

Oklahoma State University Library

**INFANT'S RESPONSE TO THE
STILL FACE PARADIGM**

BY

ASHLEY ERIN SMITH

Bachelor of Science

Oklahoma State University

Stillwater, Oklahoma

1999

**Submitted to the Faculty of the
Graduate College of
Oklahoma State University
in partial fulfillment of
the Degree of
MASTER OF SCIENCE
July, 2000**

Oklahoma State University Library

ACKNOWLEDGMENTS
INFANT'S RESPONSE TO THE

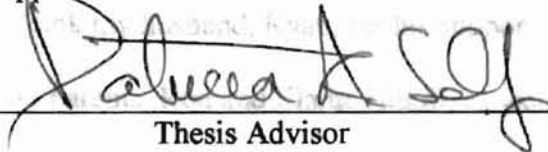
STILL FACE PARADIGM

As my sincere appreciation to my major advisor, Dr. Patricia

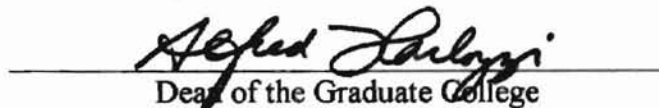
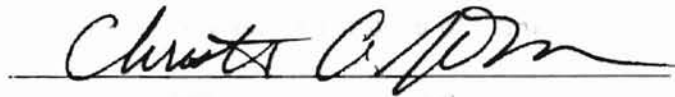

management throughout this research project. Her guidance

and Dr. Amanda Hamrick for their unwavering support

Thesis Approved:



Thesis Advisor



Dean of the Graduate College

ACKNOWLEDGMENTS

I would like to express my sincere appreciation to my major advisor, Dr. Patricia A. Self, for her advice and encouragement throughout this research project. Her guidance was invaluable in the development and completion of this study. I would also like to thank Dr. Christine Johnson and Dr. Amanda Harrist for their suggestions and support. Their input was very helpful throughout the study.

I would also like to thank my husband, Ryan, for his support, encouragement, sense of humor and love. My parents, Ron and Elaine Hukill, as well as my grandfather, Perry Parrish were also very encouraging during this time. I wish to thank them all for their support during my college career.

Finally, I would like to thank the Department of Family Relations and Child Development. Without their support and financial assistance, this research would not have been possible.

Chapter	Title of Oral Solicitation	Page
I. INTRODUCTION	Parent-Child Interaction	1
II. LITERATURE REVIEW	Parent-Child Interaction	3
	Parent Regulatory Function System	3
	Theoretical Perspective	3
	Parent-Child Interaction	7
	Gender Differences in Parent-Child Interaction	10
	Still Face Paradigm	13
	Instrument Review	17
	Problem Statement	19
	Hypotheses	19
III. METHOD		21
	Participants	21
	Materials	21
	Procedure	22
	Coding of Data	23
IV. RESULTS		26
	Descriptive Data	26
	Analysis of Specific Behaviors	28
	Analysis of Specific Hypotheses	28
	Post Hoc	29
V. DISCUSSION		39
	Summary of Results	39
	Theoretical Implications	40
	Conclusions and Implications	42
REFERENCES		43

	APPENDICES.....	LIST OF TABLES.....	50
Table	Appendix A-Outline of Oral Solicitation.....		51
	Appendix B-Informed Consent Form.....		53
IRSS	Appendix C-Outline of Oral Instructions.....		56
	Appendix D-Data.....		58
IRSS	Appendix E-Infant Regulatory Scoring System.....		63
Table	Percentage of IRSS coded behaviors.....		34
Table	IRSS response time scores for male and female infants.....		35

LIST OF TABLES

Table	Page
I. IRSS composite mean scores for all behaviors.....	32
II. IRSS composite mean score by age for all behaviors for each phase.....	33
III. Percentage of IRSS coded behaviors.....	34
IV. IRSS composite mean scores for male and female infant behaviors.....	35

CHAPTER I
INTRODUCTION

Many researchers have explored mother-infant interaction. A common goal for these studies has been to identify the characteristics of both the mother and the infant that

LIST OF FIGURES

Figure	Page
I. Still face presentation mean and standard deviation scores.....	36
II. Reengagement time mean and standard deviation	37
III. Minute reengagement times.....	38

months of life, and using the Still Face **CHAPTER I** precise way to examine mother and infant communication capabilities. The **INTRODUCTION** consists of three phases in which **the first** Many researchers have explored mother-infant interaction. A common goal for these studies has been to identify the characteristics of both the mother and the infant that affect social interaction. Researchers strive to determine basics of communication and interaction. Communication patterns are apparent in interaction both verbally and **others** nonverbally. How these patterns of communication and interaction are derived are dependent on the mother's ability to educate and the infant's ability to learn (Papousek & Papousek, 1987). Infants learn from their mothers how to socially interact with their environment and others in it. Infants also learn how to be independent and deal with **first** situations on their own. Research has found that positive, reinforcing interaction with the mother allows the infant to become more self-assured in their interacting with other people (Cohn & Tronick, 1988).

Roggman and Peery (1989) suggest that the patterns of communication and interaction being taught by the mother are gender specific. Mothers tend to interact with boys differently than they do with girls. The differences in maternal interaction are seen in early infancy. Eye contact and vocalization are keys to communication. However, several studies show that mothers look at and talk to their male and female infants differently (Parke & Sawin, 1980; Roggman & Peery, 1989; Thoman, Leiderman & Olson, 1972). This difference in early interaction may lead to differential socialization for males and females later in life (Roggman & Peery, 1989).

The main purpose of the current research was to improve understanding of early mother-infant interaction, specifically during stressful situations during the third to six

month of life, and using the Still Face Paradigm, a precise way to examine mother and infant interaction capabilities. The Still Face Paradigm consists of three phases in which the mother interacts with her infant, refrains from interaction, then tries to reengage in interaction. The infant's responses are then noted and compared.

Many researchers have found the Still Face Paradigm to be a useful tool in gathering data concerning reaction skills by infants. The three phases allow researchers to view an infant's behaviors in different levels of stress. The initial phase is not a stressful situation but gives the researchers knowledge of the infant's normal interaction with the mother. The second phase, the still face presentation, is a stressful situation. Presumably, the mother is present in front of the infant but may not touch, talk to, or look at her child. The infant does not know why its mother is not interacting with it. Studies have found gender differences in how infants react to the still face presentation. Contradictory research has found that both male and female infants tend to show more distress during the still face presentation than the other sex (Cohn & Tronick, 1983; Mayes & Carter, 1990). There has been no data gathered on the third phase, the reengagement period. This is the phase that follows the still face presentation, where the mother tries to reengage her infant in play.

Each phase of the Still Face Paradigm is an important look into the interactional capabilities of the infant. The present study explored gender differences in the still face presentation and the reengagement period of the Still Face Paradigm.

(Bandura, 1989). The infant does not have to be present at all times to display the learned behavior.

CHAPTER II
LITERATURE REVIEW

Freud (1938) claimed that the relationship an infant shares with his or her parents and family during the first year of life is the basis for all future relationships. Each of the relationships that an infant has with its family is important, and contributes to the development of the infant's environmental and personal self (Freud, 1938). The important relationships include the mother, father, and siblings. According to Lamb, Thompson, Gardner, and Charnov (1985), the relationships that an infant will have with his or her family members is a network. Each relationship has a definition and meaning for its existence. The family relationships then work together to help form the infant's idea of family as well as the infant's idea of self. The infant is said to influence the quality and quantity of the parental and family relationships. The gender of the infant is said to have an effect on the relationships as well.

Theoretical Perspectives

There are multiple theories that recognize parent-infant interaction as the base for future social relationships. In Bandura's (1989) Social Learning Theory, infants learn through the observation of others. The learning that takes place is reciprocally determined by interactions of the infant and his or her physical and social environment. Bandura (1989) claims that most learning comes from observational learning and instruction. Infants imitate how to act and react in situations from their caregivers, whether the situation is stressful or pleasurable. Imitation of the caregiver's behavior when the caregiver is no longer present is also an especially important learning skill

(Bandura, 1989). The infant does not need the caregiver to be present at all times to display the learned behavior. The infant's level of cognitive development influences its ability to observe. Bandura's (1989) theory assumes that the infant is a highly active participant in the social and cognitive learning interactions responsible for its developmental change. Social Learning Theory allows the infant to display observational learning. The infant tries to reproduce behaviors it has seen and receive feedback as to how closely its behavior matches that of the caregiver (Bandura, 1989). Social Learning Theory assumes that the infant, its caregiver, and the environment that encompasses the learning assist in the development of the infant's coping and learning capabilities (Bandura, 1989).

The main theory that is pertinent to the present study is Papousek and Papousek's (1987) Theory of Intuitive Parenting. Bandura's (1989) Social Learning Theory is similar to the Theory of Intuitive Parenting in the sense that both theories support the idea of the infant's awareness of others. According to this theory, the human infant is uniquely advanced in the development of integrative capabilities. Papousek and Papousek (1987) explain that no other animal has the capacity to conceptualize the meaning of symbolic experiences as well as the use of words as does the human infant.

The Theory of Intuitive Parenting focuses on parent-infant interaction, particularly how the parent has interacted with the infant on a daily basis. As noted above, parents are the educators when it comes to infant learning. The infant learns from daily interactions with its caregiver. Within these interactions there are two properties that are acknowledged: (1) Parent-infant interactions are potential educating experiences due to the extreme differences between what the infant has not learned and what the

parent already knows; and (2) parent-infant interactions are very special didactic interactions since there is an extreme difference in communicative capacities between the adult having advanced speech and the infant lacking any speech (Papousek & Papousek, 1987). Essentially, the parent has the information that the infant must learn but the parent has to find a way to communicate this information in a way that the infant will understand it, and since the infant has not yet experienced it, the experience itself will be educational. The parent and infant cues aid in this process. This is the basis for parent-infant interactions, which lead to infant learning according to this theory.

According to the Theory of Intuitive Parenting, infants are capable of complex integrative processes, self-awareness, autonomy in emotional behaviors, and symbolic communication (Papousek & Papousek, 1987). The parent or caregiver is considered the teacher of communication cues because of the amount of integrated life experience and communicative capacity the parent or caregiver has had compared to the infant. Infant cues such as eye contact, brow-knitting, facial and verbal expressions, hand gestures, and body posture are related to the course of learning and problem solving for the infant. These cues help the infant to cope or adjust to different stimuli. Parents and caregivers are capable of reading the infant cues as communicative signals.

The Theory of Intuitive Parenting assumes that the current situation as well as past parent-infant interactions aid in the development of the infant's interactional and social skills. In daily interaction, the mothers have taught their infants how to display cues and how to act or react in certain situations. These interactive patterns are the basis for the symbolic communication between parent and child. In this study, the infants are at the age, three to six months old, where interaction and learning experiences are

important. This study tests the infants' ability to handle a stressful situation. According to Papousek and Papousek (1987), the infants should have some idea of how to react in this situation based on past interactions with their parents.

The present study explores several aspects of this symbolic communication during early infancy. First, Intuitive Parenting Theory would suggest that parents respond differently to their infant's cues depending upon the infant's biological sex. These gendered interactions are likely due to cultural socialization. Second, the Still Face Paradigm, with its second phase of non-responsiveness of the parent, should reflect how infants respond to interactive stress. This response to the interactive stress may also be gender related. Finally, the reengagement portion of the Still Face Paradigm should also reflect gender differences of both the infant and parent as the interaction moves back toward the usual pattern of interactive communication. It was assumed that the mothers taking part in this study treated their male and female infants differently according to previous studies. The theory of Intuitive Parenting aids this study in that both hypotheses are based on the assumption that the caregivers had previous interactions that were educational yet may have differed depending on the sex and age of the infant.

To apply Papousek and Papousek's theory of Intuitive Parenting, this study examined the Still Face Paradigm as a social situation in which the infant is responsible for the symbolic communication which then continues into the reengagement of the mother-infant interaction. The infant is thought to be responsible for the symbolic communication during the still face presentation as it has been assumed that the infant has learned how to react in a stressful situation from its mother. Additionally, it is also assumed that the mother has treated the child in a gender-differential way. This is

presumed to lead to gender differences in the infant's response to the stress and reengagement time during the Still Face Paradigm.

Parent-Child Interaction

The basis of the theories listed above is that the mother and father are the infant's primary learning facility. When the infants are awake, they interact with their parents almost constantly. Mothers of infants are usually the primary caregivers and nurturers of the infants, therefore, they tend to the infant's social, emotional, and cognitive needs more regularly. At least in the recent past, fathers have tended to be more playmates for the infant (Parke & O'Leary, 1976). For this reason, the mother-infant relationship will be the primary concentration for this study.

Early interaction between mothers and their infants is assumed to be crucial to infant development. Infants learn from their mothers how to socially interact, respond to a given situation, and how to be independent. Researchers Cohn and Tronick (1988) investigated the structure of mother-infant interaction. Infants at 3, 6, and 9 months of age were videotaped interacting with their mothers. The mothers were to engage their infant in normal, positive interaction. This research found that positive interaction helped to engage the infants more fluidly with their mothers. However, what aspects of interaction are most important?

Historically, multiple aspects of the interactive process have been studied. Aspects of mother infant interaction that are important for the development of the infant determined by past research include eye contact and verbal stimulation.

Eye Contact

Eye contact is an indispensable part of adult communication, yet is thought to have its roots in infancy (Hains & Muir, 1996; 1999). Hains and Muir (1996) examined the display of adult eye direction in infant-adult interaction. The research was conducted by manipulating adult eye direction while infant-adult interaction was taking place. The research found that “when adults engage in normal face-to-face interaction with 3-6 month olds, adult eye contact appears to cue infants to engage in communicative exchanges (p. 1940).” This in turn means that infants may indicate their cognitive recognition of the adult’s eye direction by their affective behavior (smiling, fussing; Hains & Muir, 1996; 1999). Some researchers (Jaffe, Stern, & Perry, 1973) found that the gross temporal patterns of mother-infant gaze are identical to those found in adult conversations. Eye contact is considered to be coordinated with speech between infants and their caregivers (Stern, 1974). Stern’s research has found that the direction of gaze in infant-adult interactions may serve as a primer for initiating and terminating social interactions.

Eye contact also helps mothers feel more connected with their infants (Robson, 1967). With eye contact, infants tend to direct maternal behavior. Mothers tend to look where the infant looks (Collis & Schaffer, 1975). The infant also seems to initiate and conclude the visual contact with the mother. Research has shown that if the infant initiates eye contact, the mother will immediately respond. If the mother initiates eye contact, then she will tend to remain looking at the infant until the infant also connects (Brazelton, Koslowski, & Main, 1974; Hains & Muir, 1999; Jaffe et al., 1973; Stern, 1974).

Another aspect of eye contact is gaze aversion. Gaze aversion has a simple definition. It is when an infant is fixated on an adult's face and then looks away (Clyman, Emde, Kempe, & Harmon, 1986). Gaze aversion allows the infant to decrease the amount of stimulation or arousal by turning away from the stimulus that is affecting him or her by being too intense or too complicated (Stern, 1974). The infant may also use gaze aversion to turn away from a stimulus that is boring or redundant. This allows the infant to find a new stimulus that may increase his or her state of arousal (Stern, 1974).

Verbal Stimulation

As eye contact helps to build infant confidence, verbal stimulation also is a way for mothers and infant to interact. Theoretically, maternal responsiveness to infant verbal communication encourages the development of future communication by facilitating the growth of confidence in the child (Bell & Ainsworth, 1972). Vocal interactions will differ in infancy based on the infant's gender (Roggman & Peery, 1989). Vocal interactions tend to include voice pitch and tone, as well as the amount of time a parent spends "talking" with the infant.

Early verbal interaction is also presumed to be important for the mother. Mothers of infants usually need to be reassured that they are doing a satisfactory job raising their child (Lamb et. al, 1985). Early interaction tends to give the mother a sense of satisfaction and love. Stern (1974) considers social play at the 3-month-old period is concerned mainly with mutual regulation of stimulation to obtain a high level of arousal pleasing to both individuals. Tronick and Gianino (1986) describe normal face to face interactions as infants being able to engage their mothers through attention getting

behaviors. In response, mothers help regulate their infant's stimulation by displaying their exaggerated vocal and facial expressions when infants are engaged and by reducing interaction when infants are disengaged. The mother's vocal and facial expressions toward the infant would not be acceptable in an adult conversation. The mother's speech is slowed down to more closely match the infant's speech abilities. The facial expressions usually include eyebrows highly arched, eyes opened very wide, and the mouth open. The mother's head also comes up and forward very close to the infant's face (Stern, 1974). Additionally, the interaction between mother and infant has a conversation like pattern where each individual responds to the other.

Gender Differences in Parent-Infant Interaction

Verbal stimuli and eye contact serve as a communication platform between mother and infant. Each mother and infant dyad develop their own style of communication. However, this style of communication is sometimes based on the gender of the child. Many researchers have found that parents treat male and female infants differently. This difference appears in every realm of interaction and parenting. The way a parent talks to, touches, plays with, and cares for an infant may depend on the infant's gender. The differences start in infancy but continue until adulthood (Roggman & Perry, 1989).

The observed differences in interactions for male and female infants are numerous. Roggman and Perry (1989) explored the relationship between nonverbal behaviors of parent gazing and touching with infant gazing. In infant-parent interaction, mothers were found to touch male infants more frequently and fathers tend to touch male infants for longer periods of time (Moss, 1967; Parke & O'Leary, 1976; Parke & Sawin,

1980; Roggman & Perry, 1989). Consequently, female infants were touched less by their mothers but were looked at more by their mother and father (Roggman & Perry, 1989). Researchers also found that mothers spend more time stimulating, talking with, and smiling at female infants than male infants (Thoman, Leiderman, & Olson, 1972). Additionally, there is evidence that female infants can be more easily calmed by their caregiver than male infants after crying for a period of time (Thoman, 1976; Horowitz, Self, Paden, Culp, Laub, Boyd, & Mann, 1971). In the vocal interactions, female infants have been found to be talked to more (Bell, 1968), receiving more vocal stimulation from both the mother and father than males (Rebelsky & Hanks, 1971). A greater amount of vocalization directed toward female infants also has been found in a home setting at 6 months of age (Lewis, 1972). At 3 months of age, female infants tend to receive more attention than male infants (Lewis, 1967), and three-month-old male infants were found to sleep less and cry more than females (Moss & Robson, 1968).

As eye contact and verbal stimulation aid in the development of an infant's interactional abilities, gender differences also play a role in the mother-infant's interaction quality and quantity. Parent-infant interaction establishes patterns early in the infant's life. The early play patterns are specific to the gender of both the infant and parent (Roggman & Peery, 1989). Some of the gender differences in a child's future social behavior may originate in infancy during interactions with their mother and father.

According to Moore (1967), female infants are more sensitive to auditory stimulations, and male infants are more sensitive to visual stimuli such as objects in motion. Moore (1967) observed male and female infants to test auditory and visual stimuli orientation. This may be evidence to show that in calming effects female infants

respond more to the sound of the mother's voice, and male infants respond to the sight of the mother's face. The gender differences found in years of research help to establish the reasons why a male or female infant responds the way he or she does to the Still Face Paradigm.

Contradictory research exists relating to reactions concerning gender differences in the Still Face Paradigm. In the Still Face Paradigm, Mayes and Carter (1990) found that three-month-old female infants are more distressed than male infants in response to the mother's still face, whereas Cohn and Tronick (1983) found that three-month-old male infants showed more distress than female infants. Mayes and Carter (1990) studied the emotional experiences of infants during the Still Face Paradigm. The researchers found that facial and vocal affect, gaze, posture, and self-comforting behaviors are prominently displayed from three-month-old infants during the Still Face Paradigm. In this study, female infants exhibited greater amounts of gaze aversion and self-comforting behaviors than did male infants during the Still Face Paradigm. Male infants seemed to respond less negatively when their mothers refrained from interaction. Cohn and Tronick (1983) explored the issue of maternal depression by simulating the Still Face Paradigm with the infant-mother dyad to recreate maternal depression. Mothers were instructed to interact with their infant, then stop the interaction. The three-month-old male infants tended to react more negatively, by exhibiting stress behaviors, to the still face than female infants.

Some research has found that there are no significant gender differences in the response to the still face presentation (Toda & Fogel, 1993). These researchers conducted the Still Face Paradigm with three to six month old male and female infants,

and found that there was no crucial difference in the responses by either sex. It is clear that more research needs to be done before there is any definitive conclusions about a gender and the still face responses.

The current study was based on the presented research and literature concerning gender differences in daily parent-infant interactions. There has been evidence in several studies that suggest female infants display more stress behaviors during parent-infant interaction but are calmed more easily following a stressful period. Based on the above information, this study will investigate the proposed gender differences in the Still Face Paradigm.

Still Face Paradigm

The Still Face Paradigm is used for measuring mother and infant interaction capabilities and has been used by a number of researchers to study the effect of alterations in maternal emotional expressions on infant behavior (Cohn & Elmore, 1988; Field, Vega-Lahr, Scafidi, & Goldstein, 1986; Fogel, Diamond, Langhorst, & Demos, 1982; Gusella, Muir, & Tronick, 1988; Mayes & Carter, 1990; Murray & Trevarthen, 1985; Stack & Muir, 1990; Stroller & Field, 1982; Tronick, Als, Adamson, Wise, & Brazelton, 1978, Weinberg & Tronick, 1996). It is used to help understand infants' experiences and effective responding as well as mother reengagement (Tronick et al., 1978).

According to Kogan and Carter (1996), the Still Face Paradigm consists of three episodes, during which the mother and infant are facing each other. The mother sits in a chair while the infant is in an infant seat up on a table so that the two individuals can be eye level. First, the mother is asked to play with the infant in a natural style. Next, the

mother is asked to maintain a still, neutral facial expression and refrain from interaction and eye contact (the still face presentation). Lastly, the mother is asked to return to a natural interaction (the reengagement period).

Infants will experience a range of emotions during the still face presentation. The mother's soundless, unresponsive face usually has an immediate affect on the infant (Fogel et al., 1982). Tronick, Als, Adamson, Wise and Brazelton (1978) have shown that most infants will attempt to regain the mother's attention after she assumes the still face position. After a few unsuccessful attempts to regain the mother's attention, the infant begins to show distress. Most infants will become upset with the lack of maternal interaction. Tronick et al. (1978) investigated infant response to normal face-to-face interaction with the mother and mothers who were instructed to be nonresponsive. The research consisted of mother-infant dyads that participated in the normal interaction and the Still Face Paradigm. The infants were found to react to the different types of interaction. The absence of the face-to-face interaction with the mother is said to be more distressing and results in more gaze aversion for a 4-month-old infant than a physical separation (Field, Vega-Lahr, Scafidi, & Goldstein, 1986; Field, 1994). According to Fogel et al. (1982), the severity of the response for the infant depends on the amount of time the mother is unresponsive. Infants seemed to deal with this lack of interaction with the mother from the still face presentation by gaze aversion, self-comforting actions, or withdrawal from the interaction situation (Tronick et al., 1978).

Following the still face presentation, the infant may respond in a variety of ways (Tronick et al., 1978). During the reengagement period, the infant may avoid the mother's attempts at reengagement by gaze averting in response to her interaction; the

infant may exhibit protest and agitation, by looking at the mother yet fussing insistently; or the infant may attempt to regain her attention and contact by looking at her, smiling, vocalizing or reaching.

Research on the third phase of the Still Face Paradigm has been scarce. Studies employing the still face tend to minimize discussion of the reengagement period (Kogan & Carter, 1996). It has been noted as a “carry-over” effect, where the infant’s stress during the still face presentation carries over to the reengagement period rather than an opportunity to learn about infant individual differences in response to a stressful situation (Carter et al., 1990; Cohn & Tronick, 1983; Fogel et al., 1982; Stroller & Field, 1982; Tronick et al., 1978). The reengagement period is also found to be influenced by the first two phases of the Still Face Paradigm. The infant’s affect in the first and second phases contribute unique variance to their affective state in the reengagement period (Kogan & Carter, 1996; Carter et al., 1990). Also, the infant must simultaneously cope with the resumption of the maternal interaction and cope with the carry-over of negative emotions from the still face presentation (Weinberg & Tronick, 1996).

The reengagement period provides a chance to observe how male and female infants reorganize after a stressful situation has stopped, as well as an opportunity to further explore the infants’ emerging social regulatory capacities (Kogan & Carter, 1996). The ability to be soothed by the mother after the regulation system has been obstructed is not only a critical adaptive mechanism but may indicate the quality of the mother-infant interactive history (Kogan & Carter, 1996). The reengagement period also provides a look into mother-infant attachment. Cohn, Campbell, and Ross (1992) found

that infants' response during the three phases of the Still Face Paradigm at 6 months of age were found to predict secure and avoidant attachment at 12 months of age.

There has been research on parent-infant interaction that did not use the Still Face Paradigm but evaluated the synchrony of mother-infant interaction by the speed of that interaction. These studies are important to the present study because they provided a foundation for the investigation of mother-infant interactions based on the infant's gender and age. Arco and McCluskey (1981) designed a study to examine the speed of mother-infant interaction. The researchers manipulated face-to-face interactions by changing the pace of maternal play. They hypothesized that infants would not only react to changes in maternal pacing, but the infants would be able to discriminate between the changes. Their study consisted of 32 mother-infant pairs ranging in age from 3 to 5 months. The mother-infant pairs interacted for four-two-minute phases which ranged from natural pacing to faster-than-usual pacing to slower-than-usual pacing. This study found that infants had the highest level of synchrony during the natural pacing and the faster-than-usual pacing (Arco & McClusky, 1981).

Along this same line, a study was conducted in 1995 that focused on infant gender, infant age, and maternal pacing in mother infant interaction (Czekaj, 1995). The researcher videotaped mother infant interaction. The mother was instructed to speed up or slow down interaction with her infant after experiencing normal interaction (Czekaj, 1995). The infant's response was then studied, and compared to the infant gender and age (Czekaj, 1995). This study found that both male and female infants gazed at the mother less during the slow paced phase, and more during the fast paced phase of

interaction (Czekaj, 1995). There were no other age or gender differences during mother infant interaction (Czekaj, 1995).

There was no research found on gender and its effects on the reengagement period following the still face presentation. As noted above, attachment behaviors were the only factors that had been researched in the small amount of data concerning the reengagement period. This factor makes the current study of the male and female infants' response during the reengagement period needed and necessary.

Instrument Review

The Still Face Paradigm is a tool that many researchers have used to examine maternal and infant interactional capabilities. There are different uses of the Still Face Paradigm. Some studies will use the instrument with mothers only, mothers and fathers, or fathers only. Although factors differ, in each study, the infant is seated in an infant seat on a table at eye level with its parent, and the parent is seated in a chair.

Braungart-Reiker, Garwood, Powers, and Notaro (1998) used the Still Face Paradigm to assess infant affect and affect regulation with mothers and fathers. These researchers were interested in the role of infant characteristics in relation to parental sensitivity. This study had the parents individually interact with their four-month-old infant following the guidelines of the Still Face Paradigm. This study inspected parenting behaviors, infant temperament, and infant behaviors. This study found that there is not a significant difference in the way mothers and fathers interact with their infants during the Still Face Paradigm. However, infants tended to be more negative during the Still Face Paradigm when fathers were the interacting parent.

Another study evaluated gender differences in infant and maternal emotional expressivity and regulation using the Still Face Paradigm with six-month-old infants (Weinberg, Tronick, Cohn, & Olson, 1999). This research consisted of mother-infant dyads presented with the Still Face Paradigm. This study found that male infants had greater difficulty than female infants in maintaining affective regulation during each phase of the Still Face Paradigm. Mother-son dyads had higher synchrony scores than mother-daughter dyads but took longer in repairing interaction errors.

Toda and Fogel (1993) also used the Still Face Paradigm to investigate infant response. The infants were assessed twice, first at three months old, then again at six months old. This research was interested in the developmental changes in the infant's responses to the mother's still face presentation. They found that infants reduced their smiling gestures and increased their gaze aversion during the Still Face Paradigm at both three and 6 months of age. The research also shows that 6-month-old infants were more likely to use directed hand activities while gaze averting from the mother.

As noted above, the Still Face Paradigm is a useful tool in investigating aspects of infant development. Numerous studies have been conducted using the Still Face Paradigm to investigate infants' responses to stress. This study is not only interested in the stress levels during the still face presentation but also in the reengagement period following the still face. There has been little research that examines the amount of time that it takes an infant to regain interaction with his or her mother after a stressful situation.

Problem Statement

As indicated by the literature, mother-infant social interaction has been heavily researched during the past thirty years. The theoretical frameworks used in the past to explore mother-infant communication development have found many variables which affect maternal and infant interaction styles. With all of the research on mother-infant interaction, less has been done concerning the Still Face Paradigm and the reengagement period. Infant response to the still face presentation and the reengagement period is important in assessing stressful situations for mother and infant. The current study explored the question of infant gender differences in relation to the Still Face Paradigm: would female infants exhibit higher amounts of stress during the still face presentation and would female infants be easier to reengage in interaction after the still face period versus male infants? The current study theorizes that there will be a difference in gender reaction to the Still Face Paradigm based on the assumption that the mothers have treated their male and female infants differently in daily parent-infant interactions.

Hypotheses

To investigate the proposed gender differences in the Still Face Paradigm, this study inspected the videotaped face-to-face interactions of mothers and infants. The main hypotheses for this study were concerned with male and female infant responses to the Still Face Paradigm. The hypotheses for this study are as follows:

- 1) Stress levels would be higher for female infants than male infants during the still face presentation.

- 2) During the reengagement phase, female infants would recover baseline levels (how they acted in the phase 1) of responding sooner than male infants as measured by minute-by-minute Infant Regulatory Scoring System (IRSS) scores.

CHAPTER III

METHOD

Participants

The participants were 33 infants (18 males and 15 females) ranging in age from 3 to 6 months of age and their mothers (age range for male infants, 3 to 6 months; range for female infants, 3 to 6 months). The mean age for the male infants was 4.4 months, and female infant mean age was 4.7 months. Three of the subjects, 2 males and 1 female, were tested but excluded due to fussiness. These three infants became extremely upset during the still face presentation and the experiment was stopped, thus the data were coded for 30 infants. The sample was obtained from the birth announcements in the local paper. The mothers were contacted by telephone (Appendix A). The mothers were informed that their participation was strictly voluntary. All of the mothers who participated were above the age of 18. The group was sampled from a medium sized south central community in the United States. The participants appeared to be Anglo-American and lower to middle class.

Materials

The mother-infant pairs were videotaped in an observation room at the Child Development Laboratory. The observation room contained an infant seat placed on a table at a height that allowed face-to-face interaction when the mother was seated. One color video camera was used to videotape the interaction. The camera was set up behind a one-way mirror to record the infant's behavior.

Procedure

The mothers and infants were videotaped together for one session lasting at least 5 minutes and at the most 19 minutes. The videotaped session was divided into 3 phases; each of which is described below. Phase 1 was normal mother infant interaction and lasted 2 minutes. Phase 2 was the still-face paradigm and lasted 2 minutes. Phase 3 was the recovery period, which involved a return to normal temporal interaction, and lasted zero to 15 minutes.

The procedure was reviewed with the mother prior to videotaping and consent for participation was obtained (Appendix B). The researcher gave the following instructions to the mother. The mother was asked to keep the child in the infant seat unless she/he became upset and needed to take a break. The mother was informed that she would be videotaped from behind the one-way mirror. She was also told that to observe her playing with her infant the researcher would come into the room at different times and give her instructions on how to interact with her infant (exact instructions in Appendix C).

Phase 1-Before beginning, the researcher instructed the mother to play with her infant as she does at home, but not to use toys or any other items to assist in her interaction with her infant. The mother was told that after 2 minutes she would be given further instructions about her interaction. The researcher left the room before each session. At the end of phase 1, the researcher went back into the room. When the participants were ready, the second phase was explained to the mother.

Phase 2-When the mother and infant were ready to continue, the researcher asked the mother to refrain from interacting with her infant. The mother was instructed not to

look at, touch, or talk to her infant. At the end of the 2 minutes, the researcher returned to the room. When the participants were ready, phase 3 was explained.

Phase 3-When the mother and infant were ready to continue, the researcher asked the mother to interact with her infant as she did before in Phase 1. The mother was to try to reengage her infant in normal play. At the end of the last phase, the researcher returned to the room and concluded the session by thanking the mother. The mother was asked if she has any questions about the study. She was told that the study was looking at how both infants and mothers react when the still-face paradigm is implemented, and how long it would take the mothers to reengage their infants in play after the still-face paradigm.

Coding of Data

The method of coding the videotaped data was the Infant Regulatory Scoring System (IRSS; Tronick & Weinberg, 1994). This method of measurement codes the infant's behaviors in categories of direction of gaze, vocalizations, pick-me up gestures, self-comforting, distancing, and autonomic stress indicators (Tronick, Weinberg, Cohn & Olson, 1999).

The behavior categories noted above were broken down into distinct actions by the infant. Gaze included the actions of looking at the adult's face, looking at a new object, looking at the same object, looking away from mother, and eyes closed. Vocalization actions were neutral/positive, negative/fussy and crying. Gesture included actions of two-hand reach toward mother, one hand reach toward mother, touching mother, leaning forward in seat, and odd gestures. Self-comfort actions were putting hands in mouth, mouthing objects, mouthing mother, touches self, self hand clasp, and

rocking in seat. Distance included get away and escape actions, arching of back, push away and pull away from mother, and screen out or ignore the environment. Autonomic stress indicators included spitting up, hiccuping, or yawning (Tronick, Weinberg, Cohn & Olson, 1999). These actions were scored if the infant displayed the behavior during the appropriate phase. The behavior was only noted once during each minute. The behavior scores were then added up for each phase. The behaviors were then added up for that phase and divided by the number of categories that the infant scored in. This allowed a mean score to be derived for comparison usage. The IRSS measurement allows the scores of the infants to be computed as one numerical total for each scored phase.

There were three phases in which the infant could display such behaviors: the initial interaction period (phase 1), the still face presentation (phase 2), and the reengagement period (phase 3). Each infant received one mean score for the first two phases based on their minute by minute score. The score from minute one and the score from minute two were added up and divided by the number of categories the infant scored in to achieve a mean score. The first and second phase mean scores were derived this way. Phase 3 was scored in the same minute by minute fashion. When the score from phase 3 was similar to the phase 1 score the infant was considered reengaged with the mother in normal interaction. The reengagement time was rounded off to the nearest minute.

Before the individuals began coding the data, they were trained using other mother-infant interaction videotapes. The individuals each coded a certain number of tapes then compared the scores. The reliability of the IRSS coding systems is achieved by the coders required to compare analysis and at least be in 80% agreement (Izard,

1982). Twenty percent of the total number of sessions were selected randomly and were coded independently by two coders. The raters scored the subjects separately then compared the results. The primary researcher was blind to which videos the second individual would code. The reliability percentage was calculated minute by minute of each phase. If the independent raters marked the same behaviors at the same time then an agreement reached. An agreement level of 92 percent was attained. The agreement level was across all behavioral categories of the IRSS.

CHAPTER IV: their infants as they did at home

RESULTS reaction phase was 78, standard

Descriptive data from the study are presented first followed by t-tests to analyze gender differences during the still face presentation and the reengagement period.

The data was obtained from the videotaped data of the Still Face Paradigm. Each infant was scored on the six different categories within the IRSS. The IRSS scores were then divided by the number of categories to obtain a mean score for each phase. The frequency that each infant displayed each behavior category was also scored.

T-tests were used to examine the IRSS-coded behaviors. The study's hypotheses, that females will exhibit higher stress levels during the Still Face Paradigm and that males will take a longer period of time to reengage in interaction with their mother following the Still Face Paradigm, were tested using the mean score for the phase. The number of minutes for each phase and the number of infants who displayed the IRSS behavior during the Still Face Paradigm were used to examine the accuracy of the hypotheses.

Descriptive Data

This study examined possible differences between male and female infant's behavior during the Still Face Paradigm, specifically in the still face presentation and the reengagement period. The study included phases in which infants displayed behaviors related to their reaction to their mother's interaction and lack of interaction. Male and female infants scored differently in each of the phases. The first phase in which the infants were scored was the initial interaction phase (minutes 1 and 2). The initial interaction phase (phase one) established the baseline levels in which comparisons could

be done with phase three. Mothers were to play with their infants as they did at home. The composite mean IRSS score for the initial interaction phase was 6.78, standard deviation of 2.88 with a range of 12.20. The minute 1 mean score was 6.37, standard deviation of 2.47 with a range of 10.00. The minute 2 mean score was 7.27, standard deviation of 2.70 with a range of 13.00. The male infants' mean score was less than female infants' mean score during phase 1. A complete look at the initial interaction phase data is presented in Table 1.

The second phase in which the infants were scored was the still face presentation (minutes 3 and 4). Mothers were not to interact with their child. They were not allowed to make eye contact, touch or talk to their infant during this phase. The still face presentation or phase two was used to stimulate stress behaviors in the infants. The composite mean IRSS score for the still face presentation was 8.62, standard deviation of 5.33 with a range of 22.00. The minute 3 mean score was 12.56, standard deviation of 2.11 with a range of 12.00. The minute 4 mean score was 8.80, standard deviation of 4.32 with a range of 17.00. The male infants' mean score was less than the female infants' mean score during phase 2. A complete look at the phase 2 data is presented in Table 1.

The third phase in which the infants were scored was the reengagement period. Mothers were to try to reengage their infant in interaction as in the first phase. The time factor was important during the reengagement period. This study was interested in the amount of time that it took the male and female infants to reengage with their mothers in normal play. The composite mean IRSS score for the reengagement period was 5.42, standard deviation of 2.47 with a range of 11.97. The male infants' mean score was

again lower than the female infants' mean score during the reengagement period. A complete look at the reengagement phase data is presented in Table 1.

Analyses of Specific Behaviors

This study was interested in the behaviors exhibited by male and female infants during the Still Face Paradigm. The infant's specific behaviors were divided into categories of direction of gaze, vocalizations, pick-me up gestures, self-comforting, distancing, and autonomic stress indicators. Each of the 30 infants displayed gaze behaviors. Only 17 infants vocalized during the Still Face Paradigm, 13 did not make any vocal sounds. Only four infants gestured in any way. Twenty-six infants made no gesture behaviors. Self-comfort actions were split down the middle. Fifteen infants displayed self-comforting behaviors, and fifteen infants did not. The majority of the infants did not display any distancing actions. Seven infants did display distancing actions, but 23 infants did not. Autonomic stress indicators were not displayed by the majority of the infants. Three infants did display one or all of the autonomic stress indicators, and 27 did not. Percentages for each behavior category are presented in Table 3.

Analysis of Specific Hypotheses

The primary analyses examined gender differences during and after the Still Face Paradigm. The main hypotheses for this study were concerned with male and female infant responses to the still face presentation and the reengagement period following the Still Face Paradigm. Two hypotheses were examined using a one sample t -tests.

The first hypothesis analyzed the stress levels between genders during the Still Face Paradigm. The study hypothesized that stress levels would be higher for females

than males during the still face presentation. For the intensity of stress during the still face presentation, gender approached significance ($t = -1.73$, $p = .095$). The statistical results were in the expected direction (Figure 1). Females tended to display higher amounts of stress during the still face presentation (the mean for the females stress levels was 10.36, standard deviation of 6.73, while the mean score for the males was 7.10, standard deviation of 3.21).

The second hypothesis examined the reengagement period after the Still Face Paradigm. The study hypothesized that upon reengagement female infants would recover baseline levels of responding sooner than male infants as measured by minute by minute IRSS scores. When the infant's score from phase 3 was similar to their phase 1 score the infant was considered reengaged with the mother in normal interaction. The reengagement time was then rounded off to the nearest minute. For the duration of the reengagement period, gender was not significant ($t = -1.35$, $p = .19$). However, the results were in the expected direction (Figure 2). Females did resume baseline levels of interaction with their mothers as they had in the initial interaction period quicker than males did, but not significantly. The female reengagement time mean was 1.57, standard deviation of 1.20. The male reengagement time mean was 1.88, standard deviation of 3.62. The range was 4.00. The minimum amount of time that it took an infant to reengage was 1 minute, and the maximum was 6 minutes. A complete look at the reengagement time span is presented in Figure 3.

Post-hoc

Following the results of the independent t -test, a Chi-Square test was conducted to see if there were differences in stress behaviors exhibited during the Still Face Paradigm

between the infant age levels. It was thought that the results of the previous tests may have been age biased.

The present study spurred two additional questions. Does the infant age or infant gender have an affect on the displayed behaviors during a stressful situation? During the trial of this Still Face Paradigm study, age was not considered. However, after the initial results were evaluated, age was thought to be a factor in the displayed behaviors in each phase. The IRSS composite mean scores for each behavior category for all three phases is presented in Table 2. A 2-tailed t -test was conducted with infant age and behavior category in order to investigate if infant age contributed to the displayed behaviors during the Still Face Paradigm. According to the chi-square analysis, overall infant age does not significantly effect the displayed behaviors. However, in this study there was the same amount of stress shown in the younger infants (3 and 4 months) as the older infants (5 and 6 months). The chi-square showed no significance ($\chi^2 = .000$, $p = 1.00$). However, differences in the specific behaviors of males and females were obvious. As such t -tests were used to compare the means of the various behaviors. The complete statistics are presented in Table 4.

Infant gender was a prime factor for displayed stress levels during the Still Face Paradigm (Table 4). Initially, infant gender was not examined to be a factor for each behavior category. A 2-tailed t -test was conducted with infant gender and each behavior category in order to determine if infant gender contributed to the displayed stress behaviors during the Still Face Paradigm. According to the test conducted, infant gender is a factor for each displayed behavior category. However, differences in the specific behaviors of males and females were obvious. As such t -tests were used to compare the

means of the various behaviors. According to the IRSS composite mean scores for each behavior category, male and female infants responded differently to specific behaviors. Gaze (range of 4) and gesture (range of 1) behaviors were displayed more by female infants. Vocalizations (range of 3), self-comforting actions (range of 3), distancing (range of 1), and autonomic stress indicators (range of 1) were displayed more by male infants. Infant gender was statistically significant in influencing the behavior categories. Complete data are presented in Table 4.

Table 1

IRSS composite mean score for all behaviors

	General		Male		Female	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Phase 1	6.78	2.83	5.80	1.61	7.89	3.61
Phase 2	8.63	5.33	7.11	3.21	10.36	6.73
Phase 3	5.43	2.48	4.86	2.63	6.07	2.20

Table 2

IRSS composite mean score by age for all behaviors for each phase

	3-4 months		5-6 months	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Phase 1	6.46	1.48	7.09	3.85
Phase 2	9.08	5.39	8.17	5.40
Phase 3	5.44	2.87	5.41	0.54

Table 3

Percentage of IRSS coded behaviors

	Displayed	Male	Female
Gaze	100.00%	100.00%	100.00%
Vocalization	56.70%	68.75%	42.86%
Gesture	13.30%	12.50%	14.29%
Self-Comfort	50.00%	62.50%	35.71%
Distance	23.30%	25.00%	14.29%
Stress Indicator	10.00%	12.50%	7.00%

Table 4
IRSS composite mean scores for male and female infant behaviors for each phase

Behavioral Category	Phase 1		Phase 2		Phase 3	
	Mean	SD	Mean	SD	Mean	SD
Gaze						
Male	4.18	0.10	4.76	1.99	3.24	1.79
Female	4.77	1.42	5.46	2.15	4.31	2.50
Both	4.43	1.19	5.07	2.05	3.70	2.15
Vocalizations						
Male	0.47	0.87	1.18	1.07	0.94	1.14
Female	0.15	0.55	0.92	1.04	1.08	1.12
Both	0.33	0.76	1.07	1.05	1.00	1.11
Gesture						
Male	0.29	0.69	0.12	0.49	0.18	0.53
Female	0.00	0.00	0.23	0.60	0.38	0.77
Both	0.17	0.53	0.17	0.53	0.27	0.64
Self-Comfort Actions						
Male	0.65	1.06	1.29	1.21	0.59	0.71
Female	0.38	0.77	0.92	1.38	0.31	0.63
Both	0.53	0.94	1.13	1.28	0.47	0.68
Distancing						
Male	5.88	0.24	0.12	0.33	0.00	0.00
Female	0.15	0.55	0.15	0.55	0.15	0.38
Both	0.10	0.40	0.13	0.43	6.67	0.25
Autonomic Stress Indicators						
Male	0.18	0.53	0.00	0.00	0.18	0.39
Female	0.00	0.00	0.15	0.55	0.15	0.38
Both	0.10	0.40	6.67	0.37	0.17	0.38

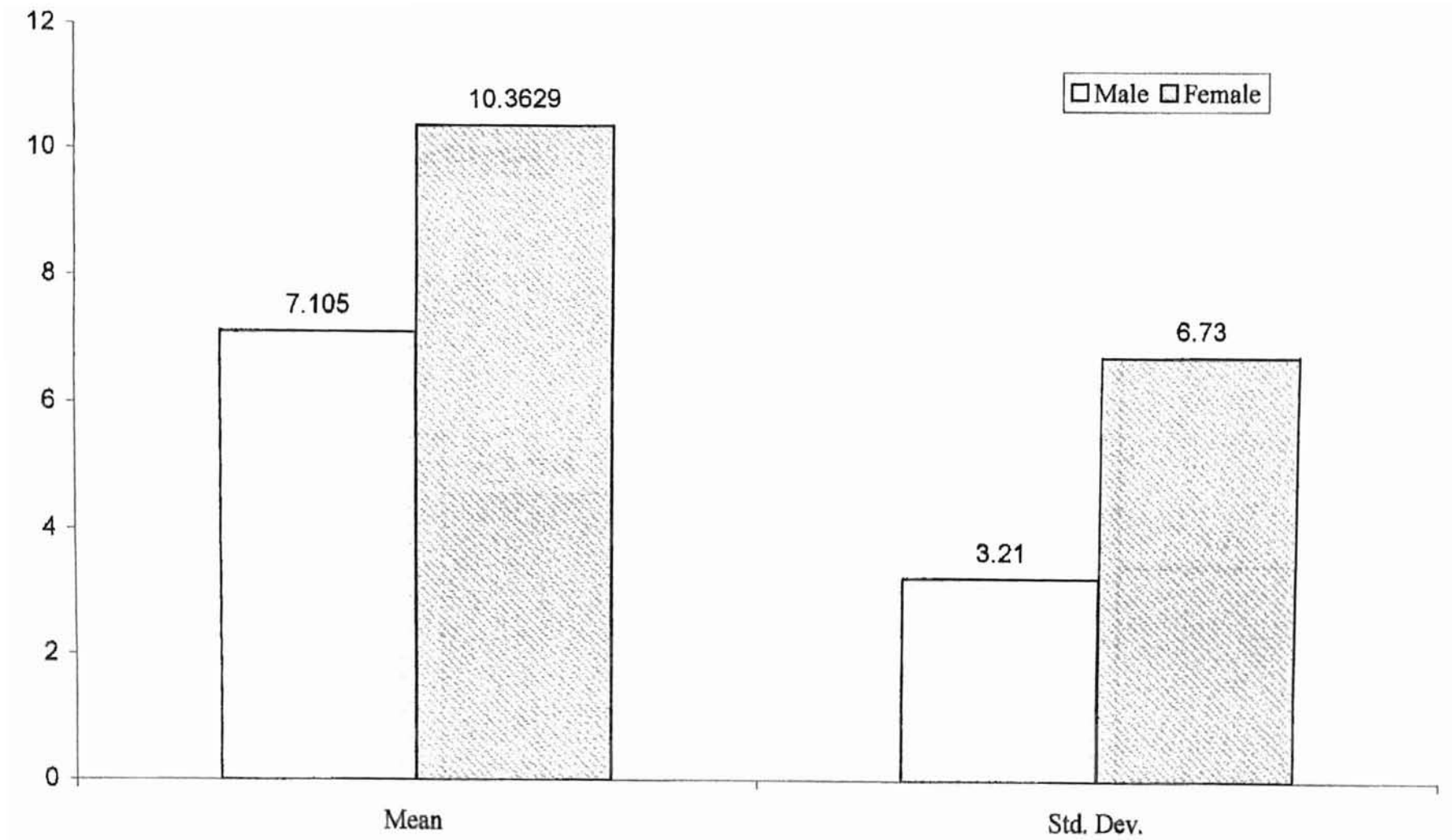


Figure 1. Still face presentation mean and standard deviation scores

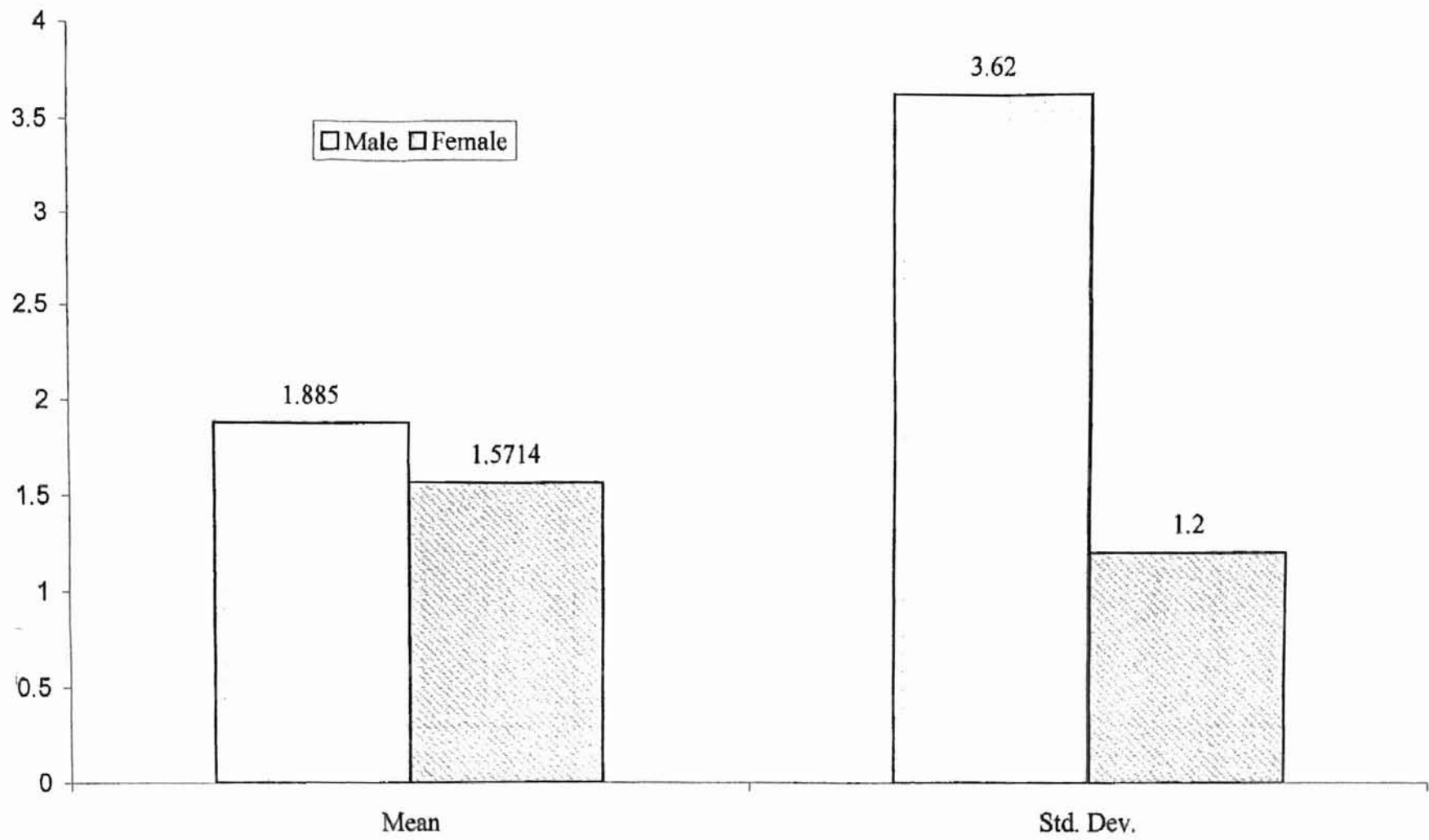


Figure 2. Reengagement time mean and standard deviation

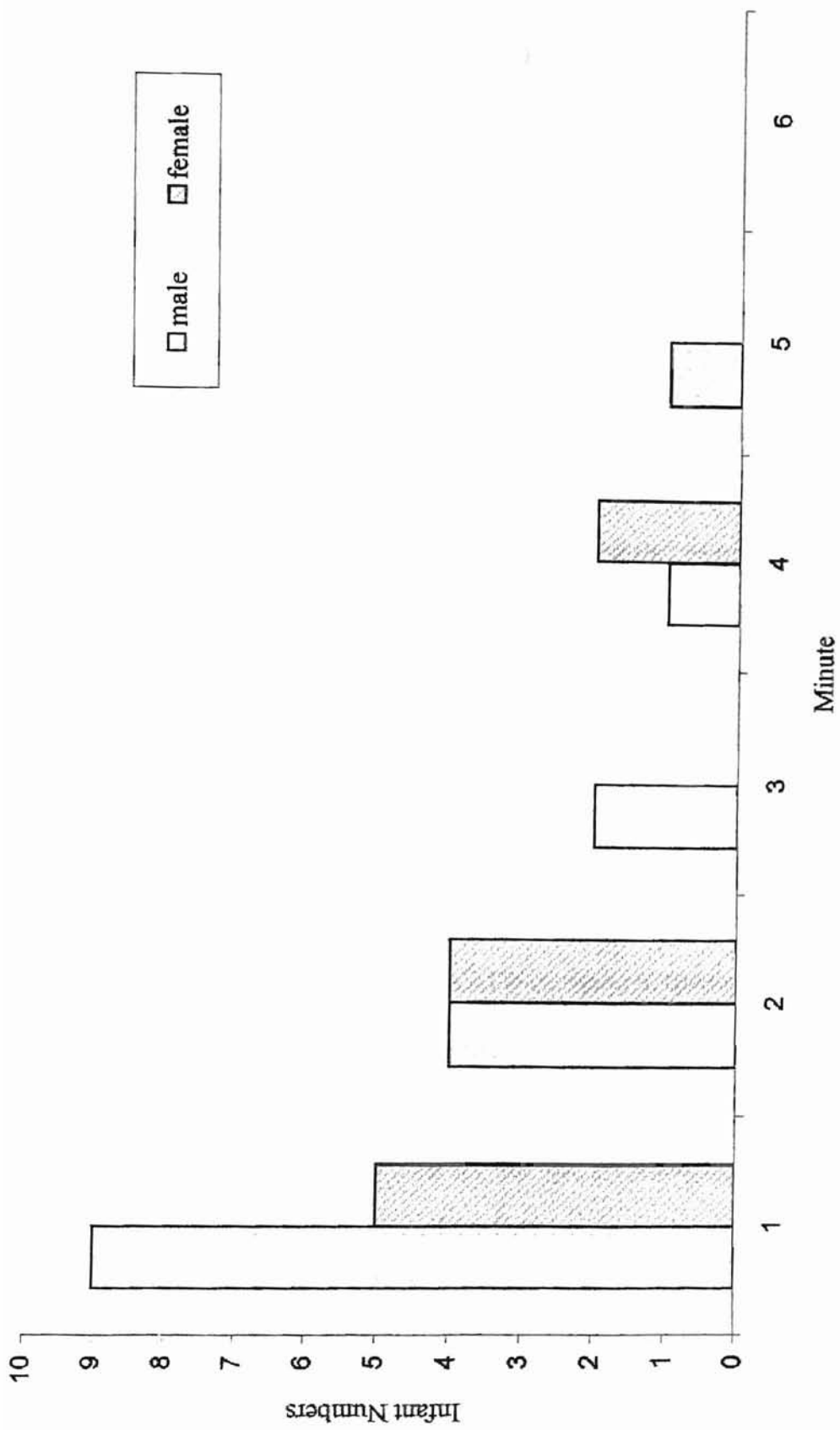


Figure 3. Minute Reengagement Times

CHAPTER V

DISCUSSION

Summary of Results

One question of interest in the present study was whether infant gender influenced stressful behaviors in the still face presentation. The results indicate that gender marginally affected the displayed behaviors in response to the stressful situation. The results, though not statistically significant, did show that female infants became more stressed during the still face presentation than did male infants. In this study, differences in means were in the expected directions. Female infants did tend to display more stressful behaviors during the still face presentation, and they also reengaged quicker than male infants. If the study would have had a larger sample ($n > 30$), results might have been more clear.

Research has not reported on the reengagement period following the still face presentation. The second question of interest in the present study was whether infant gender influenced the reengagement time needed for the infant to maintain baseline levels of interaction following the still face presentation. The results indicate that gender does not significantly affect the amount of time needed to reengage in baseline levels of interaction with the mother following the still face presentation. However again, the results were in the expected direction. Even though not significant, female infants did reengage quicker than male infants following the still face presentation. Gender has not been studied as a factor during the Still Face Paradigm.

Additional post hoc According to the post hoc analyses, there were no age differences for the display of specific stress behaviors. Both age levels displayed similar

stress behaviors during the Still Face Paradigm. However, in some of the stress behavior categories gender differences were found. Male infants were found to exhibit distancing behaviors, self-comforting behaviors, autonomic stress indicators and vocalize more often than female infants. As found in previous research, male infants displayed more negative affect emotions during the face-to face Still Face Paradigm (Weinberg et. al, 1999; Feldman, Brody, & Miller, 1980; Korner, 1969; Osofsky & O'Connell, 1977; Phillips, King & DuBois, 1978).

Female infants were found to display gaze behaviors and gesture more often than males. Prior research supports the data that female infants gaze at their mothers, gaze at objects and gaze at new objects more often during a stressful situation (Weinberg et. al, 1999). In the present study, gesturing behaviors were produced more often by female infants. Previous research has also found that female infants gesture more frequently than male infants (Korner, 1974).

Theoretical Implications

The results of this study support both theories that were introduced earlier. Papousek and Papousek's Theory of Intuitive Parenting and Bandura's Social Learning Theory both preserve the notion that infants learn from watching those around them. Each theory believes that infants are unique learning systems that absorb knowledge from their physical and social environments. This study showed that infants, when presented with a stressful situation, deal with their feelings by displaying behaviors that they have previously learned as being negative or appropriate for this type of situation.

In accordance with the Theory of Intuitive Parenting, the infants did present cues to their mothers during the still face presentation and the reengagement period. Infant

cues such as eye contact, brow-knitting, facial and verbal expressions, hand gestures, and body posture were displayed by the infants. These cues were presumably helpful to the infant in adjusting to the stressful stimuli of the still face presentation (Papousek & Papousek, 1987). The cues were not facilitated by the mothers during the still face presentation but helped the infants cope with the stressful stimuli (Papousek & Papousek, 1987). In turn, the mothers were capable of reading the infant cues as communicative signals during the reengagement period. Following the still face presentation, the infants primarily responded quickly to their mothers' bids to reengage them in interaction.

Previous research had utilized the Still Face Paradigm with phases running three minutes. In the present study, the amount of time for Phase 1 and Phase 2 was two minutes. Both male and female infants reengaged fairly quickly. The mean reengagement time was 1.88 minutes for males and 1.57 minutes for females. Previous research had noted that the infants who were being tested using the Still Face Paradigm would need at least 15 minutes to reengage if they reengaged at all (Tronick et al., 1978). For this reason, a 15-minute time limit was issued in Phase 3. This study may have limited the intensity of the stressful behaviors for the infants by running Phase 1 and Phase 2 only two minutes long. Further research would need to be done to justify the amount of time needed for the Still Face Paradigm. The question of duration of induced stress could then be answered.

The Infant Regulatory Scoring System (IRSS) was used to code the present study's data. However, the researcher believes that the IRSS is too conservative in scoring infants' actions. The IRSS did not rate the level of stress that the infant may have been experiencing. The IRSS allowed a mean score to be derived for each behavior;

category. If the IRSS would have had more sensitive scoring (ie. A stress rating system for each of the behaviors), this study could have assessed the depth of stress felt by the infants. Part of this may be because the IRSS coded behaviors were not marked as positive or negative behaviors. All behaviors were included in the mean IRSS score regardless of emotion. In the future, another scoring system should be obtained for analyzing the continuous behaviors and exhibited stress levels of three to six month old infants.

Conclusions and Implications

In conclusion, numerous studies have documented the importance of early parent-infant interaction (Stern, 1974). This early interaction is crucial for the infant during the first year of life (Stern, 1974). The relationships that the infant will form during the first year of life are hypothesized to be the basis for all future relationships that the infant may have. This study supports the theory that mother-infant interaction is important to both male and female infant development during the three to six month age period. Each of the infants in this study coped with the stress presented by the Still Face Paradigm by displaying behaviors presumably learned from their mothers. This study explored gendered infant reactions to stress inducted by the parent as well as recovery to stress. Female infants seemed somewhat more sensitive to the stress, although not significantly more. These young infants showed remarkable resilience to brief periods of inducted stress. The normal pattern of mother-infant interaction, as measured by the IRSS, was disrupted only briefly.

REFERENCES

- Arco, C., & McCluskey, K. (1981). "A change of pace": An investigation of the salience of maternal temporal style in mother-infant play. Child Development, *52*, 941-949.
- Bandura, A. (1989). Social cognitive theory. In R. Vasta (Ed.), Annals of Child Development. Theories of Child Development: Revised formulations and current issues. Greenwich, CT: JIR press.
- Bell, R. (1968). A reinterpretation of the direction of effects in studies of socialization. Psychological Review, *75*, 81-95.
- Bell, S., & Ainsworth, M. (1972). Infant crying and maternal responsiveness. Child Development, *43*, 1171-1190.
- Braungart-Rieker, J., Garwood, M., Powers, B., & Notaro, P. (1998). Infant affect and affect regulation during the Still Face Paradigm with mothers and fathers: The role of infant characteristics and parental sensitivity. Developmental Psychology, *34*, 1428-1437.
- Brazelton, T., Koslowski, B., & Main, M. (1974). The origins of reciprocity: The early mother-infant interaction. In M. Lewis & L. Rosenblum (Eds.), The effect of the infant on its caregiver. New York: Wiley & Sons.
- Carter, A., Mayes, L., & Parker, K. (1990). The role of dyadic affect in play and infant sex in predicting response to the still-face situation. Child Development, *61*, 764-773.

Clyman, R., Emde, R., Kempe, J., & Harmon, R. (1986). Social referencing and social looking among twelve-month-old infants. In T. Brazelton & M. Yogman (Eds.), Affective development in infancy. New Jersey: Ablex.

Cohn, J., & Elmore, M. (1988). Effect of contingent changes in mothers' affective expression on the organization of behavior in 3-month-old infants. Infant Behavior and Development, 11, 493-505.

Cohn, J., & Tronick, E. (1983). Three-month-old infants' reaction to simulated maternal depression. Child Development, 54, 185-193.

Cohn, J., & Tronick, E. (1988). Mother-infant face-to-face interaction: The sequence of dyadic states at 3, 6, 9 months. Developmental Psychology, 24, 386-392.

Collis, G., & Schagger, H. (1975). Synchronization of visual attention in mother-infant pairs. Journal of Child Psychology and Psychiatry, 16, 315-320.

Czekaj, R. (1995). Infant gaze during mother-infant face-to-face interaction. Thesis. Oklahoma State University.

Feldman, J., Brody, N., & Miller, S. (1980). Sex differences in non-elicited neonatal behaviors. Merrill-Palmer Quarterly, 26, 67-73.

Field, T. (1994). The effects of mother's physical and emotional unavailability on emotion regulation. Monographs of the Society for Research in Child Development, 59, 208-227.

Field, T., Vega-Lahr, N., Scafidi, F. & Goldstein, S. (1986). Effects of maternal unavailability on mother-infant interactions. Infant Behavior and Development, 9, 473-478.

Fogel, A., Diamond, G., Hoover-Langhorst, B., & Demos, V. (1982). Affective and cognitive aspects of the 2-month-old's participation in face-to-face interaction with the mother. In E. Tronick (Ed.), Social interchange in infancy. Baltimore: University Park Press.

Freud, S. (1938/1905). Three contributions to the theory of sex. In Basic writings of Sigmund Freud. New York: Random House.

Gusella, J., Muir, D., & Tronick, E. (1988). The effect of manipulating maternal behavior during an interaction on three and six-month-olds' affect and attention. Child Development, 59, 1111-1124.

Hains, S., & Muir, D. (1996). Infant sensitivity to adult eye direction. Child Development, 67, 1940-1951.

Hains, S., & Muir, D. (1999). Young infants' perception of adult intentionality: Adult contingency and eye direction. Early social cognition: Understanding others in the first months of life. New Jersey: Lawrence Erlbaum Associates Publishers.

Horowitz, F., Self, P., Paden, L., Culp, R., Laub, K., Boyd, E., & Mann, M. (1971). Newborn and four-week re-test on a normative population using the Brazelton Newborn Assessment Procedure. Paper presented at the biennial meeting of the Society for Research in Child Development. Minneapolis.

Jaffe, J., Stern, D., & Perry, J. (1973). Conversational coupling of gaze behavior in prelinguistic human development. Journal of Psycho-linguistic Research, 2, 321-329.

Kogan, N., & Cater, A. (1996). Mother-infant reengagement following the still-face: The role of maternal emotional availability in infant affect regulation. Infant Behavior and Development, 19, 359-370.

Korner, A. (1969). Neonatal startle, smiles, erections, and reflex sucks as related to state, sex, and individuality. Child Development, 40, 1039-1053.

Korner, A. (1974). The effect of the infant's state, level of arousal, sex, and ontogenetic stage on the caregiver. In M. Lewis & L. Rosenblum (Eds.), The effect of the infant on its caregiver. New York: Wiley.

Lamb, M., Thompson, R., Gardner, W., & E. Charnov (1985). Infant-Mother attachment: The origins and developmental significance of individual differences in strange situation behavior. New Jersey: Lawrence Erlbaum Associates Publishers.

Lewis, M. (1967). The meaning of a response or why researcher in infant behavior should be oriental metaphysicians. Merrill-Palmer Quarterly, 13, 7-18.

Lewis, M. (1972). Parents and children: Sex role development. School Review, 80, 229-240.

Lewis, M. (1972). State as an infant-environment interaction: An analysis of mother-infant behavior as a function of sex. Merrill-Palmer Quarterly, 18, 95-121.

Lewis, M., & Goldberg, S. (1969). Perceptual-cognitive development in infancy: A generalized expectancy model as a function of the mother-infant relationship. Merrill-Palmer Quarterly, 15, 81-100.

Mayes, L., & Carer, A. (1990). Emerging social regulatory capacities as seen in the still-face situation. Child Development, 61, 754-763.

Moore, T. (1967). Language and intelligence: A longitudinal study of the first eight years: Part I. Patterns of development in boys and girls. Human Development, 10, 88-106.

Moss, H. (1967). Sex, age, and state as determinants of mother-infant interaction. Merrill-Palmer Quarterly, 13, 19-36.

Murray, L., & Trevarthen, C. (1985). Emotional regulation of interactions between two-month-olds and their mothers. In T. Field & N. Fox (Eds.), Social perception in infants. Norwood, NJ: Ablex.

Osofsky, J., & O'Connell, E. (1977). Patterning of newborn behavior in an urban population. Child Development, 48, 532-536.

Papousek, H., & Papousek, M., (1987). Intuitive parenting: A dialectic counterpart to the infant's integrative competence. In J. Osofsky (Ed.), Handbook of infant development. New York: Wiley & Sons.

Parke, R., & O'Leary, S. (1976). Family interaction in the newborn period: Some findings, some observations, and some unresolved issues. In K. Riegel & J. Meacham (Eds.), The developing individual in a changing world, Vol. II. Chicago: Aldine.

Parke, R., & Sawin, D. (1980). The family in early infancy: Social interactional and attitudinal analyses. In F. Pedersen (Ed.), The father-infant relationship: Observational studies in a family context. New York: Praeger.

Phillips, S., King, S., & DuBois, L. (1978). Spontaneous activities of female versus male infants. Child Development, 49, 590-597.

Rebelsky, F., & Hanks, C. (1971). Fathers' vocal interaction with infants in the first three months of life. Child Development, 42, 63-68.

Robson, K. (1967). The role of eye-to-eye contact in maternal infant attachment. Journal of Child Psychology and Psychiatry, 8, 13-25.

Roggman, L., & Peery, J. (1989). Parent-infant social play in brief encounters: Early gender differences. Child Study Journal, 19, 65-79.

Seifert, K., & Hoffnung, R. (1997). Child and adolescent development. Boston: Houghton and Mifflin Co.

Stack, D., & Muir, D. (1990). Tactile stimulation as a component of social interchange: New interpretations for the still-face effect. British Journal of Developmental Psychology, 8, 131-145.

Stern, D. (1974). Mother and infant at play: The dyadic interaction involving facial, vocal, and gaze behaviors. In M. Lewis & L. Rosenblum (Eds.), The effect of the infant on its caregiver. New York: Wiley & Sons.

Stroller, S., & Field, T. (1982). Alteration of mother and infant behavior and heart rate during a still-face perturbation of face-to-face interaction. In T. Field & A. Fogel (Eds.), Emotion and early interaction. Hillsdale, New Jersey: Erlbaum.

Thoman, E. (1976). Development of synchrony I mother-infant interaction in feeding and other situations. Proceedings of the 58th annual meeting of the Federation of American Societies for Experimental Biology.

Thoman, E., Leiderman, P., & Olson, J. (1972). Neonate-mother interaction during breastfeeding. Developmental Psychology, 6, 110-118.

Toda, S., & Fogel, A. (1993). Infant response to the still-face situation at 3 and 6 months. Developmental Psychology, 29, 532-538.

Tronick, E., Als, H., Adamson, L., Wise, S., & Brazelton, T. (1978). The infant's response to entrapment between contradictory messages in face to face interaction. American Academy of Child Psychiatry, 17, 1-13.

Tronick, E., & Gianino, A. (1986). The transmission of maternal disturbance to the infant. In E. Tronick & T. Field (Eds.), Maternal depression and infant disturbance. New York: Wiley.

Tronick, E., & Weinberg, K. (1990). The Infant Regulatory Sourcing System (IRSS). Unpublished document, Children's Hospital Harvard Medical School, Boston.

Tronick, E., & Weinberg, K. (1994). Beyond the face: An empirical study of infant affective configurations of facial, vocal, gestural, and regulatory behavior. Child Development, *65*, 1503-1515.

Weinberg, K., & Tronick, E. (1996). Infant affective reactions to the resumption of maternal interaction after the still-face. Child Development, *67*, 905-914

Weinberg, K., Tronick, E., Cohn, J., & Olson, K. (1999). Gender differences in emotional expressivity and self-regulation during early infancy. Developmental Psychology, *35*, 175-187.

APPENDICES



APPENDIX A
OUTLINE OF ORAL SOLICITATION

Outline for Telephone Solicitation

I. Introduction

Hello, my name is Ashley Smith and I am a graduate student in Child development at Oklahoma State University. I am currently doing research on the interactions between mothers and their infants. I am calling to ask if you would be willing to participate in a research study with your infant. My study involves videotaping mother and infant interaction in response to the mother's cues during the still face paradigm. The still face paradigm involves observing the different ways that infants respond to their mother's interaction styles. You will interact with you infant as you do normally in everyday life. Then, you will be asked to stop all interaction with your infant for a 2 minute period. Then, you may begin interacting with your infant once again. The still face paradigm is no different from you watching television, and the stress level of the infant is minimal.

II. Questions

A. Participation

1. Would you be willing to participate in the study?
 - a. No, I will thank them for their time
 - b. Yes, I will thank them for their interest and inform them that they can decided not to participate at any time.
2. Do you have any questions at this point about the study?
 - a. No, continue with section B
 - b. Yes, answer any questions.

B. Appointment

1. I will be doing the videotaping at Oklahoma State University in a child development testing room in the Human Environmental Science West Building. I would like to set up an appointment with you to come in with your infant. The entire process should take about 30 minutes. When would be a good time for you?

C. Information

1. I would like to ask you a few questions before we meet:
 - a. What is your baby's name?
 - b. When was he/she born?

III. Closing

A. Parking

1. Possible locations
2. Temporary parking permits

B. Reminders

1. Time, day, and place of the appointment

C. Thank them for their time and I look forward to meeting them and their infant.

APPENDIX B
INFORMED CONSENT FORM

Informed Consent Form

I, _____ (print name) hereby authorize and direct Dr. Patricia A. Self and Ashley E. Smith to include me and my child, _____ in their research project.

I understand that the research study will involve videotaping interactions between me and my child. I understand that this procedure is part of a study entitled, "Infant responses to changes in mother-infant face-to-face interaction." The purpose of this study is to investigate early social interaction. I understand that the still face paradigm involves observing the different ways that infants respond to their mother's interaction styles. I will interact with my infant as I normally do in everyday life. Then, I will be asked to stop all interaction with my infant for a 2-minute period. Then, I may begin interacting with my infant once again. I understand that the still face paradigm is no different from me watching television, and the stress level of the infant is minimal. I also understand that this procedure will last approximately 20 minutes.

I understand that all my responses and the videotaped interaction will be held in confidence. More specifically, I understand that this informed consent form will be kept separate from the videotape and the videotape is coded with an identification number and will not have my name on it anywhere. I understand that the findings of this study will be reported for the group and not for the individual.

I understand that participation is voluntary, that there is no penalty for refusal to participate, and that I am free to withdraw my consent and participation in this projects at any time without penalty. If I do not want to continue my participation, I understand that I need to notify the project director or her assistants.

I may contact the project director, Dr. Patricia A. Self at 405-744-8348 or Ashley E. Smith at 405-624-3247 for further information about this research. I may also contact Sharon Bacher at the Institutional Review Board located at 203 Whitehurst, Oklahoma State University, Stillwater, OK, 74078; telephone, 405-744-5700.

I have read and fully understand the consent form. I sign freely and voluntarily. I understand that I will be given a copy of this consent form.

Date: _____ Time: _____

Signed: _____
Signature of Subject

Since it is sometimes useful to view the videotapes for future research and educational purposes, we would like your permission to use the videotape. As stated above, we will make every effort to keep your identity confidential.

In addition to consenting to participate in the research project outlined above, I consent to the use of the videotape for future research and educational purposes by the project director, and her assistants or associates. I understand that not consenting to this condition will not have an impact on my participation in this study.

Signed: _____
Signature of Subject

I certify that I have personally explained all elements of this form to the subjects before requesting the subject to sign it.

Signed: _____
Project Director or Associate

Dear Parent,

Thank you for taking the time to review the following information. I am a graduate student at Oklahoma State University and am conducting research on infants' response to the still face paradigm.

The research consists of having you and your infant interact with each other. There will be three phases included in the research. The research will assess how your infant handles stress during the still face paradigm. The still face paradigm involves observing the different ways that infants respond to their mother's interaction styles. You will interact with your infant as you normally do in everyday life. Then, you will be asked to stop all interaction with your infant for a short 2 minute period. Then, you will be asked to begin interacting with my infant once again. The still face paradigm is no different from you watching television, and the stress level of the infant is minimal. The research should take no longer than 30 minutes to complete and will be done in the Human Environmental Sciences West building on the Oklahoma State University campus.

Please read the attached Informed Consent and sign the bottom if you will agree to participate in this research. If you have any questions or concerns, please do not hesitate to contact Sharon Bacher from O.S.U.'s Institutional Review Board, 203 Whitehurst, Stillwater, OK. (405) 744-5700 or either researcher listed on the bottom of the page. Again, than you for taking the time to review this information.

Sincerely,

Ashley Smith
Graduate Student, Family Relations & Child Development
Oklahoma State University
(405) 624-3247

Patricia A. Self, Ph.D.
Professor, Family Relations & Child Development
Oklahoma State University
(405) 744-8348

APPENDIX C
OUTLINE OF ORAL INSTRUCTIONS

Oral Instructions and Debriefing for Parents and Children

A. Introduction

1. Hello, my name is Ashley Smith.
2. Thank you for coming to meet with me and participate in my study.
3. Before, we begin the actual data collection, I would like you to read and sign the Informed Consent Form. If you have any questions, please feel free to ask me. (I will sign the consent form once all questions have been answered and I will give the parents a copy of the form.)
4. Today I will be videotaping you interacting with your infant for up to 20 minutes.
5. Do you have any questions before we begin?

B. Instructions

1. Before we begin the study I would like to go over a few instructions:
 - a. First, you may stop participating at any time if you or your infant needs a break.
 - b. Second, please leave the infant seated unless she/he becomes extremely upset.
 - c. Third, please do not use any toys or pacifiers during the videotaping.
 - d. Do you have questions about the instructions?
2. Now I will explain the videotaping to you.
 - a. First, I will be videotaping you from behind this two way mirror.
 - b. Second, in order to observe you interacting with your infant, I will come into the room every three minutes and give you instructions on how to interact with your infant.
 - c. Do you have any questions concerning the videotaping?
3. Now for the first three minutes, I would like you to interact with your infant as you normally do.
 - a. After the three minutes are up, I will enter the room and explain the next phase.
4. Now I would like you to refrain from interaction with your infant. Do not talk to, touch, or make eye contact with your infant.
 - a. After the three minutes are up, I will enter the room and explain the final phase.
5. Now I would like you to interact with your infant as you normally do to get the infant to interact again or calm down. This could take up to fifteen minutes.
 - a. After the fifteen minutes are up, I will enter the room and debrief the mother.

C. Debriefing

1. Thank you for your time and cooperation.
2. If you would like a summary report of my findings in the summer of 2000 when I complete the study, please sign your name on the list and one will be mailed to you.
3. I also want to remind you that the videotaped interaction of you and your child will be kept confidential.
4. If you have any other questions, please feel free to contact me or Dr. Self.
5. Do you have any questions before you go?

ID	Sex	Age	Initial mos. raw score	Initial Mean raw score	Still Face raw score	Still Face mean	Reengage raw score	Reengage mean	Time raw score	Time Minute
1	m	6	14	2.8	9	3	19	3.8	2.15	2
2	f	6	12	6	21	5.25	5	5	0.15	1
3	m	4	13	6.5	21	5.25	3	0.33	3.18	3
4	m	4	22	7.3	24	6	37	12.3	3.16	5
5	f	5	10	10	18	6	7	3.5	0.43	1
6	f	6	15	15	22	11	12	6	4.06	4
7	f	5.5	21	10.5	20	20	11	5.5	1.25	1
8	m	3	19	6.3	19	6.33	5	5	0.15	1
9	f	3	6	6	25	25	1	1	0.10	1
10	f	5.5	17	5.6	16	4	35	7	4.44	4
11	m	3	11	5.5	15	15	5	5	0.13	1
12	m	6	14	4.6	24	8	5	2.5	0.11	1
13	f	5	11	5.5	26	12	11	5.5	6.42	7
14	m	4.5	16	8	26	12	12	5.5	1.54	2
15	m	5	21	5.25	19	4.75	23	4.6	2.02	2
16	f	3	12	6	16	5.33	8	8	0.35	1
17	f	3	13	4.3	12	6	11	6	2.09	2
18	m	5	10	3.3	10	5	7	2.3	1.05	1
19	m	4.5	12	6	12	12	12	4	0.39	1
20	f	3.5	10	10	10	10	17	8.5	2.13	2
21	m	5	15	7.5	11	5.5	15	7.5	2.20	2
22	m	3	8	4	18	6	8	4	0.50	1
23	m	6	13	4.3	23	7.6	7	3.5	0.16	1
24	f	5	12	6	13	6.5	15	7.5	1.50	2
25	m	4	14	7	15	5	11	5.5	0.33	1
26	m	4	15	7.5	11	5.5	13	6.5	0.05	1
27	f	6	15	5	16	4	15	7.5	2.18	2
28	f	5	15	15	20	20	38	9.5	3.28	3
29	f	4	11	5.5	20	10	9	4.5	1.19	2
30	m	4	14	7	27	6.75	11	5.5	4.06	4

Phase 1

ID	Sex	Age mos.	Gaze	Vocal	Gesture	Self Comfort	Distance	Autonomic Stress Ind.
1	m	6	6	1	2	0	2	3
2	f	6	10	2	0	0	0	0
3	m	4	11	0	0	2	0	0
4	m	4	10	0	6	0	0	6
5	f	5	10	0	0	0	0	0
6	f	6	15	0	0	0	0	0
7	f	5.5	20	0	0	1	0	0
8	m	3	11	2	6	0	0	0
9	f	3	6	0	0	0	0	0
10	f	5.5	15	0	0	1	1	0
11	m	3	10	1	0	0	0	0
12	m	6	10	2	0	2	0	0
13	f	5	10	0	0	1	0	0
14	m	4.5	12	0	0	4	0	0
15	m	5	12	4	2	3	0	0
16	f	3	10	2	0	0	0	0
17	f	3	10	2	0	1	0	0
18	m	5	2	2	0	6	0	0
19	m	4.5	11	1	0	0	0	0
20	f	3.5	10	0	0	0	0	0
21	m	5	10	5	0	0	0	0
22	m	3	6	2	0	0	0	0
23	m	6	10	1	0	2	0	0
24	f	5	11	1	0	0	0	0
25	m	4	12	2	0	0	0	0
26	m	4	15	0	0	0	0	0
27	f	6	10	4	0	1	0	0
28	f	5	15	0	0	0	0	0
29	f	4	8	3	0	0	0	0
30	m	4	10	4	0	0	0	0

Phase 2

ID	Sex	Age mos.	Gaze	Vocal	Gesture	Self Comfort	Distance	Autonomic Stress Ind.
1	m	6	6	1	2	0	0	0
2	f	6	12	3	4	2	0	0
3	m	4	12	0	2	5	2	0
4	m	4	15	4	0	0	2	3
5	f	5	12	0	2	0	4	0
6	f	6	18	0	0	4	0	0
7	f	5.5	20	0	0	0	0	0
8	m	3	5	2	0	12	0	0
9	f	3	25	0	0	0	0	0
10	f	5.5	9	1	0	4	2	0
11	m	3	15	0	0	0	0	0
12	m	6	20	2	0	2	0	0
13	f	5	17	0	0	9	0	0
14	m	4.5	20	0	0	6	0	0
15	m	5	5	2	0	9	0	3
16	f	3	10	2	0	0	0	4
17	f	3	10	2	0	0	0	0
18	m	5	5	0	0	5	0	0
19	m	4.5	12	0	0	0	0	0
20	f	3.5	10	0	0	0	0	0
21	m	5	10	1	0	0	0	0
22	m	3	10	2	0	6	0	0
23	m	6	17	2	0	4	0	0
24	f	5	12	1	0	0	0	0
25	m	4	12	0	0	2	1	0
26	m	4	10	1	0	0	0	0
27	f	6	5	3	0	6	2	0
28	f	5	20	0	0	0	0	0
29	f	4	16	4	0	0	0	0
30	m	4	16	4	0	5	2	0

Phase 3

ID	Sex	Age mos.	Gaze	Vocal	Gesture	Self Comfort	Distance	Autonomic Stress Ind.
1	m	6	10	2	3	1	0	3
2	f	6	5	0	0	0	0	0
3	m	4	1	0	0	2	0	0
4	m	4	25	12	0	0	0	0
5	f	5	5	0	0	0	2	0
6	f	6	10	0	0	2	0	0
7	f	5.5	10	0	1	0	0	0
8	m	3	5	0	0	0	0	0
9	f	3	1	0	0	0	0	0
10	f	5.5	24	4	1	1	2	0
11	m	3	5	0	0	0	0	0
12	m	6	5	0	0	0	0	0
13	f	5	10	1	0	0	0	0
14	m	4.5	10	0	0	2	0	0
15	m	5	15	3	2	0	0	3
16	f	3	5	1	0	0	0	2
17	f	3	10	1	0	0	0	0
18	m	5	5	0	0	2	0	0
19	m	4.5	10	1	0	1	0	0
20	f	3.5	12	2	0	0	0	3
21	m	5	10	0	0	5	0	0
22	m	3	5	3	0	0	0	0
23	m	6	5	2	0	0	0	0
24	f	5	14	1	0	0	0	0
25	m	4	10	1	0	0	0	0
26	m	4	10	0	0	0	0	3
27	f	6	10	5	0	0	0	0
28	f	5	23	5	2	8	0	0
29	f	4	6	3	0	0	0	0
30	m	4	6	5	0	0	0	0

APPENDIX E
INFANT REGULATORY SCORING SYSTEM

INFANT REGULATORY SCORING SYSTEM/IRSS

Edward Z. Tronick & M. Katherine Weinberg

4/96 Children's Hospital

GAZE:

- L1. LOOKS AT ADULT'S FACE
- L33. LOOKS AT NEW OBJECT
- L3. LOOKS AT SAME OBJECT
- L4. LOOKS AWAY
- L5. EYES CLOSED

VOCALIZATION:

- V1. NEUTRAL/POSITIVE
- V3. NEGATIVE/FUSSY
- V4. CRYING

GESTURES:

- G1. TWO HAND REACH
- G2. ONE HAND REACH
- G4. TOUCH
- G5. LEAN FORWARD
- G6. STEREOTYPIC/ODD GESTURES

SELF-COMFORT:

- C1. ORAL-SELF
- C2. ORAL-OBJECTS
- C3. ORAL-MOM
- C4. TOUCHES SELF
- C5. SELF-CLASP
- C6. ROCK

DISTANCE:

- D1. GET AWAY/ESCAPE
- D2. ARCH
- D3. PUSH AWAY/PULL AWAY
- D4. SCREEN OUT

AUTONOMIC STRESS INDICATORS:

- T1. SPIT UP
- T2. HICCUP
- T5. YAWNING

GAZE: Each of the codes for the direction of the infant's gaze are mutually exclusive. This means that these codes cannot be scored in the same one second interval. Each of the gaze codes can be of any duration. The rule is: if you can see it in real time code it. If you cannot distinctly tell what the baby is looking at, and are trying to choose between two codes, give the baby the benefit of doubt. Thus certain codes superordinate other codes. (This is the only situation in which the superordinate rule applies.) These codes are as follows: L1. LOOKS AT ADULT'S FACE, superordinates L3. LOOKS AT OBJECT. L3. LOOKS AT OBJECT superordinates L4. LOOKS AWAY. L4. LOOKS AWAY superordinates L5. EYES CLOSED.

L1. LOOKS AT ADULT'S FACE: The infant looks at the adult's face (e.g., her chin or forehead). If the baby looks at the caregiver's chest, hands..., code an L3 OR L33. **NOTE:** When the mother is playing a PEEK-A-BOO game with the infant, continue to code an L1 when the mother covers her face with her hands if the infant continues to look at the mother's face during this time.

L33. LOOKS AT NEW OBJECT & LOOKS AT SAME OBJECT:

- L3. The infant looks at or manipulates an object which is proximal or nearby to the infant. Use the code L33. LOOKS AT NEW OBJECT, when the infant first looks at an object. Code the first second of this look as L33. LOOKS AT NEW OBJECT. If the infant continues to look at that same object, code the second and subsequent seconds of the infant looking at that object as L3. LOOKS AT SAME OBJECT. In the face-to-face paradigm, mothers are instructed not to bring toys into the laboratory. LOOKS AT NEW OBJECT and LOOKS AT SAME OBJECT therefore refer to such objects as the chair, the infant strap, the caregiver's chest or hands, or the infant's clothing. When the infant is scanning a number of objects in very rapid succession without focusing on any one object, score an L33 repeatedly.
- L4. LOOKS AWAY: The infant looks away from the adult's face and does not look at a proximal object. This code includes instances when the infant visually explores the room, or looks at something not in proximity to the infant.
- L5. EYES CLOSED: The infant's eyes are closed. For example, the infant is crying so hard his/her eyes are closed, or the infant is rubbing/screening his/her eyes and can see nothing besides the hands.

VOCALIZATION: The infant vocalizes. Every sound, with the exception of exhalations and heavy breathing, the baby makes is scored including soft vocalizations or grunts even though these sounds are occasionally subtle and hard to hear. Score in the second the vocalization occurs. Do not round off. ALWAYS SCORE WITH THE VIDEOSCREEN COVERED. EARPHONES ARE ALSO USEFUL.

- V1. NEUTRAL/POSITIVE: The vocalization is neutral to positive. This code includes laughter, gurgles, coos, and neutral sounds. It also includes grunts that have a neutral tone. If it is difficult to decide whether a vocalization is neutral or fussy score it as a V1.
- V3. NEGATIVE/FUSSY: Negative sounds including fussiness and protests.
- V4. CRYING: The infant is crying. Must be a full-blown cry to be scored. If a coder has difficulty deciding whether a vocalization is a fuss or a cry score the vocalization as a V3. During full-blown cries, infants often slow down and the intensity of the cry decreases to a level where it is no longer full-blown. These instances should be scored as V3s.

GESTURES (6 Months): The infant gestures with his/her arms or body. In the case of reaches, code even brief reaches as long as they are not bangs. Typically, reaches are characterized by a stationary point or moment of suspension at the end of an upward movement. By contrast, a bang is typically a continuous up and down movement with no stationary point. Begin coding reaches when the arm first begins its upward movement and stop coding when the arm is down in a resting position. Also, stop coding a reach if the caregiver grabs hold of the infant's hands/arms and therefore either prevents the infant from continuing the reach or holds the infant's hands/arms up. If a touch or a reach is obscured because of the angle of the camera, continue coding the touch or the reach if you feel reasonably certain that the touch or the reach continued.

- G1. TWO HAND REACH: The infant extends both arms towards the adult. There is no physical contact. Although infants tend to look at the adult while reaching for the adult, there is no gaze criterion. Thus G1 can be coded if the infant extends both arms in the direction of the adult and looks away. Do not score a G1, however, if the infant extends both arms towards an object or towards anything else that is not the adult.
- G2. ONE HAND REACH: The infant extends one arm, points or reaches towards the adult. There is no physical contact. As with G1, the infant does not have to look at the adult for a

G2 to be coded. Do not score reaches for an object or anything else that is not the adult.

- G4. **TOUCH:** The infant's hand is in physical contact with any part of the adult's body including her clothing, glasses, hair, and jewelry (stop coding Touch if the infant takes the mother's glasses away from her face or removes her jewelry). Score the touch until the infant's hand is no longer in physical contact with the mother. If the mother takes the infant's hand(s), score a touch as long as the infant's hand(s) is in physical contact with the mother. Do not score a touch if the mother, for instance, holds the infant's arms or feet. Touch refers only to the infant's hands, not to his/her feet or head. If within the same second, the infant reaches towards the adult and then touches her, score both the touch and the reach. Stop coding the reach when the infant touches the mother. If it is unclear that a touch is occurring and you cannot make a good guess, do not code.
- G5. **LEAN FORWARD:** The infant leans forward in the chair towards the adult. The infant must be leaning in the direction of the caregiver. Typically the chair strap is pulled taut behind the infant and tight across the infant's chest. For a lean to be coded the infant must also be leaning past the 90° upright position. There is no gaze criterion. Code G5 even if the infant leans forward for long periods of time since this may be the infant's preferred interactional style (e.g., the infant may like being in close proximity to the adult). Begin coding a lean forward when the infant is clearly leaning forward past the 90° upright sitting position. Stop coding G5 when the infant is back at or past the 90° marker.
- G6. **STEREOTYPIC/ODD GESTURES:** The infant engages in gestures that appear odd or strange. The gestures may be repetitious, perseverative, or autistic-like (e.g., hand-flapping, self-stimulatory gestures...). Always describe these gestures in the comment section.

GESTURES (3 months): The same definitions as described above apply to all gesture codes for 3-month-olds. Three-month-old infants' gestures, however, are often less well defined and clear than those of 6-month-olds. 3-month-olds also engage in fewer types of gestures. For instance, it is unlikely that a 3-month-old will lean forward in the manner prescribed above. Nevertheless, if it happens, code it. If the 3-month-old gestures do not meet the criteria specified above, do not code. Note: For 3-month-olds, G1 is called Two Hand Person Directed Arm Projection and G2 is called One hand Person Directed Arm Projection.

SELF-COMFORT: The infant uses his/her body to provide self-stimulation. With the exception of the code "oral-mom", self-comforting must be initiated by the infant. For example, if the mother brings the infant's hand to the infant's mouth and the baby sucks on the hand, do not score

C1a. If the mother removes her hold and the baby continues to suck, then C1 can be scored.

C1. **ORAL-SELF:** The infant sucks on his/her body, e.g., his/her thumb. Score a C1 also if the infant brings his/her hand to the mouth but does not suck on the hand. There must be skin and hand to mouth contact.

Code with oral-other only if the infant's fingers can clearly be seen in his/her mouth.

- C2. **ORAL-OTHER:** The infant sucks on or brings to his/her mouth something other than his/her body such as the strap of the chair or his/her clothing.
- C3. **ORAL-MOM:** The infant sucks on or brings to his/her mouth the mother's hand or finger. There must be skin contact. This category is scored regardless of who initiated the contact.
- C4. **TOUCH SELF:** The infant touches or rubs his/her face or head (e.g., rubs eyes or ears, twirls hair). Do not code touches to any other part of the body. Code with oral-self only if the infant is making an extra effort to touch or rub him/herself.

C5. SELF-CLASP: The infant clasps his/her hands together or wraps his/her arms around himself/herself as in a self-hug. Code from the time the infant's hands come together until the hands separate.

C6. ROCK: The infant rocks back and forth or side to side. There must be at least two rhythmic movements.

DISTANCE: The infant attempts to increase his/her perceptual or physical distance from the adult without engaging an object.

D1. GET AWAY/ESCAPE: The infant tries to get away by turning and twisting away from the caregiver. The infant's shoulders and trunk are always rotated sideways (The shoulders and trunk need not be completely rotated but some rotation must be evident). The infant's head is averted sideways or up and sideways with gaze directed sideways or up and sideways away from the adult. The arms are usually, but not always raised above or at the level of his/her head. The back is typically, but not always arched. Do not score infants who have this constellation of behaviors but are trying to get a better look at an object (e.g., the side or back of the seat).

D2. ARCH: The infant's shoulders are pushed back against the chair and the torso is thrust forward and up. There is no shoulder or trunk rotation. The infant's arms are usually down by the infant's sides but are occasionally raised. The infant typically looks at the adult but head and gaze are sometimes averted.

D3. PUSH AWAY/PULL AWAY: The infant attempts to push the mother away from him/her. The infant pushes the mother's hand(s) or head away from himself/herself. The infant pulls his/her hands, feet, or body free from/away from the mother. For example, the mother is holding the infant's hands and the infant pulls his/her hands away out of the mother's grasp. There must be physical contact between the infant and mother before the occurrence of a pull away.

D4. SCREEN OUT: While attending to the mother, the infant screens both eyes with his/her hands or arm(s).

AUTONOMIC STRESS INDICATORS:

T1. The infant exhibits behaviors which may indicate distress such as spitting up, hiccupping, and/or yawning. Drooling should not be coded as spitting up. The infant's spit up should have consistency and be white.

GENERAL NOTE:

The IRSS was designed to score the behavior of infants younger than 1 year. The system has been used primarily to score the behavior of 3, 6, and 9-month-old infants. To score the behavior of infants 1 year or older, use the Infant Regulatory Scoring System for 12-month-olds originally designed to capture the behavior of infants in the Ainsworth Strange Situation paradigm.

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Date: March 20, 2000 IRB #: HE-00-151

Proposal Title: "INFANT'S RESPONSE TO THE STILL FACE PARADIGM"

Principal Investigator(s): Patricia Self
Ashley Smith

Reviewed and
Processed as: Full Board

Approval Status Recommended by Reviewer(s): Approved

Signature:



Carol Olson, Director of University Research Compliance

March 20, 2000

Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

VITA

Ashley E. Smith

Candidate for the Degree of

Master of Science

Thesis: INFANT'S RESPONSE TO THE STILL FACE PARADIGM

Major Field: Family Relations and Child Development

Biographical:

Personal Data: Born in Oklahoma City, Oklahoma, October 23, 1976, the daughter of Elaine and Ron Hukill and Vernon Bertram. Married Ryan W. Smith in May 1998.

Education: Graduated from Putnam City High School in May 1995; received Bachelor of Science degree in Family Relations and Child Development from Oklahoma State University, Stillwater, Oklahoma in May 1999. Completed the requirements for the Master of Science degree at Oklahoma State University in July 2000.

Graduate Honors: Dean's Honor Roll

Undergraduate Honors: Dean's Honor Roll, Family Relations and Child Development Club