CULTURAL VARIATIONS IN SOCIALIZING YOUNG CHILDREN'S MASTERY MOTIVATION: A COMPARISON BETWEEN EUROPEAN-, AFRICAN-, AND HISPANIC-AMERICAN FAMILIES

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ABSTRACT

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Mastery motivation is an individual's innate drive to master and influence the environment; children's social experiences with caregivers can shape the development of mastery motivation (Barrett, Morgan & Maslin-Cole, 1993; Busch-Rossnagel, Knauf-Jensen, & DesRosiers, 1995). Family plays the most important role in fostering children's mastery motivation development, starting from a young age. This dissertation aims to investigate family process of socializing child mastery motivation. Furthermore, culture shapes the parenting and family contexts and moderates the functions of the parenting and other family factors that influence children's mastery performance. However, previous studies have overlooked the cultural variance in the socialization processes of children's mastery motivation within the family context. Given the lack of research, the two studies investigate the cultural variance in the socialization process towards children's mastery motivation.

Study one focuses on the cultural variances in the direct influence of parenting on children's mastery behaviors. Specifically, using both variable-oriented and person-oriented approaches, study one aims to investigate how parents' response varies across cultures when children are dealing with challenging tasks; and how the effects of parenting vary across cultures in the socialization process of children's mastery motivation. Results showed that in a group level, European American parents were higher on parents' autonomy supportiveness and cognitive stimulation, and lower on intrusiveness than the other two groups. Considering all

three dimensions of parental behaviors together, the person-oriented approach found the similarities across three cultures: all three groups identified the same typology of parenting styles; and restrained style was the most common style for all three groups. Also, the study identified cultural moderation of the effects of parental intrusiveness; and cultural specific meanings of parental control have been discussed.

Study two investigates family process of socializing mastery motivation socialization, including both micro-level factors, such as parenting, and macro-level factors, such as socioeconomic (SES) backgrounds. Further, study two investigated the ethnic variation in the process of mastery motivation socialization, by testing the model equivalence among the three ethnic groups. It has been found that parental education predicted parental behaviors both directly and indirectly mediating through parenting beliefs; and that parenting beliefs impact child's persistence in challenging tasks indirectly, mediating through parental supportiveness. Further, it found the cultural moderation of the effects of parental education on autonomy-supportive parenting beliefs, and cultural specific family process of socializing child mastery motivation has been discussed.

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CHAPTER 1. INTRODUCTION

Introduction

When children attempt to learn a new skill or acquire new knowledge, the motives behind children's mastery attempts may vary. Children could be motivated either by extrinsic motivations, such as avoiding punishment and approaching rewards. Also, children may be motivated by intrinsic motivations, such as an innate interest in the activity itself because of the appeal, novelty, challenge, and value of the activity (Ryan & Deci, 2001). In the following literature review, I first define the concept of mastery motivation as the intrinsic interest in the environment and innate desire for competence. Then, I explain how mastery motivation is observed in mastery behaviors: persistence and emotional expression are two important indicators of mastery motivation. Next, I describe relations between mastery behaviors and other related characteristics and skills of a child.

After clarifying the definitions of mastery motivation and related concepts, I discuss the development of mastery motivation. Although infants and toddlers are able to demonstrate certain mastery behaviors, such as persistence in exploring the environment (Banerjee & Tamis-LeMonda, 2007), it is not until 36 months of age that children can start to demonstrate mature mastery behaviors, because at that age, they have the ability to evaluate their own work (Barrett & Mogan, 1995). Although a mastery drive is an innate and instinctual characteristic, the environment influences the development of mastery motivation (Ryan & Deci, 2000). Previous research pointed out that in the process of mastery motivation socialization, family environment plays an important role when children are young (Bae, Hopkins, Gouze, & Lavigne, 2014; Banerjee & Tamis-LeMonda, 2007; Ryan & Deci, 2000; Turner & Johnson, 2003). There is no universal way of socializing child mastery motivation because parenting behaviors and child rearing beliefs are defined by culture. Further, the effects of parenting are moderated by culture

(Bornstein 2009). This proposal will investigate cultural variations in young children's mastery motivation socialization through two studies, with comparisons between European-, African-, and Hispanic-American families.

Bronfenbrenner's ecological system theory of child development suggests that child development is affected by different levels of environment. Parent-child interaction operates at the micro level of the environment, which is one of the most direct influences on child development. There are other family factors, such as family socioeconomic backgrounds in the macrosystem; that also influence child development and are mediated through parent-child interaction. Culture also operates at the macro level and defines the meanings and the effects of family factors which are in the micro- and exosystem. The first study focuses on the direct influence of parenting on child outcomes, and examines how culture shapes parenting and determines the effects of parenting on child mastery behaviors in challenging tasks through both variable-oriented and person-oriented approaches. In study two, I analyze the model of children's mastery motivation socialization from a broader perspective, not only focusing on the micro-level factors, but also embracing socioeconomic backgrounds. I hypothesize that parent education influences children's mastery performance, mediating through parenting beliefs and behaviors. Through comparing the model across three ethnic groups, study two aims to examine whether the direct and indirect effects of parent education and parenting on children's mastery motivation development vary across three ethnic groups.

The two studies share the same sample, which is generated from Early Head Start Research and Evaluation (EHSRE) study. The cultural/ethnic groups for the two studies are the same: including European-, African-, and Hispanic-American families. However, I use the term "culture" for Study one, and "ethnicity" for Study two. Culture is the "human-made part of

environment" and composited by some important psychologically relevant elements, such as norms, roles, beliefs, and values (Betancourt, & López, 1993). Ethnicity emphasizes the membership or affiliation of a nation, culture, or language (Betancourt, & López, 1993). In most cases, culture and ethnicity share common groups of individuals; therefore, in cross-cultural research literature, it is common to use these two terms interchangeably (Betancourt, & López, 1993). However, culture emphasizes the psychological constituent; and ethnicity is related to the demographic information. Thus, I use “culture” in Study one to discuss the child-rearing values which lie behind parental behaviors, and "ethnicity" in the second study which is related to socioeconomic status and minority group membership.

Mastery Motivation

People have the innate psychological need or inherent developmental tendency to seek novel stimulation, explore and learn about their environment, and master challenging skills or tasks; this is defined as intrinsic motivation (Ryan & Deci, 2000) or mastery motivation (Barrett et al., 1993; Dichter-Blancher, Busch-Rossnagel, & Knauf-Jensen, 1997; Morgan, MacTurk, & Hrncir, 1995). Children’s mastery motivation development is very important because it is not only positively correlated with current reading skills (Turner & Johnson, 2003), but also predicts children's later academic skills (Bae et al., 2014), school readiness (Bustamante, 2014), social functioning (Bae et al., 2014), and psychological well-being (Ryan & Deci, 2000).

First, one important element of mastery motivation is curiosity. Curiosity, or the desire for exploration and acquisition of new information, is a precursor for mastering the environment (Litman, 2005). The motivation of seeking out novel stimuli is an innate need for both animals and humans (Litman, 2005). White (1959) argued that, other than the drives for hunger, sleep, and sex, exploration (learning) is another basic human drive. Ultimately, human ability to control

or alter the environment through learning yields "primary pleasure" (White, 1959). Bruner (2009) pointed out in his learning theory that, rather than external motivations, innate interest in learning new material is the best stimulation driving students to learn and may lead to the best learning results. For example, in classrooms, there are two types of students: learning-oriented and performance-oriented students. Learning-oriented students are interested in learning skills and knowledge to fulfill their feelings of competence, whereas performance-oriented students value performance rather than the learning itself. Performance-oriented students have the goal of performing better than others and achieving certain standards (Ames, 1992; Ames & Archer, 1988). Studies have shown that learning-oriented students are more persistent and express more positive emotions than performance-oriented students (Ames, 1992; Elloit, 2005; Elloit & Dweck, 1988). Overall, prior research shows that an intrinsic interest towards learning novel stimuli drives people to approach the environment and persist on tasks.

Competence is another indispensable element of mastery motivation. White (1959) defined competence as one's capacity to interact with the environment effectively. Competence can refer to a successful action (e.g., putting the ring on a peg), or a skill (e.g., playing piano), or a general achievement (e.g., being a good student) (Elliot & Dweck, 2005). Elliot and Dweck (2005) believe that competence is the "inherent psychological needs for human beings". People's needs for increasing competence will spur them towards new challenges and lead to mastery behaviors (such as persistence and interest) (Elliot & Dweck, 1988). Therefore, mastery motivation is best assessed through observing children's attempts at success in challenging or problem-solving settings (e.g., Badridze, 2003; Marsland, 2005; Mokrova, Calkins, Leerkes, & Marcovitch, 2012; Young & Hauser-Cram, 2006).

Mastery Behaviors

The desire for competence combined with innate human curiosity can result in a series of mastery behaviors and performance, which can be classified into two aspects: instrumental and affective aspects (Barrett & Morgan, 1995; Busch-Rossnagel, 1997). The instrumental aspect refers to children's persistence at tasks, preference for challenges, and physical or cognitive control of their environment (Barrett & Morgan, 1995). Persistence, defined as the continuation of work required to complete a task or activity, is one of the most important indexes for investigating children's mastery motivation (Master, Dweck, Markman, & Walton, 2011). Persistence is usually measured as the duration of a child's work on a task (e.g., Banerjee & Tamis-LeMonda, 2007; Mokrova et al., 2012; Young & Hauser-Cram, 2006); or measured by an observer's ratings of the degree to which a child's persist at tasks (e.g., Martin, Ryan, & Brooks-Gunn, 2013); or rating of children's sustained attention to toys (e.g., Lee, 2014); or children's apparent goal-directed behaviors (e.g., Badridze, 2003; Marshland, 2005; Messer et al., 1986). Conversely, lack of persistence is a sign of helplessness, which is a negative response to challenging situations (Nolen-Hoeksema, Girgus, & Seligman, 1986).

Mastery motivation leads to children's positive and negative emotional feelings and experiences while working on challenging tasks, or right after completion of challenging tasks (Barrett & Morgan, 1995). With a desire of mastering challenges, children may experience positive feelings when they control the environment, and experience negative feelings when they fail in the challenges. For example, Heckhausen (1987a) found that, 3-years-old children showed happiness after successful mastery attempts and showed sadness after failure in their attempts. A child is able to show different expressions according to his/her different performances in challenging tasks because the child sets a certain goal in mind and is able to evaluate his/her

performance. Affect aspects of mastery motivation include feelings of pleasure, pride, frustration, shame, and sadness (Barrett & Morgan, 1995; Busch-Rossnagel, 1997). In previous studies, affect aspects of mastery motivation are usually measured as the degree of children's expression of pleasure or enthusiasm (e.g., Martin et al., 2013; Marshland, 2005; Sparks et al., 2012; Turner & Johnson, 2003; Wang, Mogan, & Biringen, 2014) and frustration (e.g., Bae et al., 2014; Badridze, 2003) in challenging settings.

Persistence and emotional experience are closely related to each other. Some studies have found that high persistence is aligned with positive emotions, such as pride and happiness; (Deater-Deckard, Petrill, & Thompson, 2007). High persistence and positive emotional experience are in a virtuous circle: children with the intrinsic interest of the activity or learning may persist in solving the challenge which may lead to the feeling of competence; children's positive emotional experience of mastering the environment may predict future persistence. For example, using a sample of adults, Seo, Barrett, and Bartunek (2004) found that pleasant feelings during work led to high work motivation, measured as high performance goals and efforts put forth towards tasks.

Although the correlation between positive emotion and persistence is consistent in previous studies, the relation between negative emotion and persistence is complicated: not all negative emotions are related to poor mastery performance. Studies have shown that fear hinders mastery motivation attempts (Baker, D'Mello, Rodrigo, & Graesser, 2010). For example, temperament studies have shown that fear draws out avoidance behaviors (Rothbart & Hwang, 2005). If an individual perceives that the stimulation is too new and too unusual, their fear reaction will draw them back from approaching the activities (Litman, 2005). However, other than fear, frustration towards the task is viewed as another emotion which may be related to

children's poor mastery performance (Deater-Deckard et al., 2007). High levels of frustration make it difficult for children to persist in tasks. However, anxiety and frustration does not always link to bad mastery performance. For example, the frustration-exploration hypothesis proposed that the anxiety and frustration of uncertainty prompt people to approach and explore novel stimuli, acquire new knowledge, and overcome challenges (Wong, 1979). That is, the unpleasant feeling of a lack of knowledge can lead to curiosity (Loewenstein, 1994). Baker and colleagues (2010) found that, compared to boredom, students' feelings of frustration are less likely related to poor learning and behavioral problems. The researchers concluded that for students, it's "better to be frustrated than bored" (Baker et al., 2010). Therefore, it is possible that a high level of frustration interferes with children's performance on challenging tasks and that a moderate or low level of frustration may not be negatively related to children's persistence. Thus, rather than assuming frustration and persistence are two opposite indicators of mastery behaviors, the current study treats frustration and persistence as two separate indicators of mastery motivation.

Mastery Motivation and Self-regulation

Mastery motivation and self-regulation are closely related, but distinct constructs (Berhenke, 2013; Wang & Barrett, 2013). Mastery motivation concerns the desire for control, including both control of the environment and control of one's own behaviors and feelings in order to achieve a certain goal. Controlling one's own behaviors and feelings is usually understood as self-regulation. Self-regulation is defined as "the ability to inhibit a dominant response and/or to activate a subdominant response" (Rothbart & Bates, 2006).

Not every mastery attempt involves self-regulation. In some cases, children show mastery desires because of their intrinsic interests towards certain activities in which self-regulation is rarely involved. However, when one's emotions are not coherent with their desires and goals,

self-regulation (or emotion regulation) is needed to help the individual to achieve competence. For example, one student may feel that a homework assignment is too difficult and not interesting, but may still work diligently because of an intrinsic goal towards success in their future career (Ryan & Deci, 2000). In this process, self-regulation plays an important role towards achievement.

Mastery motivation and self-regulation share some similarities. First, mastery motivation and self-regulation have similar functions in children's development - both mastery motivation and self-regulation positively predict children's academic achievement (e.g., Bae et al., 2014; Turner & Johnson, 2003; Zimmerman, 1990). Second, both constructs have similar behavioral indicators: emotion and persistence. With efficient self-regulation, an individual is able to use strategies to inhibit the impulse of negative emotion (e.g., high level of frustration) during challenging circumstances (Spinrad, Stifter, Donelan-McCall, & Turner, 2004; Eisenberg et al., 2010), and therefore exhibit persistence towards the task (Chang & Burns, 2005; Lee, 2014).

Although persistence (sustained attention) is the indicator for both mastery motivation and self-regulation, the settings in which persistence is measured are also important to determine the constructs that constitute the concept of persistence. For example, in self-regulation domain, persistence is measured as self-regulation of attention during boring/limited tasks, in order to investigate whether children can efficiently follow the requirements of a task, regulate their attention during the task, and successfully complete the task (Sulik et al., 2010). However, free-play settings allow children to choose the toy that most interests them; thus, the duration of play (persistence) in this setting not only allows for the ability to measure attention regulation, but also allows for the ability to measure children's interest in different toys. Persistence on challenging tasks concerns mastery motivation, because other than sustained attention, children

must perceive a desire for competence to keep them engaged in a task. The current study uses persistence in a setting of challenging tasks as one of the indicators of children's mastery motivation (The other indicator is frustration in challenging tasks).

Development of Mastery Motivation

Mastery motivation is an innate psychological trait and the indicators of mastery motivation can be observed at very early ages. Barrett and Mogan (1995) pointed out that before 9 months old, infants show a preference for novel stimuli and awareness of contingencies between two events. As age increases, children show preference for challenges, as well as related emotional reactions to their experience with a challenge, such as pride and frustration. In the first two years of life, children start to internalize caregivers' standards (Kochanska & Aksan, 1995); and by 36 months, children have acquired their own sense of standards for their performance (Barrett & Mogan, 1995). With the ability to judge their own work, children are able to generate the self-evaluated emotional expression (e.g., pride), which is related to the future intrinsic motivations towards the task. For example, with a clearer perception of their success in acting upon the environment, 36-month-old children express much more pleasure than 24 month olds when they complete challenging tasks (Redding, Morgan, & Harmon, 1988). Therefore, 36 months of age is seen as the age at which children start to demonstrate mature mastery behaviors.

Mastery Motivation Socialization

Since mastery motivation is an individual's innate characteristic, children's some other inborn characteristics, such as children's gender and temperament, might be related to child mastery motivation (Figure 1 shows the theoretical model of mastery motivation socialization). First, with the sample of school aged children, studies have found that children's mastery motivation in academic achievements vary across genders (Boggiano, Main, & Katz, 1991;

Meece, Glienke, & Burg, 2006). It has been found that girls are more likely to be influenced by teachers' control than boys (Boggiano et al., 1991); and boys reported more intrinsic motivation in mathematics and science than girls (Meece et al., 2006). Although there are few studies about gender differences in young children's mastery motivation, the meta-analysis study has found that, compared with girls, boys have lower level of persistence in terms of attention and behaviors, but have greater incidence of externalizing disorders (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). Therefore, it is possible that boys will show lower level of mastery motivation than girls due to their insufficiency in controlling their attention and negative emotions during challenging situations. Thus, in the two study of understanding the socialization of child mastery motivation, child gender is treated as controlling variable in the models. Further, since the temperament, especially effortful control is related to children's mastery behaviors of persistence and negative emotion expressions, child temperament is also controlled in the two studies.

Although a mastery drive is an instinctual characteristic, the development of mastery motivation can be influenced by various conditions and factors, especially children's social experiences with caregivers (Busch-Rossnagel et al., 1995). In Bronfenbrenner's ecological system theory, parenting is one of the most influential factors of child development. Some other family factors, such as family socioeconomic backgrounds, operate in the outer layers of environment which influence child development mediated through parenting. Research has shown that caregivers' characteristics (such as occupation and education) are related to young children's mastery motivation (Mokrova et al., 2012; Turner & Johnson, 2003), which impact children through parenting and parent-child relationships (Mocrova et al., 2012; Turner & Johnson, 2003). In Bronfenbrenner's theory, culture operates at the macro-level and defines the

meanings and the effects of family factors (Figure 1). However, few studies investigate how culture moderates the mechanism of child mastery motivation socialization. The current two studies examine cultural/ethnic variations in mastery motivation socialization within the family context from two different viewpoints. The first study focuses on the direct influence of parenting on child outcomes, and examines how culture shapes parenting and determines the effects of parenting on child mastery behaviors in challenging tasks. The second study seeks to expand the model presented in the first study, but embraces other family context factors. In the model in study two, parent education influence children's mastery behavior performance, mediating through parenting beliefs and behaviors. Furthermore, study two investigates whether and how the model of mastery motivation socialization varies across cultures/ethnicities.

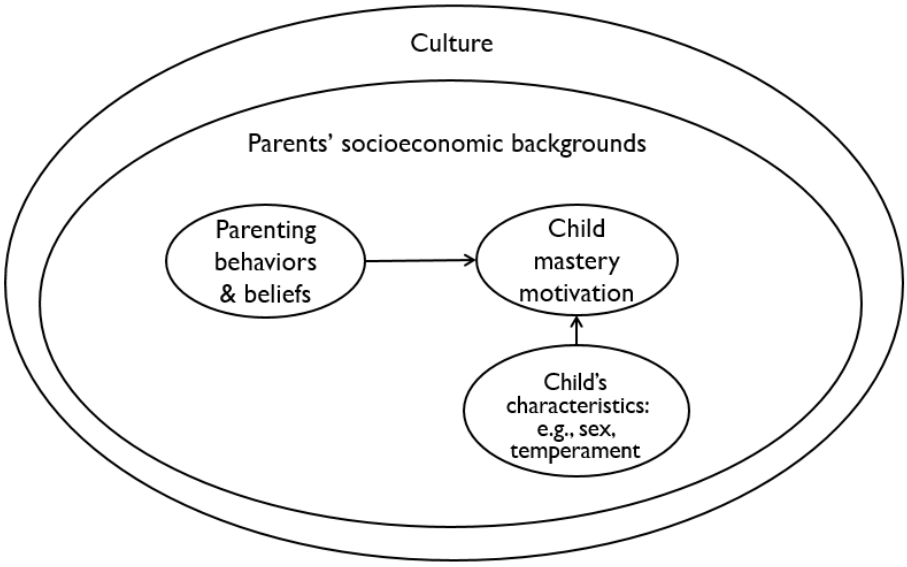

Figure 1. Theoretical model of mastery motivation socialization

CHAPTER 2. CULTURAL VARIANCES IN PARENTING AND ITS EFFECTS ON CHILD MASTERY MOTIVATION

Literature Review

Culture and Socialization

According to Sameroff's (2009) transactional model, a child's development is the result of the interaction between the child and his experience, including family and other social settings. Placing the parent-child interaction in a broad cultural context, Bornstein (2009) proposed a multilevel transaction model (the Culture↔ Parent ↔Child model) to understand how culture affects the course of child development by shaping the child's developmental context through its influence on parents. Culture defines the shared values, norms, and beliefs within a group; and therefore child rearing is shaped by culture, such as child-rearing traditions, family structures (Coll & Pachter, 2002), parental ethnotheories (that is, parents' culturally-specific, abstract, and unconscious schemes about the right way to raise a child which varies in every culture; see Super & Harkness, 2002), parents' expectations for and understanding of their children (Bornstein, 2009), and child-rearing goals (Tamis-LeMonda et al., 2008). Different parenting approaches are the adaptive responses to these culturally determined characteristics (Coll & Pachter, 2002; Kotchick & Forehand, 2002). That is, as the bearers of culture, parents structure cultural-specific daily child-rearing practices, parent-child interactions, and daily communication to transmit their cultural values, beliefs, and activities to their children (Bornstein, 2009). These culturally adapted parenting behaviors and environment form a cultural specific "developmental niche" for children, and lead to differences in children's skills and developmental milestones across cultures (Super & Harkness, 2002). For example, the acquisition of language and gestures is different across cultures (Tamis-LeMonda & Song, 2013;

Wang & Vallotton, 2016). Wigfield and colleagues (2015) pointed out that there are differences in the level of the fear of failure between European- and Asian-American teens. In order to reveal how culture shapes parental behaviors and therefore influence young children's mastery motivation development, I plan to investigate cultural variations in parental behaviors in the specific parenting practices of socializing child mastery motivation, and cultural variations in the effects of parental behaviors on child mastery performance.

Parenting and Mastery Motivation

How is child mastery motivation socialized? What types of parenting style and strategy will enhance children's intrinsic motivations and persistence in challenging situations? Self-Determination Theory (SDT), a theory about the social-contextual conditions of facilitating or hindering one's self-motivations, proposed that the nature of socializing child intrinsic motivation is to promote one's feelings of autonomy, competence, and relatedness; whereas, some external reinforcements, such as tangible rewards, pressures, and threats, do not benefit these feelings and thus are not effective in enhancing an individual's intrinsic motivation in learning (Deci & Ryan, 2000; Ryan & Deci, 2000). In family contexts, both parenting styles and practices influence child mastery motivation through enhancing or undermining children's feeling of autonomy, competence, and relatedness in activities or learning.

Parenting styles is parents' collective behaviors and general attitudes towards children during parent-child daily interactions (Darling & Steinberg, 1993). According to Baumrind's parenting style theory, parental responsiveness and parental control are two important dimensions of parenting. Parental responsiveness refers to "the extent to which parents intentionally foster individuality," and to which parents support and meet children's needs and demands (Baumrind, 1991). Parental control refers to the extent to which parents expect their

children's mature and responsive behaviors and demonstrate supervision and disciplinary behaviors (Baumrind, 1991). Based on the two dimensions, Baumrind proposed three types of parenting styles: authoritative, authoritarian, and permissive. Authoritative parenting is a child-centered parenting style, which is categorized by high level of warmth, parental sensitivity, expectation of child's maturity, and encouragement of independence. Also, authoritative parents will control their children with clear limits and gentle guidance (Baumrind, 1978). In western culture, authoritative parenting is viewed as the most effective parenting style; also, in samples primarily representing European Americans, authoritative parenting is found to be positively related to child intrinsic motivation and performance in learning (Turner, Chandler, & Heffer, 2009). There are several reasons authoritative parenting is expected to support children's development of mastery motivation. First, authoritative parenting supports children's feeling of autonomy and competence. Authoritative parents are autonomy-granting, tend to respect children's choices, treat children as independent agents, direct children towards the development of intrinsic interest in activities, and allow children to take initiative and make choices. With autonomy supportiveness, children are able and willing to work on a task or control their environment (Ryan & Deci, 2000). Second, authoritative parenting also promotes children's feeling of relatedness. Authoritative parents are warm and sensitive to children, and provide children a safe environment for children to explore (Baumrind, 1991). Also, infants who feel secure are likely to explore the new toys and surroundings, which can be viewed as early signs for mastery motivation (Barrett & Morgan, 1995). With school-age children, studies have found that having warm and close relationships with significant others, such as parents or teachers, students tend to present a high level of intrinsic motivation in learning (Ryan & Grolnick, 1986). SDT hypothesized that this is because, other than feelings of autonomy and competence, children

also need another important feeling of security and relatedness (Ryan & Deci, 2000). In contrast, authoritarian parenting, which is represented as a high level of control without being sensitive to children's needs, or accompanied with harsh discipline and negative emotional expressions, showed negative effects on children's intrinsic motivations, and may lead to children's poor performance in learning, because it undermines children's feelings of autonomy and competence (Deci & Ryan, 2000; Ng, Kenney-Benson, & Pomerantz, 2004; Ryan & Deci, 2000).

In the specific situations in which children deal with challenging tasks, or parents and children solve problems together, authoritative parenting beliefs are reflected in two specific parental behaviors: autonomy supportiveness and cognitive stimulation. Parental autonomy supportiveness refers to parental encouragement of independence and emotional supportiveness. Specifically, autonomy supportive parents allow children to work autonomously when they are interested in the activity, provide positive feedback on the child's efforts, provide comfort and support (e.g., hug) when children feel frustrated in the face of difficulties. Thus, parental autonomy supportiveness enhances children's mastery behaviors in challenging contexts. For example, measuring 36-month-old children's persistence in problem-solving tasks, Kelley, Brownell, and Campbell (2000) found that parental positive feedback on children's personal characteristics (e.g., "You're so smart!") and children's products or actions (e.g., "You got the piece in!") at 24 months old positively predicted children's persistence one year later. However, studies have shown the nuanced differences of the effects for these two types of positive feedbacks: praise of children's efforts (e.g., persistence in a challenging task, strategies for solving problems) has a better effect than praise of children's inherent characteristics (e.g., intelligence), because praise on a controllable behavior makes children more self-directed and gain the motivation towards mastering the environment (Mueller & Dweck, 1998). For example,

Gunderson and colleagues (2013) found that caregivers' positive feedback on children's efforts, rather than on children's inherent characteristics, during infancy and toddlerhood was positively related to child's preference for challenging and hard work when they entered elementary school. Dweck and Elliot (2005) proposed a theory of mindsets, which suggests that people who believe that their abilities can be developed through hard work (growth mindset) will demonstrate more mastery motivation when they encounter difficulties than those who holds the belief that ability is innate and success is only related to innate talent (fixed mindset). These findings reveal that children not only obtain emotional supports from parents when children encounter difficulties, but also internalize the parents' values and attitudes towards the relationships between self and the environment. In Vygotsky's sociocultural theory, he believes that children internalize the meanings of language and symbols into their own repertoire in the social interaction with others, to develop both internal and external representations (that is, language and thoughts) (Vygotsky, 1986). In this way, parents pass the cultural specific meanings of symbols to their children through the interaction. Therefore, through the interaction and internalization in challenging contexts, parents pass the culture of solving problems to their children. Parents who support children's autonomy and guide children to find the effective strategies of solving problems (parental cognitive stimulation, which will be elaborated in the following paragraph) will transmit their beliefs to their children that the environment is controllable and there are ways of success.

Another positive parental behavior in challenging situations is cognitive stimulation. According to Vygotsky's child development theory, children learn through the interaction with knowledgeable others (usually parents, in most parent-child dyads). Parents' cognitive stimulation which fits children's zone of proximal development (ZPD), will benefit children's

learning (Vygotsky, 1978). Parents who provide scaffolding within children's ZPD in challenging situations will adapt their guidance to children's current developmental level, either by setting advanced goals with moderate challenges, or withdrawing their instructions when children become more competent and master the tasks (Heckhausen, 1987b, 1993). Thus, on these occasions, parents not only keep children's intrinsic interests in activities alive, but also protect children's feeling of autonomy and competence, so children show greater persistence in attempting to solve problems (Grusec & Davidov, 2010; Young & Hauser-Cram, 2006). For example, Yarrow and colleagues (1984) found that when infants were 6 months old, parental stimulation (including using sensory stimulation and directing children's attention) was positively related to infants' problem solving performance. Banerjee and Tamis-LeMonda (2007) found that maternal teaching behavior (cognitive stimulation and responsiveness) when children were 6 months old was positively related to children's persistence at age 14 months. In addition, parental assistance can provide children a good role model; children learn from parents about specific strategies to solve problems.

In sum, both autonomy supportiveness and cognitive stimulation requires parents to have "child-centered" parenting beliefs, be sensitive to child's needs and ability, and adjust their responses accordingly. Parents who use autonomy supportiveness and cognitive stimulation pass the belief of independence and the value of the intrinsic interests of the activities to their children. Autonomy-supportive parents encourage children's autonomous attempts and provide emotional supports when children get frustrated. With cognitive stimulation, parents provide children with scaffolding to bring a child's skills beyond their current understanding and ability. These two parental behaviors benefit children's mastery motivation through fostering children's feelings of autonomy and competence.

Conversely, in the challenging situations, parental intrusiveness without considering children's needs and ability is associated with poor persistence and more negative affect (Ryan & Deci, 2000). Indicators of intrusive behaviors include persisting with an action that does not interest the child, taking the toy away when the child is still interested in it, taking over the task or doing the puzzle for the child without considering the child's attention and autonomy, not allowing the child to make choices or handle the puzzles, not allowing the child to take turns or go at his/her own pace, and physically intrusive behaviors such as poking the child. According to SDT, maternal intrusiveness or control may suppress children's behaviors and limit children's opportunities for autonomous exploration (Brinker & Lewis, 1982; Busch-Rossnagel, 1997), and therefore undermine children's feelings of competency and intrinsic interests towards the environment (Ng et al., 2004). Parental use of intrusiveness or harsh control may lead children to internalize the idea that they are unable to and not expected to make attempts. For example, Marsland (2005) found that one-year-old infants who experienced high levels of negative maternal control (negative regard and controlling behaviors without being sensitive to child's needs) were more likely to withdraw when faced with challenges and feel hopeless after failure at 5 years old. Badridze (2003) also found that high levels of maternal control in joint problem solving tasks were positively associated with toddlers' negative emotional expressions during the task.

However, the findings about the effect of parental intrusiveness on child outcomes are not consistent: some studies did not find the negative effects of maternal control on children's mastery behaviors (Kelley et al., 2000; Marsland, 2005). For example, Kelley and colleagues (2000) categorized maternal control into intrusiveness and gentle guidance, and found that children with more maternal gentle guidance at 24 months were less likely to avoid challenging

tasks at 36 months. The discrepancies of the results in parental control on child mastery behaviors are due to whether parents consider children's needs and ability and endorse children's independence when they use control. For example, in Kelley and colleagues' (2000) study, "gentle guidance", which has positive effects on child mastery motivation development, was defined as a type of directiveness that supports children's autonomy (e.g., mother holds toy still so child can engage, rather than grabbing the toy out of child's hand and completing task herself). The operationalized definition of "gentle guidance" is consistent with "cognitive stimulation" in other studies, which is one of the components of supportive parenting (Banerjee & Tamis-LeMonda, 2007; Yarrow et al., 1984).

The first gap present in the current literature is that it has overlooked the cultural variations in the socialization process of young children's mastery motivation by either focusing on highly homogeneous samples, comprised of predominantly middle-income European American (e.g., Lee, 2014; Marsland, 2005; Sparks et al., 2012; Wang et al., 2014), or using heterogeneous samples which might represent a broader population, but nevertheless analyzing the overall effects of maternal behaviors on children's outcomes by lumping all ethnic and SES groups together (e.g., Gunderson et al., 2013; Kelley et al., 2000; Martin et al., 2013; Mokrova et al., 2012). Thus, we know little about whether and how young children's mastery motivation is socialized differently across different cultures, including different subcultures within the United States. Since culture defines the meaning of behaviors, it is possible that parental behaviors with the same form have different functions for shaping child development; further, parental behaviors with different forms may have similar effects on child development (Bornstein, 2009). From cross-cultural studies in other domains of child cognitive and social development, it is known that there are both similarities and differences in parenting and the effects of parenting on

child development. However, few studies have investigated how parent-child interaction varies across cultures in the specific parenting practice of solving challenging tasks, and whether SDT can explain parents' and children's behaviors in mastery motivation domain in other cultures, other than the main stream European American culture.

Further, in the literature, parental autonomy supportiveness and cognitive stimulation are automatically viewed as the opposites to parental control or intrusiveness. However, in some other cultures, parental control may not necessarily be negatively correlated with parental warmth and responsiveness. For example, in Asian culture which has inherited Confucianism and values parenting beliefs of training, parental control, and strict parenting style are understood as positive factors for child's academic performance (Chao, 1994). Therefore, children who grow up in this culture internalize the value of parental control and strictness, and do not interpret that parental control is opposite to parental warmth and responsiveness. Thus, it is found that Asian children's perception of parental control is positively related to their perception of parental warmth, which is not the case for European American children (Rohner & Pettengill, 1985). In the challenging contexts, parents from different cultures may vary in their beliefs about the effective strategies and behaviors of helping their children deal with difficulties. That is, in some other cultures, such as African American and Hispanic cultures, parental intrusiveness is not necessarily viewed as the opposite side of parental autonomy supportiveness and cognitive stimulation. However, previous studies usually investigated parental behaviors of autonomy supportiveness, cognitive stimulation, and intrusiveness separately. Few studies have examined how these behaviors are clustered together (that is, parental response styles) during children's challenging tasks. Therefore, part of the current study's aims is to use observational data and

latent profile analysis to classify parents' response styles during children's challenging tasks in order to investigate parenting styles in mastery motivation socialization.

Cultural Variations in Parenting

When comparing between the three cultural groups (European-, African, and Hispanic families) on parental supportiveness and control, studies have found that a positive parenting style, which refers to a combination of parental sensitivity, responsiveness, positive regards towards children, and cognitive stimulation of children, is dominant across all groups (Brady-Smith et al., 2013), and as children gain more autonomy, parental intrusiveness decreases across all groups (Ispa et al., 2013). However, there is also some evidence of cultural differences across the three groups in terms of parenting. For example, compared with European American groups, African American parents show a higher level of control (Ispa et al., 2004), physical punishment (Kotchick & Forehand, 2002), and authoritarian attitudes (LeCuyer, Swanson, Cole, & Kitzman, 2011), and Hispanic parents showed more intrusive behaviors during free-play when children were one year old (Ispa et al., 2004).

Some studies have shown that the effects of parenting on child social and cognitive development are the same across the three ethnic groups (European-, African-, and Hispanic American). For example, Brady-Smith and colleagues (2013) found that supportive mothering when children were one year old, measured as parental sensitivity, responsiveness, positive regard, and cognitive stimulation during free-play, positively predicted children's cognitive and emotional regulation scores on the Bayley scales one and two years later. McLoyd and Smith (2002) also found that parental warmth, responsiveness, and encouragement at home when children were 4 years old were negatively related to child behavior problems currently as well as when they were 10 to 11 years old. Also, parental intrusiveness and parental harshness (e.g.,

spanking) negatively predicted children's social skills and adjustment (Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012; Ispa et al., 2013) across all three groups. When only comparing between European- and African-American samples (Brady-Smith et al., 2013; Fuligni et al., 2013; Ispa et al., 2004), or European- and Hispanic samples only (Hill, Bush, & Roosa, 2003), similar results were found for the effects of positive and negative parenting.

There are also some differences in the effects of parental behaviors on children's development across cultures. For example, despite high levels of authoritarian parenting among African American parents, authoritarian parenting/control does not always have negative effects on children's development. For example, Ispa and colleagues (2004) found that parent intrusiveness in free-play negatively predicted children's engagement for parent-child dyads in a European American sample, but this relationship was not present for African American families. Further, some studies have even found that parental control has positive effects on children's outcomes in African American families. For example, unlike European American children, African American children with highly authoritarian parents showed more, rather than less, independence (Baumrind, 1973) and compliance (LeCuyer et al., 2011). This cultural moderation of the effects of parental control can be explained by cultural variation in the meanings of parenting behaviors. In European American culture, authoritarianism is connected with parental anger, coldness, and rejection (see Baumrind, 1972) and seen as indicators of "bad" parenting in this group, but in the African American cultural context, control and authoritarian parenting are not necessarily seen as indicators of "bad" parenting. For example, through qualitative interviews with nine low-income African American mothers, Ispa and Halgunseth (2004) found that mothers believed it is effective and necessary to set firm limits with their children early, starting with infants and toddlers. Control is viewed as one of the characteristics of supportive parenting

for African American families. For example, using principal component analysis, Tamis-LeMonda and colleagues (2009) found that "structuring" was one of the components of parental sensitivity for the sample of African American parents. Ispa and colleagues (2004) explain this phenomenon that control is often combined with parental warmth in African American parenting, which is less true of European Americans. Moore and Brooks-Gunn, (2002) named this unique African American parenting style as "tough-love", which includes aspects of both authoritative and authoritarian parenting and is beneficial to children's development in African American families. The unique meaning of control in African American parenting is an adaptive response to their contextual factors, such as the experience of discrimination and dangers present in neighborhoods; therefore, controlling serves as protection for children in these contexts (LeCuyer et al., 2011; McAdoo, 2002; Moore & Brooks-Gunn, 2002).

Studies revealed culture-specific child rearing values and corresponding parenting behaviors for Hispanic American families (Coll & Pachter, 2002). For example, "familismo" (familism) is a very important, but unique cultural value for Hispanic families, which emphasizes the closeness, cohesiveness, and cooperativeness among family members (Harwood, Leyendecker, Carlson, Asencio, & Miller, 2002). Under the value of familism, Hispanic American parents emphasize the importance of family, high parental involvement, and high parental monitoring (Ayón, Williams, Marsiglia, Ayers, & Keihne, 2015; Taylor, Conger, Robins, & Widaman, 2015). The value of familism explained the seemingly contradictory results that Latino parents are both highly indulgent and highly controlling (Halgunseth, Ispa, & Ruby, 2006). Specifically, studies showed that, compared to Euro-American parents, Latino parents not only provide more cuddling and comfort to fussy children (see Halgunseth et al., 2006), but also provide more physical guidance in daily caregiving (Carlson & Harwood, 2003) and more

intrusive behaviors during free-play when children are young (Ispa et al., 2004 Luo & Tamis-LeMonda, 2015). Also, the effects of parental control are shaped by these culture-specific child-rearing values. Ispa and colleagues (2004) have found that, unlike European-American families, Hispanic American parents' intrusiveness at 14 months does not have negative effects on child's engagement in the play one year later. Further, the parenting which is high on both closeness and control positively predicts school-aged Hispanic children's social adjustment (Taylor et al., 2015), social self-efficacy (Leidy, Guerra, & Toro, 2010), and greater school engagement (Bingham & Okagaki, 2012).

Overall, cross-cultural studies of children's cognitive and social development reveal that culture moderates the relationship between control/authoritarian parenting and children's outcomes. However, few studies have investigated cultural moderation in the domain of mastery motivation. Therefore, the current study investigates the cultural variations in parental behaviors and the effects of parental behaviors in the domain of child mastery motivation socialization by comparing across sub-cultures in the U.S., including European-, African-, and Hispanic American groups.

Cross-cultural Research Method

The majority of cross-cultural studies that focus on parenting and child socialization (those described in the preceding section) use a variable-oriented perspective to compare the means and effects of parents' behaviors at the group level. A variable-oriented approach allows us to compare the levels and functions of the same parental behaviors and discuss similarities and differences across cultures. The variations between groups are usually interpreted in terms of culturally specific values and traditions (Kotchick & Forehand, 2002). However, this approach has two limitations. First, the construct equivalence is the main challenge of the variable-oriented

method; that is, whether the target behaviors share the same meaning across cultures. The meanings of behaviors are defined by culture, and the same behaviors may have different meanings across cultures. However, cross-cultural studies usually adopt the concepts and measurements from mainstream or Western research (Kim & Wong, 2002). In this case, the European American group is used as the norm (Oyserman, Coon, & Kemmelmeier, 2002), and the differences between European American and other ethnic groups are mistakenly interpreted as "deficiencies" or "deviations" (Kotchick & Forehand, 2002). Second, this approach, which compares means and coefficients among variables across groups, cannot illustrate within-group variance (Coll & Pachter, 2002). Within-group variance is important, but is often neglected in cross-cultural studies. In particular, Hispanic/Latino families vary largely in terms of their origins, levels of acculturation, and socioeconomic levels (Harwood et al., 2002). However, in general, Hispanic culture is more collectivistic than European American culture (Oyserman et al., 2002); child-rearing values and strategies also vary within this heterogeneous group according to their acculturation level (Harwood et al., 2002). For example, one study found that more acculturated Mexican mothers who spoke English shared more similarities in terms of parenting practices with European American mothers than with less acculturated Mexican mothers who spoke Spanish (Hill et al., 2003). Therefore, it is important to incorporate acculturation when comparing a Hispanic group to other groups. In some parts of the analysis in the current study, the Hispanic American group is divided into two groups according to their acculturation level. Sometimes, studies with indigenous samples can make up for some of the shortages of the variable-oriented approach. Indigenous studies provide the cultural-specific child rearing purposes and parenting experiences, and also identify effective parenting styles for each group, thereby breaking the assumption that European Americans represent the norm (Coll & Pachter,

2002; Kotchick & Forehand, 2002). However, the limit of indigenous studies is that specific parenting beliefs and behaviors that originate from unique cultural values are not comparable across cultures.

A person-oriented approach may provide another method of investigating both between- and within-group variances, allowing for both comparisons across cultures and identification of the specific parental behaviors present in a certain cultural group. A person-oriented analysis identifies classes of individuals who show similar or different patterns of targeting behaviors (Magnusson, 2003), which allows for the ability to determine the dominate parenting style present in each culture and whether there are culturally specific parenting styles (within-cultural variance); also allows to investigate whether there are similar styles across cultures, and whether and how the weights of the same styles vary across cultures (between-cultural variance). In addition, another advantage of the person-oriented method is that it allows for the incorporation of multiple dimensions of parenting behaviors and considers the cultural variations in parenting styles, rather than just looking into cultural variations for a certain behavior. However, the person-oriented approach (latent profile analysis approach specifically) only provide exploratory and descriptive results; it is not possible to draw conclusions about the cultural moderation effects, as is possible in variable-oriented studies. Therefore, in the current study, I plan to include both types of analysis to investigate cultural variations in child mastery motivation socialization: 1) I will use a variable-oriented approach to investigate the cultural variance on each parental behaviors, and cultural moderation of the effects of each aspect of parental behaviors which are highly related to child mastery performance; 2) I will use a person-oriented approach to identify the typology of parenting response styles during challenging tasks and then compare between- and within-groups.

Research Questions and Hypotheses

The first research aim I pose in the current analysis is concerned with cultural variations in parental behaviors that are highly related to children's mastery motivation socialization. First, to identify the group differences in the levels of parental autonomy supportiveness, cognitive stimulation, and intrusiveness, a variable-oriented approach will be used to compare group means on each of the three behaviors. I hypothesize that compared to the European American group, the African American and Hispanic parents may demonstrate similar level of autonomy supportiveness and cognitive stimulation, but higher level of intrusiveness. Second, I aim to identify the typology of parental response styles – representing particular combinations of specific behaviors - when children are dealing with challenging tasks, and whether there are common parenting styles across cultures and whether there are unique parenting styles for a certain culture. The person-oriented approach will be used to identify the typology of parental behaviors, and I will perform a comparison between- and within-cultures for the patterns of parental behaviors. Since this is an exploratory study, there are no strong hypotheses for this approach.

The second research aim is about the cultural moderation of the effects of parental behaviors on 3-year-old children's mastery performance in challenging tasks. Specifically, I ask whether autonomy supportiveness and cognitive stimulation have positive effects on child mastery performance across three cultures, and whether intrusiveness has negative effects across cultures. I hypothesize that both parental autonomy supportiveness and cognitive stimulation are positively related to children's mastery behaviors (high persistence and low frustration), and the effects are similar across cultures. In contrast, I hypothesize that culture moderates the effects of parents' intrusiveness: parental intrusiveness has negative effects on children's mastery behaviors

for the European-American group, but the effects are weak or even reversed for African-Americans and Hispanics. Since Hispanic parents' childrearing beliefs and behaviors diverge to a large degree, according to the level of acculturation, the Hispanic group is divided into two subgroups: a highly acculturated group who uses English as their primary language, and a lowly acculturated group who uses Spanish as their primary language. I hypothesize that the levels and effects of parental behaviors on children's mastery behaviors for highly acculturated Hispanic American families are more similar to European Americans than lowly acculturated Hispanic American families.

Method

Participants

The sample is drawn from Early Head Start Research and Evaluation (EHSRE) study. There are 3,001 low-income families who were randomly assigned to either an Early Head Start (EHS) service group or a control group (no EHS services). There are 1,086 (36.2%) primary caregivers who reported that they are European American, 1,014 (33.8%) African American, and 692 (23.1%) Hispanic American. Individuals with other races and participants with missing values for race/ethnicity are equally important but not included in the current study. Since all main outcome and predictor variables for the current study are generated from videotaped data of puzzle game tasks, the current study will use the sample with families who have completed puzzle game task. Across all three ethnic groups, there are a total of 1,558 families videotaped completing challenging tasks. In this sample, there are 636 (58.5% of the original EHSRE European American sample) European American families, 515 (50.8%) African American families, and 407 (58.8%) Hispanic American families. Within the Hispanic sample, 298 families (73.95%) did not use English as the primary language and 105 families (26.05%) used English as

primary language. Table 1 shows the demographic information (e.g., child's gender, maternal education, household income, etc.) for the sample with families who have completed puzzle game task. Chi-square analysis showed that African American families were more likely to live in severe poverty (household income less than 33% of federal poverty threshold) ($\chi 2$ (6) = 45.7, p<.001) and more likely to experience risks (more than 4 risk factors) ($\chi 2$ (10) = 73.3, p<.001), and Hispanic moms were less likely to complete a high school education than European and African American mothers ($\chi 2$ (4) = 135.5, p<.001). I will control for these household and maternal characteristics in the following analysis.

Table 1.

Demographic Information for Families Who Completed Puzzle Game Tasks (Percentage)

	European American	African American	Hispanic American
Total number	636	515	407
Child is male	306 (48.1%)	257 (49.9%)	222 (54.6%)
Maternal education			
<12th grade	205 (32.2%)	226 (43.9%)	274 (67.3%)
12th grade or GED	234 (36.8%)	145 (28.2%)	62 (15.2%)
>12th grade	189 (29.7%)	128 (24.9%)	56 (13.8%)
Missing	8 (1.3%)	16 (3.1%)	15 (3.7%)
Poverty			
Income <33% of poverty level	127 (20.0%)	150 (29.1%)	73 (17.9%)
33-67% of poverty level	178 (28.0%)	113 (21.9%)	108 (26.5%)
67-99% of poverty level	178 (28.0%)	72 (14.0%)	111 (27.3%)
100% or above of poverty level	81 (12.7%)	53 (10.3%)	48 (11.8%)
Missing	72 (11.3%)	127 (24.7%)	67 (16.5%)
Risk factor (sum of five)			
0 risk factors	40 (6.3%)	9 (1.8%)	8 (2.0%)
1 risk factor	144 (22.6%)	68 (13.2%)	57 (14.0%)
2 risk factors	158 (24.8%)	98 (19.0%)	121 (29.7%)
3 risk factors	178 (28.0%)	181 (35.2%)	130 (31.9%)
4 risk factors	97 (15.3%)	136 (26.4)	76 (18.7%)
5 risk factors	19 (3.0%)	21 (4.1%)	14 (3.4%)
Missing	-	2 (0.4%)	1 (0.3%)
Child age (months/SD)	37.2(1.41)	37.1(1.63)	37.1(1.45)

Note. The percentages in the table are within each ethnic group.

Procedures

In order to collect the data, interviewers visited each family at home four times over the course of the study for interviews, observations, and assessments when children were about 14, 24, 36, and 54 months old. Puzzle game tasks were videotaped at the 36 months of age wave. Before collecting data, the interviewers were trained and practiced with at least two families who were not part of the main study, and were required to send one video to Methematica Policy Research team (MPR). They were certificated to collect data with study families only if their videos met the criteria established by the review team. All the videos were copied by MPR and sent to Columbia University team to code by trained coders (see EHS project Final Technical Report Appendixes, 2002).

Puzzle game task. The puzzle game tasks were developed based on the work of Matas, Sroufe, and colleagues (Matas, Arend, & Sroufe, 1978; Sroufe, Egeland, & Kreutzer, 1990, see EHS project Final Technical Report Appendixes, 2002). In the current study, a child was asked to solve up to three puzzles of increasing difficulty (Puzzle 1, teddy bear; Puzzle 2, panda; Puzzle 3, paddington bear) in 6 to 7 minutes. The child was allowed to work on the puzzle for up to 4 minutes. If the child took more than 4 minutes on one puzzle, the interviewer would ask the child to move on to the next puzzle. The parent was instructed to let the child to work on each puzzle by himself/herself, and then give the child any help any time when the parent thought the child needs. The parent was informed to feel free to talk with the child and do what the parent normally would do (EHSRE codebook).

Measures

Observational measurement of parent and child behaviors in a semi-structured puzzle task. Two variables of child mastery behaviors (persistence and frustration) and three variables

of parents' behaviors (autonomy supportiveness, cognitive stimulation, and intrusiveness) were generated from the puzzle game tasks in the current study. There is a seven-point rating scale for each variable. In one dyad (video), the coders recorded 5 scores, one for each of the five variables (two for children's behaviors and three for parents' behaviors)[1]. These seven-point rating scales were adapted from the Newark Observational Study of the Teenage Parent Demonstration (Brooks-Gunn, Liaw, Michael, & Zamsky, 1992; Spiker, Ferguson, & Brooks-Gunn, 1993; Sroufe, Egeland, & Kreutzer, 1990 see EHS project Final Technical Report Appendixes, 2002). Sroufe et al., (1990) used "tool problem tasks" (three games with increased difficulties) to measure children's performance of persistence, dependency, coping, enthusiasm, noncompliance, and negative affect when children were at 24 months old. For each observed variable, the score is a global rating score, ranging from 1 to 7. Then, the authors applied factor analysis to these variables and found that children's persistence (factor loading of 0.85) and frustration (factor loading of -0.31) fell into two different factors. The similar task was also used to measure children's persistence (Spiker et al., 1993) and frustration (Matas, Arend, & Sroufe, 1978), as well as maternal autonomy supportiveness and cognitive stimulation (Matas et al., 1978; Spiker et al., 1993) using global rating scores (ranging from 1 to 7) for each variable. The coding manual of current puzzle game task was adapted from these studies. The definition and rating criteria of each variable will be elaborated in details in the following description for each variable. The indicators of a certain behavior and rating scales can be found in Appendix A.

Reliability. All the videos were coded by the Columbia University research team. The coders were trained with videos which contained exemplars of high, medium, and low scoring behaviors. The coders need to reach 85 percent agreement (exact or within one point) before

[1] In the EHS project, several variables were obtained from the puzzle game tasks. Two of them are not related to the current study, so only five variables are described here.

independent coding. Fifteen to twenty percent of each coder's assignments were randomly selected every week to be used to check the ongoing reliability. In total, 194 videos (12 percent of codable videos) were reliability videos. The average agreement within one point is 93 percent, with a range between 88 to 100 percent, across all the puzzle game coders. (EHS project Final Technical Report Appendixes, 2002, in Appendix C, page 14)

Validity. To investigate the validity of the puzzle game tasks, I examined the correlations between the variables which were obtained from the current coding system and the variables generated from widely used instruments which assess related constructs. I also analyzed whether the variables in the puzzle game tasks can predict later child outcomes as showed in previous studies. Some of these additional instruments and measurement were completed by parents or interviewers during the home visits when children were at 36 months and 54 months; some others were used to assess children when they were at Grade 5. In the following discussion, I will first describe how each variable was measured in the puzzle game tasks and then report the correlations between this variable and the related variables from other instruments (concurrent validity), or/and the predictions of the variables on later child outcomes (predictive validity).

Child persistence. Child's persistence was measured as the degree to which the child remains goal-oriented, focused, and motivated toward the puzzle throughout the session in face of the challenge and boredom. High scores mean that the child showed apparent efforts in solving the puzzle, regardless of whether the child ultimately solved the puzzle (EHSRE codebook). A child with a high level of persistence remained focusing on the task for most of the session. The child monitored their attempts of solving the puzzle, ensured that the pieces fit properly, and tried to understand the task; also the child was able to shift his/her strategies, and sustain attention without parents' redirection. The child could be highly frustrated, but the child

was able to maintain focus on the task or quickly redirect to the task. A child with a low level of persistence showed little self-direction, attempted the puzzle only under parents' directions, or showed protracted off-task episodes. The child with low persistence might play with puzzle consistently but without monitoring his/her strategies of solving the puzzle successfully, randomly place pieces on the board without trying to fit properly, and also display apathetic, bored, distracted, aimless, or resistant (Bradly-Smith, Ryan, Berlin, Brooks-Gunn, & Fuligni, 2001, page 16).

Child persistence rating score is positively related to the observer-rated score of children's sustained attention in Leiter International Performance Scale-Revised (Leiter-R; Roid & Miller, 1997), measured in 54-month visits, r (1243) = 0.17, p <.001. Previous research pointed out that young children's mastery motivation predicts both concurrent (Bae et al., 2014) and later academic achievement (Ryan & Deci, 2000; Turner & Johnson, 2003). Here, children's reading and matrix reasoning scores at 5th grade were chosen as the indicators of academic success. In the current study, child persistence ratings at 36 months predict child's academic achievement at grade 5: persistence predicts the z-scores of reading assessment from Early Childhood Longitudinal Study, β = 0.267, p <.001; and predicts z-scores of matrix reasoning subscale of WISC-IV, β = 0.208, p <.001. This result is consistent with the effects of mastery motivation in previous studies.

Child frustration. Child frustration measures the degree to which the child showed frustration and anger towards the task. For this scale, "the quality (i.e., intensity) of frustrated behaviors is more important than the quantity (i.e., frequency) of occurrence" (Bradly-Smith et al., 2001, page 18). The subtle indicators of frustration "include sigh, putting hands down (or behind back), negative facial expression, whining, pouting, and pushing puzzle pieces away. The

intense indicators of frustration include throwing puzzle pieces away, throwing a temper tantrum, crying about the puzzle (not about parents' behaviors), complaining the puzzle is too hard or not fun, other negative statement about the puzzle with strong negative emotion expressions" (Bradly-Smith et al, 2001, page 18). Children's frustration score at 36 months is negatively correlated with child's persistence score ($r_{(1543)} = -0.21$, $p<.001$). According to previous studies, child's persistence and frustration are two different and opposite constructs (persistence and frustration were loaded in two different factors, in Sroufe et al., 1990). The coding manual also emphasized that it was possible for children to display frustration while maintaining persistence in solving the puzzle. Therefore, I expected the moderate negative correlation between frustration and persistence.

Autonomy supportiveness. Autonomy supportiveness measures the extent to which a parent is "child-centered", or parents' respect of their child's autonomous attempts. Indicators of high autonomy supportiveness include: allowing children to work autonomously when they are interested in the activity, positive feedback on child and child's efforts, encouragement of child to take into consideration the intrinsic values of the task (e.g., "This puzzle looks so fun! I bet you'll love doing this"), and remaining aware of a child's emotional changes and provide necessary responses (e.g., hugging child when he/she is very frustrated) (Bradly-Smith et al, 2001, page 2). There is a positive correlation between the rating score of parental autonomy supportiveness in puzzle game tasks and interviewer's rating of Warmth subscale of Home Observation for Measurement of the Environment (HOME, Caldwell, & Bradley, 1984) which was assessed in 36 months wave, $r(1498) = 0.27$, $p <.001$. Warmth subscale of HOME measures parents' responsiveness and supportiveness observed by the interviewer during the home visit. Warmth is one of the most important characteristics of positive parenting. Parental autonomy

supportiveness also requires parents to have “child-centered” parenting beliefs, be warm and sensitive to child’s needs, but is measured with specific indicators in the puzzle game settings. Ispa et al., (2004) also found that parental warmth in daily communication (measured though HOME) is moderately related to parental supportiveness in the specific parenting practices of free-play when children were at 15 months ($r = 0.22$). Therefore, the moderate correlation between parental supportiveness in the puzzle game task and Warmth subscale of HOME is acceptable.

Cognitive stimulation. This item measures to what extent parents provide child scaffoldings to bring a child above their current understanding and ability. Parents with high-quality cognitive stimulation are sensitive to a child’s needs and ability, and adjust the help provided accordingly. Indicators of highly scored cognitive stimulation include diverse strategies of assistance, informative assistance (e.g., "Where do the feet go, at the bottom or at the top?"), breaking down the steps, presenting instructions logically, and breaking down the instruments into understandable segments (e.g., “It is a picture of three cars, two are small and one is big. Where is the big car's head?”) (Bradly-Smith et al, 2001, page 5). Parent cognitive stimulation in the puzzle game tasks is positively related to the score of HOME Support of Language and Learning (Learning and Literacy Stimulation) subscale, assessed during 36-month visits, $r_{(1507)} = 0.31$, $p < .001$. This subscale includes both interviewer- and self-report items to measure whether parents encourage children to learn, whether they provide suitable and diverse materials for children to learn, and whether they use complex sentences and rich language during the interaction with their children. Parental cognitive stimulation in puzzle game task and Support of language and learning in HOME is correlated but measures different theoretical constructs. The Support of language and learning subscale in HOME measure not only how parents support and

encourage children's independent learning (which is highly correlated with parental cognitive stimulation in puzzle game task), but also measures whether the home environment can benefit children's learning and language development, including items of how many times parents read to their children per week, and whether books and other learning materials are accessible for children. Also, some HOME subscale's items are self-reported, which might be correlated but vary with interviewer's rating. Therefore, the parental cognitive stimulation is expected to be moderately correlated with Support of language and learning subscale in HOME.

Intrusiveness. Coders rate the degree to which the parent controls the child without being sensitive and respecting the child's independent efforts to solve the puzzle. Indicators of intrusive behaviors include persisting with an action that does not interest the child, taking the toy away when the child is still interested in it, taking over the task or doing the puzzle for the child without considering the child's attention and autonomy, not allowing the child to make choices or handle the puzzles, not allowing the child to take turns or go at his/her own pace, and physically intrusive behaviors such as poking the child (Bradly-Smith et al, 2001, page 9). Scores on the Traditional Subscale of the Parental Modernity Scale (PMS, Schaefer & Edgerton, 1985) which is completed by parents during the 25-month home visits is positively related with parent intrusiveness scores in puzzle game tasks at 36-month visit, $r_{(1377)} = 0.31$, $p < .001$. The Traditional Subscale of PMS measures in the degree to which parents have the authoritarian attitudes in childrearing and education, believing that parents should control their children and children should not express their own opinions.

Measurement of demographic information. During the first wave of the study, demographic information was gathered during the interview. Information about parents' education, family income, and whether English was the primary language was gathered.

Results

Missing Data

There are 1,234 families in the EHSRE project who did not have videotaped data of puzzle game. Table 2 shows the demographic information for the families with and without videotaped data. Chi-square analysis showed that families with and without puzzle game data are similar in the variables of children's gender ($\chi2_{(1)} = 1.06$, p=.303) and maternal education level ($\chi2_{(2)} = 3.51$, p=.077), but compared with the families who have completed puzzle game task, the families without puzzle game task experience more severe poverty ($\chi2_{(3)} = 20.04$, p<.001) and higher family risk factors ($\chi2_{(5)} = 25.9$, p<.001). From the results, the families with or without puzzle game data are different in some indicators of the demographic background. The results of the following analysis cannot be generalized to the general low income families; those families who are in severe poverty and with high numbers of risk factors are less represented in the current study, which is further considered in the discussion of the study.

Table 2.

Demographic Information of the Families Who Have and Do Not Have Videotaped Data (Percentage)

	Families who have puzzle game data	Families who do not have puzzle game data
Total number	1558	1234
Child is male	785 (50.4%)	633 (52.4%)
Maternal education		
<12th grade	705 (45.3%)	604 (49.0%)
12th grade or GED	441 (28.3%)	246 (28.0%)
>12th grade	373 (23.9%)	256 (20.8%)
Missing	39 (2.5%)	28 (2.3%)
Poverty		
Income <33% of poverty level	350 (22.5%)	349 (28.3%)
33-67% of poverty level	399 (25.6%)	319 (25.9%)
67-99% of poverty level	361 (23.2%)	217 (17.6%)
100% or above of poverty level	182 (11.7%)	135 (11.0%)

Table 2 (cont'd)

Missing	266 (17.1%)	214 (17.3%)
Risk factor (sum of five)		
0 risk factors	57 (3.7%)	28 (2.3%)
1 risk factor	269 (17.3%)	153 (12.4%)
2 risk factors	377 (24.2%)	300 (24.3%)
3 risk factors	489 (31.4%)	409 (33.1%)
4 risk factors	309 (19.8%)	271 (22.0%)
5 risk factors	54 (3.5%)	72 (5.8%)
Missing	3 (0.2%)	1 (0.1%)

Note. The percentages are within each group with or without puzzle game data.

Within the families who have puzzle game data (the sample used in the current study), the number of missing data for the main variables are shown in Table 4. According to the missing data pattern, the missing data comes from 18 families (1.16% of the sample). Listwise deletion is used in ANOVA in preliminary analysis; and pairwise deletion is used in SEM analysis through Mplus.

Preliminary Analysis

Descriptive results of all the variables are shown in Table 3. Table 4 showed the full matrix of correlation. Parental supportiveness is positively correlated with child's persistence and frustration; and parental intrusiveness is negatively correlated with both child's persistence and child's frustration.

Table 3.

Descriptive Results of Observed Parents' and Children's Behaviors

	Mean (SD)	Range	Missing (freq)
Child mastery behaviors			
Persistence	4.54 (1.16)	1 - 7	14
Frustration	2.68 (1.34)	1 - 7	6
Parents' behaviors			
Autonomy supportiveness	4.46 (1.30)	1 - 7	1
Cognitive stimulation	3.54 (1.18)	1 - 7	2
Intrusiveness	2.68 (1.27)	1 - 7	3

Table 4.

Bivariate Pearson Correlation among Main Variables for Study 1

Main variables	1	2	3	4	5
1. Child persistence	-				
2. Child frustration	-0.21***	-			
3. Parental autonomy supportiveness	0.25***	0.08**	-		
4. Parental cognitive stimulation	0.27***	0.02	0.59***	-	
5. Parental intrusiveness	-0.20***	-0.13***	-0.46***	-0.27***	-

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Results for Research Aim One: Cultural Variations in Parental Behaviors

Comparing means among groups. To investigate the cultural variations in parental behaviors, one-way ANOVA was used to investigate the mean difference among groups. Results showed that group differences were significant for all three parental behaviors (Table 5). Bonferroni test showed that European American group was higher than African- and Hispanic American groups in parental supportiveness and cognitive stimulus. There were no significant differences among African- and Hispanic American groups. For parental intrusiveness, European American group was lower than African American group, and Hispanic group was in the middle. In addition to analyzing parental behaviors, one-way ANOVA was also used to compare children's performance in order to provide information in discussing parental behaviors. It is found that African- and Hispanic children had lower levels of both persistence and frustration than European American children; there were no differences between African- and Hispanic children (Table 5).

Table 5.

Comparing Means between European-, African-, and Hispanic-American Groups (One-way ANOVA)

	European American Mean (SD)	African American Mean (SD)	Hispanic American Mean (SD)	F-value
Child mastery behaviors				
Persistence	4.80 (1.17)	4.29 (1.18)	4.46 (1.04)	29.36***
Frustration	2.88 (1.36)	2.47 (1.31)	2.64 (1.31)	13.71***
Parents' behaviors				
Autonomy supportiveness	4.94 (1.21)	4.04 (1.33)	4.23 (1.15)	83.50***
Cognitive stimulation	3.91 (1.25)	3.23 (1.11)	3.36 (1.00)	57.74***
Intrusiveness	2.33 (1.14)	3.07 (1.34)	2.75 (1.21)	51.77***

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Diversity in Hispanic group. Since Hispanic group is a diverse group, I further investigated whether the levels of parental behaviors for highly acculturated Hispanic American families are more similar to European Americans than lowly acculturated Hispanic American families to European Americans. Hispanic group was divided into two sub groups according to their acculturation level (whether they use English as their primary language at home). First, to investigate the cultural variations in the levels of parental behaviors, one-way ANOVA was used to compare the means among European American families and high-, and low-acculturated Hispanic families (Table 6). Results showed that the three groups were different on the means of parental autonomy supportiveness and intrusiveness; and there was no significant difference in parental cognitive stimulation. Post-hoc test showed that European American families showed higher level of autonomy supportiveness than high-acculturated group; and high-acculturated families were higher than low-acculturated families. For parental intrusiveness, there were no

significant differences between European American group and high-acculturated group; but the low-acculturated group showed higher level of intrusiveness than European American families.

Table 6

Comparing Means between European-Americans, High-acculturated, and Low-acculturated Hispanic American Groups (One-way ANOVA)

	European American Mean (SD)	High-Acculturated Mean (SD)	Low-Acculturated Mean (SD)	F-value
Child mastery behaviors				
Persistence	4.80 (1.17)	4.56 (.99)	4.42 (1.07)	1.22
Frustration	2.88 (1.36)	2.77 (1.28)	2.62 (1.33)	.54
Parents' behaviors				
Autonomy supportiveness	4.94 (1.21)	4.55 (1.22)	4.12 (1.11)	32.82***
Cognitive stimulation	3.91 (1.25)	3.60 (1.17)	3.28 (.92)	1.31
Intrusiveness	2.33 (1.14)	2.51 (1.12)	2.83 (1.24)	2.71*

Cultural variation of parents' response style. To answer this question, latent profile analyses (LPA) was used to investigate the typology of parenting styles, identifying different combinations of three parenting behaviors (including autonomy supportiveness, cognitive stimulation, and intrusiveness) with the sample including all three cultural groups (1558 families). A series of LPA models with categorical outcomes were run from one class (under the hypothesis that there is only one class of individuals in this group who share one pattern of parental behavior combinations) to six classes (under the hypothesis that there are as many as six classes of individuals in this group who have six different parenting styles) in Mplus version 7 (Muthen & Muthen, 2013). According to Table 7, multiple statistical indices were calculated to determine the best fitting model for the current dataset. The lower values of Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Adjusted Bayesian Information

Criterion (ABIC) indicate better fitness for the model. The higher values of entropy (ranging from zero to one) indicate stronger separation and more accurate of classification. The Lo-Mendell-Rubin (LMR) adjusted likelihood ratio test was used to evaluate whether the specified model fits better than a model with one less class (*p* value is less than .05).

According to these indices, the three-class model fitted best. Although model with six classes had the lowest AIC, three-class model had the lowest BIC and highest entropy. The ABIC for three-class model was very similar with four-class model. Also, LRT *p* value showed that three-class model significantly fitted better to the data than two-class model, but models with four, five, and six classes did not fit better than the previous model. In the three-class model, 450 families (29%) have high probability of falling in class 1; 838 families (54%) in class 2; and 264 families (16%) in class 3.

Table 7

Comparison of Model Fit for Different Profile Solutions for Parenting Factors (n = 1552)

	Profile solutions					
	1	2	3	4	5	6
AIC	14,966.04	14,225.43	13,979.74	13,937.60	13,918.81	**13,918.18**
BIC	15,062.29	14,423.28	**14,279.19**	14,338.65	14,421.46	14522.42
Adj. BIC	15,005.11	14,305.74	**14,101.29**	**14,100.39**	14,122.84	14163.45
Entropy	-	.700	**.725**	.679	.700	.673
LRT p value	-	.00	**.00**	.94	.07	.65
% Profile 1	100	44	29	15	14	04
% Profile 2	-	56	54	33	30	08
% Profile 3	-	-	16	16	32	16
% Profile 4	-	-	-	36	18	38
% Profile 5	-	-	-	-	06	08
% Profile 6	-	-	-	-	-	25

Since the outcomes were categorical data, rather than presenting the mean of each variable, results of LPA in the current study showed the probability of the rating from 1 to 7 for

each parental behavior within each class. For example, for families in class one, parents had high probability in scoring 6 in their autonomy supportiveness (.615), and had median probability in scoring 5 (.248) and 7 (.106); they had rare probability in scoring from 1 to 4. Overall, parents in class one have highest probability in scoring 6 for autonomy supportiveness, scoring 5 in cognitive stimulation, and scoring 2 in intrusiveness. Parents in class two had highest probability in scoring 4 in autonomy supportiveness, 3 for cognitive stimulation and intrusiveness. Parents in class three had highest probability in scoring 3 for autonomy supportiveness, 2 for cognitive stimulation, and 5 for intrusiveness.

Table 8.

Probability Scale of Parental Behaviors for Each Latent Class

	Class 1	Class 2	Class 3
Parental autonomy supportiveness			
Rating score 1	0	0	.053
Rating score 2	0	0	.342
Rating score 3	0	.134	.521
Rating score 4	.031	.456	.084
Rating score 5	.248	.369	0
Rating score 6	.615	.042	0
Rating score 7	.106	0	0
Parental cognitive stimulation			
Rating score 1	0	.012	.084
Rating score 2	.027	.113	.545
Rating score 3	.132	.461	.306
Rating score 4	.274	.350	.056
Rating score 5	.378	.062	.005
Rating score 6	.164	.002	.003
Rating score 7	.025	0	0
Parental intrusiveness			
Rating score 1	.290	.133	.120
Rating score 2	.526	.271	.133
Rating score 3	.154	.349	.193
Rating score 4	.022	.207	.155
Rating score 5	.008	.035	.266
Rating score 6	0	.005	.130
Rating score 7	0	0	.004

LPA yielded a probability of membership of each class for every individual. To have a more direct image of the three patterns of parents' response, I assigned individuals to the group in which they have the highest probability of membership. Table 9 showed both the raw scores and z scores for both parental and children's behaviors for each group. To understand the conceptual meanings of the three patterns, I refer the meaning of raw scores for each behavior according to the coding manual. I name parenting style of class 1 as "stimulating and supportive group", with high level of autonomy supportiveness, moderately high cognitive stimulation, and low intrusiveness. I name class 2 as "restrained group", in which group parents did not intervene child's play with either supportiveness or intrusiveness, showing moderate or moderate low level of all three behaviors. Group 3 is named as "directive group", due to the moderate level of intrusiveness and low level of autonomy supportiveness and cognitive stimulation. Figure 2 presented the three groups in a z-score scale.

Table 9.

Means of Parental and Children's Behaviors for Each Group (Both Raw Scores and Z-scores)

	Parental autonomy supportiveness		Parental cognitive stimulation		Parental intrusiveness		Child persistence		Child frustration	
	Mean of raw score	Mean of Z-score	Mean of raw score	Mean of Z-score	Mean of raw score	Mean of Z-score	Mean of raw score	Mean of Z-score	Mean of raw score	Mean of Z-score
Group1	5.909	1.118	4.693	.969	1.965	-.565	4.924	.327	2.803	.090
Group2	4.267	-.147	3.323	-.187	2.702	.015	4.493	-.043	2.657	-.019
Group3	2.524	-1.491	2.250	-1.091	3.893	.953	4.028	-.443	2.540	-.106

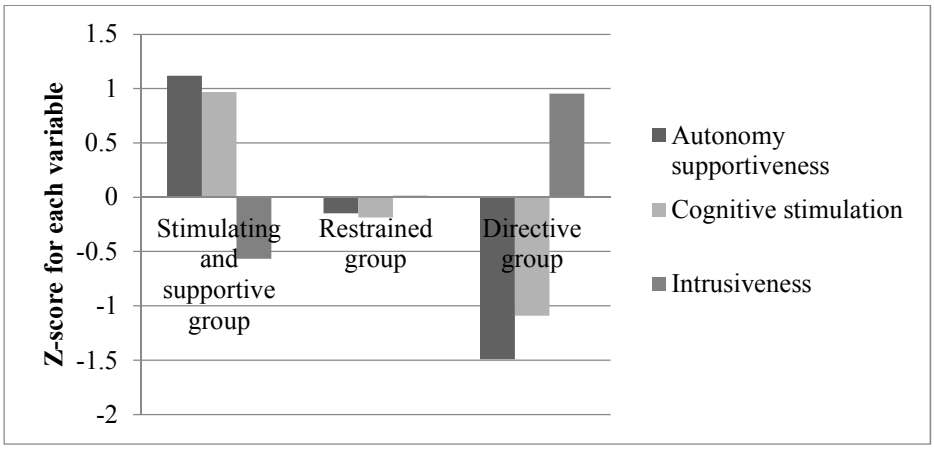

Figure 2. Three parental response styles to children during puzzle game tasks.

After describing the parenting styles for the overall sample, I identified the cultural composition of each parenting style; that is, analyzing how many percent of European-, African- and Hispanic American families were in each parenting style. It is possible that there were confounding variables which might explain the cross-cultural variances. Therefore, some other demographic variables were also taken into account to calculate the composition for each class. Figure 3a-d showed the composition of each class based on the variables of culture, mom's education, income, and family risk factors. Chi-square analysis showed that the three cultural groups distributed unequally in the three classes ($\chi 2$ (4) = 177.86, p<.001). Compared to African American and Hispanic parents, European American group had larger percentage of parents in stimulating and supportive group. Also, compared with the other two cultural groups, African American group had larger percentage of parents in directive group; and Hispanic parents had larger percentage of parents in restrained group. To investigate whether the distributions of other variables (e.g., mom education level, family income, family risk factors) were difference among the three classes, one-way ANOVA and bonferroni test were conducted. Results showed that stimulating and supportive group had higher level of maternal education and family income than restrained group; and restrained group had higher level of both variables than directive group (for

maternal education, F = 77.73, p<.001, for family income, F = 13.27, p<.001). Also, stimulating and supportive group had lower level of family risk factors than restrained group; and restrained group had lower level of family risk factors than directive group (F = 43.46, p<.001). There was no difference across three groups in term of parental depression level (F = 1.37, p<.255).

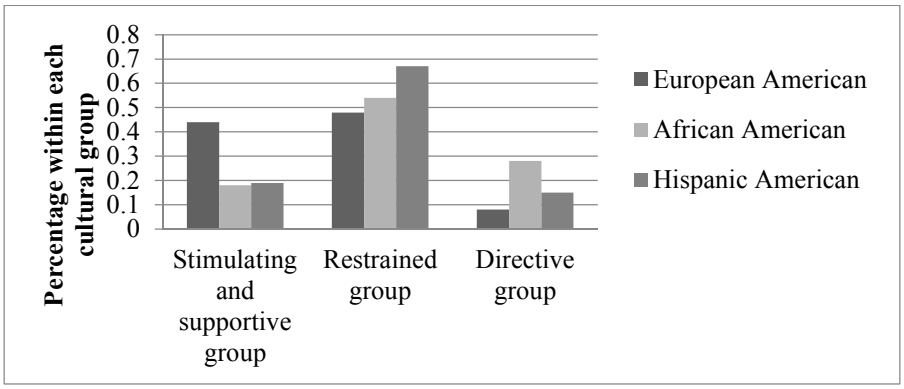

Figure 3a. Percentage within each culture for each parental style group

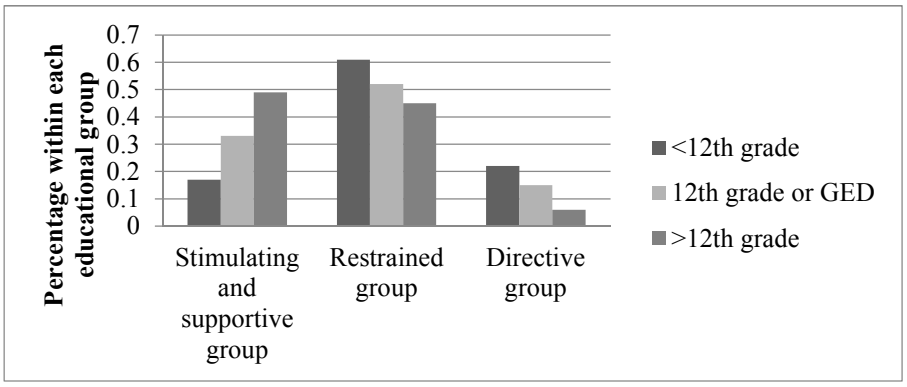

Figure 3b. Percentage within each education level for parental style each group

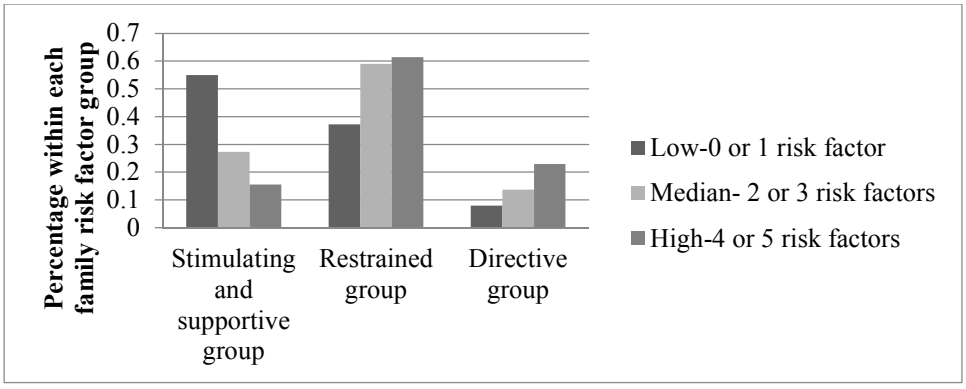

Figure 3c. Percentage within each family risk level for each parental style group

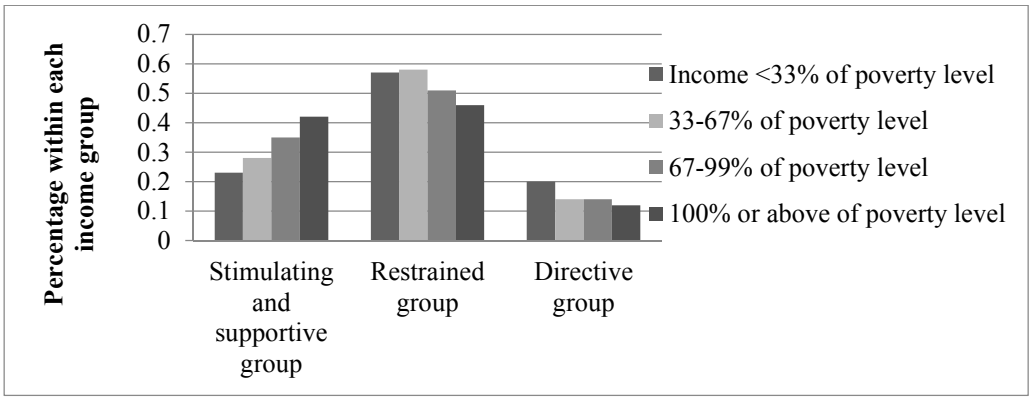

Figure 3d. Percentage within each income level for each parental style group

Results for Research Aim Two: Cultural Moderations in the Effects of Parental Behaviors

General model with the sample including all three cultural groups. In order to investigate cultural moderation on parental behaviors and child mastery behaviors, a multi-group SEM framework was used to compare the effects of parental behaviors across three groups. Before conducting multi-group analysis, the theoretical SEM model how parental behaviors influence child mastery behaviors (Figure 4) was analyzed with the overall sample including all three cultural groups. Since previous studies have shown that SES influence parental behaviors (e.g., Gershoff et al., 2006), therefore, parental education and income were controlled in the model. Also, child's temperament at 14 months and child's sex were tested as control variables for child's mastery behaviors (child persistence and frustration). Because each of the key variables (parental and children's behaviors) was measured as one rating score (ranging from 1 to 7) these five variables were analyzed as categorical variables in Mplus. Also, the model fit indices showed that the model with categorical variables fitted much better than models which treated these variables as continuous variables.

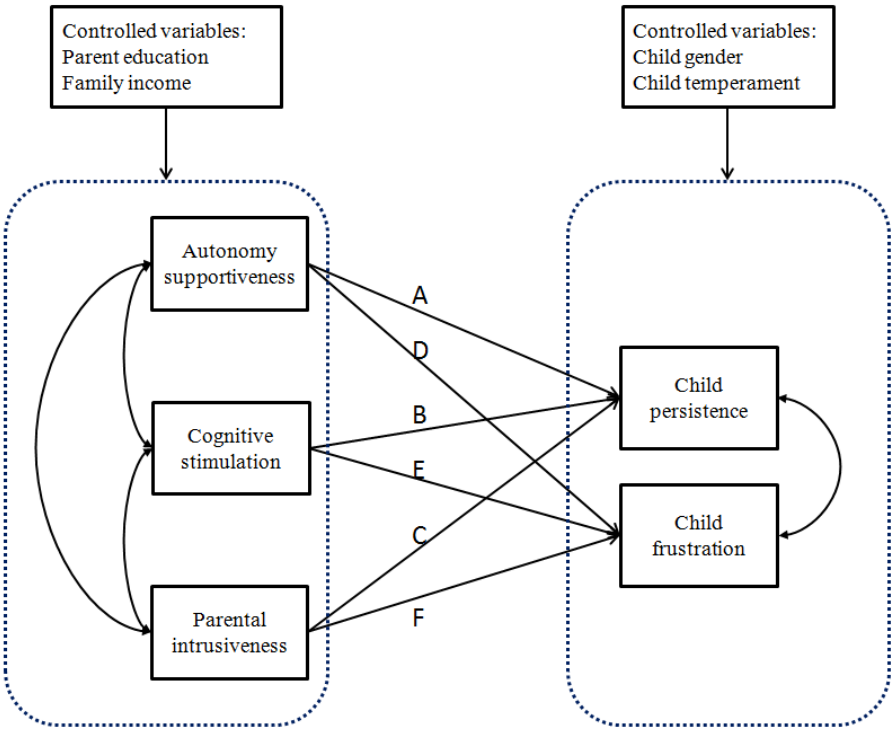

Figure 4. Theoretical SEM model about how parental behaviors influence child mastery behaviors.

Figure 5 showed the results of the SEM analysis; non-significant coefficients were presented as dashed lines in the figure. Because of the missing data in controlled variables, especially in maternal education and family income, there are 1284 families were included in the SEM analysis. The model fitness indices indicated that the model adequately fitted the empirical data (Chi-square = 44.209, $p < .001$, RMSEA = 0.041, CFI = 0.986, TLI = 0.966). As shown in Figure 5, parents' autonomy supportiveness and cognitive stimulation positively predicted children's persistence in puzzle game, but did not predict children's frustration. The higher level of parental intrusiveness led to the lower level of both children's persistence and frustration.

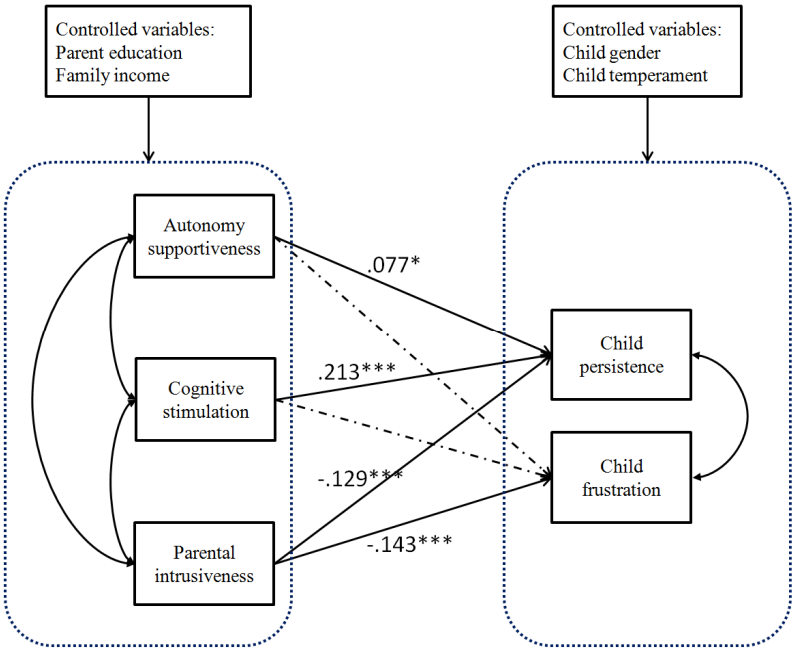

Figure 5. SEM model of how parental behaviors influence child mastery behaviors with categorical predictors and outcomes.

Cultural moderation in the effects of parental behaviors. Using a multi-group SEM framework, I compared the theoretical model presented in Figure 4 across three cultural groups. The baseline model relaxed all the six coefficients of key variables (paths A through F in Figure 4), the variances and covariance of variables, and effects of controlling variables (mom's education, family income, child temperament, and child's sex) across three groups. At the same time, the baseline model constrained the thresholds of three parental behaviors and two children's mastery behaviors across three groups. Then, the six coefficients of the paths ABCDEF in Figure 4 were constrained one by one to investigate whether culture moderates the effects of parental behaviors on children's performance. In these constrained models, the coefficients of controlling variables and the covariance among variables remained relaxed across groups. The series of constrained models were nested; therefore, the diff-test was analyzed in Mplus to compare the model fitness indices of a certain constrained model to the previous model (Table 10).

Table 10

Diff-test of Nested Constrained Models for Study 1

Cons-training order	Constrained coefficients	Chi-square (df = 2)
1st	A- From autonomy supportiveness to children's persistence	1.648
2nd	A and B- From parental cognitive stimulation to children's persistence	1.640
3rd	A, B, and C- From parental intrusiveness to children's persistence	5.726~
4th	A, B, C, and D- From autonomy supportiveness to children's frustration	2.012
5th	A, B,C,D, and E- From parental cognitive stimulation to children's frustration	2.261
6th	A, B, C, D, E, and F- From parental intrusiveness to children's frustration	5.139~

~p <.10

Diff-test showed that when constraining the coefficients of parental intrusiveness on child persistence or frustration, the model fitted worse than the previous less constrained model, which means that the effects of parental intrusiveness on children's mastery behaviors vary across three cultural groups. However, the effects of parental cognitive stimulation and autonomy supportiveness on children's mastery behaviors were not significantly different among three cultural groups. Then, the multi-group SEM was analyzed again with the coefficients of parents' autonomy supportiveness and cognitive stimulation constrained to be equal across groups, and the coefficients of parents' intrusiveness were set free. There were 542 European American families, 420 African American families, and 322 Hispanic families in the analysis. The model fitness indices were Chi-square = 137.580, p =.163, RMSEA = 0.026, CFI = 0.983, TLI = 0.983. Figure 4 showed the results of multi-group SEM model for three cultural groups. After constraining, parental autonomy supportiveness did not predict children’s persistence and frustration; parental cognitive stimulation positively predicted children’s persistence. The effects of parental intrusiveness vary across three cultural groups. For European American families, the

increase of parental intrusiveness led to the decrease of both children's persistence and frustration; for African American group, the increase of parental intrusiveness only led to the decrease of children's frustration; for Hispanic group, parental intrusiveness did not predict either of the children's mastery behaviors.

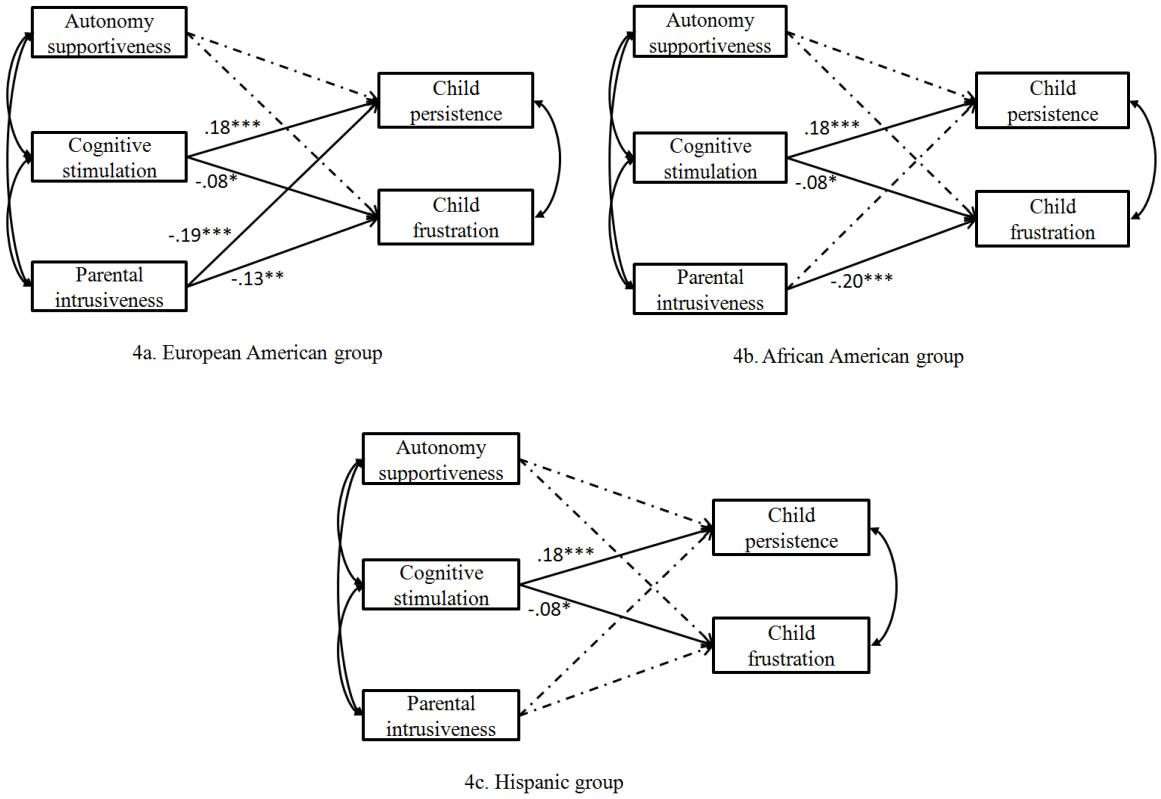

Figure 6. Multi-group SEM with the effects of parental autonomy supportiveness and cognitive stimulation constrained and the effects of intrusiveness were set free across three cultural groups

Diversity in Hispanic group. To investigate whether the functions of parental behaviors for the high-acculturated Hispanic group were more similar to European American group than the low-acculturated Hispanic group, I conducted a series of regressions, for both children's mastery outcomes (child persistence and frustration). As shown in Table 11, parental autonomy supportiveness and cognitive stimulation positively predicted children's persistence across all three groups (European American and two Hispanic groups); and there were no cultural

differences. Parental intrusiveness negatively predicted children's persistence; low-acculturated group had lower level of children's persistence than the other two groups; also, parental intrusiveness had larger impacts on children's persistence in low-acculturated group than in the other two groups. There were no differences between high-acculturated Hispanic group and European American group in the level and function of parental intrusiveness. Parental autonomy supportiveness and cognitive stimulation did not predict children's frustration, but a higher level of parental intrusiveness led to a lower level of children's frustration. There was no difference among three groups in terms of the effects of parental behaviors on children's frustration.

Table 11.

Summary of Regression Analysis for Children's Persistence and Frustration

	Children's persistence			**Children's frustration**		
Controlled variables						
Child's sex	-.30***	-.31***	-.28***	.00	.00	.01
Engagement at 14 mon	.08	.08	.09	-.03	-.02	-.03
Parental behaviors						
Autonomy supportiveness	.21***	-	-	-.01	-	-
Cognitive stimulation	-	.25***	-	-	-.06	-
Intrusiveness	-	-	-.22***	-	-	-.15**
Dummy variables for cultural groups						
High acculturated Hispanic	.14	.15	-.52	-.06	-.28	-.52
Low acculturated Hispanic	.17	-.31	-.72**	-.70	-.37	-.41
Interaction						
High × Autonomy supportiveness	-.07	-	-	.00	-	-
Low × Autonomy supportiveness	-.08	-	-	.10	-	-
High × Cognitive stimulation	-	-.09	-	-	.05	-
Low × Cognitive stimulation	-	.04	-	-	.02	-
High × Intrusiveness	-	-	.12	-	-	.18
Low × Intrusiveness	-	-	.17*	-	-	.07
R2	.083	.108	.076	.009	.009	.018

* $p<.05$; ** $p<.01$; *** $p<.001$

Discussion for Study 1

The current paper investigated cultural variances in the forms and functions of parental behaviors on children's mastery behaviors in the specific settings of puzzle game tasks. Using

both variable- and person-oriented approaches, the current study provides new evidence about how parents socialize their children's mastery motivation in different sub-cultures in the U.S. Comparing groups, parents were different in the levels of three parental behaviors: European American parents showed a higher level of parents' autonomy supportiveness and cognitive stimulation, and a lower level of intrusiveness than the other two groups. Also, Hispanic parents had a lower level of intrusiveness than African-American parents. With latent profile analysis focusing on each individual, three classes of parents were identified: stimulating and supportive parents, restrained parents, and directive parents. Although the restrained style was the most common group for all three cultural groups, the cultural distribution varied across three classes: European American parents had larger proportion in stimulating and supportive group; African American had larger proportion in directive group; and Hispanic parents had larger proportion in the restrained group.

This study also found that, with the overall sample, parents' autonomy supportiveness and cognitive stimulation positively predicted children's persistence, but were not related to children's expression of frustration during puzzle game tasks; and a higher level of intrusiveness led to lower levels of both children's persistence and expression of frustration. Parental autonomy supportiveness and cognitive stimulation positively predicted children's behaviors across all three groups, but culture moderated parental intrusiveness on children's mastery behaviors. Intrusiveness suppressed both child persistence and frustration in European American group, but only suppressed child frustration in African American group and did not predict child's behaviors in Hispanic American group. High acculturated Hispanic group was more similar with European American group in terms of the level and function of parental intrusiveness than low acculturated Hispanic group.

No Frustration, No Good

The findings in the current study about the impacts of parental behaviors on child persistence in puzzle tasks are consist with previous theories and empirical evidence for child mastery motivation socialization. Parental autonomy supportiveness and good quality of cognitive stimulation positively predicted children's persistence because, according to SDT theory (Ryan & Deci, 2000), children's feelings of autonomy, competence, and relatedness were protected, which are the essentials for children's intrinsic motivation development. Meanwhile, parents who exhibit a high level of intrusiveness limit children's opportunities of autonomous exploration, and may lead children to internalize the idea that they are unable to and not expected to make attempts, so parental intrusiveness negatively predicted child persistence.

Contrary to the expectations of the current study, parental intrusiveness did not lead to higher levels of frustration for children, rather, parents' intrusiveness suppressed child persistence and frustration at the same time. That is, rather than making children frustrated, parental intrusiveness may diminish young children's interests in the task and lead children to withdraw from the challenging task. This implies that a child experiencing no frustration may not be a good sign for problem solving or mastery motivation in the future, but instead may indicate low interest in the activity, and subsequent low motivation to complete it.

This result also draws us to rethink the conceptual relationships among mastery motivation, persistence, and frustration. In previous studies, frustration is usually viewed as a sign of decreased enthusiasm and persistence (Boyed, 1982; Burhans & Dweck, 1995; Deater-Deckard, Petrill, & Thompson, 2007; Nolen-Hoeksema, Wolfson, Mumme, & Guskin, 1995). For example, Burhans and Dweck (1995) have found that those preschoolers who tended to avoid challenges and chose not to persist in tasks were more likely to report negative feelings

than those who were willing to persist in challenging tasks. Also, in the research of helplessness, frustration is even viewed as a reason of non-persistence (Nolen-Hoeksema et al., 1995). For example, Boyd (1982) hypothesized that endured feeling of frustration for a thwarting from a goal may lead to people's give up from a task/activity because of their expectation of incapability. Further, other than mastery motivation, frustration and persistence are measured as two opposite components for some other psychological attributes/process, such as emotion regulation (Dennis, 2006). However, a child's frustration and persistence are not necessarily opposite to each other; and frustration may not be a negative indicator of mastery motivation. From the findings of the current study, child persistence and frustration were only moderately negatively correlated ($r = -.21$); also comparing across groups, European American children showed highest level of both persistence and frustration compared with the other two groups.

It is possible that frustration is positively related with persistence and one's mastery motivation. First, it is often neglected in mastery motivation studies that frustration is a natural reaction, that is, one of the possible products, of one's strong initiation of reaching a goal when encountering difficulties. Frustration will not be generated in front of an impediment unless the individual has a strong motivation to reach the goal (Berkowitz, 1989). Second, frustration may serve functions in the challenging or novel situations. Loewenstein (2005) raised that the unpleasant feeling of a lack of knowledge can lead to curiosity. For example, Litman (2005) explained that "wanting" and "liking" are two different systems; anxiety and frustration with the current uncertainty may prompt people to explore and overcome the challenge (Wong, 1979). It is possible that a child who is frustrated in the puzzle game may not "like" the task, but he still "wants" to solve the problem. Last, in previous studies (including the current study), frustration is conceptualized as general upset and annoyance that one feels because of an inability to change

or achieving something, and is measured using variety of indicators, including indicators of minor upset and distress and also intense expression of anger and aggression behaviors (Bradly-Smith et al, 2001, p. 9). However, different types of negative emotions may serve different functions. Anger which is accompanied with physical arousal and desire of a goal is viewed as approaching emotion; whereas, sadness and fear serve as withdrawing emotion with movement away from a goal (Lewis, Sullivan, & Kim, 2015). Approach and withdraw emotions and behaviors were first raised by Darwin in nineteen centuries (Darwin & Prodger, 1998). The empirical evidence about positive effects of anger on the development of persistence is rising recently (He, Xu, & Degnan, 2011; Lewis, Sullivan, & Kim, 2015). He et al., (2011) found the positive link between anger at toy removal and persistence with 2 to 5 years old children. With longitudinal data and even younger infants, Lewis et al., (2015) found that 5 month infants' anger response to the blocked goal was positively related to their persistence at play in toddlerhood. In the current study, according to the coding manual, "the quality (i.e., intensity) of frustrated behaviors is more important than the quantity (i.e., frequency) of occurrence" (Bradly-Smith et al., 2001, page 18). Therefore, the high score of frustration in the current measurement likely represented more anger and less sadness or distress, because anger is more intense and easy to identify than withdraw emotions. Thus, parental intrusiveness hindered both child persistence and the approach-oriented negative emotions (e.g., anger), which suggested that intrusiveness dismissed children's desire of reaching a goal and is a harmful parenting to child's mastery motivation development with the overall sample including European-, African-, and Hispanic American families.

Cultural Variances in the Meaning of Intrusiveness

The study examined cultural variations in parental behaviors and cultural moderations of the effects of parental behaviors on child mastery motivation in the puzzle game. Although higher levels of intrusiveness were found among African American and Hispanic parents, parental intrusiveness showed weaker impacts on child's mastery behaviors in these two groups than in the European American group. Specifically, parental intrusiveness diminished children's involvement for the European American group by suppressing both child persistence and frustration. However, no negative effects of parental intrusiveness on child persistence were found in the African-American families, although African-American parents have the highest level of intrusiveness compared to the other two cultural groups in the current study. This means that in European American families, when parents are intrusive, children disengage from the challenging task; whereas for the children in the African-American groups, parents' intrusiveness was not associated with the level of child persistence; children with more intrusive parents stayed equally engaged in the task. Also, Hispanic parents had a higher level of intrusiveness than European American parents, but there was no evidence in the current study that Hispanic parents' intrusiveness influenced children's performance in puzzle game task.

The findings of the current study are consistent with previous studies of cultural variations in the levels and effects of parenting on other aspects of child social and cognitive development (e.g., Bae et al., 2014; Baumrind, 1973; Ispa et al., 2004). It has been found that Latino and African American parents showed higher level of parental control, both physically (Carlson & Harwood, 2003; Ispa et al., 2004; Kotchick & Forehand, 2002) and psychologically (Durrett et al., 1975), than European American parents. Previous studies have also found that parental control has less negative effects on child outcomes for African- and Hispanic- American

families, such as toddlers' engagement in play (Ispa et al., 2004), and young children's compliance (LeCuyer et al., 2011), than it does for European American children. These results reflect the cultural variations in the meanings of parental control or intrusiveness, which is influenced by cultural values. In African American groups, control is viewed as a necessity and one of the characteristics to support child development (Ispa & Halgunseth, 2004; Tamis-LeMonda et al., 2009). In Hispanic American families, with the cultural value of "familism" and "respect", parental control is viewed as an important aspect of parenting (Ayón et al., 2015; Taylor et al., 2015) and often goes along with high level of warmth (Halgunseth er al., 2006). In accordance with Vygotsky's sociocultural theory, children in these two cultures may have internalized the specific meanings of parental intrusiveness in interactions with their parents, and therefore, did not react as negatively as European American children to parental intrusiveness during the puzzle games (Vygotsky, 1980).

It was also found in the current study that, although the three cultural groups showed different levels of parental supportiveness and cognitive stimulation, the effects of these parental behaviors were similar. That is, the quality of parents' supports and assistance promoted children's persistence and lowered children's frustration in the puzzle game across all three cultural groups. As pointed by Bornstein (2012), the similarities in the functions of the parenting behavior may reflect universality in some functions of parenting, even if the level or degree of certain interaction qualities varies across cultures. The universality of the function for a certain parenting behavior might imply that this parenting behavior is an inherited attribute in caregiving (Bornstein, 2012). In practice, these similarities in the positive effects of parental supportiveness and cognitive stimulation across cultures might provide us the evidence that an intervention

focus on improving parents' strategies in assisting and scaffolding their children might be applied to families with diverse cultural backgrounds to benefit children's performance in challenges.

To further understand cultural variance in socializing children's mastery motivation, I bring together the results of cultural variances in levels of both parents' and children's behaviors, as well as the cultural moderation of the effects of parental behaviors. It is found that African-American children presented less persistence as well as lower frustration compared with their European-American counterparts during the tasks. Meanwhile, African-American parents have a higher level of intrusiveness than European-American parents, but African-American parents' intrusiveness did not influence their children's persistence, but suppressed children's frustration. These results possibly due to African-American parents' discouragement of children's expression of negative emotions (Nelson, Leerkes, O'Brien, Calkins, & Marcovitch, 2012) and emphasizing of self-control and obedience (Consedine & Magai, 2002), in order to protect their children from the discrimination. Nelson and colleagues (2012) have found that African-American mothers accepted children's negative emotion expression (including both approaching emotions, like anger, and withdrawing emotions, like fear and sad) less than European-American mothers; and African-American mothers links more negative social consequences to children's display of negative emotions. Research of ethnic/racial socialization have revealed that, because of the history of oppression, African-American parents values self-control, obedience, and less self-disclosure, to prepare their children to be successful in the future interaction with the majority culture (Kelley, Power, & Wimbush, 1992). Therefore, in the current study, it is possible that children are not encouraged to express frustration when they are dealing with difficulties. Further, it may be that those African-American parents who presented high levels of intrusiveness are more rooted in African-American culture and less adapted to European-American culture. Thus,

when children internalize the cultural expectation of not expressing frustration during dealing with challenges, children tend to show less frustration with parents' intrusiveness. Also, as explained above, because parental intrusiveness in African American families is not viewed as "negative" parenting as it is in European American families, it did not influence children's persistence. In the future, through both quantitative and qualitative studies, it is necessary to further investigate how parents' beliefs, expectations, and attitudes towards children's performance in response to challenges vary across cultures.

Person-oriented Approach in Cross-cultural Research

A particular strength of the current study is the use of both variable-oriented and person-oriented approaches to investigate the between- and within-group variances of parental behaviors and styles. The variable-oriented approach assumes the homogeneity of the interested characteristics within a certain cultural group, and compares the distance between groups in terms of means or effects for certain variables. However, the within-group variance and the similarities and differences in the typology of parenting styles are unable to be explored in this approach. A person-oriented approach focuses on the characteristics for each individual, and can take multiple dimensions of parental behaviors into account and allows the different combinations of these variables, rather than only comparing only one particular variable at a time. A person-oriented approach enables us to describe the unique and common typologies for a certain culture, and also compare typologies across cultures. Although ANOVA (a variable-oriented approach) results showed that Hispanic- and African- American parents had higher level of intrusiveness and lower level of autonomy supportiveness and cognitive stimulation, when taking all three behaviors into account, LPA (a person-oriented approach) showed that "restrained group" is the main parenting style for all three cultures (48% for European American group, 54%

for African-American group, and 67% for Hispanic American group). Further, nearly 20 percent of African- and Hispanic- American parents were in the stimulating and supportive group, which means that they presented high level of autonomy supportiveness and cognitive stimulation, and low level of intrusiveness. Similarly, 8% of European American parents were in directive group, which means that these European American parents showed low level of supportiveness and high level of intrusiveness. Overall, the variable- and person-oriented approaches showed complementary results, and parts of the results of the two approaches confirmed each other. For example, a larger proportion of European American parents were in the stimulating and supportive group compared to the other two cultural groups; whereas a larger proportion of African American parents were in the directive group. Using both approaches, the current study investigated cultural variances in parental behaviors and parenting styles from different perspectives, not only comparing group differences of each parental behavior, but also illustrating the commonality and uniqueness of parenting styles across cultures in socializing mastery motivation in a puzzle game settings.

Limitation and Future Studies

The sample used in the current study is drawn from a nation-wide large sample; the large sample size enables SEM analysis for investigating the comprehensive model of socializing child mastery motivation in family contexts. However, the current study has the weakness that all the families in the study are in poverty. Also, the sample of the current study is limited to the families who have the puzzle game videotaped data. Those families without videotaped data were in more severe poverty and experienced more family risk factors, which were less represented by the study. Therefore the conclusions of the current studies cannot be generalized to other SES groups. If we could enlarge the diverse of the sample, the variables in the current

study might have larger variance and therefore might alter our conclusion about the non effects of parental intrusiveness on child persistence.

The current study measures parental behaviors and children's behaviors through a direct observation - a measurement which provides more accurate data about parent-child interactions than questionnaires or interviews (Aspland & Gardner, 2003; Roggman et al., 2013). However, one strong critique of the current study could be our reliance on one rating score (ranging from 1 to 7) of each key variable, which leaves challenges of ruling out the possibility of psychometric issue as one of the explanations for the null results in the current study. However, the current study tried to address this limitation by establishing some evidence of validity through calculating the relationship between the current measurement and some other measurements in the same datasets, including well-used surveys and observations for parents' and children's behaviors in other contexts. Furthermore, previous studies which used a similar way to measure parenting in a free-play setting (one overall rating score for each parenting variable) have shown the reliability of the measurement (Ispa et al., 2004) and the stable effects of parenting on child outcomes (Brady-Smith et al., 2013; Chang, Park, Singh, & Sung, 2009; Chang, Park, & Kim, 2009; Fuligni et al., 2013; Fuligni & Brooks-Gunn, 2013). In the future, to enhance the reliability of the measurement, the key behaviors should be observed repeatedly, such as coding each variable via time-sampling in order to obtain multiple observations within one video, or measuring child persistence as the total time of goal-directed behaviors, which is a continuous variable.

The findings of cultural variance of the effects of parental intrusiveness suggest different meanings of intrusiveness for socializing child mastery motivation in different cultures, and also implicated future methods of examining parental behaviors, especially parental intrusiveness.

Parental control is a general concept and can be measured from different aspects, such as non-punitive control and punitive control (Halgunseth, Ispa, & Rudy, 2006). Also, the format of parental control varies according to children's age. For infants, toddlers, and young children, parental control is usually studied as parental protection, physical guidance, directing and modeling; for older children and adolescents, parental monitoring, psychological control, and ruling are usually examined (Halgunseth et al., 2006). In the current study, in the setting of puzzle tasks for 3 year olds, parental intrusiveness was mainly non-punitive control, which is defined as parents' physically or verbally influencing children without being sensitive and respecting the child's independent efforts to solve the puzzle, but still involved several sub-concepts of parental control, such as modeling, directing, physical guidance, which need to be specified in the future studies. It could be that these specific behaviors involved in parental control and intrusiveness are somewhat different in different cultures, but that our unitary rating of intrusiveness did not allow for that distinction. In addition, parental intrusiveness is measured through the same group of indicators for all the three cultural groups. It does not account for different cultural understandings of the meaning of the construct, nor whether it can be measured through the same indicators across cultural groups. Future studies should identify the cultural variations of the construct for parental intrusiveness and how different aspects of parental intrusiveness were conceptualized in different cultures through both qualitative and quantitative studies.

Another question should be addressed in future studies is that the parents' beliefs of educating young children to deal with challenges and how parents' theory of socializing child mastery motivation varies across cultures. The current study has found cultural differences in the format and functions of parenting behaviors and styles in response to children's performance in

challenging situations. However, it is understudied that the reason why parents presented different behaviors and parenting styles during the puzzle game. Cultural variance in parents' domain specific theories of socializing children's development have been done on the field of child emotion development; that is, cross-cultural studies of parents' meta-emotion philosophy (Gottman, Katz, & Hooven, 1996). Studies have found that European American parents own more theories of emotion coaching and acceptance of their own and children's emotions than Asian parents, but culture moderates the effects of parental meta-emotion philosophy on child externalizing behaviors, social competence, and parent-child interaction (Daga, Raval, & Raj, 2015; Nahm 2006). However, parents' philosophy about socializing young children's mastery motivation is understudied. Future studies should focus on revealing parental domain specific beliefs about child mastery motivation development, and cultural differences of these beliefs or theories.

Implications

The findings of current study imply parents and early educators that parents' supports of children's autonomous attempts and appropriate helps maintaining the moderate difficulties of the tasks are two effective strategies to improve children's mastery behaviors. What's important, these strategies can be applied for all the three cultural groups. In addition, African- and Hispanic American children might be more tolerant to caregivers' intrusiveness than European American children; moderate level of intrusiveness might not influence African- and Hispanic American children's involvement in the tasks. Therefore, practitioners who work with families in these two cultures should focus on increasing parental positive behaviors rather than decreasing parental intrusiveness because parental intrusiveness might have different meanings from European American group.

Conclusions

Results of the current study suggested that parental autonomy supportiveness and cognitive stimulation can promote child persistence in puzzle game; and the positive effects of these behaviors are similar across cultures. Parental intrusiveness not only diminishes child persistence but also suppress children's expression of frustration; that is, parental intrusiveness makes children less involved in problem solving contexts. Furthermore, these negative effects of parental intrusiveness only hold in European American group; the effects of intrusiveness are weaker in African- and Hispanic American families.

CHAPTER 3. ETHNIC VARIATIONS IN THE PROCESS OF CHILD MASTERY MOTIVATION SOCIALIZATION

Literature Review

Study 1 has investigated cultural variance in the effects of parenting on child mastery motivation development. However, the influence of parental behaviors on child outcomes is only part of the mechanism of children's mastery motivation socialization. Parenting behaviors are directed by parents' child-rearing values and beliefs (Friedlmeier & Trommsdorff, 1999; Mesquita & Albert, 2007), which are influenced by cultural values and socioeconomic status (SES). As Bronfenbrenner's ecological systems theory of child development suggests, it is necessary to put the relationships between parental behaviors and children's mastery behaviors into a larger context to investigate how children's mastery behaviors are socialized through both the direct impact of parenting behaviors and indirect impact of SES (parents' education and family income). Kohn (1969) pointed out that social class affects parents' childrearing values, which would further influence parents' behaviors towards their children. In the domain of children's mastery motivation development, few studies have investigated models with both macro-level factors, such as SES, and micro-level factors, such as parenting and parental practices. SES is a complex phenomenon which incorporates a group of variables of financial, educational, and occupational status (Featherman, Spenner, & Tsunmatsu, 1988). Maternal education level and family income are two important predictors of SES level. Since the current study focuses on low income families, the insufficiency of variation in family income undermines our ability to test the effects of SES on parental behaviors and children's outcomes. Further, because the influence of maternal education on parenting is robust, irrespective to the control of family income and occupation (Richman, Miller, & LeVine, 1992), the current study

aims to reveal how maternal education influences child mastery behaviors as mediated through parenting style and parenting practices in low income families. However, within low income families, the variations of family resources cannot be neglected. There are still variations in resources and risks within low income groups, from in severe poverty (income is lower than 33% of the poverty level) to those just above the federal poverty line and still considered very poor. Therefore, family income will be a control variable in the current study.

Plenty of cross-cultural/ethnic studies investigate the effects of SES on parenting or child outcomes through two approaches: either considering SES and ethnicity as two independent predictors and estimating the effects of the two in separate models (e.g., Lansford, Deater-Deckard, Dodge, Bates, & Pettit, 2004; Pinderhughes, Dodge, Bates, Pettit, & Zelli, 2000), or considering SES factors as confounding factors of ethnicity, and treat them as control variables in the analysis (e.g., Fuligni & Brooks-Gunn, 2013; McCable et al., 2013; Mcloyd & Smith, 2002). Through these approaches, considering the effects of ethnicity and SES together, it is possible to understand how much between- and within-group variance can be explained by SES; and it is found that some conclusions about minority families are confounded with the effects of SES (Kotchick & Forehand, 2002). For example, SES is considered as one of the reasons why African-American and Hispanic parents use more control than European-American parents: Since minorities usually experience the more economic hardship and lower level of parents' education than European Americans, which are the main risk factors for poor child development, African American and Hispanic parents may attempt to prepare their children for difficulties in the future through the use of tougher parenting values and stricter parenting styles than European American parents (Julian, McKenry, & McKelvey, 1994). However, this approach ignores the questionable assumption about whether SES factors influence parents and children from different

ethnicities in the same way. That is, little attention has been paid to the assumption that ethnic groups share the same effect of SES on family functioning. Therefore, another approach that has recently become popular is to investigate the model equivalence across ethnicities of the child socialization process, including SES, parenting, and child outcomes. For example, Raver, Gershoff, and Aber (2007) tested the model equivalence across three ethnic groups (White, Black, and Hispanic) of how family income influences child school readiness mediating through parenting. However, there is a lack of studies that investigate whether different ethnicities share the same theoretical construct of socializing child mastery motivation socialization. Thus, the second aim for the current study is to test the model equivalence of the effect of parent education on child persistence in challenging tasks, as mediating through parenting, comparing across White, Black, and Hispanic groups.

The Direct and Indirect Effects of Parenting on Child Mastery Behaviors

Family context shapes child development not only through parenting styles which are parents' collective behaviors and general attitudes towards children, but also through specific parenting practices (Darling & Steinberg, 1993). According to Baumrind's parenting style theory, authoritative parents tend to provide a warm atmosphere at home and respect the independence of children (Baumrind, 1991). Children with authoritative parents are willing to work on challenges or master their environment (Ryan & Deci, 2000). With samples which highly represent European American, authoritative parenting is found to be positively related to child intrinsic motivation and performance in learning (Turner, Chandler, & Hefer, 2009). In contrast, authoritarian parenting, which is represented as a high level of control without being sensitive to children's needs, or accompanied with harsh discipline and negative emotional expressions, shows negative effects on children's intrinsic motivations and may lead to children's poor

performance in learning tasks (Deci & Ryan, 2000; Ng, Kenney-Benson, & Pomerantz, 2004; Ryan & Deci, 2000).

Findings show that, in the specific challenging tasks or problem solving contexts, parental autonomy supportiveness and cognitive stimulation positively predict children's mastery behaviors. Parental autonomy supportiveness refers to parental encouragement of independence and emotional supportiveness. Parental cognitive stimulation means that parents adapt their guidance to children's current developmental level and provide scaffolding to fit children's zone of proximal development (ZPD) (Grusec & Davidov, 2010; Heckhausen, 1987b, 1993; Young & Hauser-Cram, 2006). These two parental behaviors benefit child performance in challenging tasks because they promote children's feelings of autonomy, competence and relatedness, which are the essential feelings for developing intrinsic motivations in learning (SDT, Ryan & Deci, 2000). In contrast, parental intrusiveness in challenging contexts may suppress children's behaviors and limit children's opportunities for autonomous exploration (Brinker & Lewis, 1982; Busch-Rossnagel, 1997), and therefore undermine children's feelings of competency and intrinsic interests towards the environment (Ng et al., 2004). Therefore, parental intrusiveness is associated with poor persistence and more negative affect (Ryan & Deci, 2001).

Both parenting styles and specific parenting practices are related to a child's performance in challenging contexts, but few studies investigate the relationship between parenting styles and parenting practices and how they shape child outcomes together. Part of the current model aims to investigate the direct and indirect effects of parenting on children's mastery behaviors. I hypothesize that both parenting styles and parenting behaviors in a specific practices influence children's performance; and also parenting styles influence child's behaviors indirectly through the specific parental behaviors. Specifically, parental autonomy supportiveness and cognitive

stimulation require parents to have "child-centered" parenting beliefs, be sensitive to the child's needs and ability, and adjust their responses accordingly, which are key characteristics of authoritative parenting styles (Baumrind, 1991; Bornstein, Putnick, & Lansford, 2011). Carr and Pike (2012) also found that authoritative parents tend to provide scaffolding during parent-led teaching activities. Therefore, the model of direct and indirect effects of parenting is shown in Figure 7, which is part of the overall model for socializing child mastery motivation.

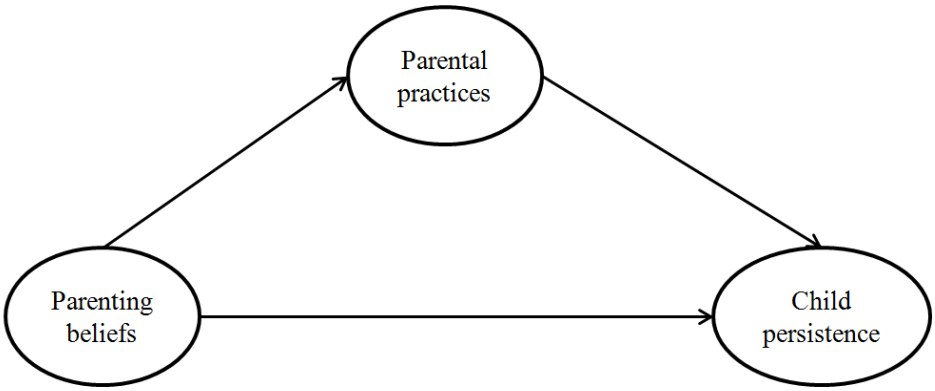

Figure 7. Theoretical model for parenting beliefs, specific parental behavior and child mastery behaviors.

The Direct and Indirect Effects of Parent Education on Parenting Behaviors

Plenty of research revealed that maternal education level is related to child cognitive development and achievement motivation, mediating through parenting styles and parent-child relationships (Davis-Kean, 2005; Dubow, Boxer, & Huesmann, 2009; Lugo-Gil & Tamis-LeMonda, 2008; Raver et al., 2007). Parent education and family income directly affect parenting beliefs and styles. Kohn (1969) proposed that one of the most important dimensions of parenting values is the contrast between conforming values (respecting obedience and external authority) and self-directing values (emphasizing a child's independence and conducting behaviors out of an internal drive). Rokeach (1968) defined "value" as a central and general

belief about how one ought or ought not to behave. Parents' conforming versus self-directing values can be interpreted as parents' progressive versus authoritarian childrearing beliefs (Schaefer & Edgerton, 1985). Parents with progressive beliefs have a "child-centered" childrearing attitude and therefore these parents tend to treat children as independent individuals, encourage children to express their own ideas and support children's autonomous initiations. In contrast, parents with authoritarian beliefs value strictness in parenting, respect for authority and obedience in children (Campbell, Pierce, March, & Ewing, 1991; Bornstein et al., 2011). Both types of beliefs are important for child development (Bornstein et al., 2011). Studies have shown that parents from low SES families are usually more inclined towards an authoritarian attitude and show more authoritarian parenting behaviors than families from high SES families (Kohn, 1969, Lansford, 2012; McLoyd, 1990; Tuner & Johnson, 2003). For example, Davis-Kean (2005) has found that parents with high parental education level showed high levels of warmth and supportiveness.

Other than the effect on parenting styles, parental education also influences specific parenting practices directly. Previous studies with school aged children have found that parental education predicts parents' expectation for children's school achievement (Davis-Kean, 2005; Halle, Kurtz-Costes, & Mahoney, 1997; Yamamoto & Holloway, 2010), and enhances parents' knowledge of child development and abilities so that they can put their expectations into effective parenting behaviors (Tuner & Johnson, 2003). For example, Alexander, Entwisle, and Bedinger (1994) have found that, with lower levels of education, parents' expectations of their children's academic performance are less related to children's actual academic performance, because parents with lower levels of education level are less effective in their involvement with their children's academic work. However, parental education has impacts on children's cognitive

development before school age, stating as early as one year old (Roberts, Bornstein, Slater, & Barrett, 1999). Little attention has been paid on how parental education early influences in young children. Also, other than children's cognitive development and academic achievement, few studies investigated how parental education impact young children's social emotional development. The current study links the effects of parental education on 3-year-old children's mastery motivation development.

Further, few studies have investigated the relationships among parent education, specific parenting beliefs and practices which are highly related to socializing child mastery motivation in puzzle game settings. Using an African American sample, Tuner and Johnson (2003) found that family income and maternal education are related to more child-centered beliefs, which leads to a positive parent-child relationship, and then results in high children's mastery motivation and high academic achievement. However, in the Turner and Johnson's (2003) model, the parent-child relationship is measured very broadly, which is possibly related to positive child outcomes in many aspects of child social and cognitive development (O'Brien & Mosco, 2012). Parental autonomy supportiveness, cognitive stimulation, and intrusiveness in challenging contexts, which directly influence children's mastery motivation, are not included in their model. Since high parent education is related to high sensitivity and low authoritarian control, which may lead to more support for child autonomy and problem-solving and less intrusiveness in challenging tasks, I hypothesize that, in addition to the direct effects on parenting styles and specific parental behaviors, maternal education has indirect effects on specific parental behaviors, mediating through general child-rearing parenting beliefs and attitudes. The theoretical model is showed in Figure 8.

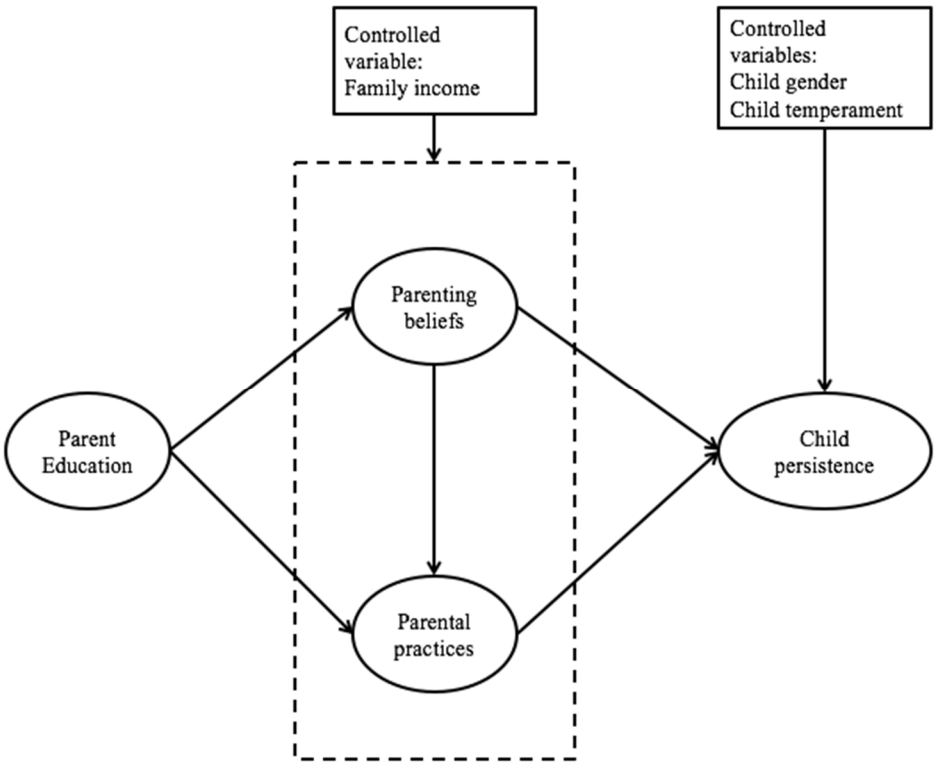

Figure 8. Theoretical model for mastery motivation socialization in family context

Model Equivalence

Will race/ethnicity moderate the process of socialization? Previous studies which tested model equivalence across ethnicities have suggested that the effects of socioeconomic background on family functioning are similar across races (Gutman & Eccles, 1999; Raver et al., 2007). For example, comparing the equivalence of an SEM model among White, Black, and Hispanic families, Raver and colleagues (2007) found similar paths across these three groups for family income, parent investment, and child cognitive development. Also, Gutman and Eccles (1999) found similarities between European- and African-American families; in both ethnic groups, parent-adolescent relationships and parent investment mediated the influence of family income on adolescents' academic achievement. By comparing model equivalence between European- and African-American samples, Davis-Kean (2005) found that, for both groups,

parental education and family income were positively related to parents' expectations for their children's educational achievement. However, Davis-Kean (2005) found that parental education was positively related with parental warmth in the European-American sample, but the path was not significant in the African-American sample. Therefore, in the current study, I hypothesize that although minorities are more likely to experience life hardships, specifically lower parental education and family income, than European-American families (e.g., Julian et al., 1994), the effects of parental education on parenting beliefs and behaviors are similar across ethnicities.

However, the paths between parenting and child outcome in the model may vary across ethnicities. The meaning of parental control may be different across ethnicities. For African American culture, which has a long history of experiencing racism and other types of hardships throughout life, parental control may not be seen as "bad" parenting and rather serves as a protective mechanism for children. For African American families, control is viewed as one of the characteristics of supportive parenting (Tamis-LeMonda, Briggs, McClowry, & Snow, 2009) and is often combined with parental warmth (Ispa et al., 2004). Also, for Hispanic families, "respect" is one of the most important and unique child-rearing values, which refers to parents' expectation that children are well-behaved and respect authorities (Harwood, Leyendecker, Carlson, Asencio, & Miller, 2002; Santiago-Rivera, Arredondo, & Callardo-Cooper, 2002). The emphasis on children's respectfulness and obedience may lead parents to have use more controlling behaviors and be less supportive of children's autonomy (Harwood et al., 2002; Tamis-LeMonda, Sze, Ng, Kahana-Kalman, & Yoshikawa, 2013). For example, compared with European-American parents, Hispanic-American parents with preschoolers and school-aged children showed more hostile control (Hill, Bush, & Roosa, 2003) and more directive and commanding child-directed speech (McCabe et al., 2013). Also, Hispanic mothers are more

likely to use physical control strategies when interacting with their infants than European American mothers (Carlson & Harwood, 2003). However, in Hispanic families, parental control and monitoring of their children are viewed as one of the necessary components of their parenting style (Taylor, Conger, Robins, & Widaman, 2015). In regression models (regressing parental behaviors on child social-emotional development), culture moderated the relationship between parental control and child outcomes: authoritarian parenting showed negative effects on child social emotional development for European American families; but the effects of authoritarian parenting/control on children's development were weak, or even reversed, for minorities (e.g., Baumrind, 1973; Ispa et al., 2004; LeCuyer, Swanson, Cole, & Kitzman, 2011; Chao, 1994). Therefore, I hypothesize that in our model, the effects of autonomy-supportive parenting beliefs and parenting supportive behaviors on child persistence in challenging tasks are similar across ethnicities; whereas, the effects of authoritarian parenting beliefs and parental intrusiveness on child mastery behaviors will vary across ethnicities; for European-American sample, authoritarian parenting beliefs and intrusiveness will be negatively related to children's outcome, but these effects will be weaker or non-existent for minorities than for European-Americans.

Research Question and Hypotheses

First, I ask, what are the mechanisms by which parenting styles socialize children's mastery motivation in the family context? I hypothesize that parent education has direct effects on parenting beliefs and parenting behaviors (specifically, parental autonomy supportiveness, cognitive stimulation, and intrusiveness in challenging tasks), and that the influence of education on specific parental behaviors is mediated through parenting beliefs. Further, I expect that

parenting beliefs and parental behaviors influence child mastery behaviors directly; and that parenting beliefs also influence child mastery behaviors through specific parental behaviors.

Second, I analyze whether and how the socialization process of young children's mastery motivation in the family context varies across ethnicities. I hypothesize that overall, the model of mastery motivation socialization within the family context varies across races/ethnicities, but part of the process shares similarities across these groups. Specifically, minorities have relatively higher family hardship (low parental education and family income), accompanied by higher authoritarian parenting beliefs and intrusiveness than the European-American group, but the direct and indirect effects of parent education, progressive parenting beliefs, and parental supportiveness in challenging tasks are similar across races/ethnicities. However, I also hypothesize that race/ethnicity moderates the effects of parents' authoritarian parenting beliefs and intrusiveness on children's mastery performance.

Method

Participants

We use the public used data of Early Head Start Research and Evaluation (EHSRE) study. Since the main variables were generated from puzzle game task, the sample of the current study is the 1,558 families who complete the videotaped challenging tasks when children were 36 months mold. There are 636 European American families, 515 African American families, and 407 Hispanic American families. Those who were in EHSRE study but have no puzzle game task data (1,234 families) were not included in the current analysis, who experience more severe poverty ($\chi 2$ (3) = 20.04, p<.001) and higher family risk factors ($\chi 2$ (5) = 25.9, p<.001) than families. Those families are less represented in the current study.

Measures

Parents' and children's behaviors. Parents' behaviors (autonomy supportiveness, cognitive stimulation and intrusiveness) and child persistence were all measured through the puzzle game task. In this task, children were instructed to complete three puzzles of increasing difficulties one by one within seven minutes. If a child worked on one puzzle more than 4 minutes, the interviewer would provide the next puzzle for the child to play with. The interviewer told parents to let children finish the task by themselves but please provide help when parents thought necessary and please talk to children as they normally do. Then the coders will code each behavior in a seven-point rating scale. The inter-coder agreements in all behaviors are between .88 and 1.00; and the average inter-coder agreement is .93 (EHS project Final Technical Report Appendixes, 2002, in Appendix C, page 14). The similar observational and coding methods were applied in free-play task, which data has been widely used in previous studies (Brady-Smith et al, 2013; Ispa et al., 2013; Fuligni et al., 2013; Fuligni & Brooks-Gunn, 2013) and the validity and reliability have been proved (Ispa et al., 2004).

Child persistence. Child persistence is coded as in which degree the child persists in goal-directed behaviors, and focuses on solving the puzzle. Indicators of child persistence includes: focusing on the piece when he/she is working on it; monitoring their own behaviors and try different strategies to solve the puzzle (e.g., try different places; turn the pieces; examining the board, etc.). When coding child persistence, whether the child ultimately solves the puzzle and the child emotional expression were not considered in the coding system (EHSRE codebook). That is, the child could be failed in solving the puzzles and feel very frustrated in the process, but he/she still can have high score in persistence if he/she presents high level of goal-directed behaviors and attention.

Parental autonomy supportiveness. Parental autonomy supportiveness is defined as parents' respect and encouragement for child's autonomous attempts. High scores mean that parents allow children to work on their own pace in solving problems, provide appropriate feedbacks when children make efforts, encourage children to like the task and feel the task is fun, and provide necessary emotional supports (e.g., hug when children feel frustrated) (Bradly-Smith, Ryan, Berlin, Brooks-Gunn, & Fuligni, 2001, unpublished coding manual, page 2).

Parental cognitive stimulation. This measures in what degree parents could be sensitive to children's need and ability, then adjust their assistance to provide necessary help to children while maintaining the moderate difficulties of the task. Parents who have high score would break down the task into small steps and provide instructions logically; rather than defectively helping children (e.g., put it here), parents would provide informative assistance (e.g., "This piece is curved. Where does it look like a curved piece might fit?"); parents would switch their strategies of assistance (e.g., if verbal statement does not work, parents may switch to demonstration, or combined modes) (Bradly-Smith et al, 2001, unpublished coding manual, page 5).

Parental intrusiveness. This item is coded as in the degrees to which parents control children without being sensitive to children's needs and attention and without being respective to children's autonomous attempts in solving puzzles. Parents who have high scores in intrusiveness if they persist on some behaviors or instructions that does not interest children, do not allow children to solve the puzzle at their own pace, do not allow children to handle a piece that they reach for, take over the task and do it for children, and physically grabbing the pieces that interest children or poking children (Bradly-Smith et al, 2001, unpublished coding manual, page 7).

Parenting beliefs. Parenting beliefs which are related to children's autonomy and giving children room for initiative were measured in the current study. According to SDT theory, the tangible rewards (for example, treats for children, money for adults) and punishment (such as, threat, or pressured evaluations) may lead to an accomplished goal, but will diminish one's intrinsic motivation of achieving the goals (Ryan & Deci, 2000). Only the feelings of autonomy and the opportunities of self-determination are able to enhance one's intrinsic motivation on a certain task (Ryan & Deci, 2000). Therefore, parents' beliefs and attitude towards children's initiative, autonomous exploration, making choices, and expressing themselves are important and closely related to children's mastery motivation development. Parents who tend to treat children as independent individuals and encourage children to express their own ideas are defined as having "child-centered" childrearing beliefs. In contrast, parents who value strictness in parenting, respect for authority and obedience in children are viewed as authoritarian parents. The two opposite parenting beliefs which are highly related to child mastery motivation development are captured in Parental Modernity Scale (PMS) (Schaefer, & Edgerton, 1985). In the current study, a short version of PMS was used when children were 24 months old. There are two subscales: a traditional subscale (e.g., "The most important thing to teach children is absolute obedience to their parents."), which measures parental authoritarian beliefs; and a progressive subscales (e.g., "Children have a right to their own point of view and should be allowed to express it."), which measures the degree to which parents support children's autonomy and give children room for initiative. Each of the scales contains 5 items.

The internal consistency reliability of traditional scale is 0.73; and the internal consistency reliability of progressive scale is 0.68 (EHSRE Project Measures and Compendium, 2016, Appendix A, page 42 - 43). Each item is a 5-point scale. A higher score on the progressive

subscale means parents are inclined to progressive parenting beliefs; a higher score on the traditional subscale means parents are inclined to authoritarian beliefs. For each subscale, if one item is missing, then the missing value is imputed from the mean of other scores. For all cases with one or no items missing, the score of each subscale is the total score for all 5 items. If more than one item is missing, the subscale is set equal to missing. Therefore, there are 181 (11.6% of the sample) missing values for PMS measurement.

Demographic information. Parents' education and income were gathered in the 14-month-wave in the parent interview.

Results

Preliminary Analysis

Descriptive results of the main variables for each ethnic group were shown in Table 12. One-way ANOVA was used to investigate the mean difference among ethnic groups. Results showed that group differences were significant for all the main variables (Table 12). Bonferroni test showed that European American group was higher than both African- and Hispanic American groups in parental supportiveness, cognitive stimulation, and children's persistence; and there was no difference between African-American and Hispanic group in these variables. For parental intrusiveness, European American group was lower than African American group, and Hispanic group lied in the middle. For parenting beliefs, European American group had higher level of progressive beliefs than African American group; and African Americans were higher than Hispanic parents in the level of progressive beliefs. African- and Hispanic Americans were higher than European American in the authoritarian beliefs; and there were no differences between African-American and Hispanic groups. European American had the highest level of

mom's education, and Hispanic group was the lowest; and African American group lies in the middle.

Table 12.

Descriptive Results of the Main Variables

	European American Mean (SD)	African American Mean (SD)	Hispanic American Mean (SD)	One-way ANOVA F value
Child mastery behaviors				
Child Persistence	4.80 (1.17)	4.29 (1.18)	4.46 (1.04)	29.36***
Parental behaviors				
Autonomy Supportiveness	4.94 (1.21)	4.04 (1.33)	4.23 (1.15)	83.50***
Cognitive stimulation	3.91 (1.25)	3.23 (1.11)	3.36 (1.00)	57.74***
Intrusiveness	2.33 (1.14)	3.07 (1.34)	2.75 (1.21)	51.77***
Parenting beliefs				
Autonomy-supportive	22.01(2.80)	20.43 (3.47)	19.82 (3.86)	55.83***
Authoritarian	16.97 (4.20)	19.81 (3.53)	20.12 (3.98)	96.39***
Parent education*	1.97 (0.79)	1.80 (0.82)	1.44 (0.73)	51.77***

* Parent education is coded as 1 - Completed less than 12 years of schooling; 2 - Completed 12 years of school or a GED; 3 - Completed more than 12 years of schooling.

Table 13 showed the full matrix of correlation. Child persistence positively correlated with parental autonomy supportiveness and cognitive stimulation, as well as progressive parenting beliefs and maternal education level; negatively correlated with parental intrusiveness and authoritarian parenting beliefs. Parents' progressive beliefs were positively related to parental autonomy supportiveness and cognitive stimulation, and negatively related to parental intrusiveness. Parental education was positively related to progressive beliefs and negatively related to authoritarian beliefs.

Table 13.

Bivariate Pearson Correlation among Main Variables for Study 2

Main variables	1	2	3	4	5	6	7
1. Child persistence	-						
2. Parental autonomy supportiveness	.25***	-					
3. Parental cognitive stimulation	.27***	.59***	-				
4. Parental intrusiveness	-.20***	-.46***	-.27***	-			
5. Autonomy-supportive beliefs	.08**	.23***	.22***	-.17**	-		
6. Authoritarian beliefs	-.13***	-.32***	-.24***	.21***	-.22***	-	
7. Maternal education	.14***	.31***	.24***	-.18***	.19***	-.28***	-

* p<0.05, **p<0.01, ***p<0.001

Results for Research Question One: How is Children's Mastery Motivation Socialized in Family Contexts?

To answer this question, the theoretical SEM shown as Figure 9 was analyzed using the whole sample including all three race/ethnic groups, to determine whether and how parent education influences children's mastery behavior, mediating through parenting beliefs and behaviors. Parental supportiveness was a latent variable, which contained two components: autonomy supportiveness and cognitive stimulation. Also, the effects of child sex and temperament on child persistence were controlled; also controlled were the effects of family income on parenting beliefs and parental behaviors.

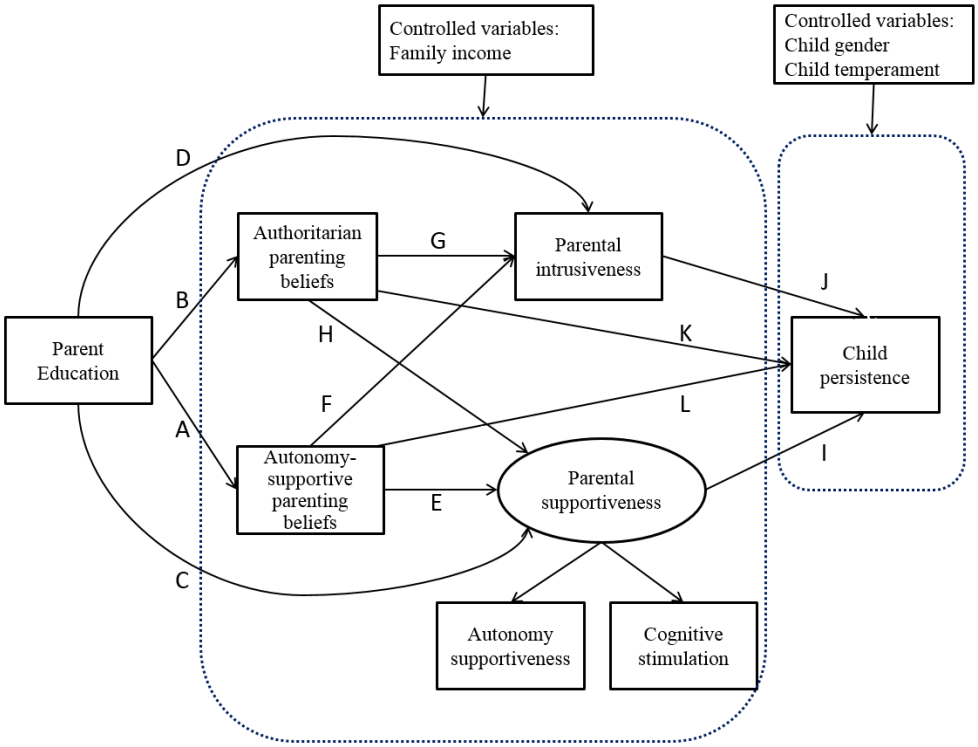

Figure 9. Theoretical model of socializing child mastery performance in family context.

Figure 10 showed the results of the SEM analysis; non-significant coefficients were presented as dashed lines in the figure. Because of the missing data in controlled variables, especially in maternal education and family income, there are 1,284 families included in the SEM analysis. Because each of the parental and children's behaviors was measured as one rating score, ranging from 1 to 7, these five variables were analyzed as ordinal categorical variables in Mplus. Another reason of treating these variables as categorical variables was because the model with categorical variables fit much better than models which treated these variables as continuous variables. The fitness indices indicated that the current model fit well with the empirical data ($\chi 2 = 108.37$, $p<.001$, RMSEA = .057, CFI = .965, TLI = .927). Parental education predicted parenting beliefs; and predicted parental behaviors (supportiveness and intrusiveness) both directly and indirectly (mediating through parenting beliefs). Parenting beliefs predicted child persistence indirectly, mediating through parental behaviors. Neither

parenting autonomy-supportive beliefs nor authoritarian beliefs significantly predict child persistence directly.

The direct and indirect effects of parental education and parenting beliefs were assessed through path analysis in Mplus. As shown in Table 14, both direct and indirect effects of maternal education on parental behaviors (including both supportiveness and intrusiveness) were significant. The effects of maternal education on parental behaviors were partially mediated through parenting beliefs. The direct effects of parenting beliefs on child persistence were not significant for either autonomy-supportive beliefs or authoritarian beliefs. The effects of both autonomy-supportive and authoritarian beliefs on child persistence were mediated through parental supportiveness, rather than intrusiveness.

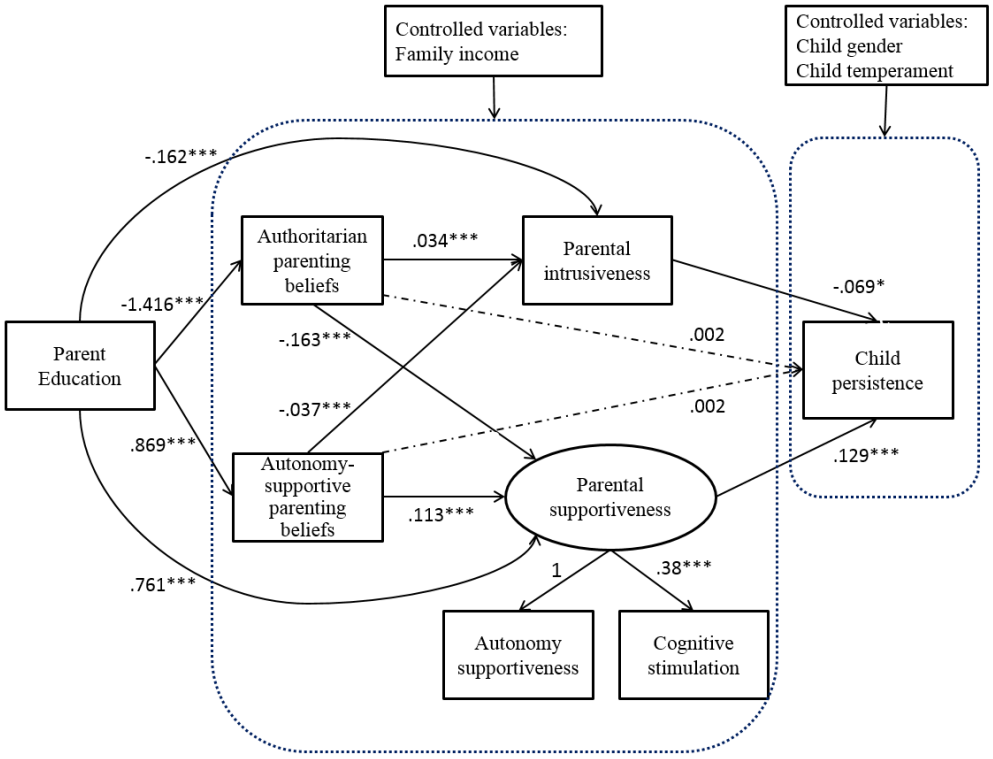

Figure 10. SEM of socializing child mastery performance in family context.

Table 14

Direct, Indirect and Total Effects of Maternal Education and Parenting Beliefs

	Effects of maternal education on parental behaviors		Effects of parenting beliefs on child persistence	
	Effects of mom education on supportiveness	Effects of mom education on intrusiveness	Effects of autonomy-supportive beliefs on child persistence	Effects of authoritarian beliefs on child persistence
Total effects	1.089***	-.242***	.019*	-.022**
Direct effects	.761***	-.162***	.002	.002
Total indirect effects	.328***	-.080***	.017***	-.023***
Specific indirect effects				
Edu-Prog-Supp	.098***	-	-	-
Edu-Trad-Supp	.230***	-	-	-
Edu-Prog-Intru	-	-.032**	-	-
Edu-Trad-Intru	-	-.048***	-	-
Prog-Supp-Persist	-	-	.015***	-
Prog-Intru-Persist	-	-	.003	-
Trad-Supp-Persist	-	-	-	-.021***
Trad-Intru-Persist	-	-	-	-.002

Results of Research Question Two: How Does the Process of Socializing Young Children's Mastery Motivation in Family Context Vary across Ethnicities?

To answer the second question, a multi-group SEM is used to test the model equivalence across ethnicities. The baseline model was analyzed relaxing all the coefficients of the key variables (paths A through L), coefficients of controlling variables, and the covariance and variance of variables ($\chi 2 = 196.045$, $p<.001$, RMSEA = .036, CFI = .965, TLI = .964). Then, I constrained the coefficients for the key variables (paths A through J) across the three ethnic groups one by one; because the direct effects from parental beliefs to child persistence were not significant in the analysis for research question one, the paths K and L were left as free across groups. The coefficients of controlling variables and the covariance among variables still remained relaxed across groups. These series of models were nested; therefore, the diff-test were

analyzed in Mplus to compare the model fitness indices of a certain constrained model to the previous model (Table 15).

Table 15.

Diff-test of Nested Constrained Models for Study 2

Cons-training order	Constrained coefficients	Chi-square (df = 2)
1st	A-From maternal education to autonomy-supportive beliefs	6.822*
2nd	A, B-From maternal education to authoritarian beliefs	4.692~
3rd	A, B, C-From maternal education to parental supportiveness	1.335
4th	A through C, D-From maternal education to parental intrusiveness	3.739
5th	A through D, E-From autonomy-supp beliefs to parental supportiveness	.634
6th	A through E, F-From autonomy-supp beliefs to parental intrusiveness	.939
7th	A through F, G-From authoritarian beliefs to parental supportiveness	3.114
8th	A through G, H-From authoritarian beliefs to parental intrusiveness	3.486
9th	A through H, I-From parental supportiveness to child persistence	1.626
10th	A through I, J-From parental intrusiveness to child persistence	8.123*

According to the diff-test results, constraining the coefficients of maternal education on parenting beliefs across groups led to significant different model fitness, which meant the effects of maternal education on parenting beliefs varied across three ethnic groups. Similarly, the effect of parental intrusiveness on child persistence varied across three ethnic groups. That is, ethnicity moderated the effects of mom education on parenting beliefs and the effect of parental intrusiveness on child persistence. The effects of mom education on parental behaviors, parenting beliefs on parental behavior, and parental supportiveness on child persistence were similar across groups. The multi-group SEM was analyzed again with the coefficients of maternal education on parenting beliefs and the coefficient of intrusiveness on child persistence relaxed across groups, and the other coefficients constrained to be equal across groups (Chi-square = 182.997, $p < .001$, RMSEA = 0.036, CFI = 0.966, TLI = 0.962). As shown in Figure 11,

for European American group, maternal education only predicted authoritarian parenting beliefs; and parental intrusiveness negatively predicted child persistence. For both African American and Hispanic Americans, maternal education predicted both autonomy-supportive and authoritarian parenting beliefs, but in these two groups, parental intrusiveness did not predict child persistence.

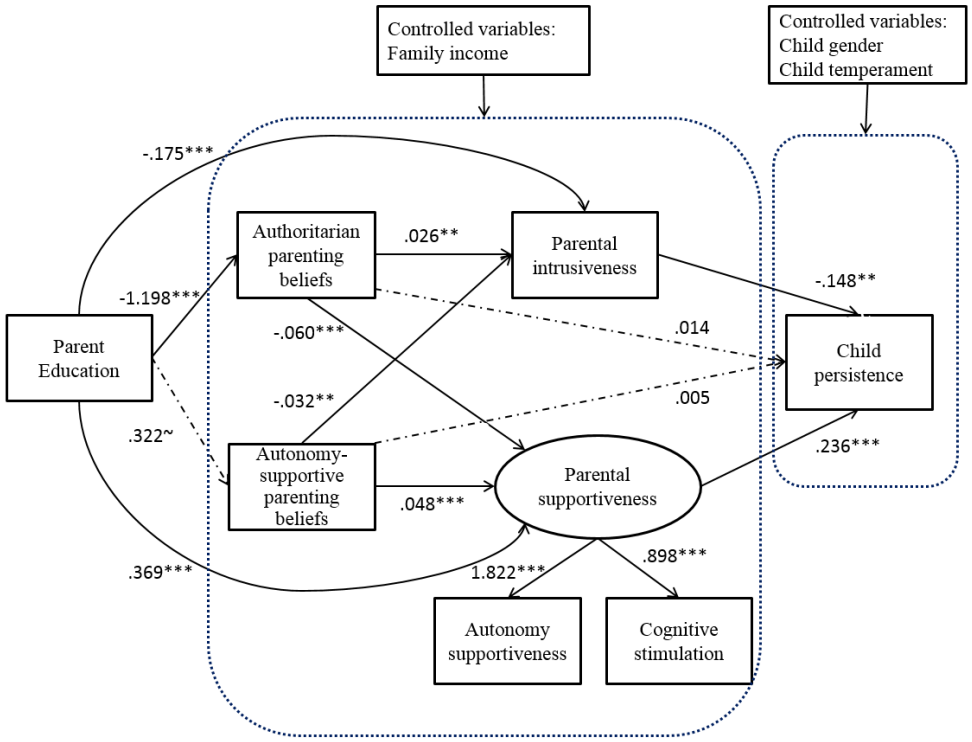

Figure 11a. Multi-group SEM of socializing child mastery performance in family context for European American group.

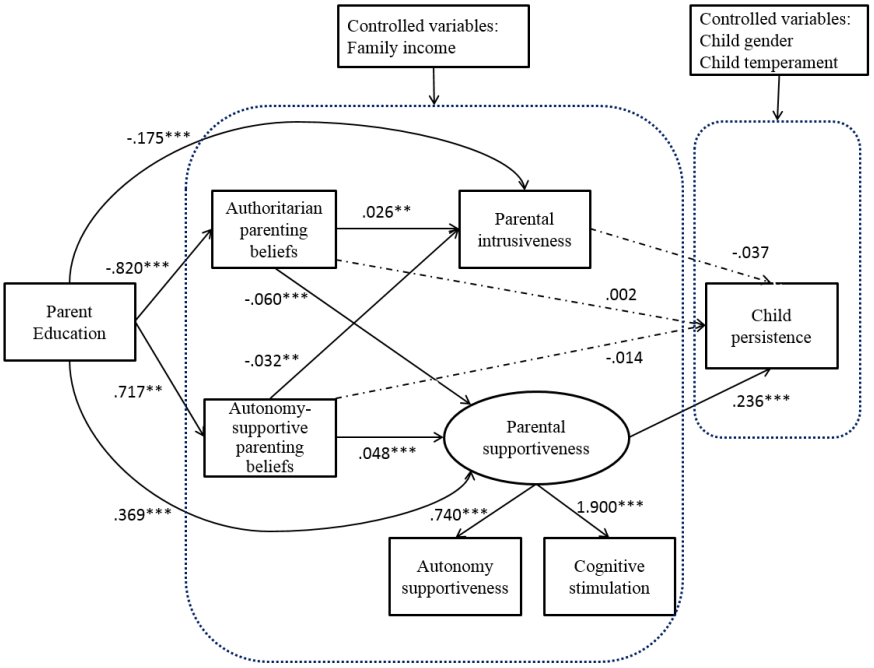

Figure 11b. Multi-group SEM of socializing child mastery performance in family context for African American group.

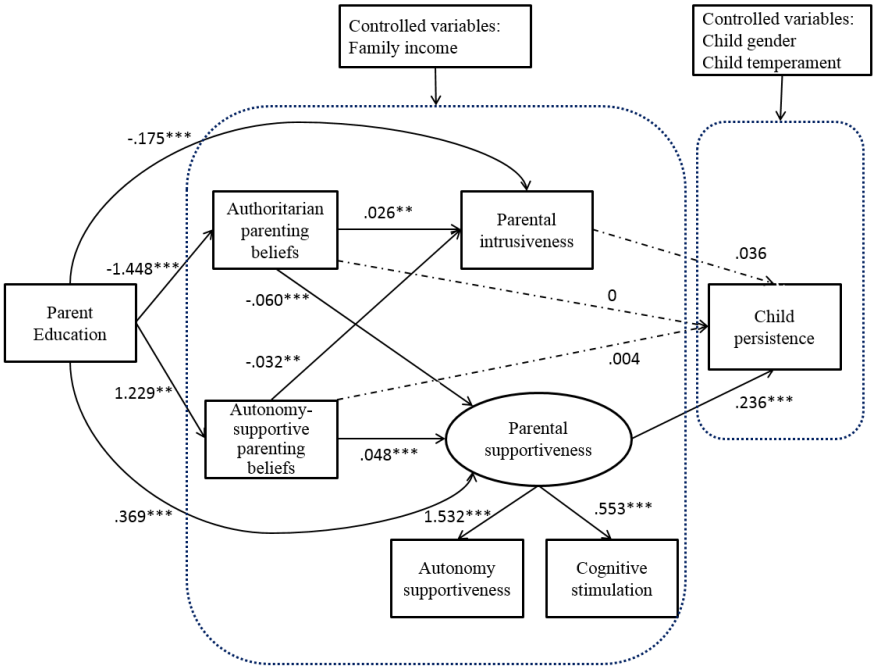

Figure 11c. Multi-group SEM of socializing child mastery performance in family context for Hispanic group.

Discussion for Study 2

The current study investigated the family process of child mastery motivation socialization and how this process varies across ethnicities. It provides us with a better understanding of how certain family factors work together to influence child performance in challenging contexts, and also helps us to understand how culture moderates this family process. Results indicated both direct and indirect (mediating through parenting beliefs) effects of parental education on parental behaviors (supportiveness and intrusiveness) in problem solving contexts. Also, parenting beliefs influence child persistence indirectly, totally mediated through parental behaviors. Further, multi-group SEM results showed that the effects of parental education level on parents' autonomy-supportive parenting beliefs, and the effects of parental intrusiveness on child persistence in puzzle game tasks, vary across ethnic groups.

The Family Process of Child Mastery Motivation Socialization

Using of structure model to incorporate family factors at different levels, the current study improves our understanding of the mechanism of by which family background variables, general childrearing beliefs, and parental behaviors together influence child mastery motivation development. The theoretical model of the direct and indirect impacts of parental education on parental practices was supported by the current findings (Figure 10). As shown in the results, parental education positively predicted parents' supportiveness and negatively predicted intrusiveness during puzzle games, which is consistent with research about the effects of education on parenting practices with school-aged children (Davis-Kean, 2005; Halle et al., 1997; Yamamoto & Holloway, 2010). Also, the effects of parental education on specific parenting behaviors were partially mediated through childrearing beliefs related to autonomy. Consist with previous studies, high education is positively related with "child-centered" parenting beliefs and

negatively related with authoritarian beliefs (Kohn, 1969; Lansford, 2012; McLoyd, 1990); further, these authoritative/ authoritarian parenting beliefs predicted parents' behaviors in the current study.

Second, the model revealed how parenting beliefs influence child mastery behaviors through specific parental behaviors in problems solving settings. The hypothesis of the theoretical model of parenting beliefs, specific parental behaviors, and child mastery behaviors are not fully supported by the results (Figure 12). Specifically, the current study did not find the direct effects of parenting beliefs on child persistence, which means that the influences of parents' beliefs about children's autonomy (in degrees to which parents are "child-centered", respecting children's autonomy and supporting their initiative and exploration) on child persistence are totally mediated through parental supportiveness in specific problem solving settings.

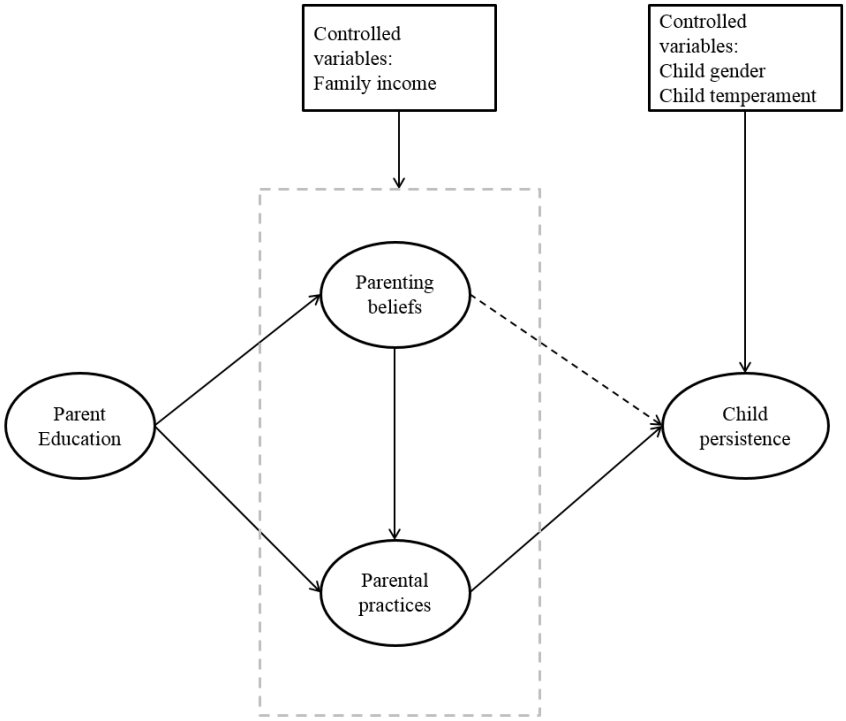

Figure 12. Difference between theoretical model and the results

*The dash line refers to the theoretical hypothesis which is not supported by the results

Cultural Variation in Child Mastery Motivation Socialization

The current study contributes to the literature by addressing whether the process of child mastery motivation socialization in family context varies across ethnicities. Using multigroup-SEM models, the study compared the equivalence of a model of socialization via parenting beliefs and behaviors varied across three groups. The results suggested that the model of child mastery motivation socialization was partially different across ethnicities. The effects of education on authoritarian parenting beliefs and behaviors were similar across ethnicities. However, ethnicity moderated the effects of parental education on autonomy-supportive parenting beliefs: education positively predicted autonomy-supportive parenting beliefs in African- and Hispanic American groups, but not in European American group. Presumably, with the dominance of individualistic culture, among European Americans, it is common for European American parents to treat their children as an independent psychological agent from a young age (Rothbaum & Trommsdorff, 2007; Tamis-LeMonda et al., 2008), and therefore "child-centered" parenting beliefs represent the values of European American parents (Chao, 1995). Chao (1995) qualitatively identified main childrearing beliefs for European American mothers and immigrant Chinese mothers; she found that, for European American mothers, more than half of their childrearing values (five out of nine) could be characterized as autonomy-supportive parenting beliefs, such as, providing a “child-centered” environment, creating environments for learning or exploring, emphasizing child independence. For immigrant Chinese mothers, only one out of eight childrearing beliefs is about supporting children’s independence.

In the current study, since European American parents’ childrearing beliefs were rooted in “child-centered” parenting values, they had higher scores (average score is 22, on a scale with a maximum value of 25) and lower variance in the autonomy-supportive belief subscale (standard

deviation is 2.8 for European American, 3.5 for African American parents, and 3.9 for Hispanic American parents), which might result in a ceiling effect on this measure of child autonomy-supportive beliefs for this group. Future studies may identify the reason why the educational level of European American parents has no effect on autonomy-supportive parenting beliefs through using more sensitive scales or measurements than were available in the current study.

For African American and Hispanic parents, although parents from these two groups have relatively lower education level than European American parents, with higher education, African American and Hispanic parents were more oriented to autonomy-supportive parenting beliefs. One of the possible reasons might be that education positively predicts parents' and children's level of acculturation to the majority group (Barankin, Konstantareas, & De Bosset, 1989) - in this case, European American. Therefore, with higher education, African American and Hispanic parents were potentially more acculturated to European American culture, and adopted more European American parents' parenting beliefs.

At last, the results of the effects of parental behaviors on child persistence in the current study supported the results of study one. First, in study one, the SEM model with the overall sample found that both parental autonomy supportiveness and cognitive stimulation had positive effects on child persistence. Rather than analyzing the two behaviors separately, the current study generated a latent variable of supportiveness for mastery motivation with the two indicators, and also found that this latent variable of parental supportiveness positively predicted child persistence across all ethnic groups, which is consist with the result of study one. Second, the SEM models in study one and study two are different conceptually: study one investigated how three parental behaviors influence child persistence and frustration; while study two investigated the mechanism of family process of socializing child persistence in puzzle games. However,

although two models are different in terms of the theoretical framework and conceptual structure, both studies found consistent cultural moderations of the effects of parental intrusiveness on child persistence. That is, both studies have found the null effects of parental intrusiveness on child persistence in African- and Hispanic-American groups, and negative effects of parental intrusiveness on child persistence for European American group, which might indicate the culture-specific meaning of the parental control/intrusiveness.

Support for A Strength-based Approach to Coach Parents

Another implication of the current study is that positive parental behaviors might have stronger power than negative behaviors in socializing child mastery motivation in family contexts. When analyzing the direct and indirect effects of parenting beliefs on child persistence with the overall sample, I found that both the effects of parents' autonomy-supportive and authoritarian beliefs on child persistence were mediated through parental supportiveness, rather than intrusiveness. This result has practical meanings for practitioners who work with parents of infants and young children: it might be more important to focus on and promote what parents did positively than to correct what they did inappropriately with their children. Some current measurements and intervention tools also focus on positive parental behaviors which can result in positive child outcomes, such as Parenting Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO). The reason that PICCOLO only includes positive items to evaluate parenting is because practically positive behavior is easy to observe, discuss with parents, and reinforce (Roggman, Cook, Innocenti, Norman, & Christiansen, 2013). The current study provides empirical evidence that these measurements of positive parental behaviors could bridge between parental childrearing attitudes and child outcomes.

Strengths, Limitation, and Future Studies

The sample used in the current study is drawn from a nation-wide large sample; the large sample size enables SEM analysis for investigating the comprehensive model of socializing child mastery motivation in family contexts. However, the current study has the weakness that all the families in the study are in poverty, which limits our ability to generalize the conclusions to other SES groups. Also, because of low variation in the income variable, income cannot be analyzed as a predictor, but treated as control variable in the theoretical model. Future studies should include income in the model by using a sample with a larger variance in family income which represents more middle and upper classes in the population. However, even with the limited sample, the study has already found cultural differences in the effects of parental education on parenting beliefs and behaviors, which imply the robust function of parental education in family process of socializing child mastery motivation.

Another limitation of the current study is that parenting beliefs were measured with short version of Parental Modernity Scale (PMS), which contains selected items of the original scale. Although the reliabilities of the two subscales are acceptable, the short version might limit the variations in parenting beliefs. One possible explanation of null effects of parent education on parents' autonomy-supportive beliefs for European American parents might be the ceiling effects of European American parents' on the autonomy-supportive subscale of PMS. If future studies use the full version of PMS to measure parenting beliefs, it might be possible to enlarge the variations of the scores in the autonomy-supportive subscale and possibly improve the current findings.

Conclusions

The results showed the mechanism of socializing child mastery motivation in family contexts. In the family process, parental education is important in improving parenting for socializing child mastery motivation, because parental education promotes autonomy-supportive childrearing beliefs and parental supportiveness during puzzle tasks, and also decreases authoritarian beliefs and intrusiveness. Further, parental supportiveness might have stronger power than negative behaviors in socializing child mastery motivation because it mediates the influence of parents' general childrearing beliefs on children's mastery motivation development. Furthermore, the family process of child mastery motivation socialization varies across ethnicities: parental education increases parental autonomy-supportive beliefs in African- and Hispanic groups, which hasn't been found in European American families, which implies cultural specific services for coaching parents who aims to improve child's mastery performance in challenges.

CHAPTER 4: GNENERAL DISCUSSION

Every competence that we achieve is a process of overcoming challenges and difficulties, in which mastery motivation plays an important role. Since early mastery motivation development is related to later academic success, social functioning (Bae et al., 2014), and psychological well-being (Ryan & Deci, 2000), it is important to investigate the process of socializing mastery motivation. For young children, family is one of the most important influences on children's social emotional development (Bae et al., 2014; Banerjee & Tamis-LeMonda, 2007; Ryan & Deci, 2000; Turner & Johnson, 2003). This dissertation aims to reveal the cultural nature of the mechanisms of socializing young children's mastery motivation in family settings. Previous research of child mastery motivation socialization typically used samples either comprised of predominantly middle-income European American (e.g., Lee, 2014; Marsland, 2005; Sparks et al., 2012; Wang et al., 2014) or included all ethnic and SES groups together to represent a broader population (e.g., Gunderson et al., 2013; Kelley et al., 2000; Martin et al., 2013; Mokrova et al., 2012), lacking consideration of cultural variations in the development of mastery motivation. Thus, this dissertation also aims to discover how culture/ethnicity shapes the family process of socializing child mastery motivation. The two studies investigated cultural variances in the forms and functions of parenting behaviors and styles which related to child mastery behaviors, identified the models of socializing child mastery motivation in family settings (with the factors of family backgrounds, parenting beliefs, specific parental behaviors), and compared the commonality and uniqueness of the family processes of socializing child mastery motivation for the three cultures/ethnicities.

In my theoretical model of child mastery motivation socialization (Figure 1 in Chapter One), parental behaviors are the most direct and important factors that influence child mastery

motivation development. Culture is a macro-level-factor, which is in the outer layer of the system, influencing family process of socializing child mastery motivation. Culture defines the shared values, norms, and beliefs within a group, which further shape the child-rearing goals (Tamis-LeMonda et al., 2008), beliefs, the content of parenting practices (Bornstein, 2009), and the meaning of parenting behaviors. In the settings of socializing child mastery motivation, I expected parents from different cultures to vary in terms of their beliefs and strategies about how to support children to deal with challenging tasks; and their parenting behaviors and styles influence children's mastery behaviors in a culture-specific way. Study one identified cultural differences of the parental behaviors both at a group level and at an individual level. Through a variable-oriented approach, the study found that European American parents were higher on parents' autonomy supportiveness and cognitive stimulation, and lower on intrusiveness than the other two groups. However, the person-oriented approach (LPA) found the similarities across three cultures: all three groups shared the same typology of parenting styles (stimulating and supportive, directive, and restrained style); and restrained style was the most common style for all three groups. On the other hand, parts of the person-oriented approach results supported the group level differences. That is, larger percentage of European American parents were in stimulating and supportive style; and larger percentage of African American parents were in directive style. The two approaches provide insights from different perspectives, but also support each other. These two approaches together provide us a thorough picture of the commonality and uniqueness of parenting behaviors and styles which are highly related to child mastery behaviors.

Further, both studies, using different SEM models, identified cultural/ethnic variations in the effects of parenting behaviors on children's mastery motivation. It is found that across three cultural groups, parental autonomy supportiveness and cognitive stimulation promoted children's

persistence in solving puzzles, which reflects the universality of SDT theory (Ryan & Deci, 2000) – regardless of families' cultural/ethnic backgrounds, these parental behaviors can promote child mastery motivation because they enable children to obtain the feelings of autonomy and competence. Both studies have found that culture/ethnicity moderated the effects of parental intrusiveness on children's mastery behaviors, which reflects cultural variances in the meanings of parental control/intrusiveness in socializing child mastery motivation. In European American families, when parents are intrusive, children tend to disengage in the challenging tasks, showing both low persistence and low frustration. In African- and Hispanic American families, parents' intrusiveness would not influence children's persistence in overcoming the difficulties. This result might be rooted in culturally specific values about "positive" parenting. In African American families, parental structure and control are viewed as a necessity in supporting child development (Ispa & Halgunseth, 2004; Tamis-LeMonda et al., 2009). Also, in Hispanic American families, parental control, combined with parental warmth, can help parents to fulfill their traditional values of "familism" and "respect" (Ayón et al., 2015; Taylor et al., 2015).

In addition to parental behaviors, the most direct and influential factor for child development, which is focused in the analytical model in study one, there are many other factors in family process playing important roles in child development. In my theoretical model, parents' beliefs and attitudes towards children's autonomous exploration and parental control/authority determine parents' specific behaviors in puzzle games. Further, parental beliefs and behaviors are influenced by family socioeconomic backgrounds, including education and income (Kohn, 1969), which are the macro-level factors. Study two investigated the complex process of socializing child mastery motivation in family settings by including family factors in both micro- and macro-levels. Consistent with previous studies with school-aged children, the study found both

direct and indirect effects of parental education on parental behaviors (supportiveness and intrusiveness) in puzzle tasks. Parents' high level of education promoted parental supportiveness both directly and indirectly through increasing autonomy-supportive parenting beliefs. Meanwhile, parents' high level of education reduced parental intrusiveness both directly and indirectly through decreasing authoritarian parenting beliefs. As in previous studies about the effects of parental education on parental warmth (Davis-Kean, 2005), parent-child relationships (Turner & Johnson, 2003), and parental expectations and performance in supporting children's academic achievement (Dubow et al., 2009; Raver et al., 2007), the current study adds to the literature on how parent education influences parents' specific beliefs and behaviors which are related to young child mastery behaviors. Therefore, the theoretical model in Chapter 1 was improved (The improved model is shown in Figure 13). Also, this study reveals the indirect effects of parental autonomy-supportive and authoritarian beliefs on child persistence in puzzle game: the impacts of both parenting beliefs on child's persistence were fully mediated through parental supportiveness, which implies a strength-based approach to coach parents in supporting young children's mastery motivation in practice. Referring back to study one's finding that the effects of parental supportiveness on child mastery motivation are similar across three cultural groups, the strength-based approach might be suitable to families with different cultural/ ethnic backgrounds, whereas an approach aimed at reducing behaviors seen by some as negative (i.e., intrusiveness) may only be useful for some cultural groups, and may be confusing or offensive to others.

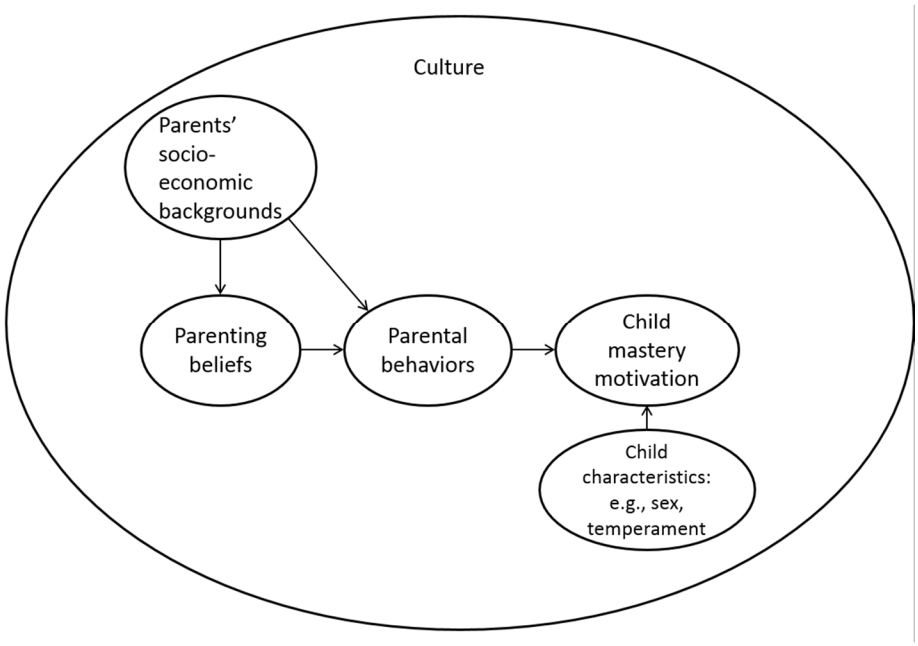

Figure 13. Improved theoretical model

According to the theoretical model of child mastery motivation, culture is the outermost layer of the environment. Culture provides the context of socializing children's mastery motivation, determines the meaning of various family factors, and shapes the family process of socializing child mastery motivation. Study two found that the family process of child mastery motivation socialization varies across ethnicities/cultures. Ethnicity moderated the effects of parental education on autonomy-supportive childrearing beliefs: education positively predicted African- and Hispanic American parents' autonomy-supportive parenting beliefs, but not European American parents. The positive effects of education on parents' autonomy-supportive beliefs for African-and Hispanic American parents may be explained by the acculturation function of education, which leads to parents in minority groups to become acculturated to European American culture. Thus, in the family process of socializing child mastery motivation, ethnicity not only moderated the effects of specific parental behaviors (parental intrusiveness), but also moderated the effects of family background, the macro child development factor.

In sum, my dissertation improves of our understanding on the mechanism of how family factors influence child mastery motivation and the cultural variance of this process. In the setting of problem solving tasks, parental autonomy supportiveness and appropriate cognitive stimulation can promote children's mastery motivation across the three cultures/ethnicities in the U.S. In families, parental education plays an important role in improving parenting beliefs and behaviors which indirectly impacts child mastery motivation development. Further, the two studies have found that culture/ethnicity moderates the effects of parental intrusiveness and family backgrounds on child mastery motivation development, which reflects cultural/ethnic variances in the meanings of parental control and cultural/ethnic specific services in supporting child mastery motivation in family contexts. In addition, the dissertation also provides the insights of understanding the concepts of mastery motivation and the relationships between child frustration and persistence in challenging situations. Last, the dissertation has the practical implications of a strength-based approach to coach parents to support children's mastery behaviors.

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