

MOKROVA, IRINA L., Ph.D. Motivation at Preschool Age and Subsequent School Success: Role of Supportive Parenting and Child Temperament (2012). Directed by Dr. Marion O'Brien. 125 pp.

Children's motivation has been identified by prior research as a predictor of academic achievement, but motivation in preschool age remains largely understudied. The present study examined the role of motivation at preschool age as a process mechanism through which maternal beliefs and supportive parenting in early childhood are related to children's academic success in first grade. Additionally, the role of child temperament as a predictor of motivation and academic success and as a moderator in the relations between supportive parenting and child motivation was examined. NICHD Study of Early Child Care and Youth Development data – a longitudinal study of 1364 children and their families – were used in the study. The results indicated that lower levels of maternal obedience beliefs and higher levels of supportive parenting in early childhood were associated with higher levels of children's motivation in preschool age, which in turn was associated with higher levels of academic success in first grade. Children with higher levels of effortful control also expressed higher levels of motivation and subsequent academic success. Children with higher levels of surgency had higher academic success, but did not differ in terms of motivation. Child negative emotionality was related to neither motivation nor academic success. Additionally, the relations between maternal supportive parenting and children's motivation did not vary depending on child temperamental characteristics. The results of the study highlight the role of motivation at preschool age in children's subsequent academic success and the need for further investigation of development of motivation in early childhood.

MOTIVATION AT PRESCHOOL AGE AND SUBSEQUENT SCHOOL
SUCCESS: ROLE OF SUPPORTIVE PARENTING
AND CHILD TEMPERAMENT

by

Irina L. Mokrova

A Dissertation Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Greensboro
2012

Approved by

Marion O'Brien, PhD
Committee Chair

*To the loving memory of my father, Lev Mokrov,
and to my family for your support and encouragement.*

Thank you.

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at The University of North Carolina at Greensboro.

Committee Chair _____
Marion O'Brien, Ph. D.

Committee Members _____
Martha Cox, Ph. D.

Dale Schunk, Ph. D.

Jonathan Tudge, Ph. D.

Feb 27th 2012
Date of Acceptance by Committee

Feb 27th 2012
Date of Final Oral Examination

ACKNOWLEDGEMENTS

I would like to sincerely thank the dissertation committee for their time, expertise, and thoughtful advice throughout this process. To my advisor and committee chair Marion, thank you for your support of my autonomy, cognitive stimulation, and emotional support you have provided throughout these years. I greatly appreciate your mentorship and care.

TABLE OF CONTENTS

	Page
LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER	
I. INTRODUCTION	1
II. THEORETICAL PERSPECTIVE	7
III. REVIEW OF LITERATURE	13
The Development of Motivation and Relation to Academic Success	14
Supportive Parenting, Motivation, and Academic Success	25
Child Temperament	33
Selection into Parental Obedience Beliefs and Parenting Behaviors	42
The Current Study	43
Study Hypothesis	45
IV. METHODOLOGY	47
Participants	47
Procedure	48
Measures	49
Data Analytic Approach	58
V. RESULTS	61
Preliminary Analyses	61
Tests of Study Hypotheses	63
VI. DISCUSSION	69
Child Motivation at Preschool Age	69
Early Parenting	72
Temperament and Motivation	74
Conclusions	81

REFERENCES	83
APPENDIX A. TABLES AND FIGURES	112

LIST OF TABLES

	Page
Table 1. Descriptive Statistics for Study Variables	118
Table 2. Bivariate Correlations among Study Variables in the Latent Path Models	119
Table 3. Bivariate Correlations among Study Variables in the Latent Path Models	120
Table 4. Zero-order Correlations between Covariates and Outcome Variables	121
Table 5. Standardized Factor Loadings for the Supportive Parenting Latent Construct	122
Table 6. Latent Construct Standardized Estimates for the Process Model	123
Table 7. Standardized Path Estimates for the Process Model	124
Table 8. Standardized Estimates for the Final Model	125

LIST OF FIGURES

	Page
Figure 1. The Conceptual Model of Maternal Beliefs, Behaviors, and Child Temperament as Predictors of Child Motivation and Academic Success	112
Figure 2a. Estimated Model of Maternal Supportive Parenting and Child Motivation as Mediators between Maternal Obedience Beliefs and Child Academic Success	113
Figure 2b. Results for the Model of Maternal Supportive Parenting and Child Motivation as Mediators between Maternal Obedience Beliefs and Child Academic Success	114
Figure 3a. Estimated Model of Maternal Parenting and Child Temperament as Predictors of Child Motivation and Academic Success	115
Figure 3b. Results for the Model of Maternal Parenting and Child Temperament as Predictors of Child Motivation and Academic Success	116
Figure 4. Estimated Model of Child Temperament as Moderator in Relations between Maternal Supportive Parenting and Child Motivation	117

CHAPTER I

INTRODUCTION

The importance of motivation for successful schooling has been recognized by educators and researchers alike. The US Department of Education (2005) includes child motivation, an ability to actively explore the environment and approach tasks with enthusiasm, into the definition of a child who is ready to learn. Children's motivation for learning has been identified as one of the predictors of children's academic achievement in middle childhood and adolescence (Eccles et al., 1993; Gottfried, 1985, 1990; Pintrich & Schunk, 2002; Wigfield, & Eccles, 2002; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006), indicating that motivation plays a critical role in academic success during the school years.

The question of the origins of motivation is not new to developmental science. Early theories of motivation by Freud (1934), Hull (1943), and White (1959) viewed motivation in terms of drives or needs, either biological or psychological. Later work by Winterbottom (1958) and Crandall and his colleagues (e.g., Crandall, Dewey, Katkovsky, & Preston, 1964; Crandall, Preston, & Rabson, 1960), in a series of studies with early school-aged children, presented evidence that supportive parenting, such as encouragement for child autonomy, age-appropriate achievement demands, and emotionally supportive family climate, can play an important role in the development of motivation in childhood. The majority of current empirical research on the connections

between parenting, children's motivation, and their academic success is conducted with elementary and secondary school students (for reviews, see Eccles, Wigfield, & Schiefele, 1998; Pomerantz, Grolnick, & Price, 2005). Empirical findings show, however, that there are individual differences both in children's levels of motivation upon their entry to kindergarten and in their reactions to success and failure (Dweck, 2000; Turner & Johnson, 2003). Thus, it is important to address the development of motivation before children begin school. Little research to date has examined connections between parenting factors and children's motivational development prior to school entry and how they relate to children's academic success in later years. This study aimed to fill this gap by examining the role of children's motivation as a mediating factor in the relations between maternal parenting and children's academic success, the focus on which is becoming increasingly prominent in research and public discourse alike.

Children's academic success is commonly regarded as one of the key factors of children's success in the future, including future economic prosperity, employment stability, and personal well-being. Research indicates the critical importance of young children's academic success, particularly in early elementary school, as a precursor of later school accomplishments (Duncan et al., 2007; La Paro & Pianta, 2000). Children with higher levels of academic success in early elementary school are routinely placed in more advanced and enriching educational tracks, and children with lower levels of success tend to systematically lose educational ground throughout the school years. As such, a continuing investigation into the processes that are likely to support children's early academic success is important. To date, little research has examined the relations

between children's motivation prior to school entry and their early academic success and how early parenting factors predict both children's motivation and their subsequent academic success. Thus, a primary goal of the present study was to examine the extent to which several aspects of maternal parenting, namely obedience beliefs, support for children's autonomy, cognitive stimulation, and emotional support in early childhood affect young children's academic success in first grade and whether these associations are mediated by children's level of motivation.

There is empirical evidence for a positive relationship between supportive parenting and academic success throughout the school years (Ginsburg & Bronstein, 1993; Grolnick, Gurland, Jacob, & DeCoursey, 2002; Gottfried, 1985, 1990). There is also evidence that children's achievement motivation mediates this relationship (Gottfried, Gottfried, & Guerin, 2006; Pomerantz et al., 2005), but whether the same processes hold for preschool age children has not been examined. Given the fact that the early years of schooling are important for children's long-term educational outcomes, it is critical to understand the role these processes play before children enter school and during the first years in school, when the precursors of academic success become solidified and can lead to vastly different educational trajectories. As such, the present study adds to the current literature by conducting a longitudinal examination of the associations between early parenting and children's academic success in first grade as well as examining the role that children's motivation plays both as a mediator in this relationship and as an independent predictor of children's academic success.

There are several ways in which the present study adds to the developmental literature. First, it extends our understanding of the role of maternal beliefs in children's motivational development and academic success. Luster and Okagaki (2005) posit important questions regarding parenting such as "Why do parents differ markedly in the ways in which they care for their children?" and "What factors contribute to individual differences in parenting behavior?" The authors suggest that parental values and beliefs may be one contributing factor. Research literature indicates that parents who hold beliefs that emphasize child obedience tend to be less supportive in their parenting behaviors (e.g., Abell, Clawson, Washington, & Bost, 1996; Luster, Rhoades, & Haas, 1989). Literature suggests that parents with more progressive (as opposed to obedience-supporting) parenting beliefs encourage exploratory behaviors in their children (Luster et al., 1989), provide them with higher levels of emotional support (Abell et al., 1996; Aunola, Vanhatalo, & Sethi, 2001; Cotterell, 1986), and create more cognitively stimulating home environments (Cotterell, 1986). As suggested by self-determination theory (Deci & Ryan, 1985, 2000), these aspects of parenting – support for autonomy, cognitive stimulation, and emotional support - aid in the development of children's motivation and are linked to increased academic success. It is logical to assume, therefore, that obedience beliefs are inversely related to children's motivational development and their academic success independently or through parenting practices, as described earlier. Nonetheless, little research has addressed this question. Understanding these links is important for practitioners who provide education to families with young

children by emphasizing the importance not only of what parents do but also what they believe about parenting.

Furthermore, there is little research that has examined the relationship between children's individual temperamental characteristics and children's motivational development. Researchers have found that certain temperamental characteristics, specifically negative emotionality and shyness, are inversely related to children's academic achievement (Caspi et al., 2003; Shiner, Masten, & Tellege, 2002). There is also evidence that children who have difficulties sustaining attention are at a disadvantage in terms of their academic success compared to children without such difficulties (e.g., Daley & Birchwood, 2010). Thus, it is possible that similar relations exist between aspects of temperament and child motivation. Knowing whether temperamental differences are associated with the development of motivation in early childhood would provide important information for early childhood education interventions and would help identify those children who are at risk of having lower levels of motivation. Thus, the present study examined whether there is a relationship between children's temperament and their levels of motivation prior to school entry.

Another contribution of the study to the developmental literature includes the question about the goodness-of-fit between child's temperament and quality of parenting as reflected in children's levels of motivation. Thomas and Chess (1977) suggested that negative child outcomes are the most likely in situations when the child's environment does not meet the needs, or the challenges, posed by the child's temperament. In other words, it is the interaction between parenting style and the child's individual

characteristics that is positively or negatively reflected in children's outcomes. The present study also addressed the question whether the interactions between parental practices and children's temperamental characteristics serve as a significant predictor of children's motivational development.

The conceptual model that was examined in the study is shown in Figure 1. This mediational model posits the relations between maternal obedience beliefs at one month and maternal supportive parenting (support for autonomy, cognitive stimulation, and emotional support) at 36 months, which in turn is related to child motivation at 54 months. Child motivation at 54 month subsequently mediates the relations between maternal supportive parenting and child academic success at first grade. The model additionally posits the direct links of child temperament at 54 months to motivation at 54 months and academic success at first grade and a moderating role of child temperament on the relations between maternal supportive parenting and child motivation.

As such, the aims of the proposed study are: a) to examine the role of maternal obedience beliefs in maternal supportive parenting and in the development of children's motivation and subsequent academic success; b) to examine whether children's motivation serves as a mediating link between maternal parenting prior to children's school entry and children's academic success in first grade; c) to examine whether children's temperamental characteristics are associated with children's motivation and academic success; and d) to examine whether child temperament characteristics moderate the relations between maternal parenting behaviors and children's motivation.

CHAPTER II

THEORETICAL PERSPECTIVE

The theoretical framework used in this study is self-determination theory (SDT; Deci & Ryan, 1985, 2000, 2002). The intellectual roots of SDT go as far back as classical Greek philosophy and Aristotle's writings devoted to *eudemonia*, the goal of human life (May, 2008). May suggested that even though *eudemonia* is often translated as 'happiness', it is more accurately defined as "flourishing" or "self-actualization". Aristotle equates self-actualization with actively doing something, thus just maintaining homeostasis or living a life of leisure could not be further away from it. He saw development as a natural process governed by this tendency for self-actualization. As Ryan and Deci (2002) argue, the fulfillment of a tendency toward self-actualization propels people to seek new challenges, exercise their interests, express their talents, and otherwise live in accord with their "true" selves.

This view of human beings as active, growth-oriented, integrating organisms has been shared by many theorists within psychoanalytic, humanistic, and existential psychological traditions (e.g., Freud, 1927; Maslow, 1955; Rogers, 1963; White, 1963). In a similar manner, Piaget (1971) saw development as a process with internal rather than external driving forces that follows the path of progressively more complex integration and differentiation. Deci and Ryan (1985, 2000) support the assumption that "all individuals have natural, innate, and constructive tendencies to develop ever more

elaborated and unified sense of self” (Ryan & Deci, 2002, p. 5). Thus, SDT proposes that individuals are innately motivated to realize their abilities and to explore their environments. Furthermore, the theory conceives this tendency for intrinsic motivation and integration as involving autonomy (i.e., holistic organization and self-regulation) and homonomy (i.e., integration of oneself with others). It is in this light Deci and Ryan (2002) maintain that successful actualization of one’s potential can be attained only when individuals perceive themselves as autonomous beings who are competent at what they do and who are inextricably connected with other people. As such, SDT uses the concept of basic psychological needs – the needs for autonomy, competence, and relatedness – as a way to organize and describe the characteristics of social contexts that promote or hinder human self-motivating tendencies. If social environments are conducive to fulfillment of these three psychological needs, individuals will be highly motivated to further develop their abilities. Inversely, if the environments are antagonistic to those needs, amotivation and withdrawal are likely. SDT maintains that basic needs are universal; they are inner human requirements rather than culturally or developmentally acquired and they exist in all cultures and at all developmental periods, although the expressions of these needs and the ways through which they are fulfilled clearly differ from context to context (Ryan & Deci, 2002).

Following White’s (1959) ideas about the importance and function of *effectance motivation*, SDT defines the need for competence as a necessity to feel effective in one’s own environment and to express and practice one’s capabilities. This need propels individuals to seek new challenges, explore their contexts, and engage in activities that

allow enhancement of their skills. Deci and Ryan (2002) maintain that it is not only the actual skills of an individual that are important, but also the feeling of competence people gain as a result of successful participation in challenging activities.

The need for relatedness is also not a new concept in psychology. Humans are social beings that yearn to feel connected and belong (Baumeister & Leary, 1995; Bowlby, 1979). SDT defines relatedness as a feeling of connection to others or a sense of belongingness with other individuals and a broader community. Relatedness reflects the homonomous aspect of development and is concerned with the psychological sense of being accepted and supported, cared for by others and caring for others.

The need for autonomy refers to an individual's ability to conceive, initiate, and control one's own behavior and actions (deCharms, 1968). It means the ability to act at will in a self-initiated manner and in regards to one's own interests and values. Of course, individuals can be influenced to act by external sources, but as long as they fully endorse these actions and value them, they perceive the self as a source of action. On the contrary, if an individual acts in a certain manner out of fear, compliance, or conformity, such actions would not be perceived as autonomous. Autonomy is often equated with independence, but SDT highlights that these are quite different concepts that exist orthogonally to each other. Independence implies self-sufficiency and non-reliance on others; and from the perspective of SDT it is closer to an antonym of relatedness rather than a synonym of autonomy. SDT maintains that close, supportive relationships with others and an ability to choose one's course of action are both needed for the development of motivation and overall well-being.

In sum, SDT theorists view human development as an active tendency toward growth and self-actualization. It maintains that the course of development is not predetermined but rather is created in relations between an individual and the environment which can be supportive (through fulfillment of the three basic psychological needs) or detrimental to an individual's growth, self-motivation, and overall well-being. Currently, SDT is utilized in research within many domains of psychological science and is used in the present study to guide analyses of motivational development in the context of adult-child interactions, including parenting.

Researchers working within the SDT perspective suggest that support for autonomy and relatedness, which parents are likely to provide for their children from a very young age, serve as a starting point for the development of infants' exploratory behaviors and curiosity, the precursors of motivation (Grolnick, Ryan, & Deci, 1991; Ryan, Deci, Grolnick, & La Guardia, 2006). As children grow older, ideally parents also provide their children with optimal challenges that stimulate the development of competence (Deci, 1975; Harter, 1974), while continuing to support children's autonomy and self-initiation and to provide emotional support in terms of warmth, care, and expressed interest in the child's activities. Even though it is possible that children can fulfill their psychological needs elsewhere if parents are unavailable or incapable of providing that support, families are the most proximal and stable context in which young children live. Thus, SDT assumes that parents' role in the development of motivation in children, at least during early childhood, before school and peers begin to play major roles.

When applying the logic of SDT to the development of motivation in children, it is important to note that people are intrinsically motivated to perform only activities that are interesting and exciting for them to begin with (Ryan & Deci, 2000). Thus, it is not always enough to create a context that affords autonomy, competence, and relatedness for children to become intrinsically motivated to do something that is not appealing to them. However, if a particular activity is considered worthy by parents or as something children should be doing, such as performing well in school, a successful fulfillment of the basic psychological needs is likely to lead to children's integration of this activity into their self and acceptance of this activity as their own.

In general, the goals of socialization are to promote children's compliance with behaviors and attitudes that are customary to their families and broader culture and to help children internalize these values and behaviors, i.e. to accept them as their own. SDT posits that children have an intrinsic tendency to accept values and behaviors of their environments as their own, even if these behaviors are extrinsic to them initially (Grolnick, Deci, & Ryan, 1997). However, the successful internalization of these values and behaviors is contingent on the satisfaction of children's needs for autonomy, competence, and relatedness by their parents and others socializing agents. Thus, the assessment of children's environments and the degree to which children's basic psychological needs are satisfied can predict how fully children will come to internalize, endorse, and self-regulate values and behaviors in question.

The research literature that addressed the role of parenting in successful fulfillment of children's psychological needs and development of motivation has

identified important and specific dimensions of parental behaviors – support for child autonomy, cognitive stimulation, and emotional support (Grolnick & Slowiaczek, 1994; Pomerantz et al., 2005). The present study used the assessment of these specific parenting dimensions as behaviors that facilitate the development of child motivation.

CHAPTER III

REVIEW OF LITERATURE

Many theoretical approaches to development, including self-determination theory, attribute a leading role in young children's motivational development to parents (e.g., Davis-Kean, 2005; Eccles & Harold, 1993; Grolnick & Slowiaczek, 1994). The current review of the literature begins by describing what is currently known about the development of motivation and the role of motivation in children's academic success. Next, early and contemporary work on the relationship between parenting and the development of children's motivation is discussed, as well as literature on children's motivation as a mediator in the relations between aspects of parenting, such as parental beliefs, behaviors, and family demographics, and children's academic achievement. Finally, the literature on children's temperamental characteristics and their links to children's achievement and well-being is reviewed, providing an argument for the possible connections between temperament and motivational development at preschool age.

Throughout the current review of the literature, evidence from various studies on the relations between parenting, children's motivation, and their academic outcomes are presented. The majority of the reviewed research has been conducted with school-age children. It is possible that aspects of parenting that appear pivotal for positive development in middle childhood and adolescence are not the same as those important in

parenting of preschoolers. The mechanisms through which parental attitudes and behaviors influence young children are likely to differ in some ways from those of older children. Yet because the current empirical evidence on the development of motivation in preschoolers and its role in future academic success is scarce, the associations that exist in the context of school-age children served as guides for the present study.

The Development of Motivation and Relation to Academic Success

Motivation is a psychological phenomenon that energizes and directs actions (Wigfield et al., 2006). As such, motivation has been related to many important developmental outcomes, including academic success. Motivation is an internal process that is most observable through individuals' behaviors and the level of energy with which they engage in those behaviors. Researchers who investigate children's motivation often study it through children's level of persistence in tasks and activities, their agency (i.e., initiatives and choices about which activities and tasks to do), their levels of engagement in a given activity or task, and their performance levels (Wigfield et al., 2006).

Achievement motivation refers more specifically to performance on tasks and goal-oriented actions where some standard of performance exist, thus offering an opportunity for success or failure (Stipek & Greene, 2001). Research on motivation in infancy and toddlerhood most often refers to mastery motivation – the study of how children become sufficiently engaged so that they persist in mastering a task or their environment.

As motivation cannot be observed directly, it has to be inferred through observable behavior and expressed affect or assessed through self-reported cognitions. In the studies involving younger children who may not be a reliable source of self-reported

cognitions, motivation is usually measured through observations of behavioral indicators, such as persistence, agency, effort, levels of engagement and sustained attention, or through affective indicators, such as pride, joy, enthusiasm, or embarrassment (MacTurk & Morgan, 1995; Stipek & Greene, 2001). Studies conducted with older children tend to utilize self-report of children's cognitive attributions, such as competence beliefs, task values, goals, self-efficacy, and expectations for success as indicators of motivations as those are less burdensome to collect and can provide a fuller picture of a child's attitudes toward achievement compared to observations, which are more time and effort consuming in terms of data collection. As certain conditions have to be constructed in order to gather reliable information from preschool age children about their competence beliefs or attitudes toward achievement, such as repeated situations of both success and failure, only children's behavioral indices of persistence and agency were used in the current study to assess children's motivation.

Age-related Changes in Motivation

Knowledge of the development of motivation in terms of both within-person stability and changes and between-person similarity and differences is somewhat limited thus far. Research on the development of motivation in infancy and toddlerhood has been based primarily on White's (1959) description of effectance (or mastery) motivation as an innate characteristic of human beings and Harter's (1978) work on the ways in which the social environment may affect the strength of an individual child's mastery motivation through positive or negative reinforcement. Harter posited that adults can shape the intensity and frequency of child mastery attempts through contingent reinforcement, and

that children ultimately internalize adults' attitudes and views of their mastery actions. Thus, from the very beginning, a body of literature addressing development of motivation in infancy and toddlerhood has focused on both within-person stability and change and on contextual influences. The contextual links with the development of motivation will be discussed later during the review of literature on the associations between parenting and child motivation.

Barrett and Morgan (1995) provide an overview of within-person change in behavioral and affective expressions of motivation for children from birth to 3 years of age. They describe infants from birth to 9 months as attentive to contingency between action and outcome, expressing a preference for novelty and for active object manipulation over passive observation, using familiar but not always appropriate means to mastery, and beginning to show persistence in somewhat difficult tasks. Infants at this age also begin to express interest in and joy at attaining their goal, frustration at barriers preventing them from reaching to goal, and sadness at their inability to attain a goal. Between 9 and 20 months of age toddlers also begin to recognize there are standards for task performance or task completion; show preference for tasks of *optimal challenge* (Harter, 1974) – tasks that are both challenging and solvable; and specifically select means that are appropriate for mastery of a task. On the emotional side of motivational expression, toddlers between 9 and 20 months begin to show pride at their accomplishments and embarrassment at their failure. Between 20 and 36 months, in addition to the behaviors and emotional expressions of earlier ages, toddlers begin to show preference for tasks they anticipate being solvable; deliberately plan and attempt to

complete multi-step tasks; and begin to form instrumental styles to failure – either mastery-oriented and avoidant (Barrett, Zahn-Waxler, & Cole, 1993); and some toddlers begin to express helplessness when they fail.

Research that addressed development of motivation in infancy and toddlerhood also has shown the relative stability of mastery motivation as an individual characteristic across the first years of life (Jennings, Connor, & Stegman, 1988; Power et al, 1985; Yarrow et al., 1983) and from 6 months to 8 years of age (Pedlow, Sanson, Prior, & Oberklaid, 1993) in that children who expressed higher degrees of persistence and more goal-oriented behaviors at earlier time points tended to show greater persistence and more goal-oriented behaviors later. Additionally, children with relatively high levels of mastery motivation were found to be more persistent and goal-oriented across different settings (Power, Chapieski, & McGrath, 1985; Yarrow, Morgan, Jennings, Harmon, & Gaiter, 1982).

Although cognitive aspects of motivation were not measured in the current study, it is important to acknowledge the available research evidence in this area. The literature indicates that children's self-evaluations begin to develop during the toddlerhood years. Before 24 months of age, children are typically not concerned with self-evaluation or other-evaluation of their success or failure (Stipek, Recchia, & McClintic, 1992). Toddlers between 24 and 36 months become more attuned to positive evaluations from others but do not react as much to negative evaluations. After 36 months, children become capable of evaluating their own successes and failures and react to both positive and negative evaluations by others (Stipek et al., 1992). Preschool age children's abilities

to self-evaluation that begin to form after 36 months of age, appear to be a first step in formation of child's reactions to failure, and particularly learned helplessness (Dweck, 2000). First identified in elementary school children, learned helplessness is expressed through negative affect, challenge avoidance, and low expectation for future success (Diener & Dweck, 1980). Moreover, helpless children tend to attribute failure to lack of abilities and success to chance and luck rather than effort. Later studies showed, however, that preschool age children are not "immune" from forming persistent negative reactions to failure, such as learned helplessness, as it was thought based on preschoolers' high and often exaggerated beliefs in their abilities (Stipek & Daniels, 1988; Stipek et al., 1998). In their work with preschoolers, Dweck and colleagues (e.g., Cain & Dweck, 1995; Smiley & Dweck, 1994) identified that children as young as 4 years of age can have strong negative emotional reactions to failure (i.e., feel very sad), choose easy tasks after failure, and become less confident in their skills. These studies also revealed that the actual task performance of preschoolers who were negatively affected by failure did not differ from the performance of children who were not negatively affected by failure (Smiley & Dweck, 1995), as it is typically seen in older children and adults (Stipek & Greene, 2001). As such, children's ability at preschool age to bounce back from a failure, at least in terms of performance, despite being negatively affected by a failure, is an important sign of resilience which needs to be examined more thoroughly and consistently than it has been before. Once again, even though the present study did not include cognitive measures of child motivation, the presented evidence highlights the importance of preschool age in development of motivation. It appears that preschool period is a critical

age for identification of children at risk for future motivational problems, at least in terms of cognitive attributes, and for potential remedial interventions as a characteristic of learned helplessness tends to solidify in elementary school age and lead to diminished performance (Dweck, 2000).

Little research has addressed individual differences in motivation at preschool age. In a study of at risk preschoolers, Turner and Johnson (2003) found that children differ in their levels of mastery motivation, as rated by both parents and teachers. Additionally, the study found that children's mastery motivation was positively linked to the quality of parent-child relations. A few other studies examined differences in motivation as they relate to children's academic success and will be discussed further (e.g., Bridgeman & Shipman, 1978; Sigman, Cohen, Beckwith, & Topinka, 1987). Yet, more research is needed to investigate individual differences in children's motivation in preschool age and beyond, particularly in longitudinal framework.

Following a comprehensive account of within-person changes in infancy and toddlerhood and very limited information on the development of motivation in preschool age, the research literature does not provide much evidence of further motivational development from the perspective of mastery motivation and its behavioral and emotional expressions. The next line of work that addressed changes in children's motivation approached the study of motivational development from a social cognitive perspective (Bandura, 1986) and focused predominantly on school-age children. This approach defines and describes cognitive indicators of motivation, with competence related beliefs, efficacy beliefs, and subjective task values being most prominent (for a

further discussion, see Wigfield et al., 2006). Most early elementary school children report high competence beliefs and expectancies for success, regardless of their actual skill levels as reported by parents and teachers (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield et al., 1997). However, this optimistic outlook soon changes to a more realistic view. Although first-graders' self-ranked abilities tend not to correlate with their performance level, sixth- and seventh-graders' competence beliefs correlate highly with their grades (Nicholls, 1979). Moreover, the examination of children's competence beliefs and expectancies for success in different subjects from first grade through high school indicates an overall decline in each domain as children get older, particularly during the transition from elementary to middle/junior high school (Fredericks & Eccles, 2002; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Watt, 2004).

Researchers have attributed such a negative change to two main reasons. First, children begin to understand and interpret feedback on their performance more accurately as they get older (Nicholls, 1984). They also become attuned to social comparisons more acutely than before (Dweck & Elliot, 1983). Secondly, school environments change drastically as children go through a transition to middle/junior high school. The effects of these transitions have been extensively studied by Eccles and her colleagues (e.g., Eccles et al., 1989; Eccles, Midgley, et al., 1993; Eccles, Wigfield, et al., 1993; Jacobs et al., 2002; Wigfield et al., 1997). These studies demonstrate a decrease in children's competence beliefs across different academic domains as children go through school transitions, particularly in children who are not academically successful. Besides physiological and interpersonal changes that occur in the early adolescent years, such as

puberty, increasing concerns with identity, and increasing salience of peer relations, there are differences in school environments and the nature of instruction between elementary and secondary schools. Due to larger school and classroom sizes, students do not receive individualized attention from teachers as they did in elementary schools. It is also difficult for teachers to notice students who may need additional help because children do not spend a whole day with the same teacher but move from subject to subject. There is also a greater emphasis on discipline and teacher authority (Midgley, Feldlaufer, Eccles, 1989), which undermines students' initiative taking in their education and goals. Students often attend classes with other children they do not know well, and their friendship/social networks tend to be disrupted, thus leading to increased anxiety and a diminished sense of competence (Roeser, Midgley, & Urdan, 1996). Furthermore, secondary schools place greater emphasis on competition and social comparison, leading to increased pressure and taking a toll especially on academically less capable students.

In sum, the available research literature indicates that many children begin their lives with relatively high levels of mastery motivation, which appear to be relatively stable over the early years, as described above. However, there is little research that investigated whether this relative stability can be attributed to the stability of family contexts or whether we should think about mastery motivation as a stable personal characteristic. Moreover, observed inter-individual differences in children's motivation tend to be examined in the context of supportive parenting, as discussed below, and little research examined the relations between children motivation levels and other individual characteristics, such as temperament. Additionally, the role of self-evaluation,

particularly during the transition to school has been poorly investigated. It is possible that when children begin to evaluate their performance against that of others and enter the educational system with current emphasis on evaluation, competition, and comparison, their levels of motivation may decline, as it has been shown to be the case during the transition into middle school. Clearly, these are general mean tendencies that do not take into account possible individual difference in development of children's motivation, but little information is available on whether some children are at higher risk for steeper declines in motivation due to their individual characteristics.

The origins of individual differences in motivation, thus, remain largely unknown. Some researchers proposed that aspects of temperament may be closely related to motivation, particularly in infancy and early childhood (Pedlow et al., 1993, Stipek & Greens, 2001). Some child behaviors that are used as indicators of motivation (i.e., persistence, activity level, attention, and latency to play with unfamiliar objects) are the same behaviors that are studied in the literature on temperament. However, no research has directly examined these linkages in preschool age children and only limited evidence is available for school age children, which will be discussed later. As such, the present study aimed to provide evidence on whether and how child temperament is related to individual differences in motivation.

Relation between Motivation and Academic Success

Research that examines motivation in infancy and toddlerhood indicates positive relations between mastery motivation and concurrent and subsequent levels of cognitive development (MacTurk & Morgan, 1995; Stipek & Greene, 2001). Several investigators

reported that infants who expressed higher levels of persistence and exploratory behaviors at 6 to 13 months scored higher on developmental scales, such as the Bayley Scales of Infant Development and the McCarthy Scales of Children's Abilities, both concurrently and at 30 months of age (Messer et al., 1986; Yarrow et al., 1982; Yarrow et al., 1983). Additionally, Jennings, Yarrow, and Martin (1984) found significant relations between early mastery motivation and later cognitive functioning in girls but not boys. Overall, these studies suggest an interconnection between children's early mastery motivation and cognitive development. Indeed, successful acquisition of knowledge and skills is likely to happen only when children are able to persist in challenging activities (i.e., to engage with tasks and sustain their engagement) long enough for learning to occur.

A few studies have focused on the relations between child motivation and academic achievement at the time of school entry. Findings from these studies suggest that motivation is positively related to academic achievement concurrently (Walker & MacPhee, 2011) and one year later (Aunola, Leskinen, & Nurmi, 2006; Reynolds, 1989; Stipek & Ryan, 1997). In a study of low-income children, Bridgeman and Shipman (1978) found that children's motivation at ages 4 and 5 were positively related to their reading, math, and problem solving skills at third grade. Moreover, Aunola et al. (2006) found reciprocal relations in which high levels of academic performance predicted mastery motivation 6 months later, which in turn predicted subsequent performance. But overall, the development of motivation in preschool age and its links to academic success after the school entry remains examined inadequately.

The importance of motivation for academic success has been convincingly established in research involving elementary and secondary school students (Wigfield & Eccles, 2002). Empirical evidence indicates that children's motivation can predict a wide range of academically-related outcomes, including subsequent academic gains (Furrer & Skinner, 2003; Gottfried, 1990; Guay, Marsh, & Boivin, 2003), perceived value of school subjects (Wigfield et al., 1997), academic and non-academic self-concepts (Eccles et al., 1989; Gottfried et al., 2006), academic anxiety (Gottfried, 1985; Meece, Wigfield, & Eccles, 1990), and post-secondary level of education (Gottfried, Cook, Gottfried, & Morris, 2005).

The longitudinal relationship between mastery motivation at toddlerhood and academic abilities at the time of school entry, however, remains largely unexamined. Two studies found a significant relationship between children's motivation at preschool age and early elementary school success, controlling for children's initial cognitive abilities (Mokrova, O'Brien, Calkins, Leerkes, & Marcovitch, 2012; Sigman, et al., 1987). Mokrova et al. (2012) found that child motivation at age 3 positively predicted math and language skills at kindergarten, controlling for initial cognitive-linguistic skills. Similarly, Sigman et al. (1987) reported that children who showed higher levels of task persistence at age 2 had higher levels of cognitive skills at age 5, controlling for children's initial cognitive abilities. As suggested by Stipek and Greene (2001), more research is needed to identify relations between motivation in early childhood and children's academic achievement at and after school entry. The present study was aimed

to provide additional research evidence on the role of preschoolers' motivation in their academic success at first grade.

Supportive Parenting, Motivation, and Academic Success

Early Studies on Parenting and Socialization of Motivation

Early research on the contextual links to child motivation began with the work of Winterbottom (1958), Rosen (1958), and Crandall and his colleagues (e.g., Crandall et al., 1964; Crandall, Katkovsky, & Preston, 1962; Crandall et al., 1960). The empirical evidence from that line of research highlighted several environmental correlates of highly motivated children: support for children's autonomous exploration and activities, developmentally appropriate achievement demands (analogous to the concept of optimal challenge in Deci, 1975, and Harter, 1974), emotionally supportive family climate and confidence in children's abilities, and achievement motivated role models. Maternal controlling behaviors were also found to negatively relate to children's academic achievement (Chance, 1961). Moreover, the highest levels of achievement motivation were evident in children whose parents placed great value on their own cognitive skills, encouraged intellectual activities in their children, and provided them with emotional encouragement during those activities (Katkovsky, Crandall, & Preston, 1964).

Consequently, children of these families demonstrated greater academic success than other children. In discussing the available empirical evidence Crandall et al. (1964) suggested that while each of the identified parental behaviors noted above predicted higher levels of motivation in children, it was their combination that seemed to be the most powerful predictor. Moreover, Smith (1969) suggested that the timing of demands

and expectations parents put on their children had to correspond to children's abilities and cognitive processes in order to stimulate the development of achievement motivation, indicating that sensitive and attentive parenting may be another key to the successful development of motivation in children. The contemporary research, as discussed below, largely supports those early findings.

Parental Support for Autonomy, Cognitive Stimulation, and Emotional Support

Empirical evidence indicates that three aspects of parenting behavior -- support for autonomy, cognitive stimulation, and emotional support -- are important to children's academic performance (Eamon, 2005; Eccles, 1993; Gottfried et al., 2006; Grolnick, Kurowski, Dunlap, & Hevey, 2000; Grolnick & Slowiaczek, 1994; Leibham, Alexander, Johnson, Neitzel, & Reis-Henrie, 2005; Sonnenschein & Munsterman, 2002). The present study focused on children's motivation as the mediating link in this relationship. A number of prior studies have investigated the relations of family factors and children's motivational development and academic success from a social-cognitive viewpoint (for a review, see Wigfield et al., 2006). These studies tend to focus on the assessment of children's self-beliefs, goals, and attitudes toward achievement and academic success as manifestations of motivation. Children's motivational cognitions can be relatively easily assessed when children can accurately describe their thoughts, goals, and competence beliefs and when they have experiences in formal educational settings, thus explaining why social-cognitive investigations of motivational development tend to be conducted with school-age children. Self-determination theory, in contrast, is readily applicable to an investigation of family links on the development of motivation in younger children.

Thus, using SDT as a framework, this study examined parental obedience beliefs, support for autonomy, cognitive stimulation, and emotional support as key factors in predicting preschoolers' levels of motivation and their subsequent academic success.

Support for autonomy is expressed in such parental behaviors as allowing and encouraging children to make choices and initiate activities, to explore their environments, and to take an active role in solving their problems. It also includes valuing self-direction in children and involving them in decision-making processes concerning children themselves and family at large. Controlling behaviors and attitudes are usually the antithesis of all the above and may take an overt form as demands for obedience, intrusiveness, and restrictions or a covert form as psychological pressures and coercion (Pomerantz et al., 2005). Research indicates that children of parents who support autonomy tend to be more mastery oriented and to have higher levels of intrinsic academic motivation (e.g., d'Ailly, 2003; Bronstein, Ginsburg, & Herrera, 2005; Frodi, Bridges, & Grolnick, 1985; Gottfried, Fleming, & Gottfried, 1994; Grolnick, Gurland, DeCoursey, & Jacob, 2002; Grolnick & Ryan, 1987; Kelly, Brownell, & Campbell, 2000). The likely explanation for the beneficial effects of autonomy granting is twofold. First, such parenting fulfills children's need for autonomy, which is necessary for children's optimal development and well-being. Secondly, autonomy granting is likely to contribute to the development of competence, because it allows children to solve challenges on their own and practice a variety of skills. Empirical evidence suggests positive relations between parental autonomy support and children's perception of academic competence (e.g., Grolnick & Ryan, 1989; Grolnick et al., 1991). Support for

autonomy has also been found to positively associate with children's academic success (e.g., Bronstein et al., 2005; Ginsburg & Bronstein, 1993; Grolnick & Ryan, 1989; Grolnick & Slowiaczek, 1994; Guay, Boggiano, & Vallerand, 2001; Ng, Kenney-Benson, & Pomerantz, 2004; Roth, Assor, Niemiec, Ryan, & Deci, 2009). Several researchers have hypothesized that children's motivation toward school mediated this relationship and the data supports those hypotheses (Bronstein et al., 2005; Ginsburg & Bronstein, 1993; Grolnick & Ryan, 1989; Grolnick & Slowiaczek, 1994; Guay et al, 2001; Steinberg, Elmen, & Mounts, 1989).

Age-appropriate cognitive stimulation and provision of intellectually enhancing experiences have been identified as another factor that contributes to positive motivational development in children. From the position of SDT as well as other theories of motivational development, optimal cognitive challenges are perceived to elicit the most interest and persistence in children (e.g., Deci, 1975; Renninger, 2000; Schunk & Pajares, 2002). Exposure to and engagement in cognitively enriching activities are likely to allow children to exercise their abilities, to practice their skills, and to lead to enhancement of their sense of competence. Furthermore, parental involvement in cognitively stimulating activities with their children tends to fulfill children's need for relatedness. It is also likely to signal that parents place high value on intellectual activities and encourage children's internalization of these values. Indeed, research supports these predictions. The work of Adele Gottfried and her colleagues (e.g., Gottfried, 1985; Gottfried, Fleming, & Gottfried, 1998, 2001; Gottfried et al., 2006; Murray et al., 2006) indicates that provision of novel and complex stimuli, availability of

cognitive stimulation at home, and more distal factors such as parental education play a critically important role in development and stability of academic intrinsic motivation in children. Moreover, these effects appear to be significant above and beyond families' socio-economic status. Parents who support and maintain their children's emerging interests and provide overall cognitive stimulation tend to have children with higher perceived academic competence and more stable long-term individual interests (Grolnick et al, 2000; Leibham et al., 2005; Tenenbaum, Porche, Snow, Tabors, & Ross, 2007). Empirical evidence also suggests that various aspects of parental cognitive stimulation, such as encouragement of using cognitive and meta-cognitive strategies during problem solving (Metallidou & Vlachou, 2007), frequency of reading interactions (Sonnenschein & Munsterman, 2002), general high levels of intellectual stimulation in the home (Eamon, 2005; Grolnick & Slowiaczek, 1994), parents' educational expectations (Brooks-Gunn, Guo, & Furstenberg, 1993; Davis-Kean, Eccles, & Schnabel, 2002) and parents' own intellectual abilities and education levels (Eamon, 2005; Eccles, 1993; Gottfried et al, 1998) are positively associated with children's academic achievement through children's motivation toward school, such as intrinsic interest in learning, perception of one's abilities, and value placed on education.

Parental emotional support has also been related to the development of achievement motivation and to greater academic accomplishments. Researchers have investigated variables such as general emotional warmth and supportiveness at home (e.g., Connell, Halpern-Felsher, Clifford, Crishlow, & Usinger, 1995; Gutman, Sameroff, & Eccles, 2002), use of positive emotional regulatory strategies (Salonen, Lepola, &

Vauras, 2007), affective quality of interactions during instructional tasks and homework (Kim & Park, 2006; Sonnenschein & Munsterman, 2002), and children's feelings of relatedness with parents and other adults (Furrer & Skinner, 2003) as they predict higher levels of motivation and academic success in school-age children. Similarly, researchers have documented the benefits of active parental involvement with children's schooling and other children's interests (Clark, 1993; Connell, Spencer, & Aber, 1994; Eccles, 1993; Grolnick & Slowiaczek, 1994). From the SDT point of view, the positive emotional relationships between parents and children fulfill children's need for relatedness and also aid in the development of their sense of competence through enhancing children's self-esteem.

Thus, the associations between supportive parenting as defined by support for autonomy, cognitive stimulation, and emotional support and academic success has been established, and there is some evidence that these associations are mediated through children's motivation. However, the majority of research that examined these mediational links has been conducted with school age children. It is possible that similar processes take place during early childhood; however, this assumption has not been verified. The present study aimed to fill this gap, which appears to be important for our understanding of the precursors of young children's early academic success.

Several investigators have stressed the view that the combination of supportive parenting behaviors would play the most beneficial role in children's motivational development and their subsequent academic success (Grolnick, 2003; Pomerantz et al., 2005; Ryan & Deci, 2002). Research evidence suggests that support for autonomy,

cognitive stimulation, and emotional support uniquely contribute to the development of motivation and academic success in middle childhood and adolescence (Grolnick & Ryan, 1989; Grolnick et al., 2002; Grolnick & Slowiaczek, 1994; Ng et al., 2004; Pomerantz, Ng, & Wang, 2006). Whether these parenting behaviors contribute in a similar fashion to the development of motivation in early childhood remains unknown. Thus, the present study simultaneously examined the relative importance of maternal support for autonomy, cognitive stimulation, and emotional support in preschool age children's motivation and subsequent academic success.

The Role of Parental Beliefs

Research indicates that parental values and beliefs play an important role in formation of parental behaviors and are associated with different child outcomes, including child motivation and academic success (Jacobs & Eccles, 2000; Kohn, 1979; Miller, 1988; Wigfield et al., 2006). For example, parents who emphasize child obedience tend to use more directives and physical intrusions as their discipline strategy (Lareau, 2002; Weininger & Lareau, 2009), to engage in less reasoning and negotiations with their children (Lareau, 2002), and to be less supportive of their children (DeGarmo, Forgatch, & Martinez, 1999). In contrast, parents who value self-direction tend to be emotionally supportive of their children's endeavors and to provide positive feedback and information (Gerris, Dekovic, & Janssens, 1997), to allow and encourage exploratory behavior (Luster et al., 1989), to stimulate their children's cognitive development through promotion of decision making, negotiating skills, and fostering of curiosity (Weininger & Lareau, 2009), to be low in restriction (Aunola et al., 2001), and to have lower levels of

conflict with their children (Park, Kim, Chaing, & Ju, 2010). As a result, children of these parents tend to receive more autonomy support, cognitive stimulation, and emotional support when compared to children of obedience-endorsing parents and demonstrate more initiative-taking (Tudge et al., 1999) and higher levels of academic success (Wu & Qi, 2006). Additionally, parental beliefs such as confidence in their children's abilities and expectations for success were found to relate to children's own beliefs about their abilities and their subsequent motivation and academic success (Eccles, 1993; Frome & Eccles, 1998).

Taken together, available evidence suggests that parental beliefs are associated with parenting behaviors and may play a role in children's motivation and academic success. Research also indicates that the associations between parental beliefs and child outcomes are likely to be mediated by parenting behaviors. Therefore, the present study examined maternal beliefs of obedience and the extent to which these beliefs are associated with children's academic success through maternal behaviors and children's motivation. Following the assumptions of SDT, young children of parents with progressive parenting beliefs are anticipated to have higher levels of motivation and academic success, because these parents are expected to support their children's autonomy, to provide high level of cognitive stimulation, and to be emotionally responsive, all of which are hypothesized to contribute to the development of motivation in children. Positioning maternal beliefs as a predictor of children's academic success extends our knowledge about the role mothers play in children's academic success

beyond maternal demographic factors and parenting behaviors and highlights the precursors of maternal parenting behaviors.

Conclusion

In sum, theory and research evidence suggest that families contribute to the development of motivation and subsequent academic success in children through the fulfillment of children's psychological needs for autonomy, competence, and relatedness by providing children with support for autonomy, cognitive stimulation, and emotional support. Moreover, parental obedience beliefs are expected to serve as precursors of parenting behaviors and to relate to children's motivation and academic success through parenting behaviors. However, the relations between parenting and child motivation and academic success are also hypothesized to be contingent upon the temperamental characteristics of children themselves.

Child Temperament

Direct Relations with Motivation and Academic Success

Recent advances in our understanding of temperament in childhood highlight the view that temperament is a dynamic characteristic that develops throughout childhood in close interactions with the environment. Rothbart and Bates (2006) define temperament as "constitutionally based individual differences in reactivity and self-regulation, in the domains of affect, activity, and attention. By the term *constitutional* [the authors] refer to the biological bases of temperament" (p. 100), that can be modified by a child's experiences and maturation processes. The term *reactivity* refers to latency, duration, and intensity of responses to changes in the environment. Reactivity usually includes a broad

range of motor, emotional, and attentional reactions, such as fear, withdrawal, and orienting; and more general tendencies such as negative emotionality, approach, and impulsivity. The term *self-regulation* in the context of temperamental literature refers to the inhibition of a dominant response to a situation in favor of a subdominant response or the activation of a subdominant response (Rothbart & Bates, 2006). The primary role of self-regulation is to modify reactivity. Eisenberg et al. (2004) proposed to distinguish involuntary modifications of reactivity, such as a tendency to react with inhibited behavior to novelty or stress, and voluntary modifications enacted through will and effort. The latter type of self-regulation has been termed as *effortful control* (Eisenberg et al., 2004; Rothbart & Bates, 1998). Effortful control usually includes attentional control (an ability to maintain or shift attention) and activational and inhibitory control (an ability to activate or suppress behavior as needed to respond appropriately to a situation). As with the broader term of self-regulation, effortful control is believed to be a temperamentally based capacity of an individual, which develops over time through interactions with other personal characteristics (e.g., cognitive abilities) and the environment (e.g., quality of parenting).

Much of the research on the dimensional structure of temperament has employed factor analysis of large sets of data that measured temperamental characteristics of infants and children (Rothbart & Bates, 2006). For example, childhood studies using the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadir, Hershey & Fisher, 2001) typically yield three broad dimensions that include Negative Emotionality (with loadings from sadness and anger/frustration subscales), Surgency (with loadings from

approach/anticipation, activity level, and reverse shyness subscales), and Effortful Control (with loadings from inhibitory control and attention focusing subscales). Similar dimensions have been derived using the Childhood Temperament Questionnaire (Thomas & Chess, 1977) and the Middle Childhood Temperament Questionnaire (Hegvik, McDevitt, & Carey, 1982).

As suggested prior, the behavioral indicators of motivation and temperament often overlap. By its definition, temperament represents emotional, attentional, and regulatory aspects of personality. Motivation can be broadly defined as an internal force that causes a person to pursue goals and that initiates and regulates goal-oriented behaviors. As such, motivation is a multifaceted phenomenon that also includes emotional, activation, and attentional processes that require initial reaction and subsequent regulation. Motivation, however, also includes a cognitive component that is not present in the construct of temperament. Yet due to the overlap in these dimensions, some researchers have suggested that certain motivational processes (particularly task persistence) are closely connected to temperament and have proposed smaller, secondary factors of temperament labeled Attention/Persistence (Thomas, Chess, Birch, Hertzog, & Korn, 1963) or Task Persistence (McClowry, Hegvik, & Teglasi, 1993; Presley & Martin, 1994). Others suggested that questionnaire items that measure persistence and attention focusing constitute a part of the Effortful Control dimension of temperament, both conceptually and empirically (e.g., Ahadi, Rothbart, & Ye, 1993; Rothbart et al, 2001; Sanson, Smart, Prior, Oberklaid, & Pedlow, 1994). Due to internal nature of motivation, it is necessary to rely on behavioral manifestations of the phenomenon, such as

persistence, interest, curiosity, agency, or engagement, to measure individual differences in young children's motivation. Whether task persistence is distinguished as a separate temperamental factor or is included into an Effortful Control dimension, some researchers suggest that this motivational manifestation is a part of temperament and is included in questionnaires that measure children's temperament (Hegvik, et al., 1982; Rothbart & Bates, 2006; Sanson et al., 1994; Thomas & Chess, 1977). Thus, to extend our understanding on the development of motivation in early childhood, it is important to examine whether and how temperamental dimensions of negative emotionality, surgency, and effortful control are related to other manifestations of motivation such as agency, which serves as one of the behavioral manifestations of motivation in this study.

Limited research evidence is available to identify how temperament dimensions are related to motivation. Children with higher negative emotionality may have more difficulties persisting through a challenging part of a new activity and may display lower levels of motivation; whereas temperamental characteristics of surgency and effortful control may help children to engage in a novel situation, to set a goal, and to attempt to reach it. The only longitudinal study that tested these relations was conducted with children from 8 to 12 to 20 years of age (Shiner et al., 2002). The findings suggest children's negative emotionality is negatively related to mastery motivation, both concurrently and longitudinally. By contrast, positive emotionality, which in that study included approach and social closeness, was positively related to mastery motivation, but only concurrently. The dimension of self-control (similarly defined as effortful control) was positively related to academic competence, but unrelated to mastery motivation.

Additionally, there is emerging evidence that negative emotionality and distractibility (an indicator of lower effortful control) are negatively related to motivation (Mullola et al., 2011), whereas activity level (part of surgency dimension) is positively related to motivation (Chen & Zhang, 2011) among school age children. The present study examined only concurrent relations between child temperament and motivation at preschool age.

The research literature that examines the associations between temperament and academic success indicates negative emotionality to be a negative predictor whereas surgency and effortful control are positive predictors of academic success (Bramlett, Scott, & Rowell, 2000; Cameron, 2009; Caspi et al., 2003; Checa, Rodrigues-Bailon, & Rueda, 2008; Colom, Escorial, Shih, & Privado, 2007; Mullola et al., 2011; Rudasill, 2011; Valiente et al., 2011; Zhou, Main, & Wang, 2010). More specifically, negative emotionality has been found to be associated with lower levels of academic success directly (Mullola et al., 2011) and through externalizing problems (Zhou et al., 2010). Shy and reserved children were more likely to avoid engaging in situations that were novel or challenging and to demonstrate lower levels of academic achievement (Caspi et al., 2003; Mullola et al., 2011), particularly in language skills (Cameron, 2009) and to engage in fewer teacher-child interactions (Rudasill, 2011), which may prevent children from establishing close relations with their teachers and partially account for lower academic success (Hamre & Pianta, 2001). In contrast, higher levels of surgency were predictive of higher levels of academic success (Bramlett et al., 2000; Colom, et al., 2007). Higher levels of effortful control, which is likely to help in sustaining attention on

a task and inhibiting competing impulses while working toward a goal, have been found to be associated with higher levels of academic success and social skills (Checa et al., 2008; Valiente et al., 2011; Zhou et al., 2010). Additionally, children's level of effortful control was reported to relate to the frequency of child-initiated interactions with teacher (Rudasill, 2011), thus providing an opportunity for maintaining positive relations with teacher and further insuring children's academic success (Lerner, Lerner, & Zabski, 1985).

It is possible that associations between child temperamental characteristics and motivation resemble those that exist between child temperament and academic success. As such, the hypotheses of this study are that higher levels of negative emotionality predict lower levels of child motivation and higher levels of surgency and effortful control predict higher levels of motivation.

Interactions between Child Temperament and Supportive Parenting

Aside from the direct associations between child temperamental characteristics and motivation and between quality of maternal parenting and motivation, which have been described so far, it is anticipated that the quality of parenting to which children are exposed will differently predict child motivation, depending on child temperamental characteristics. The idea of goodness-of-fit between the quality of parenting and child temperament characteristics, proposed by Thomas and Chess (1977), suggests that the environment does not meet the needs or challenges posed by the child's temperament, various negative outcomes are possible. At the same time, an environment that adequately addresses child's temperamental needs can sufficiently mitigate the risk of

adverse outcomes. In other words, the interactions between parenting quality and the child's temperament are likely to play a role in optimal child development. Due to lack of research that examines the interactions between parenting and child temperament as predictors of motivation, the hypotheses of the present study relied on empirical evidence from the literature academic success, wherever possible, and on findings in the area of children's psychological adjustment.

Emotional support. Mischel and Ayduk (2004) provide an illustration of how a temperamental disposition of negative emotionality and easy distress can develop into rejection sensitivity, depending of early childhood experiences. Rejection sensitivity is a chronic anxious expectation of rejection and a tendency to encode ambiguous interpersonal events as indicators of rejection. The authors suggest that children with high levels of negative emotionality who experience early criticism and rejection in their families are at highest risk for developing rejection sensitivity later in life. At the same time, children with high levels of negative emotionality whose mothers are emotionally supportive and warm are less likely to develop rejection sensitivity. Moreover, children without high levels of negative emotionality are more likely to elicit acceptance from their caregivers, thus further lowering their risk of experiencing rejection (Mischel & Ayduk, 2004). In support of such reasoning, researchers have found that easily frustrated and emotionally negative children are more likely to display aggressive behaviors concurrently and later during childhood when their mothers are intrusive, negatively affective, or harsh, but not when their mothers are emotionally positive and supportive (Bates, Viken, & Williams, 2003; Belsky, Hsieh, & Crnic, 1998; Calkins,

2002; Patterson & Sanson, 1999). Additionally, maternal hostility has been found to moderate the relations between child negative emotionality and their ability to sustain attention in that maternal hostility exacerbated the negative affects of negative emotionality on attention regulation (Davis, Harris, & Burns, 2010). Similarly, parental negative affect predicted childhood anxiety problems for children who were rated high in shyness (an indicator of low surgency), but not for other children (Lindhout, Markus, Hoogendijk, & Boer, 2009). Likewise, similar findings have been reported regarding children's effortful control: poorly regulated children who had intrusive, hostile, and punitive mothers are more likely to demonstrate externalizing problems both concurrently and longitudinally than children of emotionally positive mothers (Morris et al., 2002; Rubin, Burgess, Dwyer, & Hastings, 2003; Rubin, Hasting, Chen, Stewart, & McNichol, 1998). Additionally, children's attention control predicted higher levels of academic success when children were in classrooms with low teacher emotional support, but not in classrooms with high teacher emotional support (Rudasill, Gallagher, & White, 2010). In sum, these findings demonstrate that parental emotional support and responsiveness are most beneficial for children with negative emotionality, low surgency, and low levels of effortful control. It is reasonable to assume that children with less favorable temperamental characteristics may require higher quality parenting for optimal development.

Support for autonomy. There is little research addressing the issue of the moderating effects of child temperament on the associations between parental support for autonomy and child outcomes. Davis and colleagues (2010) found that in regard to

children's ability to regulate their attention, parental autonomy support served as a mitigating factor for children with low levels of effortful control; whereas for children with high levels of effortful control, parental support for autonomy was not associated with children's ability to regulate their attention. Similarly, children with low levels of effortful control demonstrated more behavior problems if their mothers did not support autonomy compared to children of autonomy supportive mothers (Feng, Shaw, & Moilanen, 2011; Karreman, Van Tuijl, Van Aken, & Deković, 2009). At the same time, high levels of parental control (as opposed to support for autonomy) predicted externalizing behaviors in children with higher levels of effortful control (Bates, Pettit, Dodge, & Ridge, 1998), but predicted low levels of externalizing behaviors in impulsive and dysregulated children (Bates et al., 1998; Stice & Gonzales, 1998; Stoolmiller, 2001). Thus, given limited and somewhat contradictory research evidence, it is not clear whether or how parental support for autonomy would differently predict motivation levels for children with high and low levels of negative emotionality, surgency, and effortful control. Perhaps parental autonomy support is associated with children's motivation to a greater extent in children with more problematic temperaments, namely high negative emotionality, low surgency, and low effortful control. Parental support for autonomy may be associated with child motivation to a lesser extent in those children who can sustain novel of challenging situations on their own – children with low levels of negative emotionality, high surgency, and high effortful control.

Cognitive support. A few studies have considered the associations between maternal cognitive support and child temperament in their relations to child outcomes. In

a large longitudinal study, Lahey et al. (2008) found that low levels of cognitive stimulation in early childhood were associated with higher levels of behavioral problems later in childhood above and beyond negative temperamental traits, but no significant interactions were found. Neitzel and Stright (2004) found that mothers were more likely to provide their children with cognitive stimulation, regulate task difficulty, and encourage their children's efforts and active participation in a series of problem-solving tasks if they perceived their children as temperamentally easy rather than difficult. Parents who have well regulated, low negative emotionality and higher surgency children are likely to provide more cognitive stimulation to them, because these children are easier to interact with. Such children may also request more new information from their parents and be more receptive to provision of novel information by their parents, thus developing greater levels of motivation than emotionally negative, withdrawn, and dysregulated children.

Selection into Parental Obedience Beliefs and Parenting Behaviors

In order to account for selection into parenting beliefs and practices, it is important to identify control variables that are associated with them. Parental race, education, and income are some of the factors that are known to be associated with parental beliefs and parenting practices (Benasich & Brooks-Gunn, 1996; Kohn, 1979; McLoyd, 1990). Thus, these constructs were used in the present study as control variables. Researchers have also examined gender effects on parental beliefs, such as attributions about children's abilities (e.g., Alexander & Entwisle, 1988; Jacobs, 1992). The findings indicate that parents with more traditional child-rearing views held distorted

perceptions of their children's abilities and differently encouraged their sons and daughters to participate in activities such as sports or performing arts, depending on the child's gender. Thus, child gender was also controlled. Additionally, children's cognitive abilities have been found to be related to children's levels of motivation and future academic success (e.g., Gottfried et al., 2006; Clark, Pritchard, & Woodward, 2010); therefore, children's early cognitive skills was controlled.

The Current Study

The study used longitudinal data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (SECCYD), a study of 1,364 children and their families who lived in or near 10 sites across the US. Families were followed from children's infancy into high school (NICHD Early Child Care Research Network [ECCRN], 2005). The SECCYD data set is particularly well suited to address questions about the relations between parental beliefs and practices during children's preschool years and children's academic success in elementary school. This data set provides information on families that were diverse in terms of urbanicity, income, and level of maternal education. The SECCYD data set has a large overall sample and a relatively large minority subsample. Using these data allowed an examination of the development of young children's motivation and its role in subsequent academic success. As such, the present study provides information that is currently absent from the developmental literature. The majority of studies of child motivation have been conducted with school age children. To date, the SECCYD data have not been thoroughly analyzed with regard to parenting beliefs, practices, and child temperament as they relate

to children's motivation and subsequent academic success. Even though the original focus of the SECCYD was on the links between early environments and child development, and not on motivation in particular, suitable measures of young children's motivation were collected making these data extremely useful for the present study.

Several reports using the SECCYD data have examined parenting and young children's academic skills. For example, Downer and Pianta (2006) reported that maternal sensitivity and the home learning environment, among other factors, predicted change in children's cognitive abilities from 54 months to first grade. Another study examined maternal sensitivity and cognitive stimulation as significant partial mediators in the relations between families' SES and young children's language abilities (Raviv, Kessenich, & Morrison, 2004). Mistry, Biesanz, Taylor, Burchinal, and Cox (2004) have found that maternal sensitivity and psychological distress partially mediated the relations between family income and 3-year-olds' cognitive-linguistic development in families living at the poverty threshold. A study of the relations between mother and father autonomy supportive behaviors and children's academic success indicated that autonomy supportive parenting at preschool age predicted academic success in the third grade, but for boys only (NICHD ECCRN, 2008). Although no prior reports have included children's achievement motivation in their models, their findings demonstrate the importance of considering different aspects of parenting as contributing factors to young children's academic functioning.

The conceptual model that was examined in the current study is presented in Figure 1. The primary objective of the study was to investigate children's achievement

motivation as a process mechanism through which maternal parenting is related to children's academic success and extend these findings by including children's temperamental characteristics as predictors of children's motivation and academic success and as a moderator in the relations between parenting and children's motivation. As such, the present study investigated the relations among maternal obedience beliefs at one month of age and quality of maternal parenting at 36 months of age as they relate to child academic success at first grade, focusing on child motivation at 54 months as an intervening mechanism. A second study objective was the examination of the relation between child temperamental characteristics at 54 months of age – negative emotionality, surgency, and effortful control – and both child motivation at 54 months and child academic success at first grade. Finally, this study also examined child temperamental characteristics as moderators of the links between maternal parenting at 36 months and child motivation at 54 months.

Study Hypothesis

The present study examined the following hypotheses.

1. Mothers whose parenting beliefs do not emphasize obedience will provide more support for autonomy, cognitive stimulation, and emotional support to their children at 36 months and will have children with higher levels of motivation at 54 months; in turn, children with higher levels of motivation at 54 months will show higher levels of academic success in first grade. Specific hypotheses are: (1a) maternal supportive parenting will serve as a process mechanism through which maternal obedience beliefs are associated with child motivation; and (1b) child motivation will

serve as a process mechanism through which maternal beliefs and behaviors are associated with child academic success in first grade.

2. Children with low negative emotionality, high surgency, and high effortful control at 54 months will demonstrate high levels of motivation at 54 months and higher levels of academic success at first grade compared to children with high negative emotionality, low surgency, and low effortful control.

3. The relations between maternal support for autonomy, cognitive stimulation, and emotional support at 36 months and child motivation at 54 months will vary depending on child temperamental characteristics. Specifically, high levels of maternal support for autonomy, cognitive stimulation, and emotional support will play a greater role in the development of motivation and academic success in children with high negative emotionality, low surgency, and low effortful control.

CHAPTER IV

METHODOLOGY

Participants

Participants in the NICHD SECCYD were recruited throughout 1991 from hospitals located in or near Little Rock, AR; Irvine, CA; Lawrence and Topeka, KS; Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Morganton and Hickory, NC; Seattle, WA; and Madison, WI. Of 8,986 women who had given birth within a selected period of time, 5,265 were eligible to participate in the study and agreed to be contacted later. The eligibility criteria included: (a) the mother was at least 18 years old, (b) the mother spoke English, (c) the mother did not deliver multiple births nor had a child with obvious disabilities, (d) family did not plan to move nor lived too far away, and (e) the mother did not have a substance-abuse problem. Families were called at random from the list of eligible families to enroll two to three families into the study per week at each site. Final recruitment occurred at the first home visit when the study children were 1 month old. A total of 1,364 families was enrolled in the study. The recruited families did not differ significantly from other families eligible to participate in terms of major demographic variables.

Of 1,364 families who completed the first interviews when the study children were one month old, 705 (51.7%) had a boy. The participating families included 24% ethnic-minority children (12% African American, 6% Hispanic, and 6% other or

biracial). Maternal mean age was 28.3 years ($SD = 5.6$). Maternal educational levels ranged from less than a high school diploma to postgraduate work with an average of 14.3 years of education ($SD = 2.5$); 30% of the sample had 12 years of formal education (high school diploma) or less. Fourteen percent of mothers were single parents at one month of child age. Approximately 30% of the families had low incomes, as indicated by an income-to-needs ratio of less than 2.0 (NICHD ECCRN, 1999).

Procedure

The data included in the present study were collected from the child's infancy through first grade at five time points when study children were one month, 24 months, 36 months, and 54 months of age and in first grade. Demographic data were obtained on the 1,364 target families who were interviewed in the home at one month by trained interviewers and included information on child gender, parental ethnicity, marital status, age, education, and family's level of income. During the one-month interview mothers also completed a questionnaire assessing their beliefs about the importance of child obedience. At 24 months all study children were administered the Bayley Mental Development Index (MDI) during a laboratory visit.

Trained interviewers visited participating families when study children were 36 months of age. During the home visit mother-child dyads were observed in a structured play situation, and their interactions were videotaped and later coded. The interviewers also assessed the quality of the family's home environment using the Home Observation for the Measurement of the Environment (HOME, Caldwell & Bradley, 1984).

At 54 months mother-child dyads were observed in the laboratory and father-child dyads were observed during a family home visit. During the lab visit mother-child play interactions were videotaped for later coding. Mothers completed a questionnaire designed to assess the study child's temperament within the past six months. During a family home visit father-child play interactions were videotaped and later coded by trained coders, assessing children's agency and persistence, among other factors. At 54 months, caregivers of children who provided regular care for the study child for at least 10 hours a week completed a questionnaire assessing the study child's temperament in the care setting.

In first grade, a comprehensive set of tests measuring children's cognitive abilities and academic achievement were administered. First grade teachers completed a questionnaire assessing the study child's academic skills. Complete descriptions of all data collection procedures can be found in the Manuals of Operation for the NICHD SECCYD (<http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies?q=NICHD+SECCYD>)

Measures

Maternal Beliefs of Child Obedience

During the one-month home visit mothers completed the Parental Modernity Scale (Schaefer & Edgerton, 1985), a 30-item questionnaire that measures traditional, authoritarian, obedience-focused parental beliefs and progressive, democratic beliefs. A traditional parental beliefs subscale that consists of 22 items rated on a 5-point scale (1=strongly disagree, 3=not sure, 5=strongly agree) was used in this study, with higher scores indicating more obedience-focused beliefs about child rearing. Sample items

include “The most important thing to teach children is absolute obedience to parents” and “Children must be carefully trained early in life or their natural impulses will make them unmanageable”. Cronbach’s α for all 22 items was .90.

To define a latent construct of maternal obedience beliefs for the SEM models used in the present study, the individual items were combined in three parcels of 7, 7, and 8 consecutive items each. The use of parcels allows the building of parsimonious models based on meaningful indicators of the latent constructs and enhances the likelihood of future replication of results (Little, Cunningham, Shahar, & Widaman, 2002). The three parcels used to identify *maternal obedience beliefs* at one month met the requirements specified in Little et al. (2002) in that they were internally reliable with α s above .60 (α s = .73, .88, .78), and exploratory factor analysis on each parcel yielded a single factor as determined by a single eigenvalue above 1.0.

Maternal Parenting Behaviors

Three aspects of maternal parenting – support for child autonomy, cognitive stimulation, and emotional support – were measured at 36 months of child age. *Maternal support for child autonomy* was defined as encouragement, respect, and support for children’s ability to make choices, initiate activities, solve problems, and otherwise freely express themselves. *Cognitive stimulation* was defined as provision of cognitively enriching materials, exposure to and engagement in cognitively enhancing activities, and encouragement of literacy and higher-order reasoning. *Emotional support* was defined as responsiveness, warmth, and acceptance of the child and the lack of harsh discipline strategies. These constructs were indexed by variables obtained from two measures

administered at 36 months: the Home Observation for Measurement of the Environment (HOME, Caldwell & Bradley, 1984) and the Mother-Child Structured Interaction Qualitative Ratings (NICHD ECCRN, 2008).

HOME observation. The HOME assesses the overall quality of the physical and social resources available to a child within the home. The HOME consists of both direct observation and a semi-structured interview with the mother on aspects of the family home environment, such as the presence of learning and other stimulating materials in the home, safety, responsiveness to and acceptance of the child, and the harshness of parental discipline. All observers attended centralized training sessions before collecting data and were required to maintain reliability throughout data collection by matching a master coder on 90% of items (NICHD ECCRN, 2004). The HOME contains 55 items coded in a binary fashion as “Yes” or “No.”

Mother-child interaction ratings. Qualitative ratings were obtained from mother-child interactions videotaped in semi-structured 15-min observations in which mothers were asked to show their children age-appropriate toys in three containers in a set order (see Vandell, 1979). At 36 months, washable markers, stencils, and paper were in the first container; dress-up clothes and a cash register were in the second; and Duplo blocks with a picture of a model were in the third. The mother was instructed to have her child play with the toys in each of the three containers and to do so in the order specified. The videotapes of mother-child interaction were shipped to a central location for coding using 7-point ratings (1=Very Low, 7=Very High) on each of five scales reflecting mothers' behaviors: supportive presence, respect for child autonomy, stimulation of cognitive

development, hostility, and confidence. Coders were blind as to other information about the families and were trained and supervised by Margaret Owen at the University of Texas at Dallas site. All coders met regularly for joint coding to ensure consistency of rating among all coders (NICHD ECCRN, 2008). Inter-rater reliability was calculated using intra-class correlation coefficients (ICC; Winer, 1971).

Of the five scales of mother behaviors, four were used in this study. Supportive presence (ICC = .81) represented the degree to which the mother expressed emotional support and regard for the child, acknowledged child success, positively encouraged child's actions, provided help in situations when the child had difficulties, and enjoyed interacting with the child. Respect for child autonomy (ICC = .72) represented the extent to which the mother recognized, respected, and encouraged the child's individuality and choices, acknowledged the child's ideas and actions, and restrained from intrusive interactions or assertion of her own ideas and actions. Stimulation of cognitive development (ICC = .78) represented the degree to which the mother supported the child's learning and achievement through encouragement of child engagement in stimulating activities, provided information to the child, and otherwise facilitated child's learning. Hostility (ICC = .82) represented the extent to which mothers expressed anger, discontent, or otherwise explicit rejection of the child.

Latent constructs representing supportive parenting. In the present study, the latent construct of *maternal support for children's autonomy* was indexed by the sum of 4 items (Cronbach's $\alpha = .59$) from the HOME at 36 months ("Child is permitted choice in menu for meal or snack", "Parent encourages child to talk and takes time to listen",

“Child has 2 or more toys permitting free expression”, and “Parents lets child choose certain food products at grocery store”) and by an observed score of respect for child autonomy during the mother-child interactions.

The latent construct of *maternal cognitive stimulation* was indexed by two subscales from the HOME– learning materials (sum of 11 items, Cronbach’s $\alpha = .72$) and stimulation (sum of 11 items, Cronbach’s $\alpha = .69$) – and by an observed score of stimulation of cognitive development assessed during structured mother-child interactions. The subscales from the HOME were calculated in accordance with HOME conceptual item clusters (see O’Brien et al., 2007) and describe the presence of learning materials, such as books, puzzles, and other educational toys, and parental cognitive stimulation, such as encouragement of learning, trips to museums, and the provision of other educational activities.

The latent construct of *maternal emotional support* was indexed by two subscales from the HOME – responsiveness (sum of 9 items, Cronbach’s $\alpha = .63$) and lack of harsh parenting (sum of 6 items, Cronbach’s $\alpha = .66$) – and by observed scores of maternal supportive presence and hostility (reversed) assessed during structured mother-child interactions. The subscales from the HOME were calculated in accordance with HOME conceptual item clusters (O’Brien et al., 2007) and describe positive feelings, warmth, and a lack of harsh discipline at home.

Children’s Achievement Motivation

The present study defined children’s achievement motivation as a desire to pursue goal attainments that initiates and regulates goal-oriented behaviors (Wigfield et al.,

2006). Because motivation is an internal process that cannot be directly observed, the present study used qualitative ratings of children's persistence and agency during mother-child and father-child videotaped interactions at 54 months as behavioral manifestations of motivation.

The mother-child and father-child videotaped interactions at 54 months were similar to the mother-child interactions at 36 months described above. Each involved two or three activities completed in a set sequence. At the 54-month home visit, dyadic father-child interactions involved two activities: constructing a stacked series of chutes and ramps together using Marbleworks (Discovery Toys, Livermore, California) and playing with a set of jungle animal families and props. Information for 782 children was available through father-child interactions. Mothers and children were observed and videotaped in the lab. The activities for mothers and children included completing a maze using an Etch-A-Sketch (Ohio Art, Bryan, Ohio), building a series of identical towers from blocks of varying shapes and sizes, and playing together with six hand puppets (NICHD ECCRN, 2008). The coding of the videotapes was handled in the same manner as described above for mother-child interactions at 36 months. Child persistence, the degree to which the child was engaged in a challenging activity or task, and child agency, the degree to which the child took initiative in choosing a course of action, were assessed through qualitative ratings on 7-point scales (1 = Very Low, 7 = Very High). Inter-rater reliability was calculated using intra-class correlation coefficients (ICC; Winer, 1971) Child persistence had ICC = .86 for mother-child interactions and ICC = .76 for father-

child interactions; child agency had ICC = .84 for mother–child interactions and ICC = .79 for father–child interactions.

The latent construct of *child motivation* at 54 months thus includes four indices of qualitative ratings of child persistence and agency displayed during mother–child and father–child interaction.

Child Temperamental Characteristics

Mothers and non-maternal caregivers of the study children completed the short version and a very short version of the Child Behavior Questionnaire, respectively (CBQ, Rothbart et al., 2001), which assess child temperament. Non-maternal caregivers were considered those who regularly provided care to study children at least 10 hours a week. Only one non-maternal caregiver report was obtained for each child. The total of 759 caregivers provided data for 812 study children. The mother version contained 80 items and the non-maternal caregiver version contained 48 items, each scored on a seven-point Likert scale that ranged from 1 = “Extremely untrue” to 7 = “Extremely true” of the study child within the past six months. Sample items from the mother version of CBQ included “Has temper tantrum when s/he does not get what s/he wants” as an indicator of anger/frustration; “Becomes tearful when told to do something s/he does not want to do” as an indicator of sadness; “Tends to run rather than walk from room to room” as an indicator of activity; “Becomes very excited while planning for trips” as an indicator of approach; “Acts shy around new people” as an indicator of shyness; “When drawing or coloring in a book, shows strong concentration” as an indicator of attention; and “Is able to resist laughing or smiling when it isn't appropriate” as an indicator of inhibitory

control. Most items on the caregiver version of CBQ were similar to items on the mother version.

Three broad dimensions of child temperament that were examined in the present study – negative emotionality, surgency, and effortful control – were defined as observed variables in the SEM models. *Negative emotionality* was calculated as a mean of standard scores of mother and non-maternal caregiver ratings of child anger/frustration (10 items each, Cronbach's α s of .76 and .86 respectively) and sadness (10 and 8 items, Cronbach's α s of .60 and .69, respectively). *Surgency/approach* was calculated as a mean of standard scores of mother ratings of child activity level (10 items, Cronbach's $\alpha = .69$), approach/anticipation (10 items, Cronbach's $\alpha = .67$), and shyness (8 items, reversed; Cronbach's $\alpha = .85$) and non-maternal caregiver rating of shyness (10 items, reversed, Cronbach's $\alpha = .90$). *Effortful control* was calculated as a mean of standard scores of mother and non-maternal caregiver ratings of attentional focusing (8 items each, Cronbach's α s of .74 and .80, respectively) and inhibitory control (10 items each, Cronbach's α s of .75 and .85, respectively).

Children's Academic Success

Two measures of child academic success in first grade were used in this study: a standardized assessment and a teacher-report measure.

The Woodcock–Johnson Psycho-Educational Battery–Revised (WJ–R; Woodcock & Johnson, 1989) is a wide-range, comprehensive set of individually administered tests for measuring cognitive abilities and achievement. Three achievement tests of the WJ-R – Letter-Word Identification, Applied Problems, and Word Attack –

were administered in the laboratory at first grade. Letter-Word Identification items involve symbolic learning, or the ability to match a pictographic representation of a word with an actual picture of the object, and reading identification skills in identifying isolated letters and words. The items become more difficult as they present words that appear less and less frequently in written English. The Applied Problems test measures child skills in analyzing and solving practical problems in mathematics through performance of relatively simple calculations. The Word Attack test measures the child's ability to apply phonic and structural analysis skills to the pronunciation of unfamiliar printed words through reading aloud letter combinations that are linguistically logical in English but that do not form actual words. Standard scores for each of the WJ-R tests were calculated through the scoring software (Compuscore for the WJ-R Software: The Riverside Publishing Company, Chicago, IL).

The Academic Skills Questionnaire (Nicholson, Atkins-Burnett, & Meisels, 1997) consisted of 25 items (Cronbach's $\alpha = .97$) on which teachers rate children's achievement in language, literacy, and mathematical thinking on a 5-point scale (1 = child has not demonstrated skill yet, 3 = child demonstrates skill with some regularity but varies in level of competence, 5 = child demonstrates skill competently and consistently). Sample items include "Reads first grade books independently with comprehension, for example, reads most words correctly and answers questions about what was read, makes predictions while reading, and retells story after reading", "Composes a story with a clear beginning, middle, and end", and "Uses strategies to add and subtract two digit numbers,

for example, by doubling, or knowing number families”. Teacher-rated academic skills data was available for 1,018 children.

The latent construct of *children’s academic success* at first grade was defined through four indices: three WJ-R achievement test standard scores and a mean of 25 teacher reported Academic Skills Questionnaire items.

Covariates

As discussed in the review of literature, prior research indicated several factors that needed to be controlled in the present study due to possible covariation with child characteristics under consideration. They included: (a) child sex (coded as “0” for boy, “1” for girl), (b) child race (coded as “0” for white, “1” for non-white), (c) mother’s education level as recorded at 1 month, (d) averaged across all time points family income-to-needs ratio, and (e) children’s Bayley MDI (Bayley, 1993) assessed at 24 months during a lab visit. The income-to-needs ratio was computed from maternal interview items collected during home visits. Family income was divided by the appropriate poverty threshold, determined by the year in which the income was earned and by household size. This variable was averaged across 0–54 months to create an average income-to-needs ratio used in this study. The MDI represents child’s overall cognitive level of development. Scores are standardized so that the mean is 100 with a standard deviation of 15.

Data Analytic Approach

Preliminary analyses included examining descriptive information on the study variables, calculation of correlations among variables and identification of covariates, and

the examination of missing data. Confirmatory factor analysis (CFA) was conducted to determine whether the quality of maternal parenting could be better represented as a single construct of supportive parenting or as three separate constructs of support for child autonomy, cognitive stimulation, and emotional support.

Hypotheses were tested using latent path analysis models within a structural equation modeling framework. Full information maximum likelihood estimation was used to address the missing data. This method accommodates missing data by estimating each parameter in a model by using all available data for that specific parameter. Compared to other methods of addressing the issue of missing data, such as listwise deletion or mean substitution, full information maximum likelihood is considered as the least biased method, particularly when addressing patterns of missing data that are related to study variables (Acock, 2005). Mplus 6.11 software (Muthen & Muthen, 1997-2010) was used to test path analysis models. Several fit indices were used to evaluate model fit to data: χ^2 , comparative fit index (CFI), and root mean square error of approximation (RMSEA). A model is considered to have an adequate fit to the data when CFI values are above .90 and RMSEA values are below .10 (Bentler, 1990; Browne & Cudeck, 1993), and a good fit when RMSEA values are below .08 (Curran & Bauer, 2011).

Latent path models were estimated to test study hypotheses. Hypothesis 1, which posited negative relations between maternal obedience beliefs and maternal supportive parenting, child motivation, and academic success, was tested by examining a model in which maternal supportive parenting and child motivation mediated the relation between maternal obedience beliefs and child academic success in first grade. Mediation was

tested through estimation of indirect effects and examination of specific mediators – maternal supportive parenting and child motivation. Compared with other statistical methods of assessing mediation, latent path analysis modeling permits tests of indirect effects in a single analytic model (Burchinal, Nelson, & Poe, 2006; Kline, 2005). In examining indirect effects, confidence intervals (CI) at 95% ($p < .05$) and 99% ($p < .01$) were estimated. An indirect effect is considered to be significant if the confidence interval does not include 0 (Kline, 2005). Nested models (i.e., models that have the same variables but different paths) were compared using $\Delta\chi^2$ (Kline, 2005).

Hypothesis 2, which posited positive relations between low negative emotionality, high surgency, and high effortful control and child motivation and subsequent academic success, was tested by expanding the prior model by adding child temperament characteristics as predictors of child motivation at 54 months and child academic success at first grade. Hypothesis 3, which posited child temperamental characteristics as moderators of the relations between maternal parenting at 36 month and child motivation at 54 months, was tested by adding the interaction terms between the latent construct of maternal supportive parenting and each of the three dimensions of child temperament – negative emotionality, surgency, and effortful control – to the model that tested the Hypothesis 2. The models that contained temperament characteristics were evaluated against the process model using the sample size adjusted Bayesian information criteria (adjusted BIC) – a criterion that evaluates model fit among non-nested models (i.e., models containing different variables). The smaller adjusted BIC value indicates a closer fit of the model to the data (Bollen & Curran, 2006).

CHAPTER V

RESULTS

Preliminary Analyses

Descriptive data for the study variables are presented in Table 1. The bivariate correlations among continuous study variables that are included in the latent path models are displayed in Tables 2 and 3.

To identify covariates to the outcome variable examined in the study, correlational analyses were conducted between the demographic variables, MDI at 24 months and the indicator variable for the latent constructs of child motivation at 54 months and academic success in 1 grade (see Table 4). The associations between outcome variables and child gender were largely nonsignificant, thus child gender was not used as a covariate. Ethnicity, maternal education, family income-to-needs ratio, and Bayley MDI were correlated with academic success and to a lesser degree with motivation indicators and therefore were included as covariates in the path analysis models.

Prior to conducting analyses to test study hypotheses, the amount of missing data was examined. Overall, the missingness was 16.7%, ranging from 0% to 42.7%. Variables with the largest amount of missing data included child persistence and child agency measured during father-child structured interactions (42.7%); caregiver reported child temperament at 54 months (40.5%); mother reported child temperament at 54

months (21.3%); and both teacher reported child academic skills (25.4%) and WJ-R test scores (24.9%) at first grade. Families with available father-child interaction data tended to have higher income-to-needs ratio ($t = 5.45, p < .001$) and to be White ($t = 6.43, p < .001$); mothers in these families had higher levels of education ($t = 8.40, p < .001$), and had lower levels of obedience beliefs ($t = -6.58, p < .001$). Children from families with available father-child data had higher MDI scores at 24 months ($t = 5.20, p < .001$) compared to families for whom father-child interaction data were not available. Likewise, children with available caregiver and mother reported temperament data at 54 months and first grade data were more likely to be girls ($t = 1.98, p = .05$ and $t = 2.14, p = .03$, respectively), to be White ($t = 3.59, p < .001$ and $t = 4.28, p < .001$), to have higher MDI scores at 24 months ($t = 3.40, p < .001$ and $t = 3.91, p < .001$), and to have higher educated ($t = 5.19, p < .001$ and $t = 5.33, p < .001$) and less obedience endorsing mothers ($t = 3.61, p < .001$ and $t = 4.73, p < .001$). Due to identified patterns of missing data, listwise deletion of the cases with missing data was likely to produce biased results (Acock, 2005). Thus, in the subsequent confirmatory factor analysis (CFA) and latent path analysis the missing data were addressed using full information maximum likelihood estimation.

To determine whether three separate constructs of maternal parenting at 36 months – support for child autonomy, cognitive stimulation, and emotional support – or a single construct of supportive parenting better represent the data, a CFA was conducted. The number of participants with missing data on all variables included in the factor analysis was 162, thus these families were omitted from the CFA models. First, a three-

factor model of maternal parenting was fit to the data. *Support for child autonomy* was defined by the sum of 4 autonomy-related items from the HOME and the qualitative rating of maternal respect for child autonomy from the mother-child structured interactions. *Cognitive stimulation* was defined by the stimulation subscale of the HOME, the learning materials subscale of the HOME, and a rating of maternal stimulation of cognitive development from the mother-child structured interactions. *Emotional support* was defined by the responsiveness subscale of the HOME, the lack of harsh parenting subscale of the HOME, maternal sensitivity and hostility (reversed) rated during the mother-child structured interactions. This model did not estimate properly due to high level of covariation among the three latent constructs of maternal behavior at 36 months. Thus, a single factor CFA model was estimated, with a latent construct of *supportive parenting* defined by all observed variables of maternal behavior at 36 months. The factor loadings of the observed variables onto a single latent construct are presented in Table 5. The model had a good fit to the data ($\chi^2 = 50.8$, $df = 18$, $p < .001$; CFI = .99; RMSEA = .04), indicating that observed maternal behaviors at 36 months can be viewed as manifestations of a broader phenomenon of maternal supportive parenting. In further analyses, all observed variables describing maternal parenting at 36 months were now considered as indices of one latent construct of *maternal supportive parenting*.

Tests of Study Hypotheses

Specification of Latent Variables

Because observed variables that were derived from the same measure are likely to have shared variance, these observed variables were allowed to covary. For example,

qualitative ratings of child persistence and agency at 54 months that were collected during mother-child structured interaction cannot be assumed independent because (a) they reflect the behavior of the child in a dyadic situation that was likely influenced by the mother and (b) they were rated by the same rater. Thus, to account for the shared variance in qualitative ratings of child persistence and agency that was due to the uncaptured influences of the mother and the rater, child persistence was allowed to covary with child agency. Likewise, child persistence and agency ratings during father-child interactions at 54 months were allowed to covary; WJ-R test scores were allowed to covary; the qualitative rating of maternal behavior derived from the mother-child interactions at 36 months were allowed to covary; and indicators of maternal parenting derived from the HOME were allowed to covary. The latent constructs in this model were defined through observed variables as detailed in the Methods section. The standard coefficients (β) and standard errors (SE) that describe the degree to which the observed variables were associated with their respective latent construct in this process model are presented in Table 6. Ethnicity, maternal education, family income-to-needs ratio, and Bayley MDI were included as covariates in all analyses.

Maternal Supportive Parenting and Child Motivation as Process Mechanisms

To test Hypothesis 1, which posited the mediating role of child motivation in the relations between maternal obedience beliefs and maternal supportive parenting and child academic success, a process model was estimated as depicted in Figure 2a. Direct paths were estimated from maternal obedience beliefs at one month to maternal supportive parenting at 36 months, child motivation at 54 months, and child academic success at first

grade. Direct paths were also estimated from supportive parenting at 36 months to child motivation at 54 months and academic success at first grade; and from child motivation at 54 months to academic success at first grade. The process model had a good fit to the data ($\chi^2 = 671$, $df = 231$, $p < .001$; CFI = .96; RMSEA = .04; adjusted BIC = 88901). Significant results are shown in Figure 2b. Mothers with lower levels of obedience beliefs at one month provided more supportive parenting to their children at 36 months and had children with higher levels of motivation at 54 months and academic success at first grade, after accounting for ethnicity, maternal education, family income-to-needs ration, and Bayley MDI at 24 months. Moreover, children who had higher levels of motivation at 54 months had higher levels of academic success at first grade. All associations between variables in this model are presented in Table 6. The following indirect effects were significant: (a) maternal obedience beliefs --- supportive parenting --- child motivation ($z = -.16$; 99% CI [-.28, -.03]); (b) maternal obedience beliefs --- supportive parenting --- child academic success ($z = -.18$; 99% CI [-.31, -.06]); (c) maternal obedience beliefs --- supportive parenting --- child motivation --- child academic success ($z = -.03$; 95% CI [-.05, -.01]); and (d) supportive parenting --- child motivation --- child academic success ($z = .04$; 99% CI [.01, .08]).

In summary, Hypothesis 1a was supported in that maternal obedience beliefs at one month were negatively related to maternal supportive parenting at 36 months, which in turn was directly related to both child motivation at 54 months and academic success at first grade. Maternal supportive parenting thus mediated the relations between maternal obedience beliefs and both child motivation at 54 months and academic success at first

grade. Moreover, Hypothesis 1b was supported in that child motivation at 54 months mediated the relations between both maternal beliefs and supportive parenting and child academic success in first grade.

To determine whether a more parsimonious model fit the data equally well or better, a second model was run eliminating all non-significant paths. The model had a worse fit to the data ($\chi^2 = 1037$, $df = 239$, $p < .001$; CFI = .93; RMSEA = .05) and was significantly different from the all-paths process model ($\Delta\chi^2 = 466$, $df = 8$, $p < .001$). Thus, the first, more complete, model was used as a base for an expanded model to test hypotheses about the links of temperamental characteristics to child motivation and academic success and the moderating effects of temperament onto the relations between maternal supportive parenting and child motivation.

Child Temperament as a Predictor and Moderator of Motivation and Academic Success

For the test of Hypothesis 2, which asserts a positive role of low negative emotionality, high surgency, and high effortful control in predicting child motivation and subsequent academic success, a model was specified with observed variables of negative emotionality, surgency, and effortful control added to the mediation model described above. This hypothesized model is shown in Figure 3a. Direct paths were estimated between each of the three temperamental dimensions and the latent constructs of motivation and academic success. The model had a good fit to the data ($\chi^2 = 755$, $df = 285$, $p < .001$; CFI = .96; RMSEA = .04, adjusted BIC = 75042) and a preferred fit over the process model as indicated by a smaller adjusted BIC. The results, shown in Figure 3b, indicated that the significant direct paths were from child effortful control to child

motivation ($\beta = .10$, $SE = .04$, $p < .01$) and to child academic success ($\beta = .23$, $SE = .04$, $p < .001$); and from surgency to academic success ($\beta = .15$, $SE = .04$, $p < .001$). Full results of this model are presented in Table 8. Overall, this model accounted for 10% of the variance in child motivation at 54 months ($R^2 = .10$, $p < .001$) and 40 % of the variance in child academic success at 1st grade ($R^2 = .40$, $p < .001$).

Thus, Hypothesis 2 was only partially supported. After accounting for the effects of maternal beliefs, supportive parenting, demographic factors, and child MDI at 24 months, higher levels of effortful control at 54 months predicted higher levels of child motivation concurrently and higher academic success at first grade, and higher levels of surgency predicted higher academic success at first grade, but not motivation at 54 months. Child negative emotionality was not related to child motivation concurrently or to academic success at first grade.

To test Hypotheses 3, which proposed a moderating role of temperamental characteristics in the relations between maternal supportive parenting and child motivation, a final SEM model was specified. On the basis of the previous model, the interactions between the latent construct of maternal supportive parenting and each of the temperamental dimensions were specified using the XWITH command in MPlus in addition to the main effects of negative emotionality, surgency, and effortful control. This hypothesized model is shown in Figure 4. The effects of the interactions on child motivation were freely estimated. The results of this model indicated that none of the interactions between maternal supportive parenting and child temperament predicted child motivation over and above the direct effects of supportive parenting and

temperamental characteristics indicating that the relations between maternal supportive parenting and child motivation did not vary for children with different temperamental characteristics. Thus, the expanded process model, shown in Figure 3a, that included negative emotionality, surgency, and effortful control as direct predictors of motivation and academic success was considered a final model, and Hypothesis 3 was considered not supported.

Summary

In sum, Hypothesis 1 was fully supported in that maternal obedience beliefs were negatively associated with child motivation through maternal supportive parenting. Maternal obedience beliefs were also negatively associated with academic success through both maternal supportive parenting and child motivation. Moreover, child motivation served as a mediator of the relations between supportive parenting and academic success in addition to the direct link between maternal supportive parenting and academic success and independent of demographic factors and child MDI. Hypothesis 2 was partially supported in that two child temperamental characteristics – surgency and effortful control – were positively associated with child academic success; however, only effortful control was positively related to child motivation. Hypothesis 3 was not supported in that the relations between maternal supportive parenting and child motivation did not vary for children with different levels of emotional negativity, surgency, and effortful control.

CHAPTER VI

DISCUSSION

The focus of the current study was to investigate child motivation at preschool age as a process mechanism through which parenting factors, such as maternal obedience beliefs and supportive parenting, are associated with child academic success in early elementary school. Additionally, the study examined child temperamental characteristics as predictors of child motivation and academic success and as moderators in the relations between maternal supportive parenting and child motivation. The theoretical basis of the study was provided by self-determination theory (SDT), which posits the necessity of supportive environments, and more specifically support for autonomy, cognitive stimulation, and emotionally supportive relations, as conditions that promote children's motivation and overall well-being. Moreover, SDT suggests that children's motivation serves as a mechanism through which supportive environments foster a range of positive child outcomes, including academic success.

Child Motivation at Preschool Age

Prior research conducted with school age children provides evidence that child motivation plays an important role in children's academic achievement (Eccles, et al, 1998; Gottfried, 1990; Pintrich & Schunk, 2002; Wigfield, & Eccles, 2002) and mediates the relations between supportive parenting and child academic success (Gottfried et al., 2006; Grolnick & Ryan, 1989; Pomerantz, et al., 2005). However, limited research is

available that probes the importance of children's motivation at preschool age to children's early school success. Moreover, no study to date has investigated the role of child motivation as a mediator in the relations between supportive parenting in early childhood and academic success in early elementary school. The current study aimed to fill this gap by focusing on time-sequential relations between parenting factors at one and 36 months, child motivation at 54 months, and academic success at first grade. The results indicated that children with higher levels of motivation at preschool age tended to achieve higher levels of academic success in first grade, after accounting for ethnicity, maternal education, family income-to-needs ratio, and child MDI. Furthermore, maternal supportive parenting at 36 months was related to child motivation at 54 months, which in turn mediated the relations between maternal supportive parenting and child academic success. These findings suggest that parental support for autonomy, cognitive stimulation, and emotional support are related to the development of motivation in early childhood in a similar fashion as they relate to motivation of children of school age. Additionally, the mediating role of motivation in the relations between supportive parenting and academic success that has been found for school age children (Grolnick et al., 2002; Grolnick & Slowiaczek, 1994; Ng et al., 2004; Pomerantz et al., 2006) appears to hold for preschool and early elementary school age as well.

The present study highlights individual differences in children's level of motivation in preschool age, which is another important aspect of the development of children's motivation that has been largely overlooked in prior literature. Available evidence suggests that many preschoolers have high and often unsubstantiated beliefs in

their skills and abilities (Stipek & Daniels, 1988; Stipek et al., 1998), but there are nonetheless inter-individual differences in their levels of motivation as measured through children's emotional reactions and task choices after failure (Cain & Dweck, 1995; Smiley & Dweck, 1994) and through parent and teacher ratings (Turner & Johnston, 2003). In the current study, children varied in their levels of expressed persistence and agency, ranging from very low to very high. Although the mean scores for both persistence and agency were moderate to high, the observed variability suggests that some children may not express the same levels of persistence and agency as their counterparts and may be at risk for lower levels of motivation as they transition into school.

As such, the preschool age may be an especially important developmental period to focus on children's motivation as it relates to children's subsequent academic success. Prior research suggested that the transition from elementary to middle school is a critical period in children's motivational trajectories that results in strong declines in children's levels of motivation (Fredericks & Eccles, 2002; Jacobs et al., 2002; Watt, 2004). Although the current study did not examine changes in levels of motivation as children transition into school, the observed variability in children's persistence and agency shortly before school entry and the observed association between motivation and academic success in first grade, after accounting for covariates and parenting factors, provide reasonable grounds to believe that a transition *into* school may be another critical period in children's motivational trajectories. Whether this line of reasoning would hold is an empirical question that is still to be answered. But it brings attention to the gap in

our knowledge on the development of motivation at preschool age, which may prove to be invaluable to our understanding of the mechanisms that are associated with early academic success.

Early Parenting

The initial hypotheses of the current study suggested that there are specific aspects of maternal supportive parenting – support for autonomy, cognitive stimulation, and emotional support – that are important to the development of children’s motivation and their subsequent academic success. The unique contribution of each of these parenting aspects was hypothesized based on self-determination theory and on studies conducted with school age children (Grolnick et al., 2002; Pomerantz et al., 2005). In the present analyses, however, the data did not support the differentiation between these parenting aspects as they relate to preschoolers’ motivation and later academic success. It may be that greater distinctions arise among support for autonomy, cognitive stimulation, and emotional support when children become older and parents are somewhat less involved in their children’s lives. The nature of parent–child relations is likely to change as children become more self-sufficient and require less “hands on” parenting. For example, parents are more likely to provide cognitive stimulation by reading to their young children or helping them with the completion of a multiple-step task as young children may not be able to do those things on their own. Such interactions with preschoolers are also likely to involve emotional support in that more emotionally sensitive parents are more likely to recognize their child’s need for assistance and also in that the interactions around reading together or working on tasks together demonstrate

parents' warmth and involvement. Older children are more likely to be able to read on their own and do not need to rely on their parents to help them with simple tasks, thus parents' provision of cognitive stimulation is less closely linked to emotional support. Young children are also less likely to be able to cope with negative emotions on their own and may request more parental support when scared, angry, or sad than older children would. Support for autonomy is another parenting skill that is somewhat more appropriate for older children than preschoolers who are still in need of considerable guidance from parents. As children grow, the opportunities for parents to provide increasing levels of autonomy increase. In the case of younger children, a more accurate measure of parenting quality appears to be overall sensitivity to the child's needs and bids for attention, whether the child requests support for autonomy, cognitive support, or emotional support.

Another aspect of early parenting that was examined in the present study is parental beliefs about child obedience. As suggested in the first hypothesis and confirmed in the results, maternal beliefs about obedience were moderately related to maternal supportive parenting and were indirectly related to children's motivation and subsequent academic success. These findings support theoretical (e.g., Kohn, 1979; Luster & Okagaki, 2005) and empirical (e.g., Kohn, Slomczynski, & Schoenbach, 1986; Luster et al., 1989) literature about the relations between parental beliefs and parental behaviors and about the role of parental beliefs as a potential contributing factor in formation of parenting behaviors. Understanding the links between maternal obedience beliefs and maternal supportive parenting may be essential for practitioners who provide education to

families with young children by emphasizing the importance not only of what parents do but also what they believe about parenting. Given the positive relations between supportive parenting and children's academic success, focusing on parental obedience beliefs, which may undermine maternal supportive parenting, may be an important intervention mechanism for families with children at risk for low academic success. Additionally, these findings extend our knowledge about the role of mothers in their children's academic success beyond maternal demographic factors and parenting behaviors.

Temperament and Motivation

Two hypotheses that were tested in the study examined the role of temperament in predicting child motivation and subsequent academic success and whether the relations between maternal supportive parenting and child motivation varied depending on child temperamental characteristics. Consistent with existing literature, the results indicated that child effortful control, which was defined as an ability to maintain or shift attention and to activate or suppress behavior as an appropriate response to a situation, was positively associated with child motivation and academic success (Checa et al, 2008; Mullola et al., 2011; Valiente et al., 2011). Additionally, surgency, which was defined as child's overall level of activity, approach, and lack of shyness, was found to predict subsequent academic success (Bramlett et al., 2000; Caspi et al., 2003; Colom, et al., 2007), but not motivation, which differs from earlier reports in the literature (Chen & Zhang, 2011). Contrary to prior reports, the present study did not find significant relations between child negative emotionality, the degree to which child expresses high

levels of anger, frustration, fear, and sadness, and motivation or academic success (Mullola et al., 2011; Shiner et al., 2002; Zhou et al., 2010). Overall, the results indicated that some dimensions of child temperament were related to motivation and academic success, whereas others were not. The emerging research that found significant relations between child temperamental characteristics of negative emotionality and surgency and child motivation has focused on school-age children. In the present study these links were not significant. This difference in findings is perhaps attributable to children's age. As suggested by Dweck (1998), many children of preschool age tend to have relatively high levels of motivation and tend to recover from negative experiences somewhat easier than children of school age. It is than possible that preschoolers' high negative emotionality and low surgency do not prevent them from taking initiative and being persistent while engaged in a joint activity with their mothers and fathers. Moreover, children may express their motivation differently in the context of parent-child interactions and in school context, in which the significant associations between temperament and motivation were found (Chen & Zhang, 2011; Mullola et al., 2011). As children tend to feel more comfortable in the context of parent-child interactions, the expression of children's motivation may be less constrained by the characteristics of the context, as it may be in school context, where negative associations between child motivation and shyness (part of surgency dimension) or sadness and anger (parts of negative emotionality dimension) may be triggered by a less familiar setting. In other words, the expression of motivation in children with high levels of negative emotionality or shyness may be different in a context of parent-child relations and in a context of school settings,

which could explain the differences in findings between the present study and earlier reports. As such, more research is needed to investigate the relation between child temperament and motivation in both children of preschool age and in family contexts.

Moreover, the results indicated that the relations between maternal supportive parenting and motivation did not vary as a function of child temperament. Based on prior literature, supportive parenting was expected to be associated to a greater degree with child motivation in children with high negative emotionality, low surgency, and low effortful control (e.g., Davis, et al., 2010; Morris et al., 2002; Rubin, et al, 2003; Rubin, et al., 1998), but none of the interactions were found to be significant in the present study. Due to lack of research evidence that directly examined the interactions between parenting and child temperament in predicting child motivation, the reasoning of the current study in this regard was based on the literature on academic achievement and psychological adjustment. It is possible, that the goodness-of-fit model is less applicable to the development of motivation than it is to other child outcomes. Additionally, caregiver report of child temperament was available for only about a half of the children participating in the study, thus our measure of temperament relied heavily on mother report. Therefore, it is possible that mothers who are more supportive of their children provide more favorable rating of their children's temperament, making the interactions between parenting and child temperament less likely to manifest themselves. A study that used measures of child temperament as reported by others in conjunction with observed ratings of maternal parenting would be ideal to examine these interactions in the future.

The present study is the first to examine the relations between these specific dimensions of temperament and motivation at preschool age, thus the results reported here should be replicated with other samples of preschool age children. The examination of child individual characteristics as possible predictors of motivation is predominantly absent from the current motivational literature, aside from cognitive abilities (e.g., Gottfried et al., 2006). As such, little is known about the extent to which individual temperamental characteristics may relate to the development of motivation not only in preschool age children, but in children in general. Therefore, more research is needed to address these questions.

Strengths and Limitations

There are several notable contributions of the current study to the research literature. As discussed earlier, little research to date has examined connections between maternal parenting and children's motivation prior to school entry and how they relate to children's subsequent academic success. This line of research is important for several reasons. First, there is an overall lack of empirical evidence regarding children's motivation at preschool age. Two separate lines of work that addressed child motivation focused on the development of motivation in infancy/toddlerhood and the development of motivation in the context of academic success in school age children. To connect these lines of work and to understand the development of motivation throughout childhood, more research is needed, particularly with a focus on the preschool age period. This study served as a first step in filling this gap. As such, one of the main contributions of the

present study was to highlight the gap in our knowledge about the development of motivation in preschool age and its relations to subsequent academic success.

Another contribution of the study to the research literature is the examination of motivation as a process mechanism in the relations between maternal supportive parenting in preschool and academic success at first grade. Motivation has been shown to mediate the relations between parenting and academic success in school-aged children (Gottfried et al., 2006; Pomerantz et al., 2005), but no research has examined these relations in children of preschool age. Moreover, the current study included maternal obedience beliefs as a predictor of supportive parenting and child motivation and academic success. The examination of these links contributes to the literature by providing additional evidence about factors aside from demographic variables that are associated with the quality of maternal parenting. Additionally, it extends our understanding of the role of maternal beliefs in children's motivational development and academic success.

Furthermore, little research to date has examined the relations between children's temperamental characteristics and children's motivation. There is emerging evidence that child temperament may be an important predictor of children's motivation, but these links are not consistently examined. This study provides additional evidence to the limited number of studies that address this question. The understanding of the links between temperament and motivation has possible practical implications, such as provision of additional resources to children who may be at risk for low motivation and low subsequent academic success due to unfavorable temperamental characteristics and

may be used in early childhood education interventions that strive to reduce children's risk for poor academic outcomes.

The results of this study should be interpreted in light of the following limitations. The NICHD SECCYD, which lends the data for the present study, was not designed as a study of child motivation. As such, only limited indices of child motivation were available, and no measures of the cognitive aspects of motivation, such as competence beliefs and expectancies for success were available. Moreover, like most large longitudinal data sets, this data set has a considerable amount of missing data. Even though the missing data was handled through contemporary estimation methods that should limit the bias present in the results, no estimation technique can substitute for actual data and guarantee the same results as we would have found in the absence of missing data. As such, replication of the results with different samples is warranted. Furthermore, the study focused exclusively on the role of maternal parenting in predicting child motivation and academic success. As prior research suggested, fathers are likely to play an important role in the development of motivation (Lamb, 1975; Parke, 1996, 2002; Ryan, Martin, & Brooks-Gunn, 2006). Thus, investigations into the relations between paternal parenting and child motivation are also needed.

Future Directions

The line of research on the development of motivation can and should be extended through several important steps. First, the focus on the contributions of child individual characteristics to motivational development is still in its early stages and needs to be extended in order to understand the within-person development of motivation,

including the processes through which change occurs and stability is maintained. The question of whether motivation can be viewed through the lens of resilience and thus seen to serve as a protective factor in the face of adversity, academic and otherwise, needs to be investigated. Secondly, longitudinal prospective studies are needed to chart the developmental trajectory of motivation as it unfolds in terms of both group averages and inter-individual variability. To capitalize on the energizing properties of motivation and to channel that energy into positive youth development, researchers and practitioners need to understand what normative motivational development for each individual child is and whether there *is* a normative motivation development. Longitudinal prospective studies are also needed to investigate other contextual associations with child motivation, aside from maternal supportive parenting, such as the role of fathers and older siblings in the development of child motivation and the role of peer groups not only in the context of adolescent networks, as many other developmental phenomena are currently investigated, but also in the context of peer groups during other developmental periods.

Moreover, the transition into school may be a particularly important period in the development of motivation as there are increased expectations that are placed on children's cognitive, behavioral, and social-emotional skills. As some children may struggle to cope with increased expectations, their motivation for learning and positive attitudes toward school may begin to change. The presence of social comparison that is evident in school contexts and more realistic assessment of one's skills may place an additional burden on children's motivation. As such, children with lower levels of motivation may be at risk for sharper declines in motivation compared to their higher

motivated counterparts and subsequently at higher risk for poor academic performance (e.g., Wigfield & Eccles, 2002). These empirical questions need to be examined for our more comprehensive understanding of the development of motivation throughout childhood and for our understanding of the links between motivation and academic success in preschool and elementary school age, as such information may be valuable for identifying children who are at risk for lower academic success due to low levels of motivation.

Additionally, most of the research that is available on the development of motivation has been conducted within educational contexts. It is important to extend this line of work, but it is equally important to examine child motivation as it may apply to other activities, such as volunteer work, art, sports, and future vocational training. A child who may not be highly motivated to succeed in academics may be motivated to succeed as a pianist, or a footballer, or an entrepreneur. Lastly, the connections between motivational development and positive youth development should also be investigated: whether high levels of motivation are associated with increased or decreased mental health and well-being or whether there are moderating factors by which these associations vary. These are only some possibilities that future research on motivation can address and use the possibly endless pool of energy that motivation appears to be to better the lives of children.

Conclusions

The main goals of the current study included (1) an investigation of children's motivation in preschool age as a process mechanism through which maternal obedience

beliefs and supportive parenting are related to children's academic success in first grade; and (2) an investigation of the role of child temperamental characteristics of negative emotionality, surgency, and effortful control as predictors of child motivation and academic success and as moderators of the relations between supportive parenting and children's motivation. The results indicated that lower levels of maternal obedience beliefs were related to higher levels of maternal supportive parenting, which in turn was related to higher levels of children's motivation and subsequent academic success. Moreover, children's motivation was identified as a process mechanism through which supportive parenting was associated with academic success in first grade. Children's levels of effortful control were linked with the higher levels of both motivation and academic success, whereas surgency was only associated with academic success. Negative emotionality appeared to be unrelated to motivation or subsequent academic success, and the relations between supportive parenting and children's motivation did not differ as a result of child temperament. The results of the study highlight the importance of motivation in children's academic success and the need for further investigation of development of motivation in early childhood.

REFERENCES

- Abell, E., Clawson, M., Washington, W. N., & Bost, K. K. (1996). Parenting values, attitudes, behaviors, and goals of African American mothers from a low-income population on relation to social and societal contexts. *Journal of Family Issues, 17*, 593-613.
- Acock, A. C. (2005). Working with missing values. *Journal of Marriage and the Family, 67*, 1012–1028.
- Ahadi, S. A., Rothbart, M. K., & Ye, R. (1993). Children's temperament in the United States and China: Similarities and differences. *European Journal of Personality, 7*, 359-378.
- d'Ailly, H. (2003). Children's autonomy and perceived control in learning: A model of motivation and achievement in Taiwan. *Journal of Educational Psychology, 95*, 84-96.
- Alexander, K. L. & Entwisle, D. R. (1988). Achievement in the first two years of school: Pattern and processes. *Monographs of the Society for Research on Child Development, 53*.
- Aunola, K., Leskinen, E., & Nurmi, J. E. (2006). Developmental dynamics between mathematical performance, task motivation, and teachers' goals during the transitions to primary school. *British Journal of Educational Psychology, 76*, 21-40.

- Aunola, K., Vanhatalo, O., & Sethi, R. (2001). Social background, values, and parenting. *Psykologia, 36*, 148-158.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Barrett, K. C., & Morgan, G. A. (1995). Continuities and discontinuities during infancy and toddlerhood: A conceptualization and review. In R. H. MacTurk & G. A. Morgan (Eds.), *Mastery motivation: Origins, Conceptualization, and Applications* (pp. 57-93). Norwood, NJ: Ablex Publishing.
- Barrett, K. C., Zahn-Waxler, C., & Cole, P. M. (1993). Avoiders versus amenders – Implications for the investigations of guilt and shame during toddlerhood? *Cognition and Emotion, 7*, 481-505.
- Bates, J. E., Pettit, G. S., Dodge, K. A., & Ridge, B. (1998). The interaction of temperamental resistance to control and restrictive parenting in the development of externalizing behavior. *Developmental Psychology, 34*, 982-995.
- Bates, J. E., Viken, R. J., & Williams, N. (2003). *Temperament as a moderator of the linkage between sleep and preschool adjustment*. Paper presented at the meeting of Society for Research in Child Development, Tampa, FL.
- Baumeister, R. F. & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.
- Bayley, N. (1993). *Bayley Scales of Infant Development, Second Edition*. San Antonio, TX: Psychological Corporation.

- Belsky, J., Hsieh, K., & Crnic, K. (1998). Mothering, fathering, and infant negativity as antecedents of boys' externalizing problems and inhibition at age 3 years: Differential susceptibility to rearing experience? *Development and Psychopathology, 10*, 301-319.
- Benasich, A. A. & Brooks-Gunn, J. (1996). Maternal attitudes and knowledge of child-rearing: Associations with family and child outcomes. *Child Development, 67*, 1186-1205.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238-246.
- Bollen, K. A. & Curran, P. J. (2006). *Latent curve models: A structural equation perspective*. Hoboken, NJ: Wiley & Sons.
- Bowlby, J. (1979). *The making and breaking of affectional bonds*. London: Tavistock.
- Bramlett, R. K., Scott, P., & Rowell, R. K. (2000). A comparison of temperament and social skills in predicting academic performance in first graders. *Special Services in the Schools, 16*, 147-158.
- Bridgeman, B., & Shipman, V. C. (1978). Preschool measures of self-esteem and achievement motivation as predictors of grade 3 achievement. *Journal of Educational Psychology, 70*, 17-28.
- Bronstein, P., Ginsburg, G. S., & Herrera, I. S. (2005). Parental predictors of motivational orientation in early adolescence: A longitudinal study. *Journal of Youth and Adolescence, 34*, 559-575.

- Brooks-Gunn, J., Guo, G., & Furstenberg, F. F. (1993). Who drops out of and who continues beyond high school? A 20-year follow up of Black urban youth. *Journal of Research on Adolescence, 3*, 271-294.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- Burchinal, M., Nelson, L., & Poe, M. (2006). Best practices in quantitative methods for developmentalists: IV. Growth curve analysis: An introduction to various methods for analyzing longitudinal data. *Monographs of the Society for Research on Child Development, 71*, 65-87.
- Cain, K., & Dweck, C. S. (1995). The development of children's achievement motivation patterns and conceptions of intelligence. *Merrill-Palmer Quarterly, 41*, 25-52.
- Caldwell, B., & Bradley, R. H. (1984). *Home Observation for Measurement of the Environment*. Little Rock: University of Arkansas at Little Rock.
- Calkins, S. D. (2002). Does adverse behavior during toddlerhood matter? The effects of difficult temperament on maternal perceptions and behavior. *Infant Mental Health Journal, 23*, 381-402.
- Cameron, A. C. (2009). Associations between shyness, reluctance to engage, and academic performance. *Infant and Child Development, 18*, 299-305.
- Caspi, A., Harrington, H., Milne, B., Amell, J. W., Theodore, R. F., & Moffitt, T. E. (2003). Children's behavioral styles at age 3 are linked to their adult personality traits at age 26. *Journal of Personality, 71*, 495-513.

- Chance, J. E. (1961). Independence training and first graders' achievement. *Journal of Consulting Psychology, 25*, 149-154.
- deCharms, R. (1968). *Personal causations: The internal affective determinants of behavior*. New York: Academic Press.
- Checa, P., Rodrigues-Bailon, R., & Rueda, M. R. (2008). Neurocognitive and temperamental systems of self-regulation and early adolescents' social and academic outcomes. *Mind, Brain, and Education, 2*, 177-187.
- Chen, C., & Zhang, L. F. (2011). Temperament, personality, and achievement goals among Chinese adolescent students. *Educational Psychology, 31*, 339-359.
- Clark, R. (1993). Homework parenting practices that positively affect student achievement. In N. F. Chavkin (Ed.), *Families and schools in a pluralistic society* (pp. 53-71). Albany, NY: State university of New York Press.
- Clark, C. A. C., Pritchard, V. E., & Woodward, L. J. (2010). Preschool executive functioning abilities predict early mathematics achievement. *Developmental Psychology, 46*, 1176-1191.
- Colom, R., Escorial, S., Shih, P. C., & Privado, J. (2007). Fluid intelligence, memory span, and temperament difficulties predict academic performance of young adolescents. *Personality and Individual Differences, 42*, 1503-1514.
- Connell, J. P., Halpern-Felsher, B. L., Clifford, E., Crichlow, W., & Usinger, P. (1995). Hanging in there: Behavioral, psychological, and contextual factors affecting whether African-American adolescents stay in high school. *Journal of Adolescent Research, 10*, 41-63.

- Connell, J. P., Spencer, M. B., & Aber, J. L. (1994). Educational risk and resilience in African American youth: Context, self, and action outcomes in school. *Child Development, 65*, 493-506.
- Cotterell, J. L. (1986). Work and community influences on the quality of child rearing. *Child Development, 57*, 362-374.
- Crandall, V. J., Dewey, R., Katkovsky, W., & Preston, A. (1964). Parents' attitudes and behaviors and grade-school children's academic achievements. *The Journal of Genetic Psychology, 104*, 53-66.
- Crandall, V. J., Katkovsky, W., & Preston, A. (1962). Motivational and ability determinants of young children's intellectual achievement behaviors. *Child Development, 33*, 643-661.
- Crandall, V. J., Preston, A., & Rabson, A. (1960). Maternal reactions and the development of independence and achievement behavior in young children. *Child Development, 31*, 243-251.
- Curran, P. J., & Bauer, D. J. (2012). *Structural equation modeling: Course notes*. Chapel Hill, NC: L. L. Thurstone Psychometric Laboratory.
- Daley, D. & Birchwood, J. (2010). ADHD and academic performance: Why does ADHD impact on academic performance and what can be done to support ADHD children in the classroom? *Child Care, Health, & Development, 36*, 455-464.
- Davis, D. W., Harris, R. C., & Burns, B. M. (2010). Attention regulation in low risk very low birth weight preschoolers: The influence of child temperament and parental sensitivity. *Early Child Development and Care, 180*, 1019-1040.

- Davis-Kean, P. E. (2005). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *Journal of Family Psychology, 19*, 294-304.
- Davis-Kean, P. E., Eccles, J. S., & Schnabel, K. U. (2002). *How the home environment socializes a child: The influence of SES on child outcomes*. Paper presented at the International Society for the Study of Behavioral Development, Ottawa, Canada.
- Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum Press.
- Deci, E. L. & Ryan, R. M. (1985). *Intrinsic motivation and self-determination of human behavior*. New York: Plenum
- Deci, E. L. & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268.
- Deci, E. L. & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.
- DeGarmo, D. S., Forgatch, M. S., & Martinez, C. R. (1999). Parenting of divorced mothers as a link between social status and boys' academic outcomes: Unpacking the effects of socioeconomic status. *Child Development, 70*, 1231-1245.
- Diener, C. I., & Dweck, C. S. (1980). An analysis of learned helplessness: II. The processing of success. *Journal of Personality and Social Psychology, 36*, 451-462.
- Downer, J. T. & Pianta, R. C. (2006). Academic and cognitive functioning in first grade: Associations with earlier home and child care predictors and with concurrent home and classroom experiences. *School Psychology Review, 35*, 11-30.

- Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., & Klebanov, P., et al. (2007). School readiness and later achievement. *Developmental Psychology*, 43, 1428-1446.
- Dweck, C. S. (1998). The development of early self-conceptions: Their relevance for motivational processes. In J. Heckhausen & C. S. Dweck (Eds.), *Motivation and self-regulation across the life span* (pp. 257-280). Cambridge: Cambridge University Press.
- Dweck, C. S. (2000). *Self-Theories: Their role in motivation, personality, and development*. New York: Psychology Press.
- Dweck, C. S., & Elliot, E. S. (1983). Achievement motivation. In P. H. Mussen (Ed.) *Handbook of child psychology* (3rd ed., Vol. 4, pp. 643-691). New York: Wiley.
- Eamon, M. K. (2005). Social-demographic, school, neighborhood, and parenting influences on the academic achievement of Latino young adolescents. *Journal of Youth and Adolescence*, 34, 163-174.
- Eccles, J. S. (1993). School and family effects of the ontogeny of children's interests, self-perceptions, and activity choice. In J. Jacobs (Ed.), *Nebraska Symposium on Motivation: Vol. 40. Developmental perspectives on motivation* (pp. 145-208). Lincoln: University of Nebraska Press.
- Eccles, J. S. & Harold, R. D. (1993). Parent-school involvement during the early adolescent years. *Teachers' College Record*, 94, 568-587.
- Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., & Mac Iver, D. (1993). Development during adolescence: The impact of stage

- environment fit on young adolescents' experiences in schools and families. *American Psychologist*, 48, 90–101.
- Eccles, J. S., Wigfield, A., Flanagan, C., Miller, C., Reuman, D., & Yee, D. (1989). Self-concepts, domain values, and self-esteem: Relations and changes at early adolescence. *Journal of Personality*, 57, 283–310.
- Eccles, J. S., Wigfield, A., Harold, R., & Blumenfeld, P. (1993). Age and gender differences in children's achievement self-perceptions during the elementary school years. *Child Development*, 64, 830–847.
- Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed. In W. Damon (Editor-In-Chief) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (5th ed., pp. 1017-1095). New York: Wiley.
- Eisenberg, N., Spinrad, T. L., Fabes, R. A., Reiser, M., Cumberland, A., Shepard, S. A., et al., (2004). The relations of effortful control and impulsivity to children's resiliency and adjustment. *Child Development*, 75, 25-46.
- Feng, X., Shaw, D. S., & Moilanen, K. L. (2011). Parental negative control moderates the shyness–emotion regulation pathway to school-age internalizing symptoms. *Journal of Abnormal Child Psychology*, 39, 425-436.
- Fredericks, J., & Eccles, J. S. (2002). Children's competence and value beliefs from childhood through adolescence: Growth trajectories in two male sex-typed domains. *Developmental Psychology*, 38, 519-533.

- Freud, S. (1927). *The ego and the id*. London: Institute for Psychoanalysis and Hogarth Press.
- Freud, S. (1934). *A general introduction to psychoanalysis*. New York: Washington Square.
- Frodi, A., Bridges, L., & Grolnick, W. S. (1985). Correlates of mastery-related behavior: a sort term longitudinal study of infants in their second year. *Child Development, 56*, 1291-1298.
- Frome, P. M. & Eccles, J. S. (1998). Parents' influence of children's achievement-related perceptions. *Journal of Personality and Social Psychology, 74*, 435-452.
- Furrer, C. & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology, 95*, 148-162.
- Gerris, J. R. M., Dekovic, M., & Janssens, J. M. A. (1997). The relationship between social class and childrearing behaviors: Parents' perspective taking and value orientations. *Journal of Marriage and Family, 59*, 834-847.
- Ginsburg, G. S. & Bronstein, P. (1993). Family factors related to children's intrinsic/extrinsic motivational orientation and academic performance. *Child Development, 64*, 1461-1474.
- Gottfried, A. (1985). Academic intrinsic motivation in elementary and junior high students. *Journal of Educational Psychology, 77*, 631-645.
- Gottfried, A. E. (1990). Academic intrinsic motivation in young elementary school children. *Journal of Educational Psychology, 82*, 525-538.

- Gottfried, A. W., Cook, C. R., Gottfried, A. E., & Morris, P. E. (2005). Educational characteristics of adolescents with gifted academic intrinsic motivation: A longitudinal investigation from school entry through early adulthood. *Gifted Child Quarterly, 49*, 172-186.
- Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (1994). Role of parental motivational practices in children's academic intrinsic motivation and achievement. *Journal of Educational Psychology, 86*, 104-113.
- Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (1998). Role of cognitively stimulating home environments in children's academic intrinsic motivation: A longitudinal study. *Child Development, 69*, 1448-1460.
- Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: A longitudinal study. *Journal of Educational Psychology, 93*, 3-13.
- Gottfried, A. W., Gottfried, A. E., & Guerin, D. W. (2006). The Fullerton longitudinal study: A long-term investigation of intellectual and motivational giftedness. *Journal for the Education of the Gifted, 29*, 430-450.
- Grolnick, W. S. (2003). *The psychology of parental control*. Mahwah, NJ: L. Erlbaum.
- Grolnick, W. S., Deci, E. L., & Ryan, R. M. (1997). Internalization within the family: The self-determination theory perspective. In J. E. Grusec & L. Kuczynski (Eds.), *Parenting and children's internalization of values: A handbook of contemporary theory* (pp 135-161). Hoboken, NJ: Wiley.

- Grolnick, W. S., Gurland, S. T., DeCoursey, W., & Jacob, K. (2002). Antecedents and consequences of mothers' autonomy support: An experimental investigation. *Developmental Psychology, 38*, 143-155.
- Grolnick, W. S., Gurland, S. T., Jacob, K., & DeCoursey, W. (2002). The development of self-determination in middle childhood and adolescence. In A. Wigfield & J. Eccles (Eds.), *Development of achievement motivation* (pp. 147-171). San Diego: Academic Press.
- Grolnick, W. S., Kurowski, C. O., Dunlap, K. G. & Hevey, C. (2000). Parental resources and the transition to junior high. *Journal of Research on Adolescents, 10*, 465-488.
- Grolnick, W. S. & Ryan, R. M. (1987). Autonomy in children's learning: An experimental and individual difference investigation. *Journal of Personality and Social Psychology, 52*, 890-898.
- Grolnick, W. S. & Ryan, R., M. (1989). Parent styles associated with children's self-regulation and competence in school. *Journal of Educational Psychology, 81*, 143-154.
- Grolnick, W. S., Ryan, R. M., & Deci, E. L. (1991). The inner resources for school achievement: Motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology, 83*, 508-517.
- Grolnick, W. S. & Slowiaczek, M. L. (1994). Parent's involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development, 65*, 237-252.

- Guay, F., Boggiano, A. K., & Vallerand, R. J. (2001). Autonomy support, intrinsic motivation, and perceived competence: Conceptual and empirical linkages. *Personality and Social Psychology Bulletin*, *27*, 643-650.
- Guay, F., Marsh, H. W., & Boivin, M. (2003). Academic self-concept and academic achievement: Developmental perspectives on their causal ordering. *Journal of Educational Psychology*, *95*, 124-136.
- Gutman, L. M., Sameroff, A. J., & Eccles, J. S. (2002). The academic achievement of African American students during early adolescence: An examination of multiple risks, promotive, and protective factors. *American journal of Community Psychology*, *30*, 367-399.
- Hamre, B. K., & Pianta, R.C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, *72* 625–638.
- Harter, S (1974). Pleasure derived by children from cognitive challenges and mastery. *Child Development*, *45*, 661-669.
- Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development*, *21*, 34-64.
- Hegvik, R. L., McDevitt, S. C., & Carey, W. B. (1982). The middle childhood temperament questionnaire. *Developmental and Behavioral Pediatrics*, *3*, 197-200.
- Hull, C. L. (1943). *Principles of behavior: An introduction to behavior theory*. New York: Appleton-Century-Crofts.
- Jacobs, J. E. (1992). The influence of gender stereotypes on parent and child math attitudes. *Journal of Educational Psychology*, *83*, 518-527.

- Jacobs, J. E., & Eccles, J. S. (2000). Parents, task values, and real-life achievement-related choices. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 405-439). San-Diego, CA: Academic Press.
- Jacobs, J. E., Lanza, S., Osgood, W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades 1 through 12. *Child Development, 73*, 509-527.
- Jennings, K., Connor, R., & Stegman, C. (1988). Does a physical handicap alter the development of mastery motivation during the preschool years? *Journal of the American Academy of Child and Adolescent Psychiatry, 27*, 312-317.
- Jennings, K. D., Yarrow, L. J., & Martin, P. (1984). Mastery motivation and cognitive development: A longitudinal study from infancy to three and one half years. *International Journal of Behavioral Development, 7*, 441-461.
- Karreman, A., van Tuijl, C., van Aken, M. A. G., & Deković, M. (2009). Predicting young children's externalizing problems: Interactions among effortful control, parenting, and child gender. *Merrill-Palmer Quarterly, 55*, 111-134.
- Katkovsky, W., Preston, A., & Crandall, V. J. (1964). Parents' attitudes toward their personal achievements and toward the achievement behaviors of their children. *The Journal of Genetic Psychology, 104*, 67-82.
- Kelley, S. A., Brownell, C. A., & Campbell, S. B. (2000). Mastery motivation and self-evaluative affect in toddlers: Longitudinal relations with maternal behavior. *Child Development, 71*, 1061-1071.

- Kim, U. & Park, Y.-S. (2006). Indigenous psychological analysis of academic achievement in Korea: The influence of self-efficacy, parents, and culture. *International Journal of Psychology, 41*, 287-292.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: Guilford Press.
- Kohn, M. L. (1979). The effects of social class on parental values and practices. In D. Reiss & H. Hoffman (Eds.), *The American family: Dying or developing* (pp. 45-68). New York: Plenum Press.
- Kohn, M. L., Slomczynski, K. M. & Schoenbach, C. (1986). Social stratification and the transmission of values in the family: A cross-national assessment. *Sociological Forum, 1*, 73-102.
- Lahey, B. B., van Hulle, C. A., Keenan, K., Rathouz, P. J., D'Onofrio, B. M., Rodgers, J. L., & Waldman, I. D. (2008). Temperament and parenting during the first year of life predict future child conduct problems. *Journal of Abnormal Child Psychology, 36*, 1139-1158.
- Lamb, M. E. (1975). Fathers: Forgotten contributors to child development. *Human Development, 18*, 245-266.
- La Paro, K. M., & Pianta, R. C. (2000). Predicting children's competence in the early school years: A meta-analytic review. *Review of Educational Research, 70*, 443-484.
- Lareau, A. (2002). Invisible inequality: Social class and childrearing in black families and white families. *American Sociological Review, 67*(5), 747-776.

- Leibham, M. E., Alexander, J. M., Johnson, K. E., Neitzel, C. L., & Reis-Henrie, F. P. (2005). Parenting behavior associated with the maintenance of preschoolers' interests: A prospective longitudinal study. *Applied Developmental Psychology, 26*, 397-414.
- Lerner, J.V., Lerner, R.M., & Zabski, S. (1985). Temperament and elementary school children's academic performance: A test of 'goodness-of-fit' model. *Journal of Child Psychology, 26*, 125–136.
- Lindhout, I. E., Markus, M. T., Hoogendijk, T. H. G., & Boer, F. (2009). Temperament and parental child-rearing style: Unique contributions to clinical anxiety disorders in childhood. *European Child and Adolescent Psychiatry, 18*, 439-446.
- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*, 151-173.
- Luster, T. & Okagaki, L. (2005). *Parenting: An ecological perspective*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Luster, T., Rhoades, K., & Haas, B. (1989). The relation between parental values and parenting behavior: A test of the Kohn hypothesis. *Journal of Marriage and Family, 51*, 139-147.
- MacTurk, R. H., & Morgan, G. A. (1995). *Mastery motivation: Origins, conceptualizations, and applications*. Norwood, NJ: Ablex Publishing.
- Maslow, A. H. (1955). Deficiency motivation and growth motivation. In M. R. Jones (Ed.), *Nebraska symposium on motivation*, (Vol. 3, pp. 1-30). Lincoln, NE: University of Nebraska Press.

- May, H. (2008). *Aristotle's ethics: Moral development and human nature*. New York: Continuum International.
- McClowry, S. G., Hegvik, R., & Teglassi, H. (1993). An examination of the construct validity of the middle childhood temperament questionnaire. *Merrill-Palmer Quarterly, 39*, 279-293.
- McLoyd, V. C. (1990). The impact of economic hardship on African American families and children: Psychological distress, parenting, and socioemotional development. *Child Development, 61*, 311-346.
- Meece, J. L., Wigfield, A., & Eccles, J. S. (1990). Predictors of math anxiety and its influence on young adolescents' course enrollment intentions and performance in mathematics. *Journal of Educational Psychology, 82*, 60-70.
- Messer, D. J., McCarthy, M. E., McQuiston, S., MacTurk, R. H., Yarrow, L. J., & Vietze, P. M. (1986). Relation between mastery behavior in infancy and competence in early childhood. *Developmental Psychology, 22*, 366-372.
- Metallidou, P., & Vlachou, A. (2007). Motivational beliefs, cognitive engagement, and achievement in language and mathematics in elementary school children. *International Journal of Psychology, 42*, 2-15.
- Midgley, C., Feldlaufer, H., Eccles, J. S. (1989). Student/teacher relations and attitudes toward mathematics before and after the transition to junior high school. *Child Development, 60*, 981-992.
- Miller, S. A. (1988). Parents' beliefs about children's cognitive development. *Child Development, 59*, 259-285.

- Mischel, W., & Ayduk, O. (2004). Willpower in a cognitive-affective processing system: The dynamics of delay of gratification. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 99-129). New York: Guilford Press.
- Mistry, R. S., Biesanz, J. C., Taylor, L. C., Burchinal, M., & Cox, M. J. (2004). Family income and its relation to preschool children's adjustment for families in the NICHD Study of Early Child Care. *Developmental Psychology, 40*, 727-745.
- Mokrova, I. L., O'Brien, M., Calkins, S. D., Leerkes, E. M., & Marcovitch, S. (2012). *The role of persistence at preschool age in academic skills at kindergarten*. Unpublished manuscript.
- Morris, A. S., Silk, J. S., Steinberg, L., Sessa, F. M., Avenevoli, S., & Esses, M. J. (2002). Temperamental vulnerability and negative parenting as interacting predictors of child adjustment. *Journal of Marriage and Family, 64*, 461-471.
- Mullola, S., Jokela, M., Ravaja, N., Lipsanen, J., Hintsanen, M., Alatupa, S., & Keltikangas-Jarvinen, L. (2011). Associations of student temperament and educational competence with academic achievement: The role of teacher age and teacher and student gender. *Teaching and Teacher Education, 27*, 942-951.
- Murray, L., Woolgar, M., Martins, C., Christaki, A., Hipwell, A., & Cooper, P. (2006). Conversations around homework: Links to parental mental health, family characteristics and child psychological functioning. *British Journal of Developmental Psychology, 24*, 125-149.

- Muthén, L. K., & Muthén, B. O. (1997-2010). *Mplus user's guide*. Los Angeles: Muthen & Muthen.
- Neitzel, C. L. & Stright, A. D. (2004). Parenting behaviours during child problem solving: The roles of child temperament, mother education and personality, and the problem-solving context. *International Journal of Behavioral Development, 28*, 166-179.
- Ng, F. F., Kenney-Benson, G. A., & Pomerantz, E. M. (2004). Children's achievement moderates the effects of maternal use of control and autonomy support. *Child Development, 75*, 764-780.
- NICHD Early Child Care Research Network (1999). Child care and mother-child interaction in the first 3 years of life. *Developmental Psychology, 35*, 1399-1413.
- NICHD Early Child Care Research Network. (2005). *Child care and child development: Results from the NICHD Study of Early Child Care and Youth Development*. New York, NY: Guilford Press.
- NICHD Early Child Care Research Network (2004). Trajectories of physical aggression from toddlerhood to middle childhood: II. Method and data analysis. *Monographs of the Society for Research in Child Development, 69*, 26-40.
- NICHD Early Child Care Research Network (2008). Mothers' and fathers' support for child autonomy and early school achievement. *Developmental Psychology, 44*, 895-907.

- Nicholls, J. G. (1979). Development of perception of own attainment and causal attributions for success and failure in reading. *Journal of Educational Psychology, 71*, 94-99.
- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*, 328-346.
- Nicholson, J., Atkins-Burnett, S., & Meisels, S. J. (1997). *Academic Rating Scale* (field trial ed.). Washington, DC: US Department of Education, National Center for Education Statistics.
- O'Brien, M., Nader, P. R., Houts, R. M., Bradley, R., Friedman, S. L., Belsky, J., & Susman, E. (2007). The ecology of childhood overweight: A 12-year longitudinal analysis. *International Journal of Obesity, 31*, 1469-1478.
- Park, Y. S., Kim, B. S. K., Chiang, J., Ju, C. M. (2010). Acculturation, enculturation, parental adherence to Asian cultural values, parenting styles, and family conflict among Asian American college students. *Asian American Journal of Psychology, 1*, 67-79.
- Parke, R. D. (1996). *Fatherhood*. Cambridge, MA: Harvard University Press.
- Parke, R. D. (2002). Fathers and families. In M. H. Bornstein (Ed.), *The handbook of parenting: Vol. 3. Being and becoming a parent* (2nd ed., pp. 27-73). Mahwah, NJ: Erlbaum.
- Patterson, G. & Sanson, A. (1999). The association of behavioral adjustment to temperament, parenting, and family characteristics among 5-year-old children. *Social Development, 8*, 293-309.

- Pedlow, R., Sanson, A., Prior, M., & Oberklaid, F. (1993). Stability of maternally reported temperament from infancy to 8 years. *Developmental Psychology, 29*, 998-1007.
- Piaget J. (1971). *Biology and knowledge*. Chicago: University of Chicago Press.
- Pintrich, P. R. & Schunk, D. H. (2002). *Motivation in education: Theory, research, and applications*. Upper Saddle River, NJ: Prentice-Hall.
- Pomerantz, E. M., Grolnick, W. S., & Price, C. E. (2005). The role of parents in how children approach achievement. In A. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 259-278). New York: Guilford Press.
- Pomerantz, E. M., Ng, F. F., & Wang, Q. (2006). Mothers' mastery-oriented involvement in children's homework: Implications for the well-being of children with negative perception of competence. *Journal of Educational Psychology, 98*, 99-111.
- Power, T. G., Chapieski, L., & McGrath, M. (1985). Assessment of individual differences in infant exploration and play. *Developmental Psychology, 21*, 974-981.
- Presley, R. & Martin, R. P. (1994). Toward a structure of preschool temperament: Factor structure of the temperament assessment battery for children. *Journal of Personality, 62*, 415-448.
- Raviv, T., Kessenich, M., & Morrison, F. J. (2004). A mediational model of the association between socioeconomic status and three-year-old language abilities: The role of parenting factors. *Early Childhood Research Quarterly, 19*, 528-547.

- Renninger, K. A. (2000). Individual interest and its implications for understanding intrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation* (pp. 373-404). San Diego: Academic Press.
- Reynolds, A. J. (1989). A structural model of first-grade outcomes for an urban, low socioeconomic status, minority population. *Journal of Educational Psychology, 81*, 594-603.
- Roeser, R. W., Midgley, C., & Urdan, T. C. (1996). Perceptions on the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology, 88*, 408-422.
- Rogers, C. (1963). The actualizing tendency in relation to "motives" and to consciousness. In M/ R. Jones (Ed.), *Nebraska symposium on motivation* (Vol. 11, pp. 1-24). Lincoln, NE: University of Nebraska Press.
- Rosen, B. C (1958). The achievement syndrome: A psychocultural dimension of social stratification. In J. W. Atkinson (Ed.), *Motives in fantasy, action and society* (pp. 495-508). New York: Van Nostrand.
- Roth, G., Assor, A., Niemiec, C. P., Ryan, R. M., & Deci, E. L. (2009). The emotional and academic consequences of parental conditional regard: Comparing conditional positive regard, conditional negative regard, and autonomy support as parenting practices. *Developmental Psychology, 45*, 1119-1142.

- Rothbart, M. K., Ahadi, S. A., Hershey, K., & Fisher, P. (2001). Investigations of temperament at 3 to 7 years: The children's behavior questionnaire. *Child development, 72*, 1394-1408.
- Rothbart, M. K. & Bates, J. E. (1998). Temperament. In W. Damon (Editor-In-Chief) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (5th ed., pp 105-176). New York: Wiley.
- Rothbart, M. K. & Bates, J. E. (2006). Temperament. In W. Damon & R. M. Lerner (Editors-In-Chief) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp 99-166). New York: Wiley.
- Rubin, K. H., Burgess, K. B., Dwyer, K. M. & Hastings, P. D. (2003). Predicting preschoolers externalizing behaviors from toddler temperament, conflict, and maternal negativity. *Developmental Psychology, 39*, 164-176.
- Rubin, K. H., Hasting, P., Chen, X., Stewart, S., & McNichol, K. (1998). Intrapersonal and maternal correlates of aggression, conflict, and externalizing problems in toddlers. *Child Development, 69*, 1614-1629.
- Rudasill, K. M. (2011). Child temperament, teacher-child interactions, and teacher-child relationships: A longitudinal investigation from first to third grade. *Early Childhood Research Quarterly, 26*, 147-156.
- Rudasill, K. M., Callagher, K. C., & White, J. M. (2010). Temperamental attention and activity, classroom emotional support, and academic achievement in third grade. *Journal of School Psychology, 48*, 113-134.

- Ryan R. M. & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, 55, 68-78.
- Ryan, R. M. & Deci, E. L. (2002). An overview of self-determination theory: An organismic dialectical perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3-33). Rochester, NY: University of Rochester Press.
- Ryan, R. M., Deci, E. L., Grolnick, W. S., & La Guardia, J. G. (2006). The significance of autonomy and autonomy support in psychological development of psychopathology. In D. Cicchetti & D. J. Cohen, (Eds.), *Developmental psychopathology* (2nd ed., Vol. 1, pp. 795-849). New York: Wiley.
- Ryan, R. M., Martin, A., & Brooks-Gunn, J. (2006). Is one good parent good enough? Patterns of mother and father parenting and child cognitive outcomes at 24 and 36 months. *Parenting: Science and Practice*, 6, 211-228.
- Salonen, P., Lepola, J., & Vauras, M. (2007). Scaffolding interaction in parent-child dyads: Multimodal analysis of parental scaffolding with task- and non-task oriented children. *European Journal of Psychology of Education*, 22, 77-96.
- Sanson, A. V., Smart, D. F., Prior, M., Oberklaid, F., & Pedlow, R. (1994). The structure of temperament from 3 to 7 years: Age, sex, and sociodemographic influences. *Merrill-Palmer Quarterly*, 40, 233-252.
- Schaefer, E. S., & Edgerton, M. (1985). Parent and child correlates of parental modernity. In I. E. Sigel (Ed.), *Parental belief systems: The psychological consequences for children* (pp. 287-318). Hillsdale, NJ: Erlbaum.

- Schunk, D. H. & Pajares, F. (2002). The development of academic self-efficacy. In A. Wigfield & J. Eccles (Eds.), *Development of achievement motivation* (pp. 15-31). San Diego: Academic Press.
- Shiner, R. L., Masten, A. S., & Tellegen, A. (2002). A developmental perspective on personality in emerging adulthood: Childhood antecedents and concurrent adaptation. *Journal of Personality and Social Psychology*, *83*, 1165-1177.
- Sigman, M., Cohen, S. E., Beckwith, L., & Topinka, C. (1987). Task persistence in 2-year-old preterm infants in relation to subsequent attentiveness and intelligence. *Infant Behavior and Development*, *10*, 295-305.
- Smiley, P. A., & Dweck, C. S. (1994). Individual differences in achievement goals among young children. *Child Development*, *65*, 1723-1743.
- Smith, C. P. (1969). *Achievement-related motives in children*. New York: Russell Sage Foundation.
- Sonnenschein, S. & Munsterman, K. (2002). The influence of home-based reading interactions on 5-year-olds' reading motivations and early literacy development. *Early Childhood Research Quarterly*, *17*, 318-337.
- Steinberg, L., Elmen, J. D., & Mounts, N. S. (1989). Authoritative parenting, psychosocial maturity, and academic success among adolescents. *Child Development*, *60*, 1424-1436.
- Stice E. & Gonzales, N. (1998). Adolescent temperament moderates the relation of parenting to antisocial behavior and substance use. *Journal of Adolescent Research*, *13*, 5-31.

- Stipek, D. J., & Daniels, D. (1988). Declining perceptions of competence: A consequence of change in the child or the educational environment? *Journal of Educational Psychology, 80*, 352-356.
- Stipek, D. J., Feiler, R., Byler, P., Ryan, R., Milburn, S., & Salmon, S. (1998). Good beginnings: What difference does the program make in preparing young children for school? *Journal of Applied Developmental Psychology, 19*, 41-66.
- Stipek, D. J., & Greene, J. K. (2001). Achievement motivation in early childhood: Cause for concern or celebration? In S. L. Golbeck (Ed.), *Psychological perspectives on early childhood education* (pp. 64-91). Mahwah, NJ: Lawrence Erlbaum.
- Stipek, D. J., Recchia, S., & McClintic, S. M. (1992). Self-evaluation in young children. *Monographs of the Society for Research on Child Development, 57* (2, Serial No 226).
- Stipek, D. J., & Ryan, R. H. (1997). Economically disadvantaged preschoolers: Ready to learn but further to go. *Developmental Psychology, 33*, 711-723.
- Stoolmiller, M. (2001). Synergistic interaction of child manageability problems and parent-discipline tactics in predicting future growth in externalizing behavior for boys. *Developmental Psychology, 37*, 814-825.
- Tenenbaum, H. R., Porche M. V., Snow, C. E., Tabors, P., & Ross, S. (2007). Maternal and child predictors of low-income children's educational attainment. *Journal of Applied Developmental Psychology, 28*, 227-238.
- Thomas, A. & Chess, S. (1977). *Temperament and development*. New York: New York University Press.

- Tudge, J. R. H., Hogan, D. M., Lee, S., Tammeveski, P., Meltsas, M., Kulakova, N. N., et al. (1999). Cultural heterogeneity: Parental values and beliefs and their preschoolers' activities in the United States, South Korea, Russia, and Estonia. In A. Goncu (Ed.), *Children's engagement in the world: Sociocultural perspectives* (pp. 62-96). New York: Cambridge University Press.
- Turner, L. A. & Johnson, B. (2003). A model of mastery motivation for at-risk preschoolers. *Journal of Educational Psychology, 95*, 495-505.
- U.S. Department of Education (2005). *Helping Your Child Succeed in School*. Washington: Author.
- Valiente, C., Eisenberg, N., Haugen, R., Spinrad, T. L., Hofer, C., Liew, J., et al. (2011). Children's effortful control and academic achievement: Mediation through social functioning. *Early Education and Development, 22*, 411-433.
- Vandell, D. L. (1979). Effects of a playgroup experience on mother-son and father-son interaction. *Developmental Psychology, 15*, 379-385.
- Walker, A. K., & MacPhee, D. (2011). How home gets to school: Parental control strategies predict children's school readiness. *Early Childhood Education Quarterly, 26*, 355-364.
- Watt, H. (2004). Development of adolescents' self-perception, values, and task perceptions. *Child Development, 75*, 1556-1574.
- Weininger, E. B., & Lareau, A. (2009). Paradoxical pathways: An ethnographic extension of Kohn's findings on class and childrearing. *Journal of Marriage and Family, 71*(3), 680-695.

- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297-333.
- White, R. W. (1963). *Ego and reality in psychoanalytic theory*. New York: International Universities Press.
- Wigfield, A. & Eccles, J. S. (2002). The development of competence beliefs, expectancies for success, and achievement values from childhood through adolescence. In A. Wigfield & J. Eccles (Eds.), *Development of achievement motivation* (pp. 92-122). San Diego: Academic Press.
- Wigfield, A., Eccles, J. S., Schiefele, U., Roeser, R. W., & Davis-Kean, P. (2006). Development of achievement motivation. In W. Damon & R. Lerner (Editors-In-Chief) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp 933-1002). New York: Wiley.
- Wigfield, A., Eccles, J. S., Yoon, K. S., Harold, R. D., Arbretton, A. J. A., & Blumenfeld, P. C. (1997). Changes in children's competence beliefs and subjective task values across the elementary school years: A three-year study. *Journal of Educational Psychology*, 89, 451-469.
- Winer, B. J. (1971). *Statistical principles in experimental design* (2nd ed.). New York: McGraw-Hill.
- Winterbottom, M. (1958). The relation of need for achievement in learning experiences in independence and mastery. In J. W. Atkinson (Ed.), *Motives in fantasy, action and society* (pp. 453-478). New York: Van Nostrand.

- Woodcock, R. W. & Johnson, M. B. (1989). *Woodcock-Johnson Test of Achievement (Revised)*. Allen, TX: DLM Teaching Resources.
- Wu, F., & Qi, S. (2006). Longitudinal effects of parenting on children's academic achievement in African American families. *Journal of Negro Education, 75*, 415-429.
- Yarrow, L. J., McQuiston, S., MacTurk, R. H., McCarthy, M. E., Klein, R. P., Vietze, P. M. (1983). Assessment of mastery motivation during the first year of life: Contemporaneous and cross-age relationships. *Developmental Psychology, 19*, 159-171.
- Yarrow, L. J., Morgan, G. A., Jennings, K. D., Harmon, R. J., & Gaiter, J. L. (1982). Infants' persistence at tasks: Relationships to cognitive functioning and early experience. *Infant Behavior and Development, 5*, 131-141.
- Zhou, Q., Main, A., & Wang, Y. (2010). The relations of temperamental effortful control and anger/frustrations to Chinese children's academic achievement and social adjustment: A longitudinal study. *Journal of Educational Psychology, 102*, 180-196.

APPENDIX A
TABLES AND FIGURES

Figure 1. The Conceptual Model of Maternal Beliefs, Behaviors, and Child Temperament as Predictors of Child Motivation and Academic Success

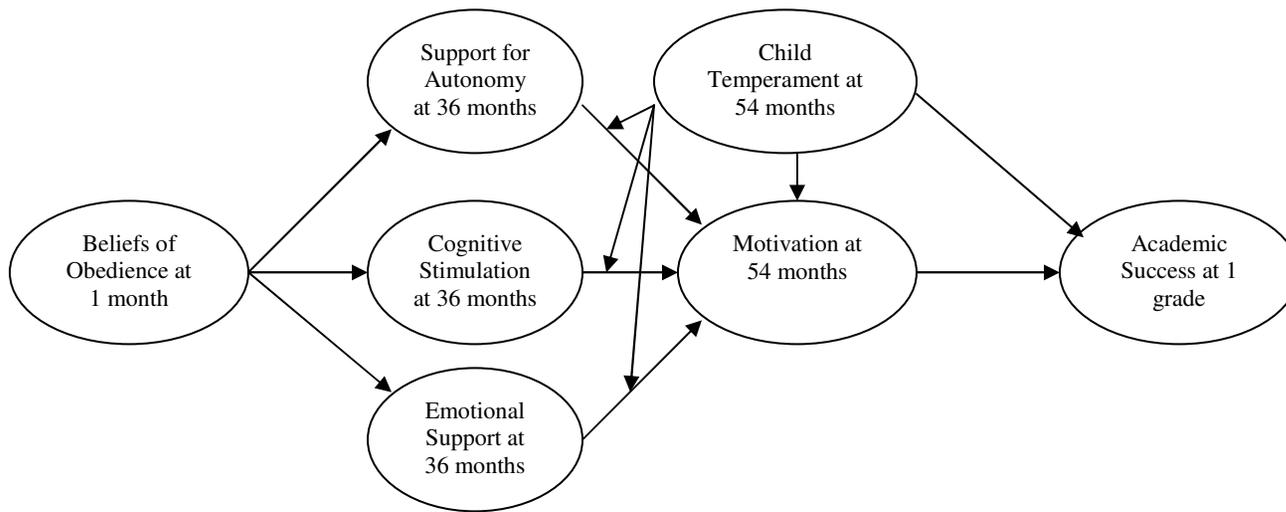


Figure 2a. Estimated Model of Maternal Supportive Parenting and Child Motivation as Mediators between Maternal Obedience Beliefs and Child Academic Success

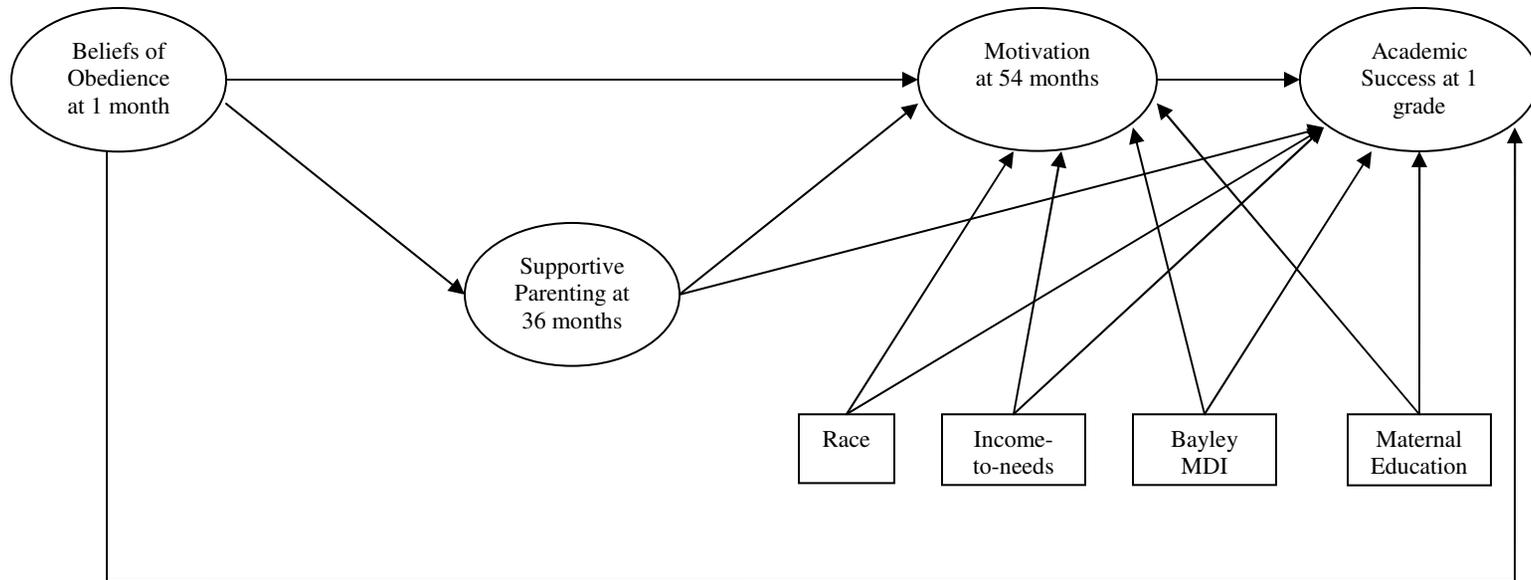
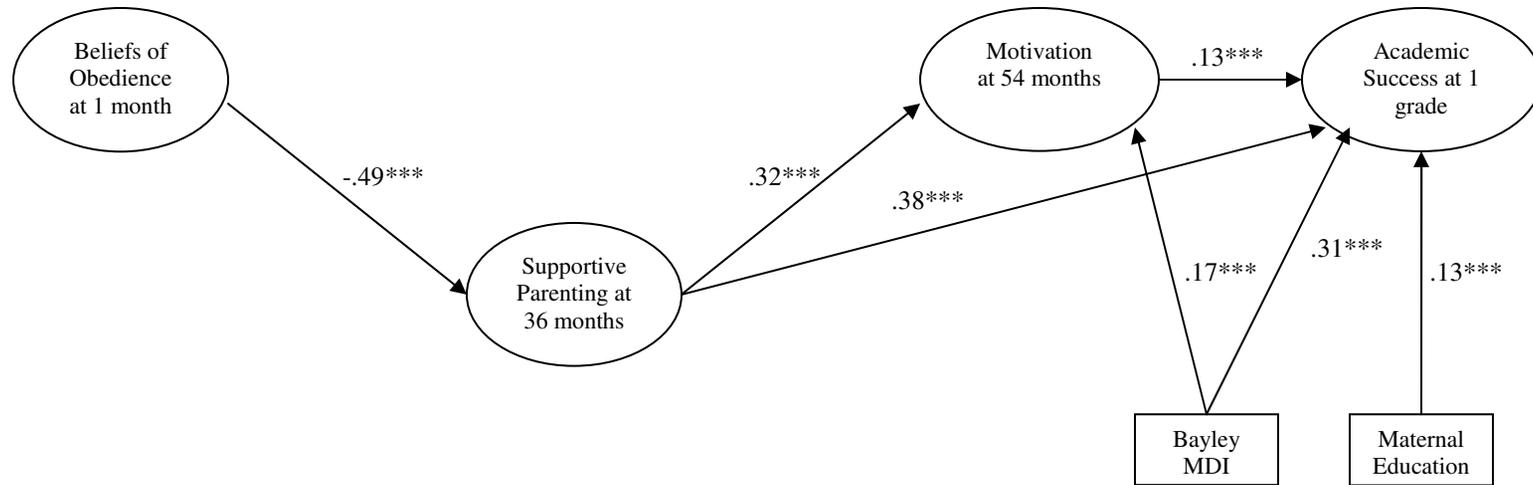


Figure 2b. Results for the Model of Maternal Supportive Parenting and Child Motivation as Mediators between Maternal Obedience Beliefs and Child Academic Success



Note: Standardized estimates are displayed

Figure 3a. Estimated Model of Maternal Parenting and Child Temperament as Predictors of Child Motivation and Academic Success

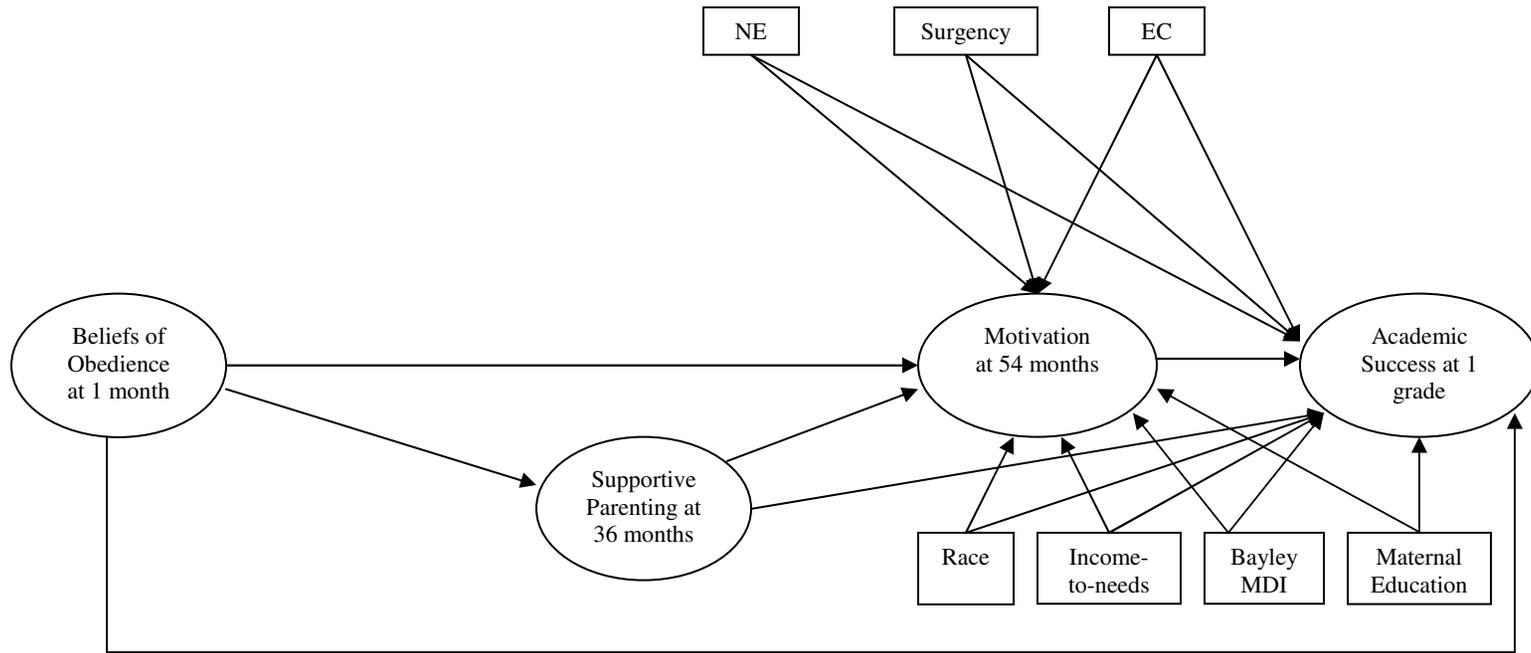
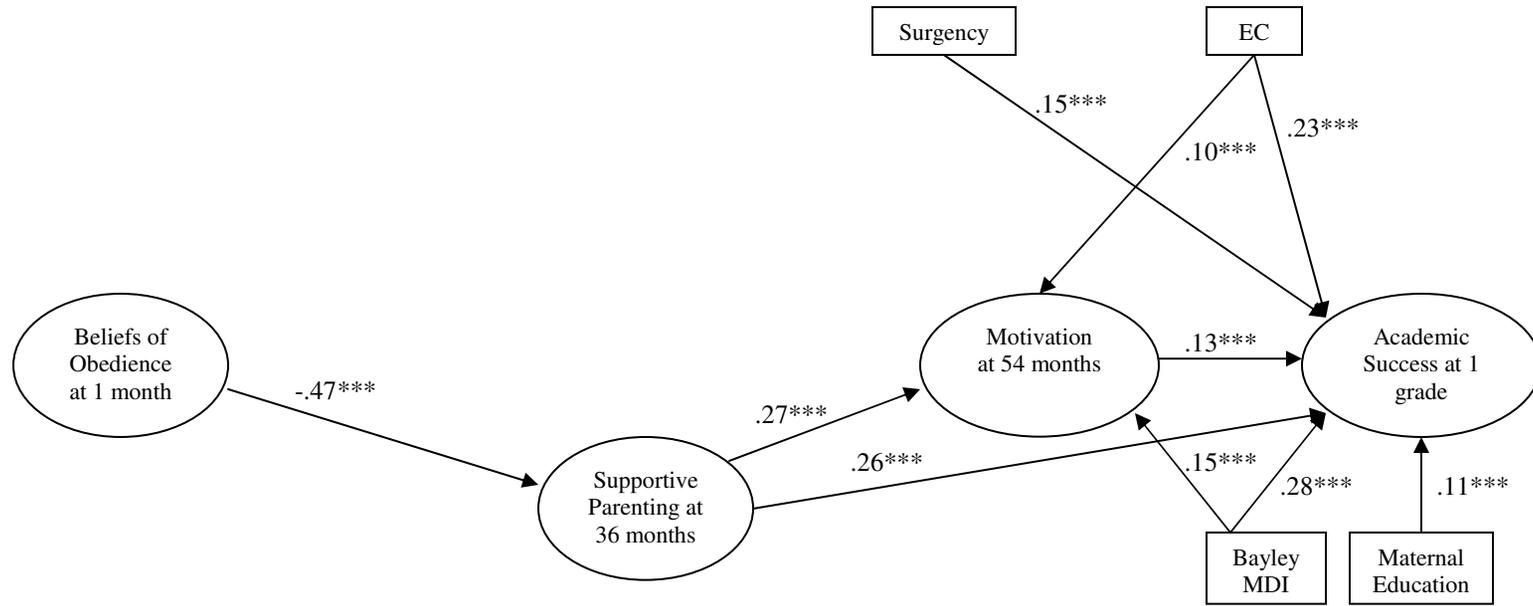
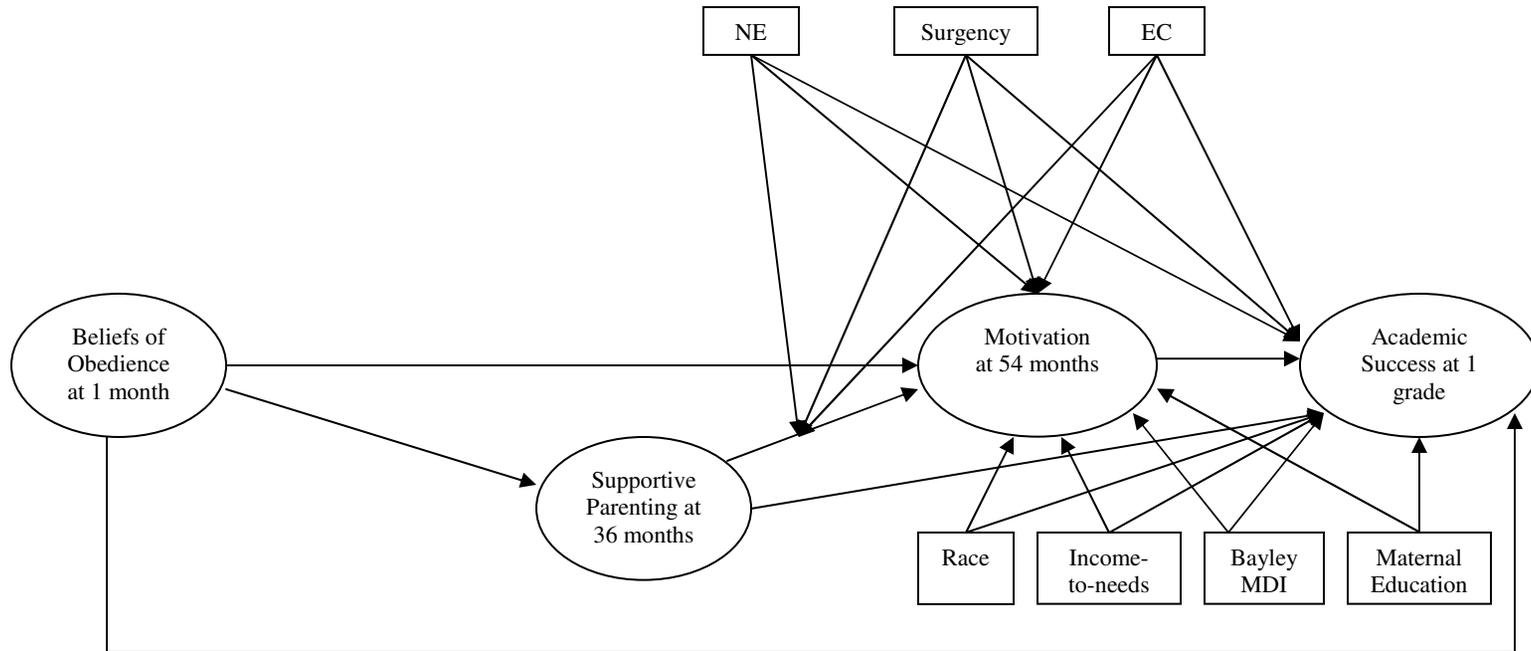


Figure 3b. Results for the Model of Maternal Parenting and Child Temperament as Predictors of Child Motivation and Academic Success



Note: Standardized estimates are displayed

Figure 4. Estimated Model of Child Temperament as Moderator in Relations between Maternal Supportive Parenting and Child Motivation



*Table 1**Descriptive Statistics for Study Variables*

Construct/Variable (Measure)	N	M	SD	Min-Max
Maternal Obedience Beliefs at 1 m	1361	60.27	15.20	23-104
Autonomy Support				
Autonomy subscale (HOME)	1179	3.49	.75	0-4
Respect for Child Autonomy (M/C)	1161	5.29	1.10	1-7
Cognitive Stimulation at 36 m				
Stimulation (HOME)	1179	8.06	2.08	0-11
Learning Materials (HOME)	1179	7.25	2.47	0-11
Stimulation of Cognitive Develop (M/C)	1161	4.47	1.44	1-7
Emotional Support				
Responsiveness (HOME)	1179	7.23	1.48	0-9
Lack of Harsh Parenting (HOME)	1179	5.06	1.30	0-6
Supportive Presence (M/C)	1161	5.28	1.37	1-7
Hostility (reversed, M/C)	1141	6.66	.74	1-7
Child Motivation at 54 m				
Persistence (M/C)	1040	4.74	1.28	1-7
Agency (M/C)	1040	4.63	1.14	1-7
Persistence (F/C)	782	5.95	.94	1-7
Agency (F/C)	782	5.40	.95	1-7
Child Temperament at 54 m				
Effortful Control (CBQ-M, CG)	1083	0.0	.79	-2.51-2.29
Negative Emotionality (CBQ-M, CG)	1083	0.0	.75	-2.41-2.37
Surgency (CBQ-M, CG)	1081	0.0	.87	-3.51-2.42
Academic Success at first grade				
Teacher reported Academic Skills	1018	3.51	.92	1.04-6.0
WJ-R Letter-Word Identification	1025	111.99	15.79	51-154
WJ-R Applied Problems	1023	110.8	17.14	46-163
WJ-R Word Attack	1024	108.38	14.35	76-145

Note: HOME = the Home Observational Measure of Environment; M/C = Mother-child structured interactions; F/C = Father-child structured interactions; CBQ-M = the Child Behavior Questionnaire, mother version; CBQ-CG = the Child Behavior Questionnaire, non-maternal caregiver version; WJ-R = the Woodcock-Johnson Psycho-Educational Battery-Revised.

Table 2

Bivariate Correlations among Study Variables in the Latent Path Models

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Maternal Obedience Beliefs	---												
2 Autonomy subscale (HOME)	-.23	---											
3 Respect for Child Autonomy (M/C)	-.42	.19	---										
4 Stimulation (HOME)	-.29	.42	.27	---									
5 Learning Materials (HOME)	-.46	.44	.38	.62	---								
6 Stimulation Cognitive Development (M/C)	-.30	.25	.46	.29	.37	---							
7 Responsiveness (HOME)	-.31	.34	.25	.42	.46	.33	---						
8 Lack of Harsh Parenting (HOME)	-.27	.22	.26	.24	.31	.21	.30	---					
9 Supportive Presence (M/C)	-.37	.23	.68	.26	.37	.71	.29	.23	---				
10 Hostility (reversed, M/C)	-.25	.14	.50	.19	.29	.32	.20	.20	.52	---			
11 Child Motivation (M/C)	-.14	.10	.13	.10	.14	.23	.13	.10	.19	.17	---		
12 Child Motivation (F/C)	-.13	.07	.12	.09	.12	.15	.11	.11	.16	.12	.13	---	
13 Teacher reported Academic Skills	-.23	.12	.24	.26	.32	.24	.23	.13	.23	.18	.17	.14	---
14 WJ-R mean of 3 Standard Scores	-.41	.18	.37	.35	.44	.36	.30	.19	.36	.25	.25	.12	.55

Note: all correlations equal or greater than .11 are significant at $p < .001$; greater or equal than .09 are significant at $p < .01$

Table 3
Bivariate Correlations among Study Variables
in the Latent Path Models

Variable	EC	NE	Surgency
1 Maternal Obedience Beliefs	-.26	.04	.08
2 Autonomy subscale (HOME, 4 items)	.21	.02	-.04
3 Respect for Child Autonomy (M/C)	.29	-.10	-.11
4 Stimulation (HOME)	.24	-.02	-.04
5 Learning Materials (HOME)	.32	-.09	-.06
6 Stimulation Cognitive Development (M/C)	.26	-.09	-.10
7 Responsiveness (HOME)	.23	-.04	-.07
8 Lack of Harsh Parenting (HOME)	.22	-.12	-.14
9 Supportive Presence (M/C)	.27	-.10	-.11
10 Hostility (reversed, M/C)	.21	-.06	-.10
11 Child Motivation (M/C)	.17	-.08	-.08
12 Child motivation (F/C)	.11	-.02	.02
13 Teacher reported Academic Skills	.26	-.12	-.02
14 WJ-R mean of 3 Standard Scores	.34	-.08	-.03
15 Effortful Control (EC)	---	-.41	-.39
16 Negative Emotionality (NE)		---	.33

Note: all correlations equal or greater than .09 are significant at $p < .01$

Table 4

Zero-order Correlations between Covariates and Outcome Variables

Variable	Sex	Race	Mother Education	Income- to-needs	MDI
Child Motivation					
Persistence (M/C)	-.02	-.09	.10	.11	.20
Agency (M/C)	-.06	-.08	.13	.09	.20
Persistence (F/C)	-.01	-.06	.05	.01	.16
Agency (F/C)	-.04	-.10	.11	.08	.15
Academic Success					
Teacher reported Academic Skills	.04	-.12	.29	.18	.34
WJ-R Letter-Word Identification	.08	-.16	.28	.22	.32
WJ-R Applied Problems	-.05	-.25	.35	.30	.45
WJ-R Word Attack	.02	-.20	.27	.19	.32

Note: M/C = Mother-child structured interactions; F/C = Father-child structured interactions; WJ-R = the Woodcock-Johnson Psycho-Educational Battery–Revised; MDI = Bayley Mental Development Index; all correlations equal or greater than .09 are significant at $p < .01$

Table 5

Standardized Factor Loadings for the Supportive Parenting Latent Construct

Latent Construct	Observed Variable (Measure)	<i>Estimate</i>
Supportive Parenting	Autonomy (HOME, 4 items)	.54
	Respect for Autonomy (M/C)	.45
	Stimulation (HOME)	.62
	Learning Materials (HOME)	.73
	Stimulation of Cognitive Development	.50
	Responsiveness (HOME)	.67
	Harsh Parenting (reversed, HOME)	.44
	Supportive Presence (M/C)	.48
	Hostility (reversed, M/C)	.35

Note: M/C = Mother-child structured interactions; HOME = the Home Observational Measure of Environment;
all estimates are significant at $p < .001$

Table 6

Latent Construct Standardized Estimates for the Process Model

Latent Construct	Observed Variable (Measure)	β	SE
Mother Obedience Beliefs at 1 m	Parcel 1	.78	.02
	Parcel 2	.88	.01
	Parcel 3	.80	.01
Supportive Parenting at 36 m	Autonomy (HOME)	.32	.04
	Respect for Autonomy (M/C)	.58	.03
	Stimulation (HOME)	.47	.03
	Learning Materials (HOME)	.69	.03
	Stimulation of Cognitive Development	.53	.03
	Responsiveness (HOME)	.48	.03
	Harsh Parenting (reversed, HOME)	.40	.03
	Supportive Presence (M/C)	.57	.03
	Hostility (reversed, M/C)	.42	.03
Child Motivation at 54 m	Persistence (M/C)	.84	.03
	Agency (M/C)	.94	.03
	Persistence (F/C)	.13	.04
	Agency (F/C)	.15	.04
Academic Success at 1 grade	Teacher reported Academic Skills	.64	.03
	WJ-R Letter-Word Identification	.72	.03
	WJ-R Applied Problems	.83	.03
	WJ-R Word Attack	.69	.03

Note: M/C = Mother-child structured interactions; F/C = Father-child structured interactions; HOME = the Home Observational Measure of Environment; WJ-R = the Woodcock-Johnson Psycho-Educational Battery-Revised; all estimates are significant at $p < .001$

Table 7

Standardized Path Estimates for the Process Model

Outcome	Predictor	Estimate (β)	SE
Supportive Parenting at 36 m	Maternal Obedience Beliefs at 1 m	-.49***	.03
Child Motivation at 54 m	Maternal Obedience Beliefs at 1 m	.05	.06
	Supportive Parenting at 36 m	.32***	.09
	Race	.03	.04
	Maternal Education	-.02	.05
	Income-to-needs	.01	.04
	MDI	.17***	.04
Academic Success at 1 grade	Maternal Obedience Beliefs at 1 m	.05	.06
	Supportive Parenting at 36 m	.38***	.09
	Child Motivation at 54 m	.13***	.04
	Race	-.07	.04
	Mother Education	.13***	.04
	Income	.05	.04
	MDI	.31***	.04

Note: *** $p < .001$

Table 8

Standardized Estimates for the Final Model

Outcome Construct	Predictor	Estimate (β)	SE
Supportive Parenting at 36 m	Maternal Obedience Beliefs at 1 m	-.47***	.04
Child Motivation at 54 m	Maternal Obedience Beliefs at 1 m	.03	.06
	Supportive Parenting at 36 m	.27***	.09
	Negative Emotionality	.00	.04
	Surgency	-.04	.04
	Effortful Control	.10**	.03
	Race	.04	.04
	Maternal Education	-.08	.06
	Income-to-needs	.02	.04
	MDI	.15***	.04
Academic Success at 1 grade	Maternal Obedience Beliefs at 1 m	.02	.06
	Supportive Parenting at 36 m	.26***	.09
	Child Motivation at 54 m	.13***	.04
	Negative Emotionality	-.05	.03
	Surgency	.15***	.03
	Effortful Control	.23***	.04
	Race	-.05	.04
	Mother Education	.11***	.04
	Income	.05	.04
MDI	.28***	.04	

Note: ** $p < .001$; *** $p < .001$