

**Predictors of mother-infant interaction quality: The role of parental social cognitions and parenting stress**

by

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**ABSTRACT**

Using a social cognition theoretical lens and based upon tenets from symbolic interactionism theory, this study explores the influence of parental social cognitions and parenting stress on the quality of the parent-infant interaction. Parenting stress, parent expectations of self in the parenting role, parent expectations of infant development, and observations of parent-infant interactions were obtained from 150 mother-infant dyads. Hierarchical linear regression analyses tested the hypothesis that parenting stress mediates the relationship between parental social cognitions and quality of the parent-infant interaction. After controlling for maternal age, parent expectations of self in the parenting role were not related to observed interaction quality, but parent expectations of infant development were related to observed interaction quality. The predicted hypothesis of mediation was not supported, however stress related to parent-child dysfunctional interaction was related to observed quality of interaction. These findings indicate a need for services focused on educating parents about developmentally appropriate expectations for infant development, as well as supporting parents in their interactions with their infants.

## CHAPTER 1. INTRODUCTION

For the first time in medical history the top five health issues impacting children today are mental, rather than physical illnesses (Slomski, 2012). Furthermore, the World Health Organization reports that by 2020, childhood neuropsychiatric disorders will become one of the five most common causes of disease, disability, and death among children throughout the world (U.S. Surgeon General, 2000). Gaining an understanding of the mental health issues that young children face is necessary in order to provide prevention for mental illnesses and to promote lifelong health beginning at birth.

While it can be difficult to distinguish between variations in typical behavior and persistent problems, very young children can begin to show clear signs of mental health problems, such as anxiety and conduct disorders, depression, and neurodevelopmental disabilities (Egger & Angold, 2006). Results from recent studies indicate that between 13% and 20% of all U.S. children suffer from psychological problems, with a 10% prevalence rate among preschool age children (Burns et al., 1995; Jellinek et al., 1999). Researchers at Children's Memorial Hospital at Northwestern University Medical School propose that these illnesses start at a very young age (Lavigne et al., 1996). In this study the prevalence of a child having a psychiatric diagnosis defined by the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* was 21.4% in two to five year old children. These statistics are particularly alarming due to the fact that mental health issues during childhood have potentially long-term negative consequences for both the child and society. Specifically, psychopathology and behavioral problems such as attention-deficit/hyperactivity disorder (ADHD) have been found to predict higher levels of alcohol and other substance abuse during adolescence (White, Xie, Thomson, Loeber, & Stouthamer-Loeber, 2001). Indeed early mental health problems literally shape

development because they disrupt typical patterns of brain development and impair cognitive and social skills (National Scientific Council on the Developing Child, 2012). Because mental health has such a crucial impact on the developmental outcomes of children, it is necessary to study the foundations of infant mental health.

Although the term “mental health” tends to entail a negative connotation due to mental illnesses, infant mental health should be better understood as comprehensive and strengths-based (Osofsky, 2005). ZERO TO THREE’s (the National Center for Infants, Toddlers, and Families) infant mental health task force defines infant mental health as, “the developing capacity of the infant and young child to experience, express, and regulate emotions; form close and secure relationships; and explore the environment and learn, all in the context of cultural expectations” (2002). The World Association of Infant Mental Health similarly defines infant mental health with the addition, “Because infants grow in a context of nurturing environments, infant mental health involves the psychological balance of the infant-family system” (Fitzgerald & Barton, 2000, p.25). Combining these two definitions, infant mental health can be thought of as the optimal social and emotional development of infants as supported within the context of the family during the first three years of life.

The current study examines factors that influence the quality of the parent-infant interaction using a social cognition theoretical lens. Social cognition focuses on the cognitive processes that we use during social interactions, such as how we perceive and process information to make sense of others’ behavior (Bandura, 1989). First, an individual perceives a social stimulus. Then the individual encodes the stimulus using cognitions, such as prior knowledge or attitudes. Finally, the individual produces a behavioral response to the stimulus. In terms of the parent-infant interaction, social cognition theory can be used to understand how



parental social cognitions impact the quality of their interactions. For example, consider an infant who is in her crib crying because she is tired. The crying is the stimulus and the parent must then use cognitions, such as knowledge of infant development, to determine a response to the crying. This response to the crying stimulus is the parent's reaction to the infant, which ultimately influences the quality of the interaction. If the parent has limited knowledge of infant development and thinks the infant is just crying to be difficult, the parent is more likely to react negatively or to be nonresponsive to the infant's primary means of communication, crying. Using the social cognition framework this study related two parental cognitions, perceptions and knowledge, to the quality of the parent-infant interaction. The study also examines how parenting stress might mediate the relationship between parental cognitions and the quality of the parent-infant interaction.

## **CHAPTER 2. LITERATURE REVIEW**

### **Parent-Infant Interaction**

The foundation for lifelong mental health begins with an infant's earliest experiences and relationships. Because infants experience their world as an environment of relationships, the quality and stability of these early relationships, particularly the parent-infant relationship, lays the groundwork for future developmental outcomes. While biology also has an influence on developmental outcomes, the environment interacts with genes to authorize or prevent genetic predispositions from occurring (National Scientific Council on the Developing Child, 2012). Adverse events in the environment activate the stress response system, which increases an individual's heart rate, blood pressure, and stress hormones. When stress is brief and occurs in the context of supportive relationships it has a positive effect on the body and is considered a normal and healthy part of development (National Scientific Council on the Developing Child, 2014). Prolonged activation of the stress response system in infants can have damaging effects on the developing brain architecture; however, if an infant's stress response system is activated within an environment of supportive relationships, these physiological effects are buffered and the effects of stress are considered tolerable. A toxic stress response can occur when an infant experiences prolonged adversity, such as neglect or extreme poverty, in the absence of supportive early relationships. Prolonged activation of the toxic stress response system has lifelong consequence for physical and mental health, including heart disease, diabetes, substance abuse, and depression.

By 24 months of age, biological risk factors appear to decrease while the influence of psychosocial risks becomes more prominent (Laucht et al., 2000). Some examples of psychosocial risks include: low parental educational level, poor social integration and support of

parents, and poor coping skills in parents, all of which can ultimately lead to poor parent-child relationships. Parent-child relationship problems during the first ten months of a child's life have been positively associated with a more than twofold increase in the risk of a child mental disorder at 18 months (Skovgaard, 2010). This may be because responsive and supportive relationships can actually buffer young children from some of the effects of adverse experiences. Without these supportive buffering relationships, the atypical stress levels interfere with the typical development of the brain. Other studies have also found that adult activity and speech in early social interactions with their infants powerfully predict later mental health diagnoses at the age of seven (Marwick et al., 2013). The Council on the Developing Child (2012) uses the term "serve and return" to describe adult-infant interactions consisting of an adult reading an infant's cues (serve) and an adult responding appropriately (return). For example, when a young infant cries, the adult responds with eye contact and soothing words. These types of consistent and responsive back-and forth interactions shape the developing architecture of the infant's brain as the infant learns to expect responsive relationships and affirming experiences. Ferrier-Lynn and Skouteris found a significant positive association between parent-infant interaction and infant development, in terms of mental skills, psychosocial skills, and quality of behavior (2008). In addition, increases in parental responsiveness during the toddlerhood and preschool years is associated with lower levels of problematic social behavior and higher levels of self-regulatory abilities (Mistry, Benner, Biesanz, Clark, & Howes, 2010).

In the absence of these "serve and return" interactions, the developing architecture of the brain may be disrupted leading to later mental and emotional health issues. In one study conducted in Copenhagen, emotional and behavioral disorders and ADHD were associated with parent-child relationship disorders (Skovgaard, 2010). These relationship disorders were the

most frequent mental health problem of all participants and were found in 8.5% of parent-child pairs. Olson and colleagues support these conclusions with their findings that infants who experienced low levels of responsiveness and affection at six months of age received higher ratings of aggressive conduct and disturbances at the age of 17 (2000). Furthermore, low maternal involvement in parent-child interactions are associated with the development of later behavior problems (Gardner, 1994), which have in turn been shown to predict later long-term disturbances in children and adolescents (Pihlakoski, 2006).

As a result of the findings that parent-infant interactions have a significant influence on lifelong social-emotional development and mental health, myriad studies have been conducted to determine influences on the parent-infant relationship and more specifically, parent-infant interactions. Studies concerning parent-infant interactions have focused primarily on the constructs of the attachment relationship (Wolff & Ijzendoorn, 1997) and the mental health status of the mother (Beck, 1995; Goodman, Rouse, Connell, Broth, Hall, & Heyward, 2011). The current study adds to this literature by examining how parental social cognitions influence the quality of the parent-infant interaction.

### **Parental Cognitions**

There has recently been a shift in research from focusing on parental behaviors and attitudes to focusing on a “multilevel conceptualization of parents’ cognitions” (Sigel & McGillicuddy-De Lisi, 2002, p. 487). This is because some researchers have recognized that parental attitudes do not directly reflect parental behavior (Holden & Buck, 2002). Rather, attitudes should be thought of as filters that indirectly affect parental behavior, which in turn indirectly affects the parent-child relationship and child development. On the other hand, social cognitions are patterns of thought that define how an individual makes sense of and responds to

an experience. These thought patterns can be envisaged as “cognitive maps” that guide an individual through social interactions (Baldwin, 1992, p. 462). In this manner, social cognitions are mechanisms leading directly to social behaviors. Bugental and colleagues (1993) suggested that cognitive maps might guide parenting behavior and Sigel and McGillicuddy-Delisi (2002) note that parental social cognitions have been associated directly with child outcomes. Ferrier-Lynn and Skouteris (2008) found that parent cognitions predicted both the quality of the parent-infant interactions and infant development.

While many different types of parent cognitions have been studied, Goodnow and Collins (1990) characterize parent cognitions in two domains. The first domain consists of cognitions concerned with parents’ goals and developmental expectations of children, while the second domain consists of cognitions concerned with the influence and responsibility of parents. In a similar vein, Newberger (1980) categorized parental cognitions into two dimensions: the parent’s conceptions of the child and of the parental role. In the next section these two domains of parental social cognitions will be reviewed in terms of a parent’s expectations of herself in the parenting role and a parent’s developmental expectations of her infant.

### **Parent Expectations of Self in the Parenting Role**

Prior to a discussion about parental expectations of themselves in the parenting role, a brief dialogue differentiating beliefs, attitudes, perceptions, and expectations is necessary. While these terms are often used interchangeably in parenting literature they differ in the level of analysis of thought. Beliefs can be defined as something that one accepts as true and attitudes defined as a settled way of thinking or feeling about something. Beliefs and attitudes are primarily influenced and informed by past experiences and therefore do not require an active thought process (Schiff, 1970). In contrast, perception is the process by which an individual

selects, organizes, and interprets information from the environment. Beliefs and attitudes influence perception by helping an individual to place value on and interpret the new information. In this manner, two individuals who receive identical information may respond differently based on their perceptions.

Because beliefs and attitudes influence parental perception, it is important to consider where these beliefs originate. In a recent survey conducted by the Hart Research Associates (2009) for the ZERO TO THREE organization, parents noted that the way they were raised, as well as their faith/religious background, has the largest influence on their parenting beliefs and styles. These beliefs contribute to a parent's expectation of herself in the parenting role (Luster, Rhoades, & Haas, 1989), but parenting perceptions come from an interaction of these beliefs and parenting information. Parents actively seek out information about child development and parenting techniques and then use their attitudes and beliefs to perceive the information and develop expectations of the parenting role. It is now evident that parental attitudes and beliefs are poor predictors of parent behavior (Holden & Edwards, 1989) likely because they do not involve active thought processes that serve as mechanisms for social behavior. From a social cognitions perspective there is reason to believe that parent perceptions of the parenting role may influence parenting practices directly. Explicitly, the personal significance and importance that a parent places on the parental role has an effect on parent behavior (Reitzes & Mutran, 2002; Rosenberg, Schoenbach, Schooler, & Rosenberg, 1995). Despite these findings, relatively few studies have directly assessed parental perceptions of the parenting role. This study adds to the literature by examining parents' expectations of responsibilities within the parenting role.

## **Parent Expectations of Infant Development**

While perceptions about the parental role appear to underlie parenting behavior, several researchers have suggested that parental knowledge may interact with perceptions to influence parenting behavior (Huang, O'Brien Caughy, Genevero, & Miller, 2005; Sigel & McGillicuddy-DeLisi, 2002). In fact, this belief that improved parent knowledge and perceptions can facilitate parent-child interactions underlies many interventions (Blair & Ramey, 1997). According to Dichtelmiller et al. (1992), parental knowledge is an aspect of social cognition that includes understanding of child development processes and norms, and caregiving and childrearing skills. Parenting knowledge should help parents to develop more realistic expectations of their children and therefore improve their parenting interactions (McGillicuddy-De Lisi, 1985; Miller 1988). Indeed, mothers who are more knowledgeable about development are more likely to create an environment that is developmentally appropriate, and provide more verbal and physical stimulation to their children (Goodnow, 1988; Sigel, 1992). Mothers with greater knowledge of child development also have more accurate expectations of their children and more flexible child-rearing beliefs (Stoiber & Houghton, 1993).

In a recent study of maternal knowledge of infant development, mothers answered 65% of the total questions correctly (Reich, 2005). The questions that were most often answered incorrectly consisted of knowledge about how much sleep infants need and six month olds' developmental capabilities. Also of note, the mothers in this study tended to overestimate development by three months or more. This finding is somewhat concerning because other researchers found that mothers who have unrealistic expectations about child development often use more ineffective parenting strategies, which can sometimes lead to child maltreatment

(Dukewich, Borokowski, & Whitman, 1996). Interestingly, several studies have shown weak or no significant relationship between parental knowledge and parental behavior during parent-child interactions (Conrad, Gross, Fogg, & Ruchala, 1992; Hess, Teti, & Hussey-Gardner, 2004; Morawska, Winter, & Sanders, 2009). This is not to say that parental knowledge of child development has no influence on parenting behavior. In one of the first studies about child development knowledge, Stevens (1984) found that 20% of the variance in parenting skill was attributable to parents' knowledge about development.

### **Parenting Stress**

Parental social cognitions have been linked to parenting stress, specifically through stress arising from the parental role. The social role of parenting can be a source of distress for some, as feelings of failure may arise from not being capable of meeting one's own needs and the expectations of society (Alexander & Higgins, 1993; Lepore, 1997). Parenting stress not only has a crucial impact on the psychological functioning of parents, but it also has a significant influence on the parent-child relationship, as well as the mental health and functioning of the child (Deater-Deckard, 2004). Parenting stress was found to be the strongest predictor of children's emotional and behavioral problems (Danesco & Holden, 1998) and that children with the greatest problems in their cognitive and social development came from families with the highest level of parenting stress (Goldberg et al., 1997). Parenting stress occurs when the demands of parenthood exceed the resources available to parents. There is a distinct difference between general life stress and stress specific to the parenting role (Creasey & Reese, 1996; Crnic & Acevedo, 1995). It is important to keep in mind that all parents experience parenting stress to some degree (Crnic & Greenberg, 1990) and not all parenting stress leads to negative parent-child interactions. That being said, high levels of parenting stress have been found to have



adverse influences on the maternal-infant relationship during the first year (Singer et al., 2003). Specifically, mothers who report higher levels of parenting stress are less responsive to their infants (Pereira et al., 2012) and more irritable during interactions (Cooklin, Giallo, & Rose, 2012), resulting in less positive parent-infant interactions (Crnic & Greenberg, 1990; Lutz et al., 2012). The opposite association has also been found in that mothers who report fewer stressors are observed to have more positive interactions with their infants (McKelvey, Fitzgerald, Schiffman, & Von Eye, 2002). These negative effects appear to have a long-term consequence as evidenced by Tharner et al. (2012) who found that more parenting stress predicts more emotional and behavioral problems in three year old children.

### **Theoretical Framework**

One criticism of research on childrearing is that most is conducted in the absence of a theoretical framework (Holden & Buck, 2002). Recall that this study utilizes social cognition theory, and that according to this theory, it is essential to study the cognitive underpinnings of an individual in order to understand that individual's interactions with others. In the context of the parent-infant interaction, social cognition theory delineates that the actions and emotions of parents cannot be fully understood without recognition of the cognitive processes that underlie those actions. Symbolic interactionism is a narrower framework that helps us further understand how parental social cognitions, specifically perception of the parenting role, relates to parenting stress and the quality of the parent-infant interaction.

Two of the fundamental assumptions of symbolic interactionism is that "human behavior must be understood by the meanings of the actor" and the "actors define the meaning of context and situation" (White & Klein, 2008, pp. 98-99). This means that in order to understand why a person behaves in a certain way, we must first gain an understanding of that individual's

perceptions. The concept of roles has a major influence on perceptions and can explain an individual's behavior. Roles can be understood as the rules of standard behavior for a specific position (White & Klein, 2008). How an individual perceives his or her role directly influences the way the individual behaves. Two tenets from symbolic interactionism are used in this study to hypothesize about the relations among parental social cognitions, parenting stress, and the quality of the parent-infant interaction. The first tenet, "*the greater the perceived clarity of role expectations the higher the quality of role enactment*" (Burr, Leigh, Day, & Constantine, 1979, p. 74), says that if a parent has a strong understanding of his or her role as parent, regardless of how they define that role, then that parent will be more likely to successfully perform the responsibilities of the role. Similarly, "*the more individuals perceive consensus in the expectations about a role they occupy, the less their role strain*" (Burr, et al., 1979, p. 79). This tenet, which relates to the concept of parenting stress, says that if a parent has a clear understanding of his or her responsibilities in the role of parent then he or she will perceive less stress in association with parenting. Together, these two tenets would suggest that clear and appropriate expectations of the parenting role would decrease the level of parenting stress and increase the quality of the parent-child interaction. Using the previous example of the crying infant in the crib, a mother may have conflicting perceptions about her role in that situation which will ultimately influence her stress level and the resulting interaction. For instance, the mother may feel that her role is a nurturer, so she feels that she should rock and comfort the child until the child falls asleep. The mother may also feel that her role is to be a teacher and that she needs to teach her child to self soothe and fall asleep independently. The lack of clarity that the mother feels in her role as a parent at that time will likely increase the amount of stress she is feeling and result in a lower quality interaction with her infant. On the other hand, a mother who

is clear in her expectation of her role as a parent in this situation will feel less stress and have a higher quality interaction.

Although the symbolic interactionism tenets specifically refer to role perception, it is hypothesized that the theory can also be applied to a parent's developmental expectations of her infant. A mother who has clear and accurate expectations of infant development will experience less stress than a mother who has inaccurate or developmentally inappropriate expectations of her infant. Using the same example of the crying infant, we can see that a mother who understands her child's crying as a developmentally appropriate means of communication will experience less stress than a mother who thinks the child is crying on purpose to annoy the mother.

The aims of this study were twofold. First, parental social cognitions were examined in relation to the quality of the parent-infant interaction. Two separate cognitions, perceptions and knowledge, were examined in terms of parents' expectations of self in the parenting role and the parents' expectations of infant development. Then parenting stress was examined as a potential mediator between parental social cognitions and quality of the parent-infant interaction (Figure 1). Demographic variables including maternal age and maternal education level were examined as possible covariates in this study. These objectives ultimately lead to two guiding research questions:

How do parental social cognitions of the parenting role and knowledge of infant development predict the quality of the parent-infant interaction?

Does parenting stress mediate the relation between parental social cognitions and the quality of the parent-infant interaction?

## **CHAPTER 3. METHODOLOGY**

### **Participants**

Participants for the current study (N = 150 parent-infant dyads) were drawn from those families in Iowa who consented to the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) II evaluation. Consequently, this study was covered under the existing IRB approval for the larger evaluation study (Appendix A). The MIECHV II project in Iowa involves ten communities in 16 counties throughout the state. Three evidence based home visiting models, validated by the HOMVEE study (Paulsell, Avellar, Martin, & Del Grosso, 2010), were funded and evaluated. Each of the three models (Early Head Start, Nurse Family Partnership, and Healthy Families America) has different eligibility requirements, so the population differs slightly by model type. Early Head Start provides services for pregnant women and children up to age three. Eligibility requirements vary by program location, but in general eligibility is based on family income at or below the poverty level (Early Childhood Learning and Knowledge Center, 2006). Additionally, families who are homeless, receiving SSI or TANF, or have children in foster care are also eligible. The Nurse-Family Partnership model has stricter eligibility requirements. Participants must be first time mothers who meet the low-income criteria at intake, and mothers must be enrolled in the program early during pregnancy, ideally during the 16<sup>th</sup> week (2011). Furthermore, mothers must receive their first home visit no later than the end of week 28 of pregnancy and visits continue until the child turns two. Healthy Families America also initiates services prenatally or at birth (Prevent Child Abuse America, 2015). A standardized assessment tool is used to systematically identify families who are facing multiple challenges such as single parent status, low income, substance abuse problems, or

victim of abuse or domestic violence. After initiation, home visiting services continue for three to five years depending on the needs of the family.

Home visitors and supervisors who were identified by their agencies to participate in the MIECHV II intervention project were required to participate in the evaluation component of the project. Home visitors were asked to recruit 100% of their caseloads to reach a target sample size of 350. Home visitors recruited families by asking if they would be willing to participate in the videotaping of one home visit per year, as well as an in-home assessment that would involve a parent interview, direct child assessment, and videotaping of a parent-child play session. Consent for the study was strictly voluntary for families and those who did not consent to evaluations continued to receive the same services they would have otherwise.

The sample for the current study consisted of the first 150 parent-infant dyads enrolled in the MIECHV II evaluation in Iowa. Mothers were primarily English speaking, with more than half of the mothers identifying as White/Non-Hispanic (see Table 1). Mother's ages spanned a range of twenty years with many mothers in their early 20s ( $M = 23.41$ ,  $SD = 5.40$ ), while their infants were around six months of age ( $M = 5.87$ ,  $SD = 1.91$ ). Half of the mothers had obtained a high school diploma or GED and most were never married.

### **Procedure**

Families were visited in their homes for approximately one hour when the target child was four months old, or as soon as possible for children who were older than four months at time of enrollment in the study. Researchers began each visit with an assessment of the parent-infant interaction using the "Three Bag Task." The researcher provided the parent with three opaque bags, each of which had a different toy unknown to the parent or child. The first bag contained a soft version of the book *The Very Hungry Caterpillar* by Eric Carle, and the second and third

bags contained a toy piano and push-top spinning toy respectively. The mother was asked to sit on a blanket with her child and spend time playing with the child as she typically would, beginning with the first bag. After asking for any questions, the researcher videotaped the play session for ten minutes. The visit concluded with a self-report assessment of parent expectations of responsibilities in the parenting role, expectations of infant development, and parenting stress. At the conclusion of the visit participants received a \$50 gift card to Wal-Mart to thank them for their time and participation in the study.

## **Measures**

### **Demographic Information**

Data on maternal race, age, and education level were collected from mothers at the time of enrollment in the home visiting program. This demographic information was stored and accessed using the REDCap data management tool.

### **Parental Social Cognitions**

**Parental expectations of self in parenting role.** Parents' expectations of the parenting role were measured using the survey form of the *Perceptions of Parental Role Scales (PPRS)* (Gilbert & Hanson, 1982). The PPRS consists of items meant to assess expectations of parental responsibilities in three primary domains: teaching the child, meeting the child's basic needs, and serving the interface role between the child and the ecosystems that surround the child. The original 78-item measure is divided into 13 scales, with each scale consisting of between five and seven items. The survey form used in this study consists of 30 items that assess 11 of the original 13 scales (Gilbert & Hanson, 1983). The items selected for the survey form were those items that correlated highly with their respective scales on the PPRS and provided minimum overlap in content with other items. Parents were asked to indicate how important they believe each item is

as a parental responsibility on a scale from 1 to 5, where a “1” is “not at all important as a parental responsibility” and a “5” is “very important as a parental responsibility”. A total score was calculated by summing the 30 items. Internal consistency of the scale was good ( $\alpha = .87$ ).

**Parental expectations of infant development.** Parents’ expectations of child development were assessed using 14 of the original 75 items from the *Knowledge of Infant Development Inventory* (KIDI; MacPhee, 1981). The KIDI was designed to obtain information about parents’ knowledge of child development processes and normative infant behavior. Parents were asked to indicate their agreement with a series of statements such as, “*All infants need the same amount of sleep.*” Agreement was rated on a scale from 1 to 5, where “1” is “strongly agree” and “5” is “strongly disagree”. Four items that were written as developmentally inappropriate for infants were reverse coded so scores indicated developmentally appropriate expectations of infant development. A total score was calculated by summing the items after reverse coding. Internal consistency of the scale in this study was acceptable ( $\alpha = .63$ ).

### **Quality of Parent-Infant Interaction**

The quality of the parent-infant play interaction was assessed using the *Parenting Interactions with Children: Checklist of Observations Linked to Outcomes* (PICCOLO) (Roggman, Cook, Innocenti, Norman, & Christiansen, 2008). The PICCOLO measures 29 parenting behaviors in the four domains of affection, responsiveness, encouragement, and teaching. Each domain contains seven to eight items that are scored on a scale of 0-2, where “0” indicates the behavior is absent, “1” indicates the behavior is brief or emerging, and “2” indicates the behavior is clear and frequent. A team of four student research assistants coded the parent-infant interaction videos from the “Three Bags Task” using the PICCOLO assessment tool. Each of the research assistants established inter-rater reliability with one another prior to coding

videos. Videos were randomly assigned amongst the four coders, and 25% of the videos were double-coded by a second researcher to monitor inter-rater agreement on an ongoing basis. The mean proportion of absolute agreement across observations for the four domains ranged from 70 to 79%. These percentages align with the percentages reported in the technical report for the PICCOLO measure (Roggman et al., 2013). All videos that were not coded reliably were consensus coded by the original coder and the reliability coder to reach agreement on each item within domains. Coders then reestablished reliability with one another prior to coding additional videos independently. An overall quality of interaction score was calculated by summing scores across all items. Internal consistency of the total scale was good ( $\alpha = .79$ ).

### **Parenting Stress**

Parenting stress was assessed using two subscales from the *Parenting Stress Index-Short Form (PSI-SF)* (Abidin, 1995). The PSI-SF is a 36 item measure derived from the original 101-item Parenting Stress Index, which assesses parenting stress through three subscales: Parental Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), and Difficult Child (DC). Only the PD and P-CDI subscales were used in the current study due to it being a sub study of the larger MIECHV II evaluation. Additionally, we were narrowly focused on parental factors in this study. The PD subscale consists of 12 items that consider situational stressors from perception of child-rearing competence, conflict with spouse or partner, roles outside of parenting, and social support. The P-CDI subscale consists of 11 items that assess parents' expectations and interactions with their children. Parents responded to each item on a scale of 1 to 5, where a "1" is "strongly agree" and a "5" is "strongly disagree". When scoring the scale, each item was reverse coded so that higher scores indicate more parenting stress. Subscale scores were calculated by summing the reverse coded items within each subscale, and a total parenting stress



score was calculated by summing the two subscales. Internal consistency across subscales was good (PD  $\alpha = .85$  and P-CDI  $\alpha = .82$ ), as well as across the total 23 item scale ( $\alpha = .85$ ). In addition to calculating subscales and a total stress score, a score for defensive responding was calculated by summing seven specific items as instructed by Abidin (1995). A defensive responding score of 10 or less is an indication that the parent may be trying to minimize any problem, stress, or negativity in their relationship with their child. This score cannot determine if the parent is trying to respond in a favorable way, but a low score indicates that caution should be used when interpreting stress scores for that parent.

## **CHAPTER 4. RESULTS**

Preliminary analyses included descriptive statistics on parental social cognitions, parenting stress, and observed quality of parent-infant interactions followed by analyses to examine the relations between these constructs and demographic characteristics. Next, hierarchical linear regression was used to test the relations between parental social cognitions and observed quality of interactions as well as the predicted mediating role of parenting stress on these relationships. Missing data were estimated based on the participant average score of the non-missing data for each scale used in the analyses. Missing data never exceeded more than .03% within each measure and rates of less than 1% missing data are generally considered trivial (Acuna & Rodriguez, 2004).

### **Preliminary Analyses**

Descriptive statistics for the main constructs of interest are presented in Table 2. Parents generally reported high expectations of their responsibilities in the parenting role but were more variable in their expectations of infant development. Parents also reported limited amounts of parenting stress with the distribution of stress positively skewed for each of the subscales, as well as the total score, indicating a possible floor effect. In interactions with their infants parents were, on average, affectionate, responsive, and encouraging but taught very little. Overall, the quality of observed parent-infant interactions varied greatly.

A series of one-way ANOVAs indicated that parental social cognitions and parent-infant interactions did not differ by maternal race or maternal education. Maternal age was significantly related to expectations of infant development, parental distress, and observed quality of parent-infant interaction in that older mothers reported less parenting stress and had more positive interactions. Maternal age was included as the only covariate in analyses.

### Primary Analyses

Mothers' expectations of themselves as parents were not associated with the quality of interaction as predicted, however their expectations of infant development were significantly related to observed parent-infant interaction quality. Parental distress was not significantly related to parental social cognitions or any aspect of interaction quality, but parent-child dysfunctional interaction was significantly related to observed parent-infant interaction quality (Table 3).

Two separate hierarchical linear regression analyses were conducted to answer the two research questions. The first block regressed the control of maternal age onto the quality of interaction. The second block added the predictor of parental social cognition, with perception of the parenting role in the first model and knowledge of infant development in the second model. The final block added the predictor of parenting stress with the subscales of parental distress and parent-child dysfunctional interaction to the regression.

Parent expectation of self in the parenting role was not a significant predictor of quality of parent-infant interaction. The first block with maternal age was significant and explained 11.5% ( $R^2 = .115$ ,  $F(1,148) = 19.227$ ,  $p < .001$ ) of the variance in quality of interaction in both models. The inclusion of parent expectation of self in the parenting role added less than 1% ( $R^2$  change = .001,  $F$  change (1,147) = .112,  $p = .74$ ) to the explanation of variance in quality of interaction, and the model was no longer significant. The addition of parenting stress in the final block added 3% ( $R^2$  change = .030,  $F$  change (2,145) = 2.509,  $p = .085$ ) to the model, however this addition was not significant. An examination of the model coefficients reveals that parent-child dysfunctional interaction moderately adds to the variance in observed parent-infant interaction ( $\beta = -.17$ ,  $p = .032$ ). The measurement model is presented in Figure 2, and full model

statistics including standardized and unstandardized beta weights, standard errors, and t-values are presented in Table 4. Overall the hypothesized mediating relationship of parenting stress was not supported. The lack of significance in this model was expected based on the bivariate correlations conducted.

Parent expectation of infant development was a significant predictor of quality of parent-infant interaction. After controlling for maternal age, the inclusion of parent expectation of infant development added 2.4% ( $R^2$  change = .024,  $F$  change (1,147) = 4.09,  $p$  = .045) to the explanation of variance in quality of interaction, and the model remained significant. The addition of parenting stress in the final block added 2% ( $R^2$  change = .020,  $F$  change (2,145) = 1.742,  $p$  = .179) to the model, however this addition was not significant. An examination of the model coefficients reveals that with the addition of parenting stress in the final model, parent expectations of infant development are no longer a significant predictor of quality of parent-infant interaction ( $\beta$  = .13,  $p$  = .113). The measurement model is presented in Figure 3, and full model statistics including standardized and unstandardized beta weights, standard errors, and t-values are presented in Table 5.

## CHAPTER 5. DISCUSSION

The purpose of this study was to examine the relations among parental social cognitions, parenting stress, and the quality of parent-infant interactions using the lens of Social Cognition theory and framework of Symbolic Interactionism. Recall that two theoretical tenets guided this study: one which states that greater clarity in role expectations relates to higher quality of role enactment, and the other which states greater clarity in role expectations relates to less role strain (Burr, et al., 1979). Neither of these tenets was directly supported in this study as evidenced by the lack of significant relations between parents' expectations of the parenting role and the quality of parent-infant interactions. Parenting stress was also unrelated to expectations of the parenting role.

The lack of significant findings may be due to issues with measurement of perception of the parenting role and parenting stress. While numerous studies have examined parent social cognitions, research that explicitly examines perception of the parenting role has been sparse. Due to the lack of research in this area, finding a valid and reliable measure of perception of the parenting role proved difficult. The measure selected, *Perceptions of Parental Role Scales (PPRS)*, was designed to measure perceived parental role responsibilities. Additionally, the authors of the scale note that it can be useful in examining the relations between role perception and stress (Gilbert & Hanson, 1983). Unfortunately the structure of the scale led to a ceiling effect where most parents reported that they felt each item listed was very important as a parental responsibility. The narrow range of scores on the measure, which drastically reduced the variability, evidences this. As a result it appears that variability in expectations of the parenting role were not captured adequately in this study.

Despite using a well-known and widely utilized scale, difficulties were also encountered with measuring parenting stress. The lack of stress reported by parents was initially surprising but a closer examination of the defensive responding subscale of the *Parenting Stress Index (PSI)* revealed that over 40% of the sample may have been trying to respond in a favorable way, which in turn would minimize any problem, stress, or negativity the parent may be experiencing. Again, while this subscale cannot be used to determine the accuracy of parent report, caution should be used when interpreting scores. It is possible that the mothers in this study did not report stress because they knew their home visiting program was being evaluated and they wanted the program to look good. Another possible explanation for the reports of low parenting stress could be that parents of young infants may not be experiencing the specific types of stress measured by the *PSI*. Researchers who have found high parenting stress in parents of infants have worked primarily with parents of infants with health concerns, such as preterm or very low-birth weight infants (Halpern, Brand, & Malone, 2001; Singer et al., 2013). In contrast, the infants in the current study were typically developing with few health concerns. Regardless of the reason, parents in the current study reported minimal parenting stress, which again significantly reduced variability.

Even with these measurement issues, a significant relation was found between the parent-child dysfunctional interaction subscale and observed quality of parent-infant interaction. This subscale provides an indication of parents' expectations in their interactions with their children and includes many items focused on perception of the parent-child relationship, such as "most times I feel that this child does not like me and does not want to be close to me" or "I expected to have closer and warmer feelings for my child than I do and this bothers me." Parents who perceived difficulties in their interactions exhibited lower quality in the observed interactions

with their infants. Although the full version of the PSI has been related to observed parenting (Bigras, LaFreniere, & Dumas, 1996), no validation studies of the PSI short form have used direct observation of parenting. While a relation with observed quality of interaction was only found between one of the two subscales measured, it is still an indication that the parental social cognition of perception is related to observed parenting behavior. This finding is important because parents who endorse negative feelings about their interactions with their very young infants may be at particular risk for extremely negative interactions.

While neither of the theoretical tenets related to clarity of role expectations was directly supported in this study, the first tenet was partially supported by the finding that mothers' expectations of infant development were significantly related to the quality of their interactions with their infants even after controlling for maternal age. Mothers who had more developmentally appropriate expectations of their infants were more affectionate and encouraging in their interactions. These mothers were also more likely to use more teaching behaviors such as labeling objects, asking questions, and repeating infant vocalizations. These types of parenting behaviors are part of those essential "serve and return" interactions that build and strengthen brain development (National Scientific Council on the Developing Child, 2012) and form the foundation for development of emotional and cognitive skills.

### **Implications**

Results of this study could be utilized to develop effective interventions for infants and their families. Specifically, interventions which address parental and family support, as well as parent-infant interactions, are recommended (Shaw, Bell, & Gilliom, 2000). The finding that developmentally appropriate expectations of infants and perceived parent-child dysfunctional interaction are significantly related to the observed quality of parent-infant interactions holds

important implications for intervention efforts. Practitioners should focus their services on teaching parents about infant development and appropriate expectations within the context of parent-infant interactions, as well as supporting parents in their interactions with their infants. Specifically teaching parents about the “serve and return” process would teach parents about both infant brain development and the importance of sensitive and responsive interactions. The finding that maternal age is so strongly related to quality of interaction indicates that young mothers are particularly in need of this type of parental education. To further support positive parent-infant interactions, practitioners could videotape parents interacting with their infants and then watch the video with the parent to discuss infant development and parenting behaviors. Practitioners could also use this time to point out infant cues for interaction opportunities (or overtures) the parent may be missing and provide affirmation for sensitive and appropriate responses. In order for practitioners to provide this type of support, policy makers must continue to fund home visiting services. These services are necessary so parents can learn about infant development and sensitive interactions as early as possible in their child’s life. Because these parent-infant interactions literally build the architecture of the brain, it is essential that they are sensitive and nurturing from the beginning.

Several limitations must be considered when interpreting the results of this study. A potential limitation exists in the measurement of the quality of parent-infant interactions. The *Parenting Interactions with Children: Checklist of Observations Linked to Outcomes* (PICCOLO; Roggman et al., 2008) only measures positive parenting behaviors and does not directly account for negative or maladaptive parenting behaviors, such as harsh parenting. These negative behaviors, which are disruptive to the serve and return process, could be related to parent perceptions or parenting stress. A final consideration is that home visiting services were



ongoing throughout this study and some had even begun prenatally. The parenting perceptions and interactions with their children may be influenced by the services of a home visitor, albeit hopefully in a positive manner.

Future researchers should consider alternative measures of perceptions of the parenting role and parenting stress that would result in more variability. Additionally, the *Parenting Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO)* (Roggman, Cook, Innocenti, Norman, & Christiansen, 2008) was developed and has been validated for use with children ages 10-47 months. While a version is being developed for use with younger infants, this study is one of the first to use the *PICCOLO* with infants under the age of 10 months. Reliability analysis of this sample indicates that the current structure of the measure may not be appropriate when looking at individual domains. Despite a good overall reliability ( $\alpha = .79$ ), the reliabilities on the individual domains of affection, responsiveness, encouragement, and teaching were much lower ( $\alpha = .44, .59, .50$ , and  $.59$ ). This indicates that there is a need to look at individual items within domains and determine whether any of the items that may be appropriate for older children are actually developmentally inappropriate to measure interactions with very young infants.

Future studies of observed parent-infant interaction should consider measurement of additional parental factors. In Belsky's (1984) model of the determinants of parenting, parent factors are described as parents' personal psychological resources. These resources are personal attributes and capabilities that can help the individual function effectively as a parent, even in adverse or challenging circumstances. Some suggested factors include measurement of personality traits, parenting self-efficacy, mental health, and substance abuse. Additionally future studies should include child factors, such as temperament, which has been found to influence

perceived parenting stress and the parent-infant interaction (Belsky & Barnends, 2002). Finally, the type or strength of attachment between the infant and parent has been found to influence the quality of parent-infant interactions and should be included in future studies (Hughes, 2009). Adding these constructs to future studies would help eliminate some of the extraneous and confounding variables.

A final consideration for future researchers is that instead of finding a direct association between knowledge and behavior, what researchers are finding is an interaction of child development knowledge with other social cognitions. Studies of the interaction between knowledge and parent self-efficacy reveal that mothers with high parental self-efficacy but low knowledge of infant development have the lowest quality interactions (Conrad, Gross, Fogg, & Ruchala, 1992; Hess, Teti, Hussey-Gardner, 2004). Likewise, mothers with high levels of confidence and knowledge have the most positive interactions with their infants. Future researchers should examine possible interactions between different parental social cognitions and observed parenting behavior.

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Table 1  
*Demographics of participants*

Demographic	<i>N</i>	%
Race and Ethnicity		
White/Non-Hispanic	92	61.3
Black/Non-Hispanic	26	17.3
Asian	1	0.7
Hispanic	25	13.7
Multi-Racial	6	4.0
Education		
<12 <sup>th</sup> grade	34	23.1
High school diploma/GED	71	48.3
Job/tech training	12	8.2
Community college	18	12.2
College or grad school	12	8.2
Primary Language		
English	142	94.7
Spanish	7	4.7
Chinese	1	0.7
Marital Status		
Never married	107	71.3
Married	30	20.0
Separated/Divorced	13	8.7
Child's Gender		
Female	80	53.3
Male	70	46.7

Table 2  
*Descriptive statistics of study variables*

Measure	Possible Range	Observed Range	Mean	SD
Parent ratings				
Expectations of parental role	30-150	111-150	140.4	8.5
Expectations of child development	14-70	36-67	52.8	6.3
Parenting stress	23-115	23-67	35.8	10.7
Parental distress	12-60	12-52	22.8	9.1
P-C dysfunctional interaction	11-55	11-44	13	4.1
Observed interactions				
Affection	0-14	7-14	10.8	1.6
Responsiveness	0-14	3-14	10.8	2.2
Encouragement	0-14	5-14	10.5	2.0
Teaching	0-16	0-10	4.7	2.1
Total	0-58	19-50	36.8	5.9

Table 3  
*Bivariate relations among study variables*

Measures	Correlates					
	1	2	3	4	5	6
Covariate						
1. Maternal age						
Parent social cognitions						
2. Expectations of parental role	-.02					
3. Expectations of infant development	.26**	.04				
Parenting stress						
4. Parental distress	-.19*	-.10	.10			
5. P-C dysfunctional interaction	-.05	-.07	-.15	.19*		
6. Total	-.18*	.11	.03	.93**	.55**	
Parent-infant interaction quality						
7. Observation total	.34**	-.03	.24**	-.02	-.17*	-.08

\* $p \leq .05$ , \*\* $p \leq .01$

Table 4  
*Full hierarchical model with expectations of parental role (N = 150)*

Variable	<i>B</i>	<i>SE(B)</i>	$\beta$	<i>T</i>
Maternal age	.38	.09	.34	4.40**
Expectations of parental role	-.02	.05	-.03	-.38
Parental distress	.05	.05	.08	.93
P-C Dysfunctional Interaction	-.24	.11	-.17	-.2.17*

\* $p \leq .05$ , \*\* $p \leq .01$

Table 5  
*Full hierarchical model with expectations of infant development (N = 150)*

Variable	<i>B</i>	<i>SE(B)</i>	<i>B</i>	<i>t</i>
Maternal age	.34	.09	.31	3.81**
Expectations of child development	.12	.08	.13	.11
Parental distress	.03	.05	.05	.66
P-C Dysfunctional interaction	-.21	.11	-.15	-1.85

\* $p \leq .05$ , \*\* $p \leq .01$

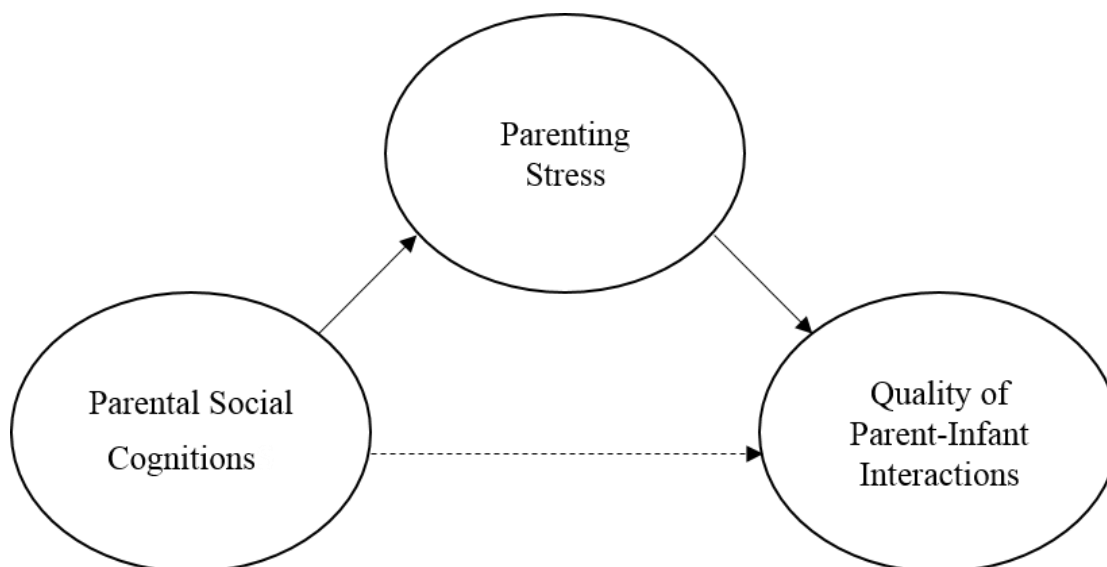


Figure 1. Theoretical framework.

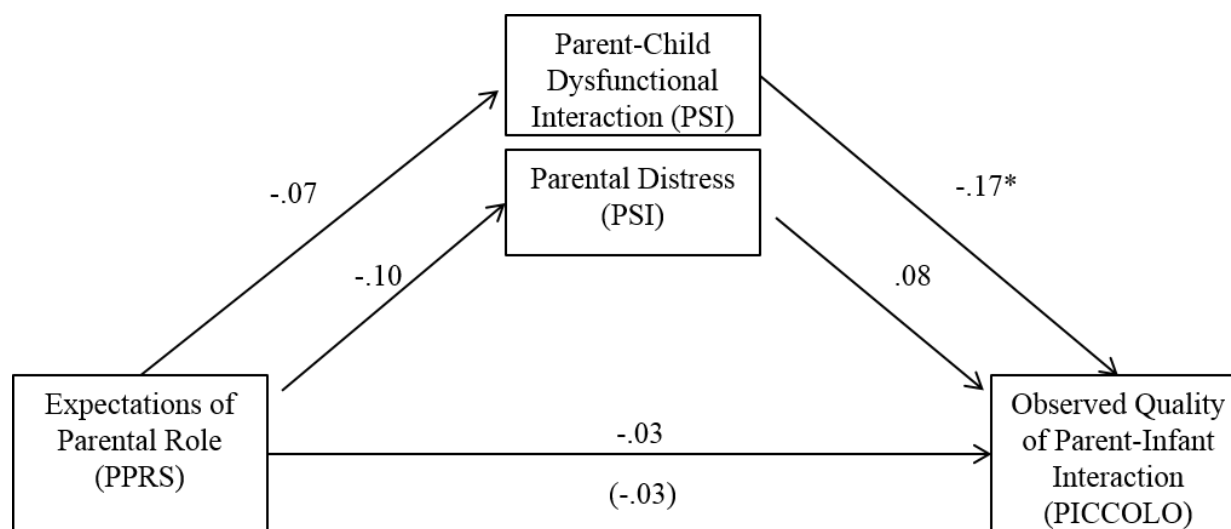
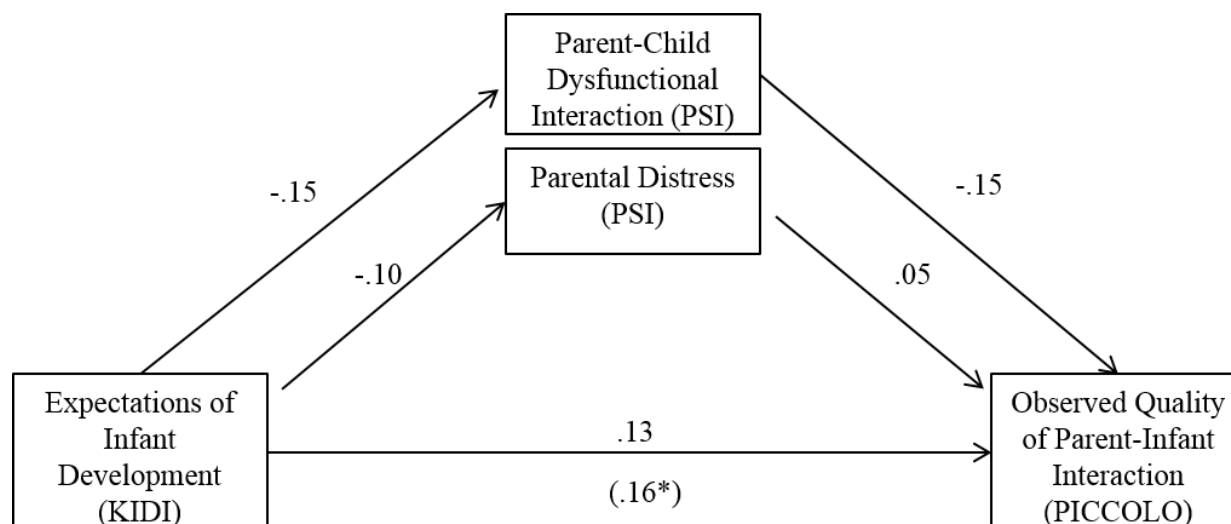


Figure 2. Measurement model with parent expectations of role responsibilities. This figure presents the standardized beta weights for the full hierarchical regression model controlling for maternal age. The number in parentheses indicates the standardized beta weight prior to testing for mediation.

\* $p \leq .05$ , \*\* $p \leq .01$



*Figure 3.* Measurement model with parent expectations of infant development. This figure presents the standardized beta weights for the full hierarchical regression model controlling for maternal age. The number in parentheses indicates the standardized beta weight prior to testing for mediation.

\* $p \leq .05$ , \*\* $p \leq .01$

## APPENDIX: IRB APPROVAL



Melissa Clucas &lt;mclucas@iastate.edu&gt;

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**IRB Process Question for Thesis**

4 messages

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**mclucas @iastate.edu** <mclucas@iastate.edu>  
To: rbappe@iastate.edu

Thu, Aug 22, 2013 at 10:55 AM

Dear Ms. Bappe,

My major professor, Dr. Hughes-Belding, referred me to you. I am currently going into my second semester as a graduate student in the department of Human Development & Family Studies and am beginning the process of applying for IRB approval. My thesis is actually a sub-study of a larger study that I am working on with Dr. Hughes-Belding and Dr. Carla Peterson. All of the data collection will be conducted through their study, which already has IRB approval. Could you please let me know which IRB process I need to go through to have my own IRB for my thesis, but be approved for the data collection through the other study?

Thank you in advance for your assistance!

--

*Melissa Clucas*  
*Graduate Research Assistant*  
*Human Development and Family Studies*  
*73 LeBaron*  
*Iowa State University*  
*Ames, IA 50011*  
[\(815\) 531-7498](tel:(815)531-7498)

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**IRB Committee [ORA]** <irb@iastate.edu>

Thu, Sep 5, 2013 at 3:01 PM

To: "Clucas, Melissa E [HD FS]" &lt;mclucas@iastate.edu&gt;

Cc: "kereh@iastate.edu" &lt;kereh@iastate.edu&gt;, "carlapet@iastate.edu" &lt;carlapet@iastate.edu&gt;

Hi Melissa,

Thanks for your inquiry. I have some question in order to determine what is necessary for IRB review. Are you already listed as key personnel on Dr. Hughes-Belding and Dr. Peterson's study? Will you be collecting any data that is different from what was approved in the study? Also, will the portion of the research that you will be conducting conflict with anything that the participants agreed to in the informed consent process?

Thanks,

Roxanne

***Roxanne Bappe***

IRB Administrator

Office for Responsible Research | Iowa State University

1138 Pearson Hall | Ames IA 50011

[515-294-4215](tel:515-294-4215) | [515-294-4267](tel:515-294-4267) fax

[www.compliance.iastate.edu](http://www.compliance.iastate.edu)

*Effective April 1, 2013: The Office for Responsible Research will no longer accept applications on previous versions of the forms. Due to the ongoing improvements and periodic changes to the forms, please visit <http://www.compliance.iastate.edu/irb/forms/> and download the current form. Applications received on old versions of forms will be returned without being reviewed.*

**From:** mclucas @[iastate.edu](http://iastate.edu) [mailto:[mclucas@iastate.edu](mailto:mclucas@iastate.edu)]

**Sent:** Thursday, August 22, 2013 10:56 AM

**To:** [rbappe@iastate.edu](mailto:rbappe@iastate.edu)

**Subject:** IRB Process Question for Thesis

[Quoted text hidden]

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**mclucas @iastate.edu** <mclucas@iastate.edu>

Thu, Sep 5, 2013 at 3:13 PM

To: "IRB Committee [ORA]" <irb@iastate.edu>

Hi Roxanne,

Thank you for getting back to me. Yes, I am listed as key personnel on Dr. Hughes-Belding and Dr. Peterson's study. The data that I will be collecting has already been approved in the study, and the portion of research that I will be conducting is in alignment with the informed consent process of the participants. The IRB-ID of their study is 12-540 in case you need it.

Thank you for your assistance,

Melissa Clucas

[Quoted text hidden]

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**IRB Committee [ORA]** <irb@iastate.edu>

Wed, Sep 18, 2013 at 3:18 PM

To: "Clucas, Melissa E [HD FS]" <mclucas@iastate.edu>

Cc: "kereh@iastate.edu" <kereh@iastate.edu>, "carlapet@iastate.edu" <carlapet@iastate.edu>

Hi Melissa,

If your study is a sub-study in that you are only analyzing the data that was already collected for this study, the existing IRB approval should cover you. However, if any of the procedures will be changed or you will be doing anything different than what was approved in the protocol, you will want to either send us a new application for your study or a modification form to update the existing study to include your changes.

Please let me know if you have any questions.

Thanks!

Roxanne