to sensitivity ($r = .17, p = .003, n = 305$). However, no significant association was found between perceived control and sensitivity among middle-to-high income families.

Hypothesis 1b was not confirmed by significance testing. Mothers with securely attached children did not have significantly higher perceived control scores than mothers with insecurely attached children. Insecure attachment was defined as avoidant, resistant, or disorganized attachment. Although perceived control was not related to strange situation classification at 15 months, perceived control was related to attachment security at 24 months as measured by the Attachment Q-Set ($r = .11, p < .001, n = 1197$).

Hypothesis 1c tests the relation between perceived control and attachment for African Americans and Caucasians. No significant relation existed when attachment was measured at 15 months for either group. However, perceived control predicted attachment security at 24 months among African Americans ($r = .26, p = .002, n = 141$).

Furthermore, there was no significant relation between perceived control and attachment security among Caucasians at 24 months ($r = .06, p = .06, n = 930$). To test for significant differences between the two correlations, the coefficients were transformed with the Fisher-Z transform (Papoulis, 1990). The difference of the two z-scores was adjusted for sample size by dividing by the square root of the sum of inverse sample sizes minus 3 [1/(N1-3) + 1/(N2-3)]. The resulting z-value was significant ($p < .02$). This test provided partial support for concluding that the relation between perceived control and attachment is stronger among African Americans than among Caucasians.

Hypothesis 1d tests the relation between perceived control and attachment by income groups. No significant relation existed when attachment was measured at 15 months for either group. In low-income families, perceived control tended to predict attachment security at 24 months ($r = .11, p < .08, n = 277$). In middle-to-high income families, the correlation effect size was similar ($r = .10, p < .02, n = 555$). The difference in significance level between the two groups was related to the sample size. The Fisher-Z contrast was not significant ($p < .98$). Thus, it is not possible to reject the null hypothesis; findings indicate no real difference in the effect of perceived control on attachment between economic groups. Tests of perceived competence follow in Table 15.

Table 15

Hypotheses and tests of perceived competence

Hypothesis	Empirical Test
2: Perceived competence and parenting style will be related to attachment classification.	Tests 2 (a – f) and Model χ^2 indicates fit of a logistic regression
2a: Children displaying an insecure-avoidant attachment are likely to have mothers with high levels of perceived competence.	Significance of contrasts in analysis of variance (preliminary test)
2b: Children displaying an insecure-resistant attachment are likely to have mothers with low levels of perceived competence.	Significance of contrasts in analysis of variance (preliminary test)
2c: Children displaying a secure attachment are likely to have mothers with an average level of perceived competence, greater than that of mothers in insecure-resistant dyads and less than that of mothers in insecure-avoidant dyads.	Significance of contrasts in analysis of variance (preliminary test)
2d: Children displaying insecure attachment are likely to have mothers who are less sensitive.	Significance for ratings of parenting behavior, analysis of variance (preliminary test)
2e: Relations between parental efficacy, parenting style, and attachment will vary between ethnic and income groups.	Within-group tests of Hypotheses 2a through 2d for African Americans, Caucasians, and economic groups

Perceived competence. Preliminary tests of perceived competence, corresponding to Hypotheses 2a – 2d, are discussed in this section. Results of the logistic regression of perceived competence and parenting on attachment security (Hypothesis 2) follow.

Preliminary ANOVAs indicated that perceived competence did not predict strange situation classification for the total sample. For African Americans, however, perceived competence was a significant predictor of attachment classification, F (2, 134)

= 3.34, $p < .04$. Greater variance within the African American sample may have explained these results; however, a test for equality of variance with Caucasians was not significant, F (2, 1212) = .14, $p < .71$.

Post-hoc tests indicated that African American children with insecure-avoidant attachments did not have mothers with the highest levels of competence as suggested in Hypothesis 2a. However, insecure-avoidant children did have mothers with high scores on this measure ($M = 4.03$) that compared favorably with scores of mothers with secure children ($M = 4.07$). Children with insecure-resistant attachments did have mothers with the lowest mean scores on this measure ($M = 3.74$), as suggested in Hypothesis 2b. Differences on this measure between insecure-resistant and secure groups reached significance, indicating that children displaying a secure attachment were more likely to have mothers with a level of perceived competence greater than that of mothers in insecure-resistant dyads. This provided partial support for Hypothesis 2c.

Within-group tests of Caucasian, low-income, and middle-to-high income families produced no significant relations between perceived competence and strange situation classification. Thus, Hypotheses 2(a – c) were supported only among the African American sample.

The Positive Parenting subscale of the HOME as measured at 15 months was also used as a measure of parenting style in the following analyses. For the total sample, the positive parenting scale was a significant predictor of attachment classification, F (2, 1177) = 6.58, $p < .001$. Post-hoc tests indicated that mothers with insecure-avoidant children displayed significantly less positive parenting than mothers with securely

attached children. In general, preliminary tests indicated that positive parenting was related to strange situation classification at 15 months (Hypothesis 2d).

Table 16 below presents results for the measures of parenting style, including global sensitivity and positive parenting. Sensitivity was a significant predictor of attachment classification for the total sample (n = 1169). Post-hoc tests indicated that mothers with insecure-avoidant children displayed significantly less sensitivity than mothers with securely attached children. Means of positive parenting scores and tests of significance by demographic groups are also displayed in Table 16. Both sensitivity and positive parenting were associated with attachment security (Hypothesis 2d). There were, however, differences by demographic groups (Hypothesis 2e). For example, positive parenting was not a significant predictor of strange situation classification among low-income families. Sensitivity did not predict strange situation classification among African American or low-income groups. Furthermore, mothers with insecure-resistant children were rated as more sensitive than mothers with secure children among middle-to-high income families.

Table 16

Parenting measures and strange situation classification with demographic groups

	Means				
	A	B	C	*F*	Contrasts
Sensitivity:					
African Americans	8.03 (30)	8.22 (86)	7.56 (18)	1.01	
Caucasians	9.16 (138)	9.46 (634)	9.83 (138)	5.49*	A < C
Low-income	8.07 (60)	8.21 (155)	8.11 (35)	.79	
Mid/high income	9.41 (59)	9.76 (358)	10.25 (84)	5.73**	A < C, B < C
Positive parenting:					
African Americans	4.58 (31)	5.24 (85)	4.37 (19)	5.64**	A < B, B > C
Caucasians	5.44 (140)	5.64 (638)	5.67 (138)	4.43**	A < B, A < C
Low-income	4.95 (65)	5.17 (169)	5.18 (38)	.79	
Mid/high income	5.62 (74)	5.77 (389)	5.80 (91)	2.40†	

Note: A = avoidant, B = secure, C = resistant. *ns* for groups are in parentheses.
**$p < .01$, *$p < .05$, †$p < .10$

Logistic regressions. Logistic regressions were used to test hypotheses for attachment security in infancy (Hypotheses 2 – 3). First, a multinomial regression including parental efficacy as perceived competence, parenting style, and income as a control variable tested Hypothesis 2. In multinomial logistic regression, the dependent

variable is nominal but not restricted to two categories (Hosmer & Lemeshow, 1989). In addition to model fit, significance of individual variables tested Hypothesis 2a – 2e. Second, logistic regressions including child care interactions and control variables examine Hypothesis 3. These regressions examine differences in the environments of children with secure and insecure attachments.

Based on preliminary tests, income was included as a control variable. Gender differences were tested as a control because of previous findings related to attachment security (NICHD, 2001). However, in these analyses, no effects were found. A measure of income-to-needs ratio averaging three timepoints (1 month, 6 months, 15 months) was constructed to exclude inappropriate information (24 months, 36 months) from these analyses of 15-month attachment security.

The fit of the multinomial logistic regression model with perceived competence, positive parenting, and income was significant for the full sample, χ^2 (6) = 28.52, df = 6, p = .000, n = 1147). However, the effect size index of Nagelkerke, a pseudo r-square measure, was trivial (.03). In simpler terms, this model explained only 3% of the variance in attachment quality. Table 17 displays significant betas for this regression.

Table 17

Multinomial logistic regression model of attachment classification for the total sample

	Avoidant	Resistant
Income	-.13 (.17)	.06 (.24)
Perceived Competence	-.10 (.15)	-.27† (.53)
Positive Parenting	-.21* (.08)	-.14 (.10)
Intercept	.46 (.74)	.12* (.79)
n	193	173

Notes: $N = 1177$. Reference category is secure attachment. Standard errors in parentheses. $^{*}p < .05$, $^{\dagger}p < .10$

A test of this regression among Caucasians was similar to the test of the total sample, with significant model fit but insubstantial effect sizes. The only significant beta was that of income. The fit of the same model using data from African Americans was considerably improved. The likelihood ratio test indicated model fit, χ^2 (6, $N = 135$) = 15.94, $df = 6$, $p = .005$). The Nagelkerke index reached .14, indicating that the model explained 14% of the variance in attachment classification. Table 18 below displays significant betas for this regression.

Table 18

Multinomial logistic regression model for African American families

	Avoidant	Resistant
Income	.04	-.13
	(.17)	(.24)
Perceived Competence	-.06	-1.11*
	(.42)	(.53)
Positive Parenting	-.42*	-.46*
	(.17)	(.20)
Intercept	1.27	5.24*
	(1.86)	(2.19)
n	31	19

Notes: $n = 135$. Reference category is secure attachment. Standard errors in parentheses.
$^{*}p < .05$, $^{\dagger}p < .10$

Within the African American sample, income was not a predictor of attachment classification. Mothers with lower perceived competence were more likely to have children with insecure-resistant classifications but not insecure-avoidant classification. Mothers whose children had insecure-avoidant classification did not have lower scores than mothers whose children were rated as secure. Positive parenting predicted secure classification.

Models divided by income groups did not reach a significant fit. In sum, findings provide partial support for Hypothesis 2, which states, in simple terms, that mothers who are insensitive and have children with insecure-avoidant classification (Type A) may overestimate their competence as parents. This effect is most noticeable among African

Americans, who had greater variance in parenting style than Caucasians (Levine's test for equality of variance, $F = 48.89, p < .001$).

The following logistic regressions, testing hypotheses related to child care quality, (Table 19) examines only the total sample because of the reduced number of participants related to child care participation. Specific interactions that are mentioned in Hypothesis 3 include depression and parenting style.

Table 19

Hypotheses and tests of moderators of child care quality

Hypothesis	Empirical Test
3: For children in child care, child care quality may moderate the effect of other variables on attachment.	With interaction terms, Model χ^2 indicates fit of the logistic regression
3a: The quality of child care may buffer the likelihood of insecure attachment for depressed mothers.	Wald λ^2 statistic for interaction term of child care quality (APECP or APFDC) x depression (CES-D)
3b: The quality of child care may buffer the likelihood of insecure attachment for mothers with insensitive parenting.	Wald λ^2 statistic for interaction term of child care quality (APECP or APFDC) x average global ratings

Two logistic regressions with a dichotomous insecure/secure dependent variable were performed on the total sample. The first regression tested child care as a moderator of the relation between depression and attachment security. In this equation, only child care quality was a significant predictor ($\lambda^2 = 19.02, p < .001$). Thus, Hypothesis 3a is not confirmed. The second regression tested the interaction of positive parenting x child care as a moderator of the relation between child attachment security. In this model, the

interaction term was significant ($\lambda^2 = 17.62, p < .001$). The model fit was also adequate ($\chi^2 = 18.32, p < .001, n = 705$). Thus, children who experience positive home environments and quality child care are more likely to be securely attached than those who rate highly on only quality child care or the positive home environment measure. These results provide support for Hypothesis 3b. The following section describes structural equation models testing relations with attachment security at 24 months and child self-control at 36 months.

Structural equation modeling. Structural equation models specify a causal order among a set of variables (Klein, 1998) and then assess the extent to which the predicted interrelationships differ from the interrelationships actually observed in the data. However, structural equation modeling does not imply causality. Causality is more probable if certain conditions are met, such as temporal ordering of path variables and the elimination of other possible causes through experimental controls.

If a model adequately describes actual relations between variables, then the model is said to fit the data, as in Hypothesis 4, "The model describing the development of mother-child attachment and child self-control as displayed in Figure 2 will fit the data." A chi-square statistic is used to test whether the differences between the obtained and the predicted data are greater than zero. A significant chi-square indicates an implausible model because the differences are too large. To reduce the tendency of chi-square to be inflated by sample size, the chi-square is divided by the degrees of freedom. If the quotient meets the commonly-accepted criteria of being less than 3.0, the data will be said to fit the model (Kline, 1998).

A number of other fit indices are available to evaluate the degree of congruence between a model and data. The goodness-of-fit index (GFI) considers the proportion of variance in the data accounted for by a given model (Ullman, 1996). It can range from 0.0 (no fit at all) to 1.0 (a perfect fit). A GFI of 0.9 is generally accepted as indicating a good fit (Bentler & Bonett, 1980). The Root Mean Square Error of Approximation (RMSEA) reflects the differences between the observed and the model-implied covariance. RMSEA of 0.0 would indicate a perfect fit of the model to the data. In practice, 0.05 or less is considered to indicate a close fit (Browne & Cudeck, 1993).

Structural equation modeling requires a set of complete data. Missing data are likely to result in less accurate computations than when data are replaced by estimation of maximum likelihood (Little & Rubin, 1989). Missing data also make inferences to the general population less meaningful. Thus, we created substitutions for missing values with a maximum likelihood method based on the Estimation Maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977). Maximum likelihood methods estimate the means and covariance matrix of study variables, rather than simply estimating single missing values (Little & Rubin, 1987).

Only cases that had a child outcome variable, either self-control or attachment security, were included in the missing data analyses. Although the total sample size is more than adequate, division of the sample into groups makes certain analyses difficult. The number of African American families (n = 176) that had one or more child variables (n = 144) is too small for an accurate analysis using structural equation modeling. Thus, this method was not used for comparisons of processes across racial groups.

Structural equation models tested a modified model similar to Figure 2. Preliminary tests eliminated temperament as a variable; thus temperament was not included in the final model. Marital quality was included in separate structural equation models including only participants who had data on the marital conflict measure. Paths linking variables were used as tests for Hypotheses 4a – 4e, displayed in Table 20.

Table 20

Hypotheses and corresponding significance tests of variable-level paths

Hypothesis	Test of path significance
4a-1: Mothers who have higher perceived control are more likely to display positive parenting practices.	Parental Locus of Control→ Attachment Q-Set
4a-2: Mothers who have higher perceived control are less likely to be depressed.	Parental Locus of Control→ CES-D
4b: Mothers who are less depressed are more likely to display positive parenting practices.	CES-D → HOME
4c: Families who experience less marital conflict are more likely to have positive parenting practices.	Love and Relationships → HOME
4d-1: Parents who display positive parenting practices (e.g., sensitivity) are more likely to have children with secure attachments.	HOME → Attachment Q-Set
4d-2: Parents who display positive parenting practices are likely to have children with greater self-control.	HOME → Self Control Procedure
4e: Relations between parenting practices, attachment, and self-control may vary between ethnic and economic groups.	Comparisons of structural equation models

Eight models describing the linkages among characteristics of maternal perceived control and maternal depression, children's home environment, and child outcomes are presented. The first model used data from the total sample; the second model, which included a variable of marital conflict, excluded single parent families. The next two models compared differences in process by child gender. The last four models described low-income and middle-to-high income samples, with and without the marital conflict variable.

The first model tested the predictors of child attachment and self-control with marital conflict omitted. Maternal perceived control and maternal depression were co-varying exogenous variables. Positive mother-child interaction, negative mother-child interaction, enrichment, and attachment were the four endogenous variables. Paths between positive and negative mother-child interaction indicated that these variables had a bi-directional effect, resulting in a nonrecursive model. This nonrecursive subset had a stability index of .36. Indices below 1 are considered to be stable. Figure 4 displays the model with path coefficients. All paths were significant excepting the path between perceived control and positive mother-child interaction. The path between positive mother-child interaction and self-control indicated a trend only ($p < .10$).

Goodness-of-fit measures indicated that the data fit the model, confirming Hypothesis 4. The χ^2 test was not significant, indicating a good fit, $\chi^2(3) = 3.03, p = .39$. Two additional indices also indicated that the interpretation of the estimated paths is acceptable (RMSEA = .003, GFI = .999).

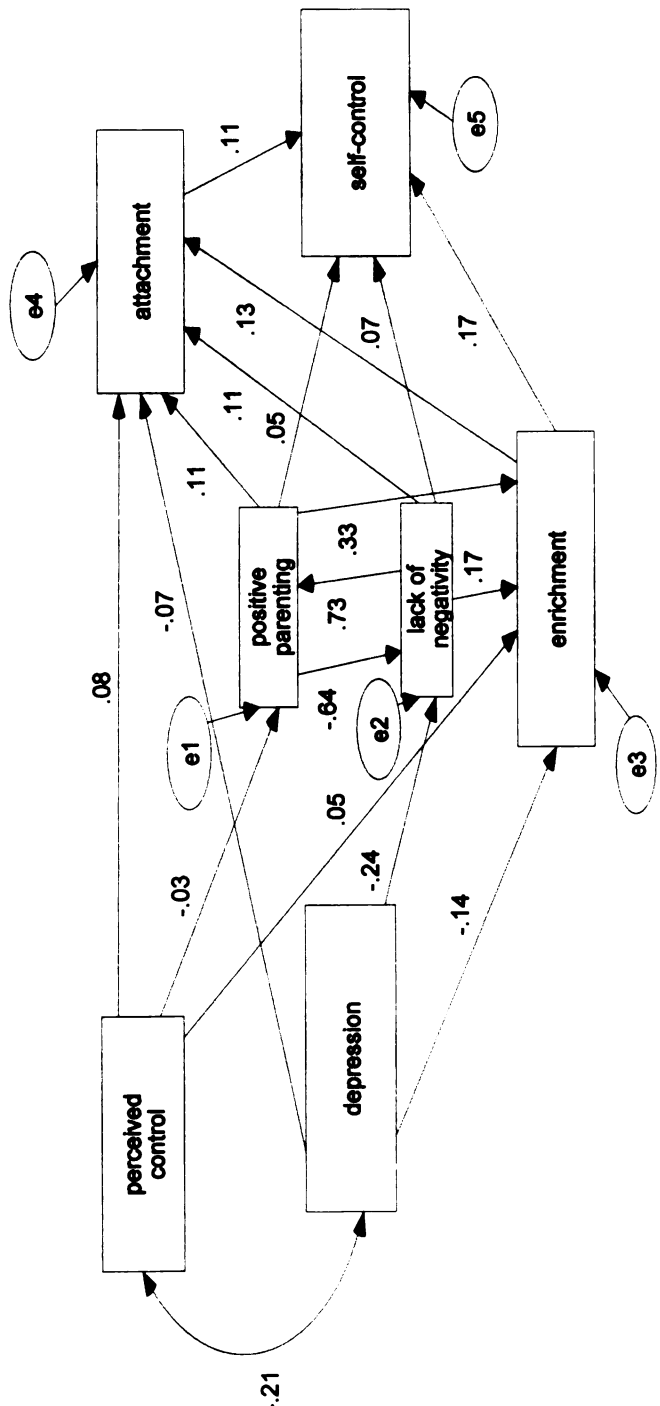

Figure 4. Structural equation model with predictors of attachment and self-control.

Two additional models examined gender differences. The structure of these models was identical to the first model. Goodness of fit was acceptable for boys, χ^2 (3) = 5.55, p = .14, RMSEA = .037, GFI = .998, n = 631; similar fit was achieved for girls, χ^2 (3) = 5.66, p = .13, RMSEA = .039, GFI = .997, n = 598. Path coefficients by gender are presented in Table 21. An enriched home environment and attachment security were related to self-control for boys only. Negative mother-child interactions were related to self-control for girls only. Perceived control predicted home enrichment only for girls.

Table 21

Path coefficients and estimates by child gender

Paths	Unstandardized	Standardized	*p*
Control → Positive			
Male	-.16	-.08	.22
Female	-.06	-.04	.36
Depression → Negative			
Male	-.05	-.31	.02
Female	-.04	-.26	***
Control → Enrichment			
Male	.05	.02	.64
Female	.25	.08	.03
Positive → Enrichment			
Male	.53	.36	***
Female	.56	.29	***
Lack of Negativity → Enrichment			
Male	.23	.19	***
Female	.24	.16	***
Depression →Enrichment			
Male	-.04	-.19	***
Female	-.02	-.09	.02
Control → Attachment			
Male	.03	.07	.06
Female	.03	.09	.03
Positive → Attachment			
Male	.02	.10	.02
Female	.03	.11	.01
Enrichment → Attachment			
Male	.02	.16	***
Female	.01	.11	.01

Notes: For boys, $n = 631$. For girls, $n = 598$. ***$p < .001$.

Table 21 (cont'd)

Paths	Unstandardized	Standardized	*p*
Lack of Negativity → Attachment			
Male	.02	.12	***
Female	.01	.06	.12
Depression → Attachment			
Male	.00	-.07	.09
Female	.00	-.08	.04
Lack of Negativity → Self-control			
Male	.02	.03	.45
Female	.07	.11	.01
Positive → Self-control			
Male	.04	.04	.29
Female	.04	.05	.28
Enrichment → Self-control			
Male	.08	.15	***
Female	.08	.19	***
Attachment → Self-control			
Male	.52	.14	***
Female	.21	.06	.12
Lack of Negativity → Positive			
Male	1.03	1.26	.01
Female	.29	.52	.01
Positive → Lack of Negativity			
Male	-1.68	-1.38	.08
Female	-.51	-.38	.09

*** $p < .001$.

A third structural equation tested the model with marital conflict included. For this model test, I created a separate data set limited to children whose mothers were in a married or partnered relationship when the child was 1 month old (n = 1159). The structure of this model was similar to the first model; only marital conflict was added as an endogenous variable. This model (Figure 5) showed additional effects of marital conflict. All path coefficients linked to marital conflict were significant. The direct path between perceived control and home enrichment was no longer significant, but perceived control was indirectly related to home enrichment through marital conflict. All indices indicated a good fit, χ^2 (5) = 4.62, p = .47, RMSEA = .000, GFI = .999. Maternal depression was related to marital conflict, which in turn, was related to a lack of negativity and home enrichment. Marital conflict had a direct effect on child self-control and indirect effects mediated by parenting variables. Marital conflict also indirectly affected attachment security through its relation to lack of negative parenting.

A similar model for boys had an improved fit, χ^2 (5) = 3.64, p = .60, n = 595, RMSEA = .000, GFI = .998 ; however, the model did not fit for girls, χ^2 (5) = 15.84, p = .01, n = 564. Comparative processes by gender are not examined for marital conflict; however, it is interesting that marital conflict appears to have more effect on the development of attachment and self-control among boys.

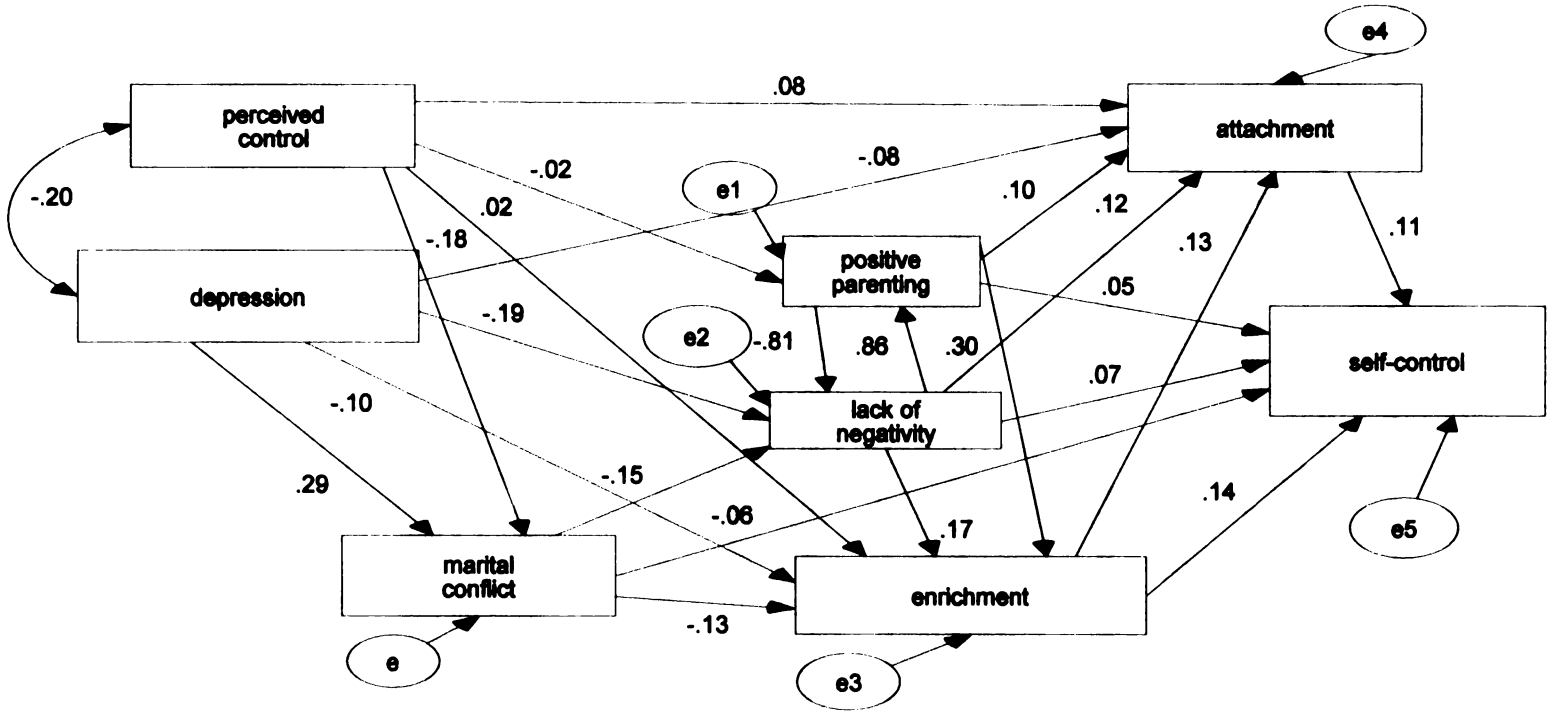

Figure 5. Structural equation model with predictors of attachment and self-control, excluding single-parent families.

The model was also tested in both economic groups. These models were not tested separately by gender due to the sample size. First, low-income families were included in a model with two-parent and single-parent families (n = 292). Although the model exhibited goodness-of-fit, $\chi^2(3) = 1.25, p = .74$, fewer paths were significant than those found in the first model. Figure 6 displays significant paths between variables for the model of the low-income group. Paths between perceived control and study variables were no longer significant. Less depression predicted a lack of negative parenting, which in turn predicted more secure attachments. Positive mother-child interaction was related to attachment both directly and indirectly through home enrichment. Thus, positive parenting predicted home enrichment; both home environment measures were positively related to attachment security. Other paths linking endogenous variables were not significant. The model with marital conflict was also tested (n = 242). The model exhibited goodness-of-fit, $\chi^2(5) = 1.67, p = .89$. However, among low-income families, there were no significant paths between marital conflict and any study variables. This model is displayed in Figure 7.

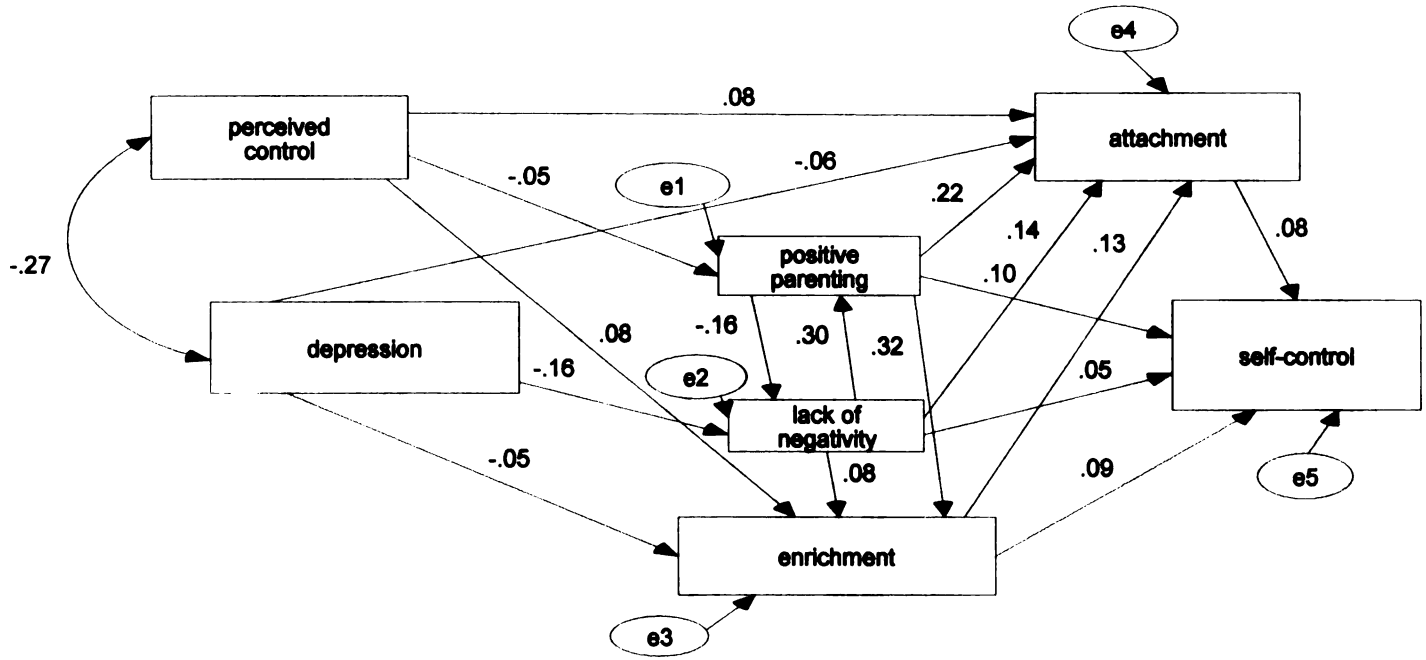

Figure 6. Structural equation model with low-income families.

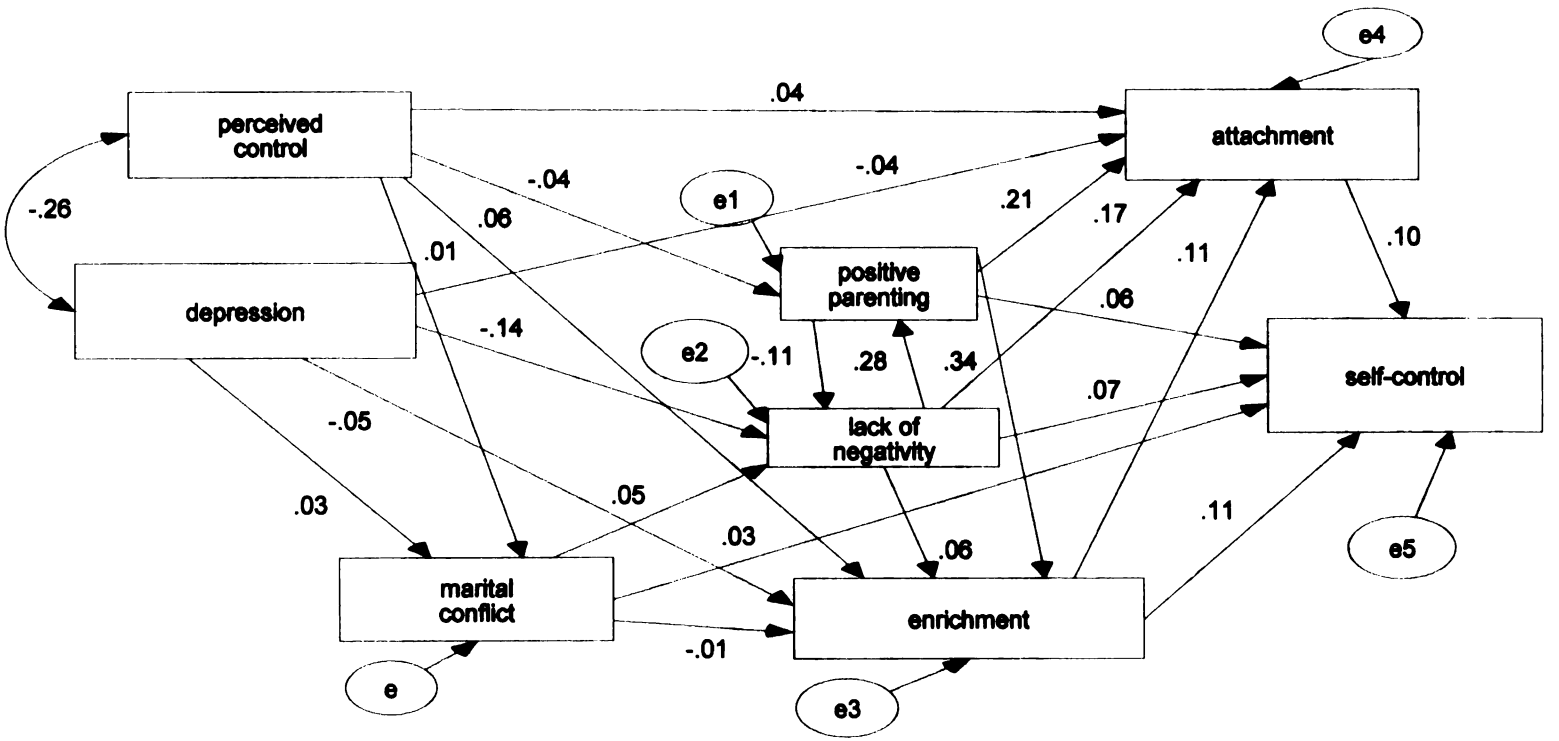

Figure 7. Structural equation model with low-income families, excluding single-parent families.

In the final two models, only families whose income-to-needs ratios equaled or exceeded 3.0 were included (n = 567). The model exhibited goodness-of-fit, χ^2 (3) = 2.12, p = .55, RMSEA = .000, GFI = .999. Perceived control was related to home enrichment, which was related to child self-control. Perceived control was also directly related to attachment security. Negative mother-child interactions predicted less home enrichment and less secure attachments, which in turn predicted less child self-control. Path coefficients are displayed in Figure 8.

In the model of middle-to-high income families with single parents excluded (n = 563), the χ^2 test confirmed the null hypothesis, indicating no difference between the predicted and observed data, χ^2 (5) = 4.27, p = .51. Two additional indices confirmed the goodness of fit (RMSEA = .000, GFI = .998). Figure 9 displays the standardized regression weights for tested paths. Mothers who were depressed were more likely to report marital conflict; mothers with more perceived control were less likely to report marital conflict. Within this group, however, marital conflict was not significantly related to other endogenous variables.

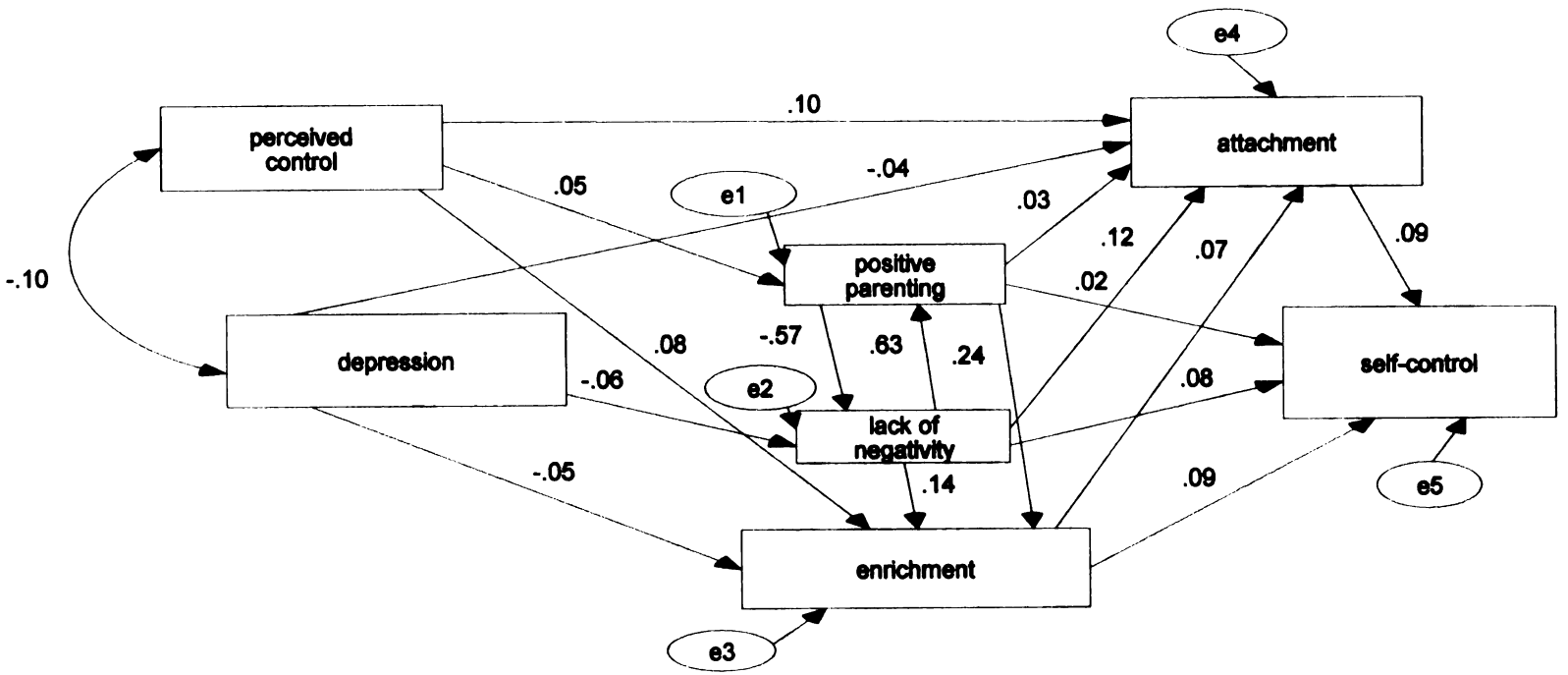

Figure 8. Structural equation model with middle-to-high income families.

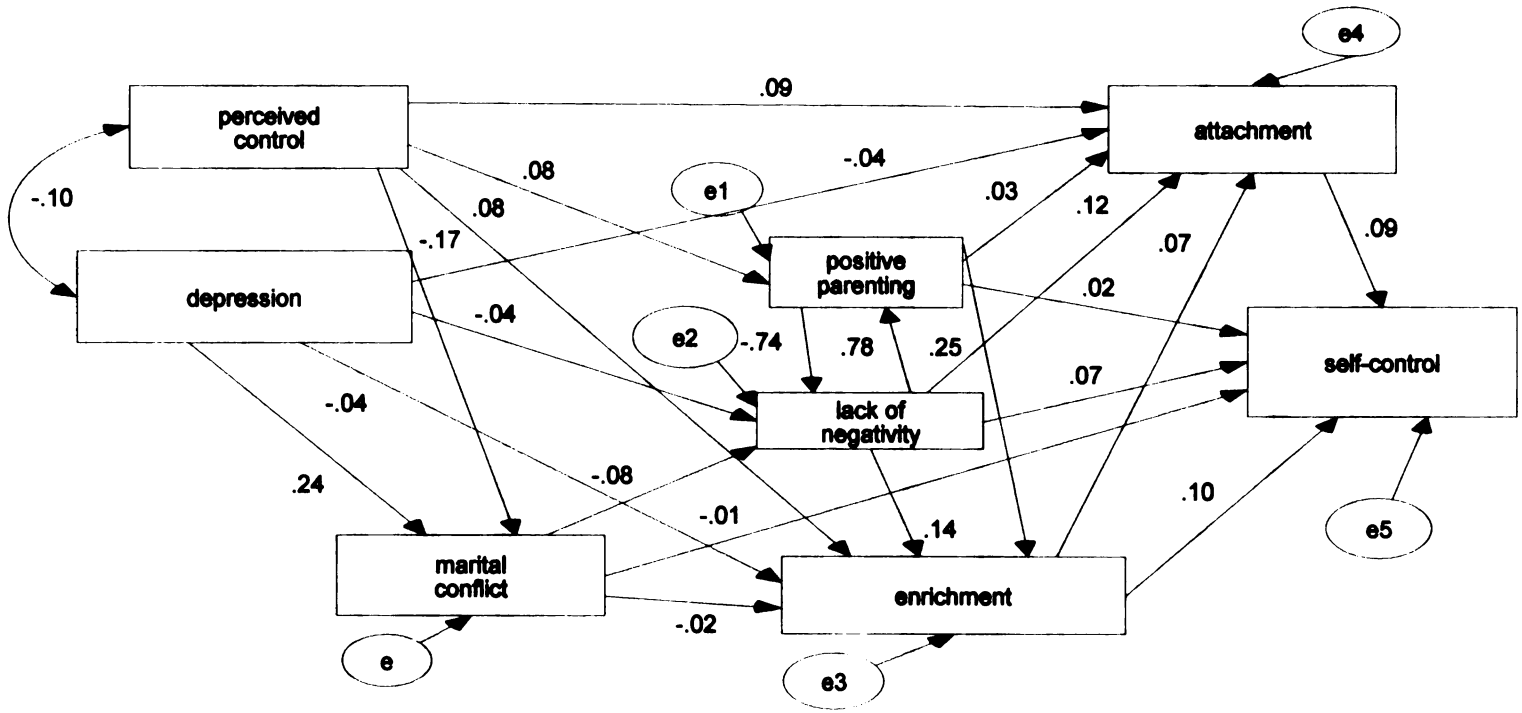

Figure 9. Structural equation model with middle-to-high income families, excluding single-parent families.

In sum, the structural equation model in Figure 4 supported Hypotheses 4 (a – d). Perceived control was directly related to attachment (Hypothesis 4a) and associated with maternal depression (Hypothesis 4b). In Figure 5, marital conflict was related to negative parenting, and families experiencing marital conflict were less likely to have an enriched home environment (Hypothesis 4c). Figure 4 displayed significant relations between aspects of the home environment and attachment (Hypothesis 4d-1) and between the home environment and child self-control (Hypothesis 4d-2). The path between attachment at 24 months and self-control at 36 months indicated a small effect, even when controlling for other study variables (Hypothesis 4e-1). There were some differences between demographic groups, e.g., gender, economic groups (Hypothesis 4f). However, limited variance within economic groups may have made it difficult to detect certain effects.

Conclusion

The results of data analyses indicated partial support for the hypotheses. Some findings related to global sensitivity were somewhat unexpected; also findings related to gender differences were unanticipated. These findings will be discussed in the final chapter. In addition, limitations and future directions for research will be included.

CHAPTER 5

DISCUSSION

The previous chapter included results of analyses, tests of hypotheses, and findings related to parental efficacy, home environments, children's attachment relationships, and child self-control at 3 years of age. This chapter will discuss these findings. The first section of this chapter presents findings in relation to the research questions from Chapter 1. Additional findings follow, including gender differences in developmental processes. A section addressing limitations of the study and suggestions for future research conclude the chapter.

Research Questions

The NICHD Study of Early Child Care investigated the relation between infant child care and the quality of attachment (NICHD, 1997). One of the goals of this dissertation was to extend their study by including dimensions of parental efficacy and later child outcomes. In addition, this dissertation tested the universal application of hypotheses across demographic groups. The first set of research questions focused on parental self-efficacy and its relation to attachment. Second, an investigation of child care quality partially replicated findings from the NICHD (1997) study. Third, predictors of attachment and self-control in early childhood are discussed.

Dimensions of Parental Efficacy

1. Can counterintuitive findings from earlier studies of the relation between parental efficacy and attachment security be explained by reexamining dimensions of parental efficacy, i.e., competence and control?
2. Does parental efficacy have different effects on parenting and attachment among different demographic groups, specifically, low-income and middle-to-high income families and African American and Caucasian families?

A differentiation between the dimensions of parental efficacy, perceived control and perceived competence, yielded interesting results. Although past research has referred to both dimensions as representative of parental efficacy, the results of this research indicate that they are two distinct parental beliefs. Perceived competence was associated with attachment classification as measured by the Strange Situation Procedure at 15 months, particularly among African Americans; however, perceived control was not related to attachment classification. With the total sample, the correlations of perceived control and perceived competence with attachment security (Attachment Q-Set) at 24 months were equivalent, representing a small effect size. Yet, when the sample was broken into separate demographic groups, different associations emerged for perceived control and perceived competence as discussed below.

Perceived competence. A review of the literature found that past studies have produced counterintuitive findings related to perceived competence and attachment (e.g., Spieker & Booth, 1988). In these studies, mothers of children with insecure-avoidant attachment (Type A) felt that they were competent mothers. However, insecure-avoidant

attachment has been associated with harsh discipline and intrusive parenting. Children with insecure-avoidant attachments were more likely to have behavior problems in school than children with secure or insecure-resistant attachment classifications (Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989; Waters, et al., 1979). Thus, the high, and in some studies, higher levels of perceived competence among mothers with children classified as insecure-avoidant were not explained by the theory of self-efficacy.

One possible explanation of inconsistent effects is the way that parental efficacy is measured. Bandura believed that perceived competence should be measured by specific behaviors, e.g., I am competent at soothing my baby when he/she is upset. In contrast, the Sense of Competence scale used in this dissertation measures global feelings about parental competence, e.g., I feel capable and on top of things when I am caring for my baby. Yet, some researchers have found associations with global scales of parental competence (e.g., del Carmen, Pedersen, Huffman, & Bryan, 1993); others have found no effects with measures of specific behaviors (e.g., Corapci & Wachs, 2002). A recent study comparing the Sense of Competence scale with the Maternal Self-Efficacy Questionnaire, a domain-specific measure (Teti & Gelfand, 1991), found that only the domain-specific measure was a predictor of child outcome among White middle-class mothers.

Although the literature suggests that domain-specific measures are preferable measures of competence, the purpose of this dissertation is not to compare domain-specific and global measures, but to examine why global measures of perceived competence are sometimes ineffective. In other studies, perceived competence has been associated with positive parenting and secure attachment. Findings in the current

dissertation suggest that a global measure of perceived competence may not be related to positive parenting and attachment security within all groups and cultures.

In this dissertation, the strength of associations between global perceived competence and attachment differed between demographic groups. Researchers have speculated that the stronger associations with parental efficacy found among diverse groups may be related to greater variance in parental efficacy scores within disadvantaged groups (Coleman & Karraker, 2003). Yet, a test comparing variances between groups indicated that there was no significant difference in perceived competence scores between African Americans and Caucasians or between low- and middle-to-high income families.

Among low-income families, mothers who perceived themselves as competent when their children were one month old were more likely to have children who were securely attached at 24 months. However, this effect was not significant among higher income families. It is possible that risks associated with economic disadvantage make assets, such as a mother who has positive feelings about her parenting abilities, more essential to the child's development of attachment security. In higher income families, other resources, such as quality child care, a supportive community, or a supportive father, may compensate for a mother who feels insecure in her parental role.

Similarly, differential risks among African American and Caucasian families affect the hypothetical process of parental efficacy influencing parenting, which in turn influences attachment development. The bivariate correlation between perceived competence at one month and attachment security at 24 months was 0.24 among African Americans; the same correlation was .08 among Caucasians. According to

Bronfenbrenner's (2000) theory, African American or low-income families should have stronger links between perceived competence and attachment security than Caucasian or middle-class families.

Parenting and other processes that directly affect the child may be more important to children who experience more risk. For example, families from middle-class homes are able to draw on other resources when a mother is depressed or neglectful of her parenting role. Neighborhood playgroups, a supportive school system, and medical insurance covering the cost of treatment are likely to be available to assist the family through difficult times. Thus, access to other environments that promote successful child outcomes may compensate somewhat for deficits in the home environment, and links between the home environment and child outcomes are theorized to be weaker among more advantaged groups.

There were also differential associations of perceived competence and attachment classification at 15 months. In a regression of income, perceived competence, and parenting on attachment classification, only income was a significant predictor of attachment classification among Caucasians. Within the African American sample, mothers who were less sensitive and had children with insecure-avoidant classification appeared to think of themselves as competent parents. Although they were less responsive and sensitive to their children than mothers with securely attached children, they perceived themselves to be equally competent. Mothers who had children with insecure-resistant classification did not report feeling competent as parents.

This finding duplicates those of a study of attachment among at-risk families, with mothers who had insecure-avoidant children scoring as high on measures of

perceived competence as mothers of securely attached children, and mothers with insecure-resistant children being significantly lower on perceived competence (Spieker & Booth, 1988). Although their study did not directly explain the unexpected findings related to perceived competence, they did point out that mothers of avoidant children in at-risk families tend to idealize their relationships. Perhaps mothers of avoidant children in families disadvantaged by the social and economic structure of our society (i.e., racism) would also idealize their parenting abilities. Furthermore, the racial composition of their sample is not cited; thus, it is not possible to draw conclusions about effects of racism within their study.

Analyses of the NICHD data also indicated that African American families were rated as less sensitive or positive parents. Links between sensitivity and attachment classification at 15 months were only present among the Caucasian group. It should be noted that global measures of sensitivity were assessed by mostly White middle-class graduate students who were, in general, untrained to understand African American parenting styles. Global sensitivity measures have been used with success for decades beginning with Ainsworth et al.'s (1978) classic attachment study, but it is only in recent years that issues related to observer bias have been raised.

Although measurement methods may have been culturally inappropriate, it is also likely that differences in the general style of mother-child interaction existed between African Americans and Caucasians. It may be that African Americans place less of an emphasis on positive parenting and responsiveness, resulting in different links between perceived competence, parenting, and attachment. The literature suggests that African Americans value parents who teach their children to survive in a challenging environment

(Murry, 2000). African American parents who teach their children to be obedient and hard workers may be considered competent parents. Cultural differences contributing to variations in parenting style and motivations may explain differences in the relations among attachment and perceived competence among African American and Caucasian parents. While positive attitudes and emotional security are certainly valued, African American parents have been shown to approach discipline in a different way than Caucasian families (Murry, 2000; McLoyd, Cauce, Takeuchi, & Wilson, 2000). Thus, it may be considered preferable to parent in accordance with cultural imperatives, socializing African American children to succeed within their environment.

Perceived control. In a structural equation model of the total sample, perceived control was a significant predictor of attachment security as measured by the Attachment Q-Set, even when controlling for maternal depression and parenting practices. This indicated the importance of parents' beliefs about their effects on child outcomes.

Although processes within African American and Caucasian families were not modeled because of the higher attrition among African Americans, other analyses indicate some differences in process. In a bivariate correlation, perceived control was associated with attachment security among African American families ($r = .26$). This is particularly notable considering that perceived control was measured when the child was 1 month old; attachment security was measured when the child was 24 months. Among Caucasian families, perceived control was not associated with attachment security at 24 months ($r = .06$). This may be due to a differential variance in perceived control scores. African American mothers had a significantly higher variance in perceived control scores than Caucasians.

Another possible explanation is that a sense of control would be a stronger asset in a less predictable environment. Many African Americans who experience unfair treatment may not view their environment as something that they can control. One study found that African Americans who perceive that they are unfairly treated due to racism passed teachings and messages about mistrust on to their children through racial socialization (Hughes & Johnson, 2001). The literature suggests that these teachings occur at a later developmental stage; however, it is possible that subtle non-verbal messages may occur in early childhood. Furthermore, among African Americans who reported higher levels of discrimination, linkages between stress and psychological problems and between psychological problems and mother-child interaction were stronger (Murry, Brown, Brody, Cutrona, & Simons, 2001). Thus, negative aspects of children's environments had a stronger influence when mothers perceived their daily experiences as being affected by capricious discriminatory acts. Parents who perceive that they are in control of their future and their children's future may use this perception as a positive coping mechanism.

It is of interest that there were no significant group differences in the association of perceived control and attachment security at 24 months between low-income families and middle-to-high income families in the structural equation model or within bivariate correlations. However, there is a significant amount of difference in variance between scores of the two groups, with low-income families having more variance in levels of perceived control. In past research, effects of African American status have been confounded with income effects (Murry, 2000). By viewing economic groups and racial groups separately, it is possible to make distinct inferences about African American

families apart from their economic status. Although it was not possible to include comparisons of processes between racial groups using structural equation models due to the limited sample size, ad-hoc analyses (see Appendix B) assisted in disentangling factors of class and race. Even though the sample size was small for middle-to-high income African Americans (n = 16), t-tests indicated group differences when contrasted with middle-to-high income Caucasians. This robust finding suggests strong cultural effects that supercede class differences, and further research is certainly indicated.

In sum, three factors may result in counter-intuitive effects related to parental efficacy and attachment. First, perceived control produced different effects than perceived competence. Second, in families with more risk factors, efficacy and parenting styles appear to be more strongly related to children's outcome. For instance, a lack of perceived control among African Americans may be more detrimental to their children's environments than among groups who do not experience discrimination. Third, African American mothers with insecure-avoidant children were likely to overestimate their parental competence in comparison with their parenting skills, as defined by the measure of positive parenting. A trend toward this effect was noted among the total sample, but not among Caucasian families.

Child Care Quality

3. Does child care quality moderate the effects of maternal depression and parenting practices on mother-child attachment?

An earlier study with these data found no main effects of child care quality or the amount of child care on attachment classification at 15 months (NICHD, 1997). Because

of these earlier results, only interactions were tested in this study. Tests indicated that child care quality was not a significant moderator of maternal depression and attachment. However, child care quality did moderate the relation between positive parenting and attachment. Although this dissertation used different measures of child care quality and mother-child interaction, results from the earlier NICHD (1997) study were replicated. Child care quality did not directly predict attachment security as measured by the Strange Situation Procedure at 15 months; however, mothers who chose good quality child care and behaved sensitively toward their children were more likely to have securely attached children.

Bivariate correlations with child care quality in infancy suggest that a different approach to modeling may yield other results. Higher child care quality was significantly related to income, less maternal depression, sensitivity, positive/negative parenting, an enriched home environment, attachment security at 24 months as measured by the Attachment Q-Set, and children's self control at 36 months (See Table 5). Other methods of modeling these data will be discussed in the section describing future research directions.

Social-emotional Development in Early Childhood

4. Are the data from the National Institute of Child Health and Development Study of Early Child Care consistent with the model linking parental efficacy, parenting practice, and children's social-emotional outcomes as shown in Figure 2?

5. Does the model fit vary as a function of demographic status? For example, do the relations among the variables differ for low-income and middle-to-high income families?

In general, the model shown in Figure 2 fit the data, suggesting that maternal perceived control and maternal depression predict parenting practices and attachment, which in turn predict children's self-control. Models including marital conflict also showed goodness of fit, excepting for the model with girls only. Gender differences are discussed later in the chapter.

Maternal characteristics. In accordance with the literature, maternal depression predicted more negative mother-child interaction. Mothers who were more depressed were less likely to provide an enriched home environment. Through parenting and the home environment, depression affected children's later attachment security and self-control. There was also a small but significant direct effect between depression and children's attachment security. Thus, depressed mothers were more likely to have children with insecure attachment, even when positive/negative mother-child interaction was controlled.

Additional effects were found between perceived control, a dimension of parental efficacy, and study variables. As expected, perceived control was associated with depression. This association was substantially larger among low-income families. There was a small but significant direct effect of perceived control on attachment. Effects of perceived control on the home environment were generally not significant, except that middle-to-high income mothers with more perceived control were likely to provide a more enriched home environment. The effect size for the path between perceived control

and enrichment among middle-to-high income mothers was actually equivalent to the effect size for the same path among low-income mothers. Significance testing varied only due to sample size.

Parenting and child characteristics. In turn, an enriched home environment was related to attachment. Mother-child interactions of positive and negative parenting also predicted attachment security. Many of these associations were reduced when the sample was divided into low-income and income families. A possible cause of reduced effects may be the lower variance within economic groups.

An enriched home environment at 15 months was related to child self-control measured 1½ years later at 36 months. The measure of enriched home environments included regular experiences, both formal and informal, that teach young children as well as the provision of toys and other materials for teaching children. It is possible that mothers who spend time teaching and playing with their children in developmentally appropriate ways also help them to develop self-control. Mothers who spend time teaching their children may enhance their social behaviors as well as assisting their cognitive development. As expected, attachment also predicted children's self-control. A positive attachment relationship assists children in their behavioral regulation (Davies, Harold, Goeke-Murray, & Cummings, 2002).

Marital Conflict

The model including marital conflict indicated some minimal effects. Among middle-to-high income families but not low-income families, marital conflict was a significant addition to the model. The variance in marital conflict was, in fact,

significantly higher within the low-income group than among the middle-to-high income group. Thus, differential effects are not explained by a restricted range.

There are other possible explanations for the limited effects of marital conflict within low-income families, besides differential variance. It may be that low-income mothers depend more on other family members and friends for support in raising their children than on their spouse. Men in low-income families may be less egalitarian in gender roles, if only because of the additional pressures to succeed in the role of breadwinner. Thus, marital conflict may have less of an effect on parenting and child outcome if the father is not actively engaged in childrearing. Although this study did not examine the effects of marital conflict within ethnic groups, ethnicity may be an important factor. Both gender roles and the effects of marital conflict differ within cultural context (McLoyd, Cauce, Takeuchi, & Wilson, 2000). For example, African American men are more egalitarian in gender roles but not in attitudes towards women. It is also important to note that a higher proportion of African Americans are single in comparison with Caucasians, particularly among low-income families. In this study, 56% of the African American mothers were no longer living with the father of the child at 15 months old in comparison to only 9% of the Caucasians.

Marital conflict was measured when the child was 1 month old; other measures were collected from 15 to 36 months later. Both cohabiting and married partners completed these measures. In high-income households, 2% of the fathers were no longer living at home at 15 months, but 38% of the fathers were no longer present at 15 months among low-income families. Hence, it may be that differences in low-income and high-income families related to the importance of partner conflict are a reflection of unstable

family structure, which is generally more prevalent in low-income households. Marital conflict that existed with the father of the child may not affect the home environment as much if the father is no longer present.

Among middle-to-high income families, mothers with more perceived control were less likely to experience marital conflict. Mothers reporting depression were likely to experience more marital conflict. Marital conflict was related to negative parenting; marital conflict indirectly affects attachment through this path. Thus, expected associations existed between marital conflict and study variables, but only for higher-income families.

In sum, differences in process between low-income families and middle-to-high income families existed in this sample. Although effects of perceived control on attachment did not differ between groups as expected, effects of maternal depression on negative parenting were stronger among low-income families. In turn, effects of parenting, particularly positive parenting and enrichment, on attachment and self-control were stronger among low-income families. Overall, most proximal processes had a stronger effect on child outcome within low-income families.

The importance of parenting practices to children living in low-income families suggests that parent education programs would be particularly beneficial for this group. Presently, family programs, such as home visiting for low-income families, are not well-supported at a federal level in the United States. Government support for experimental demonstration programs has improved in the past decade, particularly with positive results coming from certain programs (Olds & Korfmacher, 1997). However, few parent education programs are available nationwide for families with children in the preschool

years. Previous research indicates that early childhood is the stage when family resources are most influential (Duncan & Brooks-Gunn, 2000). Thus, parent education programs and programs that provide additional resources, such as healthcare, nutrition, and learning activities, need to find more avenues to reach young children before they enter school.

Gender Differences

A division of the sample by gender suggested different processes for boys and girls. The literature suggests that gender differences in behavior emerge during later years, when children are 4 or 5 years of age (Achenbach, Edelbrock, & Howell, 1987; Zahn-Waxler, Ianotti, Cummings, & Denham, 1990). Boys tend to have more externalizing behavior problems than girls in later years. Yet, some gender differences related to emotionality in infancy have been found, with boys being more negatively emotional during mother-child interaction than girls (Braungart-Rieker, Courtney, & Garwood, 1999). This study found that girls exhibited more self-control than boys at 36 months.

In this dissertation, the Strange Situation Procedure at 15 months also favored girls; girls were significantly more likely to be securely attached than boys. In previous research, significant gender differences with respect to attachment quality are not often evident. Yet, a study of low-income African American families also found that boys were significantly less likely to be securely attached than girls (Barnett et al., 1998). This study measured attachment during the preschool years and not in infancy.

Results from the present data indicated that attachment at 24 months was related to children's self-control at 36 months for boys but not for girls. Other studies have

found that early attachment security and later behavioral expression varied by gender. A study of middle-class families found an association for boy infants but not for girl infants between insecure attachment and later psychopathology (Lewis, Feiring, McGuffog, & Jaskir, 1984). Another study of toddlers found that early attachment was related to later autonomy for girls; a similar association was not found for boys (Aber & Baker, 1990).

Other significant gender differences include effects of negative parenting and marital conflict. First, the path between negative parenting and child self-control was significant for girls but not for boys. Social learning theory suggests that girls are more likely to model negative maternal behavior than boys (Crockenberg & Langrock, 2001). For example, if parents show lack of self-control in their behavior with their children, it is possible that girls are more likely to model that behavior. Thus, assuming that negative parenting, such as angry or aggressive behavior toward the child, represents low maternal self-control, girls would be more likely than boys to have lower self-control in response to viewing maternal uncontrolled behavior. In the present study, a model including marital conflict fit for boys but not for girls; other studies have found gender differences related to children's reactions to marital conflict (e.g., Davies, Harold, Goeke-Morey, & Cummings, 2002).

It is of interest that significant gender differences in attachment security have been noted among dual-earner households, but not among single-earner households, with more negative effects present for boys (Belsky & Rovine, 1988; Chase-Lansdale & Owen, 1987). The oversampling of dual-earner households for this study may have exaggerated gender differences in comparison with the national population. Further study of gender differences and child care usage may clarify these questions.

Limitations

Certain limitations are inherent in secondary data analysis. In this particular study, the diversity of measures and overall quality of measurement methods is above average. Yet, primary research allows for more focus on a particular area of interest. In this study, the use of partial measures rather than complete measures may have reduced reliability, particularly on the measures of perceived control and temperament. The use of the Early Infancy Temperament Questionnaire, which was under development at the time of the study, rather than an established measure made it difficult to reach adequate reliability. It would have been useful for the purposes of this study to have additional measures of perceived competence, such as the domain-specific Maternal Self-Efficacy Questionnaire.

Although the total sample size is more than adequate, division of the sample into groups makes certain analyses difficult. For example, the number of African American families (n = 176) was too small for an accurate analysis using structural equation modeling, especially considering attrition or missing data. An individual researcher collecting primary data could have oversampled African American families in order to compare processes in African American and Caucasian families. The number of low-income families and middle class families was sufficient for two separate structural equation models; however, additional separate models comparing processes by child gender were not possible.

The sample itself, although largely representative of demographics within the United States, is not a truly random sample. A purposeful sampling plan reflecting demographic diversity included mothers who planned to use child care full-time (60%)

or part-time (20%) and mothers who planned to stay at home (20%). The sample is limited to ten localities, mostly in the Eastern United States. Of greater importance, the sample excludes families living in unsafe neighborhoods, infants with perinatal problems requiring extensive hospitalization, school-age mothers, and mothers with insufficient English skills. In addition, those who declined to participate (42%) may have had more difficulties in their families than those who agreed to participate. Thus, the sample of low-income families is actually more advantaged than samples of low-income families in other national studies. The exclusion of high-risk families may have made it more difficult to detect differences between low-income and middle-to-high income economic groups.

In addition to the exclusion of high-risk families, the NICHD Study of Early Child Care excluded high-risk child care settings. Exclusion was not necessarily an effect of predefined qualifications for the study; it appeared that child care settings that were not optimal did not participate. A comparison between nationally representative data on child care quality and the NICHD sample suggested that national child care quality is lower and more variable (NICHD, 2000). Exclusion of low quality child care and high-risk families may have resulted in lower effect sizes of child care quality, assuming that quality of care would have stronger effects among higher-risk groups.

Attrition was relatively low for this study; however, father data were missing at a much higher rate. Documentation from NICHD (1999a) cites 1-month father data as being collected at all sites; however, data were only available for 6 of the 10 sites. Furthermore, data were not randomly missing even within the 6 sites, with fathers from higher-risk families being less likely to participate. Although a separate study could be

made of father's beliefs and involvement, it was not advisable to include father information in a study of the total sample due to the lack of consistent data collection.

Future Directions

Earlier studies from this data set found limited effects of child care quality on attachment security. However, there were significant interactions between parenting practices and child care quality on attachment. Although this study replicated the finding that child care quality combined with positive parenting predicted attachment security, it is possible that child care quality by itself is a predictor of mother-child attachment and child self-control. A structural equation model including only children in child care may answer questions about the significance of child care quality to children's developing attachment relationships that may not be detected with the use of a regression model (Newcombe, 2003).

Recent evidence suggests that significant amounts of time in child care during the early years is related to socioemotional maladjustment (NICHD, 2003). Additional effects of time in child care could also be investigated with this data set. Controls for income may artificially isolate the effects of child care (Newcombe, 2003). Further investigation of time in child care, attachment security, and behavior problems could use structural equation modeling to examine pathways between variables.

Further study is also suggested to examine effects of child care quality and time in child care among children of color. Child care quality, as measured in this dissertation, was only available for 82 African American children. Limited analyses could certainly be performed with this sample size. Yet, the NICHD has limited

information that may be relevant to the effect of child care on African American children. Discrimination and segregation within the child care setting are not measured; ethnic identity and perceived discrimination would also be helpful measures to ascertain the effects of racial socialization. Additional primary studies are needed to further investigate children's environments, including child care, and their meaning for children of color (Johnson, Jaeger, Randolph, Cauce, Ward, & NICHD, 2003).

In this dissertation, dimensions of parental efficacy had different effects on family process among African American families than among Caucasian families. Although it is possible to speculate about reasons for differential effects, further research is necessary to explain these differences. A study measuring ethnic identity, perceptions of discrimination, and their relation to parental efficacy among families of color may assist in understanding how these processes work. Certainly, more work could be done among Latino, Asian, and Native American families to gain further cross-cultural perspectives.

Unexpected findings related to gender differences could be investigated with other data sets or with primary research. It would be particularly useful to investigate father involvement when studying gender differences with self-control. Earlier research has indicated that fathers play a unique role in children's development, particularly in the development of self-control (Braungart-Rieker, Garwood, Powers, & Wang, 2001). Parenting styles of both fathers and mothers may differ between ethnicities; hence, it would be useful to include diverse groups in this study.

It is of interest that we found few effects of perceived control on parenting itself, although perceived control was associated with child outcomes. One study of mostly

middle-class Caucasian families found that neither global perceived competence or domain-specific perceived competence was related to parenting, yet a domain-specific measure of perceived competence was related to toddler behavior (Coleman & Karraker, 2003). Other studies have found more effects of perceived control on parenting among low-income mothers than among higher-income mothers; however, these studies may have confounded ethnicity with income. Further research among diverse groups may explain these effects.

Conclusion

In summary, findings indicated that parental efficacy and children's proximal environments are predictive of attachment security and children's self-control. Separate descriptive analyses of African American and Caucasian families added to our understanding of children's social-emotional development within different contexts. In particular, findings regarding parental efficacy indicated distinct effects within African American and Caucasian groups. Furthermore, the traditional measurements of sensitivity and attachment indicated possible cultural differences in the ways and meanings of parenting. Dimensions of perceived competence and perceived control also produced different effects on parenting style and child outcomes. Linkages between parenting and child outcomes were generally stronger among low-income groups than middle-to-high income groups, suggesting that proximal processes have a greater effect among children living in disadvantaged families than among children with more resources. Findings on gender, ethnicity, and class raised interesting questions that warrant further investigation. In sum, this dissertation added to our understanding of

parental efficacy and its relation to various aspects of children's environments, attachment security, and child self-control within diverse demographic groups.

APPENDICES

APPENDIX A

MEASURES

Sense of Competence Subscale

1. When my baby came home from the hospital, I had doubtful feelings about my ability to handle being a parent.

2. Being a parent is harder than I thought it would be.

3. I feel capable and on top of things when I am caring for my baby.

4. I can't make decisions without help.

5. I have had many more problems caring for my baby than I expected.

6. I enjoy being a parent.

7. I feel that I am successful most of the time when I try to get my baby to do or not do something.

8. Since I brought this baby home from the hospital, I find that I am not able to take care of this baby as well as I thought I could. I need help.

9. I often have the feeling that I cannot handle things very well.

Perceived Control Subscale

1. If a child has tantrums, no matter what you try you might as well give up.
2. My baby influences the number of friends I have.
3. I have often found that when it comes to my child, what is going to happen, will happen.
4. My baby's behavior is sometimes more that I can handle.
5. Being a good parent often depends on being lucky enough to have a good baby.
6. When something goes wrong with my baby there is little I can do to correct it.
7. It is often easier to let my baby have his/her way than to put up with a tantrum.
8. My baby does not control my life.
9. I feel like what happens in my life is mostly determined by my baby.
10. Fate was kind to me; if I had had a bad baby I don't know what I would have done.
11. What I do has little effect on my baby's behavior.
12. I'm just one of those parents who happened to have a good child.
13. Sometimes I feel my baby's behavior is hopeless.
14. My life is chiefly controlled by my baby.

Center for Epidemiological Studies – Depression

1. I was bothered by things that usually don't bother me.
2. I felt that everything I did was an effort.
3. I felt I was just as good as other people.
4. I had trouble keeping my mind on what I was doing.
5. I felt sad.
6. I felt fearful.
7. I felt lonely.
8. I had crying spells.
9. I talked less than usual.
10. My sleep was restless.
11. I enjoyed life.
12. I felt that I could not shake off the blues even with the help of my family/friends.
13. I thought my life had been a failure.
14. I was happy.
15. I could not get "going".
16. I felt hopeful about the future.
17. People were unfriendly to me.
18. I did not feel like eating; my appetite was poor.
19. I felt depressed.
20. I felt that people dislike me.

Marital Conflict Subscale

1. How often do you and your partner argue with one another?
2. To what extent do you try to change things about your partner that bother you (e.g. behaviors, attitudes, etc.) ?
3. How confused are you about your feelings toward your partner?
4. How much do you think or worry about losing some of your independence by being involved with your partner?
5. How often do you feel angry or resentful toward your partner?
6. How ambivalent or unsure are you about continuing in the relationship with your partner?
7. To what extent do you feel that your partner demands or requires too much of your time and attention?
8. To what extent do you feel "trapped" or pressured to continue in this relationship?
9. When you and your partner argue, how serious are the problems or arguments?

APPENDIX B

AD-HOC ANALYSES OF INCOME AND RACE

Table 22

Tests for equality of means and equality of variances between low-income African American and Caucasian groups

Variable	*n*	*M*	*SD*	Equality of Means *t*-value	Sig.	Equality of variances *F*-value	Sig.
Perceived control:							
African American	115	3.73	.58	.90	.37	3.35	.07
Caucasian	186	3.67	.51				
Perceived competence:							
African American	115	4.01	.56	1.25	.21	3.67	.06
Caucasian	186	3.93	.49				
CES-D 1-6 mos.:							
African American	116	13.45	7.00	-.11	.91	1.84	.18
Caucasian	185	13.54	7.51				
CES-D 15 mos.:							
African American	96	12.01	7.21	.32	.75	.93	.34
Caucasian	148	11.70	7.67				
Stimulation:							
African American	100	2.25	.66	-1.18	.24	.87	.35
Caucasian	158	2.34	.57				
Sensitivity:							
African American	100	8.00	1.78	-1.95	.05	.19	.66
Caucasian	158	8.43	1.69				
Enrichment:							
African American	94	4.83	1.99	-6.44	***	5.86	.02
Caucasian	146	6.42	1.65				

*** $p < .001$.

Table 22 (cont'd)

Variable	*n*	*M*	*SD*	Equality of Means *t*-value	Sig.	Equality of Variances *F*-value	Sig.
Positive parenting:							
African American	94	4.85	1.34	-2.26	.03	.32	.57
Caucasian	146	5.23	1.20				
Lack of negativity:							
African American	94	4.43	1.34	-.88	.38	.00	.98
Caucasian	146	4.58	1.35				
Marital conflict:							
African American	88	2.89	1.15	2.38	.02	.47	.50
Caucasian	154	2.54	1.06				
Child care quality:							
African American	43	17.41	4.21	-2.67	.01	3.03	.09
Caucasian	73	19.97	5.38				
Attachment:							
African American	93	.18	.20	-2.27	.02	.00	.98
Caucasian	140	.24	.20				
Self-control:							
African American	77	-.39	.64	-1.82	.07	8.56	***
Caucasian	133	-.21	.75				

*** $p < .001$.

Table 23

Tests for equality of means and equality of variances between middle-to-high income African American and Caucasian groups

Variable	*n*	*M*	*SD*	Equality of Means *t*-value	Sig.	Equality of variances *F*-value	Sig.
Perceived control:							
African American	16	3.80	.42	-.34	.74	.55	.46
Caucasian	529	3.84	.48				
Perceived competence:							
African American	16	3.99	.40	-.36	.72	2.45	.12
Caucasian	529	4.03	.53				
CES-D 1-6 mos.:							
African American	16	10.22	6.49	1.64	.10	.56	.46
Caucasian	529	7.84	5.69				
CES-D 15 mos.:							
African American	15	9.27	7.95	1.61	.11	2.96	.09
Caucasian	505	6.74	5.95				
Stimulation:							
African American	15	2.53	.52	-1.53	.13	.10	.75
Caucasian	515	2.79	.64				
Sensitivity:							
African American	15	9.20	1.57	-1.65	.10	.03	.86
Caucasian	515	9.88	1.56				
Enrichment:							
African American	15	6.47	1.46	-2.58	.02	19.19	***
Caucasian	505	7.44	.83				

*** $p < .001$.

Table 23 (cont'd)

Variable	*n*	*M*	*SD*	Equality of Means *t*-value	Sig.	Equality of Variances *F*-value	Sig.
Positive parenting:							
African American	15	5.67	.82	-.53	.60	1.34	.25
Caucasian	505	5.75	.58				
Lack of negativity:							
African American	15	5.00	.93	-1.37	.17	.17	.68
Caucasian	505	5.33	.91				
Marital conflict:							
African American	16	2.69	.96	2.47	.03	3.76	.05
Caucasian	525	2.10	.74				
Child care quality:							
African American	12	19.45	3.97	-3.24	***	.03	.86
Caucasian	346	23.66	4.44				
Attachment:							
African American	15	.25	.17	-1.61	.11	1.17	.28
Caucasian	490	.33	.20				
Self-control:							
African American	13	-.35	.77	-2.35	.02	1.22	.27
Caucasian	452	.13	.72				

*** $p < .001$.

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