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Maternal expressed emotion as a predictor of emotional and behavioral problems in low birth weight children

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MATERNAL EXPRESSED EMOTION AS A PREDICTOR OF EMOTIONAL AND BEHAVIORAL PROBLEMS IN LOW BIRTH WEIGHT CHILDREN

by

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MATERNAL EXPRESSED EMOTION AS A PREDICTOR OF EMOTIONAL AND BEHAVIORAL PROBLEMS IN LOW BIRTH WEIGHT CHILDREN

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The purpose of this study was to determine the degree to which maternal emotions expressed toward low birth weight infants (< 2500) at six months of age predicted emotional and behavioral problems at two years of the infant's age. A convenience sample of 83 ethnically diverse mother-infant dyads was drawn from hospitals in urban and rural areas. The Revised Five Minute Speech Sample (R-FMSS) was utilized to measure the Expressed Emotion (EE) constructs of Negative EE (criticism, hostility), Positive EE (positive remarks, warmth) and Overinvolved EE (self-sacrifice, dramatic overprotection, exaggerated detail). The R-FMSS assessed both verbal and nonverbal maternal expression of feelings and attitudes toward the baby through a videotaped, standardized interview made in the family's home. Emotional and behavioral problems were measured at two years of the child's age utilizing the Child Behavior Checklist/2-3. Infant temperament, experience with other caregivers and history of separation from the mother were also examined as variables which could modify the relationship between EE and child behavior problems. Results of multiple regression analyses indicated that Negative EE contributed significantly to the development of emotional and behavior problems in the child, especially internalizing problems such as anxiety and withdrawal. The detrimental impact of Negative EE was most substantial for infants who adapted more readily to the demands of their environments or who had more difficulty persisting

with a task or activity. Although Positive EE did not predict the number of problems for children in general, it did predict emotional and behavioral problems for more adaptive and less persistent children. The child's temperament also contributed significantly to the number of problems, independent of EE. Overinvolved EE by the mothers showed no relationship to the number of problems reported for a child.

Sandra J Weiss 5.29.98

Dr. Sandra Weiss Date
Chairperson

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CHAPTER ONE

THE STUDY PROBLEM

With the advancement of technology leading to an increased survival rate for low birth weight infants, mental health professionals and researchers are striving to understand the likely long-term outcomes for this population. Significant amounts of research have been generated regarding cognitive and neourodevelopmental outcomes, but much less is known about the long-term effects on the infant's emotional development (Gyler, Dudley, Blinkhorn & Barnett, 1993). Longitudinal studies linking low birth weight to later emotional and behavioral problems are just beginning to emerge in the literature. Initial evidence suggests that low birth weight infants are at risk for developing mental health difficulties such as emotional problems, hyperactive disorders, poor coping skills and learning disabilities (Pharoah, Stevenson, Cooke & Stevenson, 1994; Sommerfelt, Ellersten & Markestad, 1993; Szatmari, Saigal, Rosenbaum, Campbell & King, 1990). Further research is imperative in order to gain an improved understanding of what places this population at risk for mental health problems. In this way, appropriate interventions geared toward the prevention of emotional and behavioral problems in children may be developed.

Statement of the Problem

Research suggests that the higher incidence of mental health problems in the low birth weight population is due to psychosocial variables in the environment as well as perinatal complications (Sameroff, 1986; Sameroff, Seifer, Barocas, Zax & Greenspan, 1987; Sameroff & Seifer, 1983). These environmental variables include parental occupation and family size, income, parental education level and mental health, child-

rearing attitudes, and interactive behaviors between the caregiver and baby. Cohen, Parmelee, Sigman and Beckwith (1982) suggested that the quality of the caregiving is an important mediating factor in helping to explain why some low birth weight infants develop emotional problems and others do not. This literature closely parallels the attachment literature, which stresses the importance of maternal responsiveness to the infant's needs as laying the foundation for the healthy emotional development of the infant. The combination of the infant's vulnerabilities associated with the perinatal complications and the caregiver's inability to respond appropriately, may be placing this population at risk for developing emotional and behavioral problems later in life.

Attachment theory (Bowlby, 1969; 1973; Ainsworth, Blehar, Waters & Wall, 1978) has evolved over the past several decades as a framework for identifying variables that contribute to attachment and socioemotional development in children. Secure attachment is defined as the socioemotional connection between an infant and caregiver which enables the infant to seek proximity to this individual for protection in times of perceived stress or danger. Generally, attachment is achieved during the first year of life. The major maternal variables that have emerged from the literature for the development of a secure attachment in the infant include sensitivity to cues, use of affection and tender physical contact, and more acceptance by the mother of the infant's behavior (Ainsworth et al., 1978; Egeland & Farber, 1984). Research also indicates a strong correlation exists between secure attachment and the development of self-esteem, self confidence, ego strength and resiliency, self-reliance, and internal self-control, all of which help prevent later mental health difficulties in children (Arend, Gove & Sroufe, 1979; Lewis, 1987; Sroufe, 1983; Sroufe & Fleeson, 1986). Children with insecure attachments can display

trouble relating to peers, aggressive behavior, and low self-esteem, and they generally approach their environment with caution. Attachment to a significant other provides the foundation for the child's socioemotional development.

According to attachment theory, infants begin to display attachment behaviors at roughly 6 months of age, with the development of locomotion. The child mobilizes to explore the environment and utilizes the primary caregiver as a base for protection. It is during this period, to approximately 1 year of age, that the internal working model of attachment is developed in the infant. This working model of attachment becomes the psychological framework of the child that is integrated through experiences with the primary attachment figure and then becomes generalized into expectations for present and future experiences with other significant relationships (Weiss, 1994). Furthermore, studies have shown that infants by the age of 3 months can differentiate between faces and voices, and by 7 months they can discriminate emotional expressions in adult caregivers (Brazelton, Koslowski, & Main, 1974; Caron, Caron, & Meyers, 1982; Kuhl & Meltzoff, 1982). Others maintain that infants learn to regulate their emotions through experiencing the emotions expressed by their mothers during socialization practices (Cassidy, 1994). The infant then reads these emotions in the mother to determine the proximity seeking goal needed to establish a secure attachment. For example, if the mother responds to an environmental situation with fear, the infant will sense this emotion and then maintain closer proximity to the mother for protection. The amount of knowledge they collect about their social environment is vast and occurs quickly. Lewis and Brooks-Gunn (1979) have found that by 9 months of age, infants already have a basic knowledge about themselves. These findings would suggest that it is crucial that a

positive parental-infant interaction occur during the first 9 months of the baby's life in order for the infant to develop a secure attachment, which will then assist in the prevention of later emotional and behavioral problems.

Further complicating the low birth weight infant's ability to securely attach is a fragile nervous system which can contribute to over-excitation and poor ability to communicate cues to caregivers. Preterm infants are less likely to maintain alert states without moving into drowsiness or crying, therefore becoming a less active partner with the parent (Field 1981). This may make maternal responsiveness more difficult and could place parents at risk for expressing a less positive or inappropriate response. Barnard, Bee and Hammond (1984) drew similar conclusions when comparing preterm to term infants at 4 months of age. Utilizing the Nursing Child Assessment by Satellite Training (NCAST) Feeding/Teaching scale, they found that preterm infants had lower levels of responsiveness and involvement than the term infants. If the caregiver has difficulty reading the fragile infant's cues, then the low birth weight baby's development of a healthy attachment may be jeopardized.

The etiology of caregiver difficulties in responding to infant needs is complex, and is expressed in a multitude of fashions. Past research has generated vast amounts of knowledge linking a positive maternal response toward the infant as being necessary for the promotion of secure attachments and emotional well-being in children. Expressed Emotion (EE) is a construct developed to measure the amount of criticism, hostility, positive remarks, warmth and emotional overinvolvement in family members caring for their children suffering from a psychiatric illness (Brown & Rutter, 1966; Magana, Goldstein, Karno, Miklowitz, Jenkins, & Falloon, 1986; Vaughn & Leff, 1976).

Expressed Emotion research has indicated that the presence of emotions that express criticism or emotional overinvolvement in family members can lead to an increase in mental health symptoms in their offspring. From an attachment theoretical perspective, the ability of the mother to give an appropriate response to the infant is controlled in part by her own past attachment experience, which has become her internal working model of attachment. When applied to the attachment framework, negative EE can be viewed as an indicator that the mother has an insecure internal working model of attachment that can be transmitted to the infant. Therefore, caregivers who express negative emotions to their infants may be placing their infant at risk for developing an insecure attachment and later emotional and behavioral problems.

Since the original identification of EE and the strong predictive power it contributed to the identification of schizophrenic relapse, many studies have explored EE as a predictor of the development and exacerbation of psychiatric conditions in latency aged children (Asarnow, Tompson, Hamilton, Goldstein, & Guthrie, 1994; Hibbs, Hamburger, Lenane, Rapoport, Kruesi, Keysor, & Goldstein, 1990; Schwartz, Dorer, Beardslee, Lavori, & Keller, 1990; Stubbe, Zahner, Goldstein & Leckman, 1993; Vostanis, & Nicholls, 1995; Vostanis, Nicholls, & Harrington, 1994). Findings conclude that an association exists between high EE scores in parents with children who suffer from mental illness versus control groups. These research programs involving the EE components have provided significant findings that enable clinicians to identify family variables that contribute to the child's mental illness symptoms. Although the EE constructs have not been previously applied to the mother-infant dyad, research suggests that a negative emotional response from the caregiver can contribute to an increase in

emotional and behavioral problems in the child (Brandt, Magyary, Hammond & Barnard, 1992; Greenspan & Porges, 1984; Koniak-Griffin & Verzemnieks, 1994). Therefore, what is lacking in the EE literature are longitudinal studies that indicate directionality--that is whether or not high EE can contribute to the onset of psychopathology in children. This directionality can be assessed by exploring the effects of parental EE during the early development of the infant.

Purpose of the Study and Significance

The purpose of this research is to determine the degree to which maternal emotions expressed toward low birth weight infants at six months of age predict emotional and behavioral problems at two years of age. The early identification of indicators such as criticism, hostility and emotional overinvolvement expressed by a parent toward an infant could enhance the ability to detect those families at risk across all socioeconomic groups. The presence of criticism in a parent may reflect a negative maternal attitude toward the child that places that child at risk, and without early intervention the maladaptive behaviors could continue into adulthood. Research currently indicates that negative emotional expression in the form of maternal criticism is high in families whose children have persistent symptoms of depression and conduct disorders (Asarnow, Goldstein, Tompson & Guthrie, 1993; Asarnow et al., 1994; Vostanis, & Nicholls, 1995; Vostanis & Nicholls, 1992; Vostanis et al., 1994). If the EE measurement can be utilized to assess families at risk for the development of emotional and behavioral problems in preschool children, psychopathology may be prevented. Although, the biological nature of many mental illnesses may prevent alleviation of all

mental health problems, the severity and continuity of the symptoms could be minimized through early nursing interventions

Nurses are in the prime position to identify and provide early interventions that promote positive maternal feelings and attitudes, in the nursery after the infant's birth and during well-baby visits occurring within the first year of life. It is during this first year that early identification of negative maternal-infant interactions can be modified by nursing interventions. Therefore, it is important for nurses to understand the parental behaviors that are linked to the development of emotional and behavioral problems in low birth weight children. The long-term goal of this research program is to strengthen the identification of risk factors in order to improve assessment methods and facilitate early intervention.

CHAPTER 2

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

There are two major fields that contributed to the development of the conceptual model utilized to guide this research. They are attachment theory (Bowlby, 1969, 1973; Ainsworth et al., 1978) and the concept of Expressed Emotion (Brown & Rutter, 1966; Vaughn & Leff, 1976).

Attachment Theory

Attachment theory was originally formulated by Bowlby (1969, 1973) and later refined by Ainsworth, Blehar, Waters and Wall (1978) to describe an instinctual process that develops between an infant and a primary caregiver during the infant's first year of life. For the purpose of this study, there are specific aspects of the attachment theory that are applicable and therefore, will be presented for review. First, there is an abundance of research that indicates an appropriate maternal response is necessary for the development of healthy or secure attachment behaviors in the infant. Second, research shows that the working model of attachment developed during the mother's infancy is transmitted through her positive and negative interactions with the baby, which influences the infant's ability to develop a secure attachment. Third, research has provided evidence that without this secure attachment there is seen an increase in emotional and behavioral problems later in the child's life. Finally, attachment theory identifies important modifying variables that can influence the mother-infant interaction and the measurement of the child's emotional and behavioral problems. These include: a) the infant's temperament, b) the history of the mother-infant separations, c) the presence of important, alternative caregivers in the infant's life.

Definition

Attachment refers to the socioemotional bond between an infant and primary caregiver that allows the infant to explore the environment while utilizing the caregiver for protection in times of perceived danger (Weiss, 1994). The attachment control system which is organized in the central nervous system, maintains the vulnerable infant's relation to the primary attachment figure within certain limits of distance and accessibility while more sophisticated methods of communication develop over time. The development of attachment is intertwined with the cognitive development of the child and is labeled the "working model" of attachment. The working model of attachment refers to the psychological framework of the child that is integrated through experiences with the primary attachment figure and then become generalized into expectations for present and future experiences (Weiss, 1994). As the child's language acquisition develops and the understanding of the world increases, the attachment behaviors to seek proximity occurred less frequently and on a more sophisticated level based on past experiences with attachment. The interaction between the infant's characteristics and the mother's internal working model of attachment (developed during her formative years) determine the ability of the infant to develop a secure attachment pattern. The development of the infant's attachment pattern to the primary caregiver is seen as laying the foundation for the infant's socioemotional development.

Further expanding Bowlby's attachment conceptual framework, Ainsworth, Blehar, Waters and Wall (1978) described patterns of attachment as secure, insecure-avoidant and insecure-resistant occurring in infants 12 to 18 months of age using the Strange Situation laboratory experiments. The Strange Situation involves a playroom in

which the mother and infant are placed for a time period, and structured separation and reuniting episodes between the dyad are observed and classified as the mother leaves the room and a stranger enters the room at standard intervals. As research utilizing the Strange Situation began to unfold, Main & Soloman (1986) discovered a large portion of infants were not being classified under Ainsworth's three categories which led to the description of a fourth pattern of attachment, disorganized/disoriented. The specific attachment behaviors for each pattern vary depending on the child's temperament, but in general the behaviors exhibited are as follows: a) securely attached infants utilize their attachment figure as a source of protection and comfort in time of perceived danger (e.g. the presence of the stranger) or separation, b) insecure-avoidant children avoid their attachment figures during separation and reuniting episodes in the Strange Situation, c) insecure-resistant infants resist interaction and comfort and are not easily consoled during separation and reuniting with the primary caregiver, d) disorganized or disoriented infants display confused or disorganized behavior in their attempts to gain contact with the primary attachment figure. These patterns of attachment continue to be used in research today to predict human development, both pathological and normative, throughout the life span.

Empirical data resulting from the Strange Situation experiments strongly supports the original ideas put forth by Bowlby. The importance of maternal responsiveness to the infant's needs has emerged in the literature as revealing a strong correlation to the particular pattern of attachment displayed by the infant. Ainsworth's research strongly stressed maternal sensitivity to cues as playing a key role in the development of attachment patterns, not individual differences of the infants. The role of the infants'

temperament was largely ignored in the initial formulation of the theory but, later the role of the infant's temperament in the development of individual attachment patterns became apparent, which further enriched the theory. Another limitation to the identification of the attachment patterns with the Strange Situation experiments was the lack of cultural diversity in the sample. The majority of the infants were white, middle class subjects. This makes it hard to draw sound conclusions when measuring attachment patterns in culturally diverse groups.

Bowlby (1973) stressed the importance of the early mother-infant relationship in the development of affect, cognition and emotions in the child which is carried through adulthood and transmitted across generations. He hypothesized that intense feelings of fear of abandonment and the unavailability of the mother to provide protection, physically or emotionally, could lead to later psychopathology. Insecure attachments were speculated to lead to child phobias and were caused by mothers who threatened abandonment. Abandonment could be in the form of physical unavailability, rejection, physical and emotional abuse, or maternal depression and suicide. Bowlby expressed disappointment in the lack of research exploring this hypothesis. In his last publication he stated, "...whereas attachment theory was formulated by a clinician for use in the diagnosis and treatment of emotionally disturbed patients and families, its usage hitherto has been mainly to promote research in developmental psychology." (Bowlby, 1988 pp. ix). Understanding normative and pathological development is possible through prospective, descriptive studies that can draw from large sampling pools. Therefore, it is not surprising that the development of attachment theory has taken this course toward the explanation of normative experiences. There is a resurgence of interest in looking at

developmental pathways leading to clinical disorders in high-risk populations termed "developmental psychopathology" which has turned the focus back to Bowlby's prospective search toward understanding psychiatric illness (Cicchetti 1984; Sroufe & Rutter, 1984). This shift in perspective has made a significant difference in guiding research in developmental psychology and offers potential for the prevention of emotional and behavioral problems in children and later into adulthood.

Attachment Research

Maternal responsiveness.

Maternal responsiveness has emerged in the attachment literature as the most important criterion for predicting attachment behaviors in infants. In the original Ainsworth study, prolonged observations of the mother-infant interaction occurred in the family's home, and it was discovered that many maternal qualities were correlated with the specific attachment classification (Ainsworth et al., 1978). These observations have revealed that maternal sensitivity to the infant's signals during feeding, play and episodes of close bodily contact in the course of the first 3 months correlated to the infant's behaviors in the Strange Situation at 12 months of age. Mothers of securely attached infants are more sensitive to the infant's cues during feeding, they accurately interpret the infant's needs and then they respond quickly to meet their needs. Egeland and Farber (1984) found these mothers to be more affectionate and tender during close physical contact. Mothers of insecure-avoidant infants have an aversion to physical contact and will even verbalize a dislike for holding the baby. They are insensitive to their infant's signals, using abrupt, irritating approaches with the infant and may even appear resentful, angry or threatening toward the infant (Weiss, 1994). Infants that show an insecure-resistant pattern of attachment have been correlated with mothers who are

also insensitive to their infant's cues but are more unpredictable in their accessibility to the infant. They appear less adaptable, flexible and are more preoccupied with routines then giving sensitive care (Main & Weston, 1982). Infants displaying disorganized or disoriented attachment patterns have mothers that may be suffering from attachment related trauma such as death of their parent or may have been maltreated as an infant (Main & Hess, 1990). These mothers appear to at times reverse roles with the infants, they may behave in a frightening or threatening way toward the infant and use sudden and unpredictable movements (Weiss, 1994). Based on these early findings, numerous research studies have attempted to explain which maternal variables show a correlation to the infant's attachment classification.

Several constructs of maternal responsiveness have developed in the literature involving a large number of maternal personal variables. These include: interpersonal sensitivity, empathic awareness, predictability, nonintrusiveness, emotional availability, engagement, contingent reactivity, noncontingent approval, unconditional love, emotional tone, and devotion (Martin, 1989). Ainsworth, Bell and Stayton (1971) developed the most widely used indices of maternal responsiveness as sensitivity, acceptance, accessibility, and cooperation. Scales utilized to measure these constructs in the early months of the infant's life have been strongly correlated (sensitivity at $r = .44$, acceptance at $r = .57$, accessibility at $r = .34$, cooperation at $r = .43$, with an overall correlation at $r = .47$; $p < .01$) to the development of a secure attachment at one year of age. According to Bornstein and Tamis-Lemonda (1989), maternal responsiveness to vocalizations, facial expressions, and movements of their 4 month old infants correlated ($r = .60$) to higher scores on the Wechler Preschool and Primary Scale of Intelligence when the child was 4

years of age. Currently, there is a considerable amount of literature associating the qualities of parental interaction to child development outcomes. An overall positive parental response has been positively associated with the child's later intellectual abilities and the development of a secure attachment (Ainsworth, 1973; Bell & Ainsworth, 1972; Barnard, 1976; Belsky, Rovine & Taylor, 1984; Blehar, Lieberman, Ainsworth, 1977; Clarke-Stewart, 1973; Isbella & Belsky, 1991; Sroufe, 1985). These numerous research programs have explored a variety of the maternal qualities of responsiveness in terms of the interaction with the infant. A problem identified in the literature within the maternal responsiveness domain is that frequently responsiveness and child performance are measured at the same point in time. The lack of longitudinal studies leaves the directional effects of maternal behavior somewhat ambiguous and makes it difficult to control confounding variables.

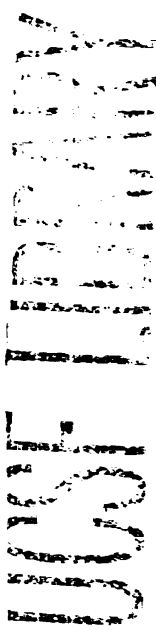
Barnard and Eyres (1979) have developed a comprehensive model for assessing and measuring parental responsiveness. This interaction model takes into consideration the caregivers characteristics (e.g. education, physical and mental health, coping skills), the environmental resources, and the child's temperament and regulation. Barnard's model assumes a systems theory approach wherein the parent-infant interaction both influences and provides feedback forming a loop in the communication. It is assumed that the goals and the circumstances in the interaction change, but that the basic characteristics and style of the dyad's communication remain consistent. Barnard describes the mother-infant interaction as a dance between partners with certain features that must be present for the healthy development of the infant. One of these features which relates to the Expressed Emotion constructs is that the content of the interaction

must be abundant in terms of positive affect and verbal stimulation. The measurement device developed from the Barnard model is called the NCAST Feeding and Teaching Tool (Barnard, 1976). Caregiver responses measured include: sensitivity to cues, alleviation of distress, social-emotional growth fostering behavior, and cognitive growth fostering behavior. Social-emotional growth fostering behavior explores affective states, voice tone/pitch and facial expression and is most similar to an Expressed Emotion framework. In addition to the above categories, a concept that is central to the feeding scales and closely relates to the EE constructs is the maternal affect subscale. The NCAST measures affect as expression of emotions, demeanor, feelings or mood state in the caregiver that determine the positive or negative quality of the communication pattern. The Barnard model incorporates the influence of emotions expressed by the caregiver toward the infant as being instrumental in the development of the child, including development of attachment.

Adult attachment classifications. Further confirming Bowlby's original proposition that attachment is carried developmentally across the lifespan, George, Kaplan, and Main (1985) developed the Adult Attachment Interview (AAI) to assess parent's attitudes and feelings of attachment. Utilizing the AAI, these researchers found a strong correlation ($r = .62$) between the infant attachment security and the mother's internal working model of attachment.

Parents rated as "autonomous" in their working model as measured by the AAI were associated with securely attached infants. These mothers can easily recall their childhood experiences and are realistic about their relationships with their own primary caregivers. They have positive memories of the care they were given, and if they do have

painful memories they have developed insight into how these memories can affect their current relationship with their infant. Avoidant infants correlated with parents labeled "dismissing." These mothers are described as being detached from their own attachment figures or devalue the importance of this attachment figure in their current relationship. They tend to idealize their primary caregiver in spite of recollections that the parent was neglectful or rejecting. Infants with resistant patterns of attachment were associated with "preoccupied" labeled caregivers. These mothers tend to be preoccupied or enmeshed with their own attachment figures and have an overwhelming recollection of negative memories that lead to angry and resentful feelings. At the same time these mothers feel dependent and have a hard time separating from their primary caregiver. Mothers of infants that are labeled disorganized/disoriented have experienced unusual trauma and have memories of their childhood that reflect dysfunctional grieving and confusion about the meaning the trauma has in their lives. The authors hypothesized that the mothers whose infants develop insecure attachment patterns may not be insensitive to the infant's cues, but are reacting based on their own internal working model of attachment. Attachment relevant information may be blocked and not able to be integrated within the mother's control system which appears in the form of insensitive behavior.



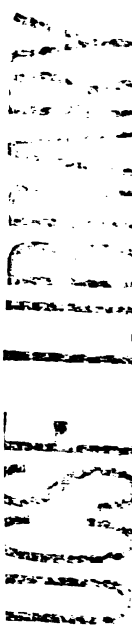
Development of emotional and behavioral problems. Children with a securely attached working model are found to be more effective in problem-solving and negotiating the environment and therefore, more competent in preschool (Arend et al., 1979; Cassidy, 1988; Waters, Wippman, & Sroufe, 1979). Secure attachment patterns have been associated with a higher self-esteem, increased internal control and more effective relationships with peers than the insecure counterparts (Erickson, Sroufe &

Egeland, 1985; Waters & Sroufe, 1983). Longitudinal studies are currently demonstrating the stability of attachment to predict social competencies over time (Ainsworth, 1989; Sroufe, 1979). Children classified securely attached at one year of age were rated by their teachers upon entry to school as more outgoing, assertive and cooperative within the classroom. Insecurely attached infants are more withdrawn, cling to the teacher and experience aggressive outbursts. Preliminary data with attachment scores and the Achenbach Child Behavior Checklist, [(CBCL) Achenbach & Edelbrock, 1983] found a relationship between security of attachment and parents scoring their 3-year-old children in the clinical range on the CBCL (Goldberg, 1991). Although the portions are small, 7% of insecurely attached children compared to 2% of securely attached children were reported in the clinical range for the presence of emotional and behavioral problems. The research to date supports the proposition that attachment classification can predict both positive and negative child developmental outcomes.

Casey, Barrett, Bradley, and Spiker (1993) utilized an assessment tool called the Pediatric Review of Children's Environment Support and Stimulation (PROCESS) which measures maternal sensitivity constructs that are similarly discussed in the attachment research. An observation of a mother-infant interaction is quantified into specific items that measure eye-to-eye contact, warmth, and tenderness expressed toward the infant. Results were correlated with the child's development of emotional and behavioral problems at 36 months of age as measured by the Child Behavior Checklist/ 2-3 [(CBCL/2-3) Achenbach, 1992]. Moderate negative correlations ($r = -.36$, $p < .03$) were found, indicating the more positive the mother-infant interaction the fewer number of emotional and behavioral problems reported.

Factors Influencing Emotional/Behavioral Problems

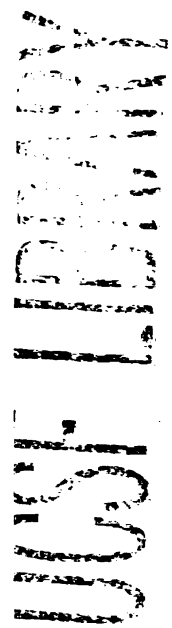
Infant Temperament. Infant temperament is a variable that can influence not only the child's ability to form a secure attachment, but also the development of emotional/behavioral problems. Temperament is defined as the behavioral style utilized by an individual in response to the environment (Chess & Thomas, 1986). Although not genetic, temperament is considered to be the combination of innate biological or inborn traits that produce a different social response to environmental stimuli. The goodness of fit between the primary caregiver's and the infant's temperament is necessary for the healthy emotional development of the child which includes attachment behaviors. Infants with difficult temperaments may be harder to soothe, and therefore, they can place stress on the ability of the caregiver to deliver an appropriate response. Conversely, infants with an easy temperament can elicit a more positive response from the caregiver that can promote their healthy growth and development. Because of its potential impact on the child's behavior, controlling for infant temperament is necessary to satisfactorily measure the effect of Expressed Emotion on the child's emotional and behavioral problems.



History of separation. The number of separations that occur from the primary caregiver during the infant's first year of life can have a confounding effect on the child's development of emotional and behavioral problem. Numerous and prolonged separations from the primary caregiver can effect the infant's ability to form secure attachments. Bowlby (1969) originally formulated attachment theory from observations of children's reuniting behavior with their mothers after being placed in alternative care for extended periods of time. Children that are hospitalized, placed in foster care, or cared for by other family members while their mothers are incarcerated or hospitalized during the first year

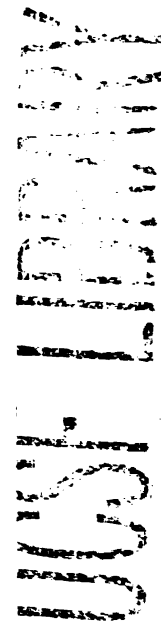
of life may be at risk for developing insecure attachments. Children with insecure attachments can have trouble relating to peers, aggressive behavior and demonstrate low self-esteem which would be reflected by an increase in emotional and behavioral problems. Therefore, it is important to control for the history of separation from the mother when measuring a behavioral outcome in children.

In addition, it has been established that children that have had repeated hospitalizations, lasting over a week, are at risk for developing behavioral problems (Douglas, 1975). Not only does the separation involving hospitalization disturb the attachment process but, the sometimes painful and invasive procedures performed can increase the infant's anxiety which may lead to social withdrawal, emotional outbursts and difficulty adjusting to new situations (Clunn, 1991). Chronic illnesses, with frequent hospitalizations, interfere with the infant's ability to meet his/her developmental milestones which are necessary for healthy growth and well-being. Because of the added risk hospitalization brings to the baby, this form of separation needs to be examined separately from out-of-home placement, and mother hospitalization and incarceration.



Alternative Caregiver. Belsky and Rovine (1988) found that infants placed in alternative care for more than 20 hours a week had a slightly higher incidence of insecure attachments. Furthermore, many studies have found an association between children who attend day-care during their first year of life and an increase in aggressive behavior and non-compliance with their parents (Haskins, 1985; Schwarz, Strickland, & Krolick, 1974; Vaughn, Deane, & Waters, 1985). Although it remains a controversial issue as to whether it is actually being placed in daycare situations that puts the infant at risk, or the existence of other parental variables in the response to the infant that leads to the

development of an insecure attachment, controlling for the presence of other caregivers is important. This would include not only daycare attachment figures but also other significant caregivers in the home, i.e. father, grandparent, or other family member. Attachment research has traditionally viewed the attachment process as developing in the mother-infant dyad, and has omitted the potential buffering effects of other caregivers in the family unit (Donley, 1993). The presence of an alternative caregiver could act to counter-balance a stressed mother-infant relationship, effecting the attachment outcome. Based on the aforementioned, controlling for the presence of alternative caregivers is imperative to sort out the effect of Expressed Emotion on the child's emotional and behavioral problems.



The Concept of Expressed Emotion

Definition

Expressed Emotion (EE) is a measure of the emotional attitude expressed by an individual toward a family member. Brown (1959) first identified the Expressed Emotion constructs--criticism, hostility, positive remarks, warmth and emotional overinvolvement by exploring which emotions expressed by family members contributed to higher relapse rates in adult patients suffering from schizophrenic illness. From his investigations, the Camberwell Family Interview [(CFI) Brown & Rutter, 1966] emerged as a tool to measure these five EE constructs. This original version of the CFI took over 4 hours to administer, and even longer to code, which posed cost and feasibility limitations for future utilization of the tool. Therefore, Vaughn and Leff (1976) developed the abbreviated version of the CFI which is the current tool used to measure the EE index of criticism, hostility, positive remarks, warmth, and emotional overinvolvement. Two

principal components, criticism and overinvolvement expressed by a family caregiver toward their child have emerged as having the most predictive power in the relapse or reoccurrence of mental health symptoms. Therefore, the Five Minute Speech Sample (FMSS) was developed from the CFI to measure criticism and emotional overinvolvement in a timely and cost effective fashion (Magana et al., 1986). The evolution of the EE literature has moved from evaluating EE with the CFI in schizophrenic populations toward evaluating EE in parents with latency age children suffering from a variety of mental illnesses utilizing the FMSS.

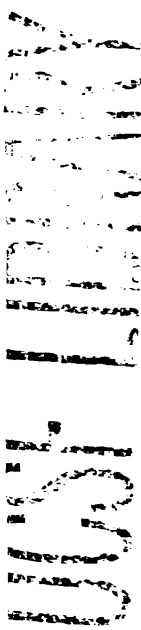
Camberwell Family Interview. Leff and Vaughn (1985) provide a detailed description of the 5 scales utilized for the abbreviated CFI. Critical comments are rated based on a clear and unambiguous statement toward the patient such as dislike, disapproval or resentment of the person's behavior or characteristic. Vocal tone is an important consideration when tabulating the critical comments to prevent false coding when a relative is merely making a description of unfavorable behaviors. Also, remarks are considered critical if there is a strong rejecting component in their delivery. Hostility is rated on a 4-point global scale and is considered to be present when the patient is attacked for what they are rather than what they do. The two criteria that must be present to rate hostility are a generalization of criticism and rejecting remarks. Positive remarks are based on a frequency count rating of the statements that express praise, approval, or appreciation of the behavior or personality of the ill family member. Warmth is weighed on a 6-point global scale and refers to the warmth expressed toward the ill member. Tone of voice is the most important criterion of this scale which is based on the spontaneity of expression, amount of sympathy, concern and empathy for the patient. Finally, emotional

overinvolvement is based on reported behavior from the respondent with an exaggerated emotional response, self-sacrificing and devoted behavior, and/or extreme overprotective behavior using a 6-point global rating. If, during the interview, the relatives make statements about the impact of the illness on themselves, have an emotional display or exhibit an over dramatization of trivial incidents they would be categorized as higher on the emotional overinvolvement scale.

As research utilizing the abbreviated version of the CFI began to unfold, two key measures showed the highest correlation with the adult schizophrenic relapse outcome--criticism and emotional overinvolvement. Therefore, the majority of research takes these two constructs and dichotomizes the results into either high or low EE according to standardized cut-off points. High EE is defined as those families who express frequent criticism and hostility to the patient or who are emotionally overinvolved and enmeshed with the patient. Conversely, low EE refers to those families who do not express frequent criticism or hostility and do not discuss the patient in an overly involved manner during the interview. When measuring the link between family emotional atmosphere and an increase in psychiatric symptoms with the abbreviated CFI, the results polarize EE into a high or low category as it relates to the extent to which a relative expresses criticism or emotional overinvolvement toward the ill family member (Brown, Birley & Wing, 1972; Karno, Jenkins, De La Selva, Santana, Telles, Lopez & Mintz, 1987; Leff & Vaughn, 1985; Miklowitz, Goldstein, Nuechterlein, Snyder & Mintz, 1988; Vaughn & Leff, 1976; Vaughn, Snyder, Jones, Freeman & Falloon, 1984).

Five Minute Speech Sample. The Five Minute Speech Sample (FMSS) was developed to measure the criticism and emotional overinvolvement expressed toward the

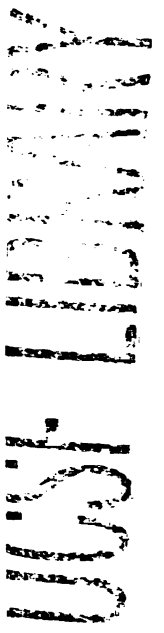
patient during a five minute interview (Magana et al., 1986). The FMSS is a series of questions asked of the parent or spouse about the ill family member. Like the CFI, the relatives are asked to tell their thoughts and feelings about the patient. Adopted from the CFI was the frequency count of critical remarks and a global rating of emotional overinvolvement. Quality of the initial statement and relationship were developed specifically for the FMSS. The initial statement was asked in a standardized fashion, "Tell me what your son is like and how the two of you get along." The initial response is believed to be particularly important as it reflects a strong feeling or attitude toward the patient. The statement is coded first and rated as positive, neutral or negative. The quality of the relationship is rated as either strong positive, weak positive, strong negative, or weak negative based on remarks which refer to the relationship in the entire interview. Criteria for a high EE critical rating was based on any one of the following: 1) a negative initial statement, 2) an overall negative relationship rating or, 3) one criticism based on content or tone. To be considered to have high emotional overinvolved EE rating, the relative would demonstrate one of the following categories: 1) an emotional display during the interview, 2) report overprotective or self-sacrificing behavior or, 3) excessive detail about the past, a statement of attitude or exaggerated praise.



Expressed Emotion Research

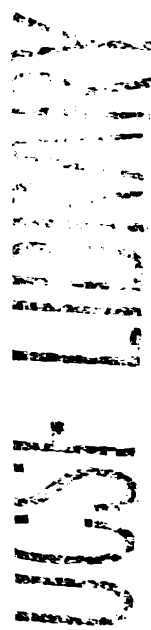
Over the past 30 years, a plethora of studies have demonstrated significant associations between families with high Expressed Emotion and morbidity rates in adult and child populations suffering from schizophrenia, mood disorders, conduct disorders and substance abuse utilizing both the abbreviated CFI and the FMSS. Research initially began with schizophrenic families and then progressed to other illnesses such as

depressive disorders and bipolar disorders (Brown et al., 1972; Karno et al., 1987; Miklowitz et al., 1988; Vaughn & Leff, 1976; Vaughn et al., 1984). More recently the literature has moved to evaluating EE in parents with younger children suffering from depression, behavior disturbances, asthma and attention deficit hyperactivity disorders utilizing the Five Minute Speech Sample (Asarnow et al., 1993; Asarnow et al., 1994; Marshall, Longwell, Goldstein & Swanson, 1989; Schobinger, Florin, Reichbauer, Lindemann & Zimmer, 1993; Schwartz et al., 1990; Stubbe et al, 1993; Vostanis, & Nicholls, 1995; Vostanis & Nicholls, 1992; Vostanis et al., 1994). Many studies have explored EE as predictors of the development and exacerbation of psychiatric conditions in latency aged children (Asarnow et al., 1994; Hibbs et al., 1990; Schwartz et al., 1990; Stubbe et al., 1993; Vostanis et al., 1994). Findings conclude that an association exists between high EE scores in parents with children who suffer from mental illness versus control groups. These research programs involving the Expressed Emotion constructs have provided significant findings that enable clinicians to identify family variables that contribute to the child's mental illness symptoms.



Significant research utilizing child populations. Stubbe, Zahner, Goldstein and Leckman, (1993) investigated the association between EE and childhood psychiatric disorders in a community sample of children and their families living in Connecticut, utilizing the FMSS with modified scoring procedures. Drawing from a random sample of 822 children ages 6-11, the researchers identified 108 children who scored in the clinical range on the CBCL (Achenbach & Edelbrock, 1983). The ethnic subgroups of the 108 children in the sample included Black (57%), Hispanic (9%), White (37%) and other (4%). The mothers' current mental health status was assessed with a Maternal Depression

index (CES-D, Radloff, 1977) and the Health Opinion Survey (Macmillan, 1957). The 108 children were diagnosed with the following conditions: (74.4%) demonstrated no DSM-III-R condition, (14.8%) disruptive behavior disorder, (9.2%) anxiety-depressive disorder and (3.5%) fulfilled broad diagnostic categories. Of the 108 subjects, 31 received a FMSS rating of high EE which was equally divided between critical and overinvolved. Seventy-two percent of children from high critical EE families were diagnosed with one or more DSM-III-R conditions (OR = 5.3, 95% CI = 2.0-14.0). Interestingly enough, (70%) of all the cases of child psychopathology for high emotional overinvolved EE parents were anxiety disorders (OR = 1.5, 95% CI = 0.4-5.2). Of the demographic variable analyzed, the only significant characteristics related to EE was a high critical expression from Catholic families and a significantly higher overinvolved rating for Hispanic families adding evidence to the theory that EE is expressed in culturally specific ways. FMSS measures of critical EE were not related to maternal depression or neuroticism but, high overinvolved maternal scores were related to psychoneurosis scores on the Health Opinion Survey.



One of the major contributions this study makes to the understanding of family functioning with childhood psychopathology is the evidence that EE is not a unitary construct. When dealing with child populations, the families who are highly critical differ significantly from families who exhibit overinvolved behavior toward their child. Furthermore, there is a higher incidence of overinvolved ratings in this sample versus the adult schizophrenic populations. Caution should be taken when interpreting the meaning of this result. It would seem natural for a parent to exhibit more emotionally involved behaviors toward a young child versus an adult child who is still living in the home. In

the development of the CFI, emotional overinvolvement was only identified in families with a schizophrenic relative and was not obviously present in normal families. Also, the modified scoring procedure utilized may have been more sensitive in detecting overinvolvement or simply may have classified normative behavior as emotional overinvolvement. Never the less, the high rate of anxiety disorders in the children of overinvolved caregivers deserves further attention. Attachment theory suggests that parents with neurotic behaviors who perceive the world as unsafe and over protect their child could contribute to the development of anxiety disorders or phobias (Bowlby, 1973). Certainly, further research is necessary to examine this proposition.

Vostanis, Nicholls and Harrington (1994) utilized the abbreviated CFI to determine if the EE constructs of criticism, positive remarks, warmth, and emotional overinvolvement differed between mothers whose children were diagnosed with conduct and emotional disorders. This study is of interest because it is the only recent report that includes the positive comment and warmth EE subgroups with the aim to avoid approaching EE in the traditional dichotomy of high/low. The sample consisted of three groups of children age 6-11 years with conduct disorders, emotional disorders and as controls. The CFI interview was slightly modified for the 6-11 age group and if both parents were participating, the interviews were conducted jointly. The rating of the CFI scores coincided with the original criteria by Vaughn and Leff (1976) but the ratings of emotional overinvolvement were slightly adapted for this age group. Interrater reliabilities were consistent with other studies, criticism ($r = .82$), emotional overinvolvement ($r = .98$), warmth ($r = .79$) and positive comments ($r = .89$). Final diagnosis of conduct disorder and emotional disorder were made by a psychiatrist after an

interview with the parent, teacher and child according to ICD-9 criteria. Concurrent validity of the diagnosis was compared to the maternal ratings on the CBCL (Achenbach & Edelbrock, 1983) which distinguished significantly between the three groups ($X = 51.37$, $p < .001$). The Family Environment Scale (Moos & Moos, 1986) was completed to assess the mother's report of the family environment.

Findings indicated that mothers of children with conduct and emotional disorders expressed significantly less warmth ($z = 6.13$, $p < .001$) and fewer positive remarks ($z = 5.14$, $p < .001$) than the controls. The amount of criticism expressed by the mothers differed significantly between the two clinical groups. Maternal criticism in the conduct disorder group was significantly higher ($z = 2.99$, $p = .003$) than the emotional disorder group and lower on warmth ($z = 2.46$, $p = .014$). There was no association between the maternal rating of the family environment and the EE scores. These findings indicated that conduct disorders and emotional disorders of childhood may be associated with different maternal styles. The authors suggested that not only does the presence of negative emotions impact the course of the child's symptoms, but the lack of warmth and positive comments has an important impact, as well. Certainly, by including the four EE components, the data was enriched by providing additional information about the influence the emotional climate has on the child. As reported in other studies, there were few families rated as emotionally overinvolved (Asarnow et al., 1993; Asarnow et al., 1994).

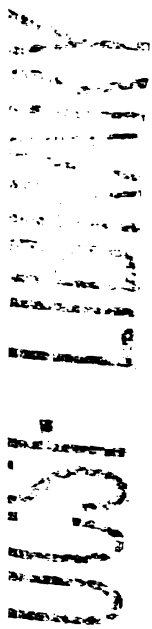
Vostanis and Nicholls (1995) performed a nine-month follow up study with above sample of conduct and emotional disorders to examine if EE scores change after 9 months of outpatient therapy. They were also interested in exploring if maternal EE had an effect

on the changes in the child's behavior. The CBCL (Achenbach & Edelbrock, 1983) was utilized to measure conduct problems as oppositional and aggressive behavior, and emotional problems as anxiety and depressive symptoms. The mothers were re-interviewed using the abbreviated CFI and asked to complete the CBCL 9 months after their first contact with a child psychiatric clinic. Results indicated that children with emotional disorders improved significantly from the clinical to the non-clinical range on the CBCL ($p < .01$). This did not apply to the children with conduct disturbances although maternal criticism did decrease significantly ($p < .007$) and warmth increased ($p < .005$). Emotional overinvolvement and positive remarks did not change significantly. In contrast, there was no difference between the first and 9 month follow-up EE scores with the emotionally disturbed group.

Based on these findings, the authors conclude that there is not evidence to determine a causal role of maternal expressed emotion toward behavior problems. They view maternal EE as both a state and a trait. A state is concluded due to the portion of mothers who showed a decrease in criticism and increase in warmth for conduct disorders children when an intervention was applied and are therefore, seen as having a reaction to one or several stressors including caring for a child with behavior disturbances. Traditionally, EE has been viewed as a trait and stable over time but clearly based on this study, criticism and warmth are modifiable with intervention. The authors concluded that the expression of emotions is only one of several risk factors which interact in a complicated fashion when examining child behavior outcomes. The role of the mother who is expressing the emotion and being the informant for the CBCL also, raises concerns for a possible biased outcome although previous research suggests the mother's

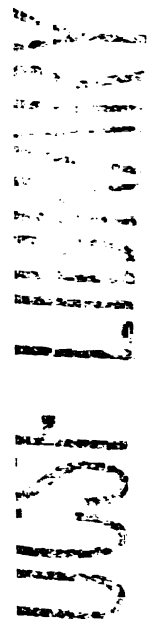
report may reflect her own characteristics, it is without bias (Lancaster, Prior, & Adler, 1989). Another interesting contribution this study brings forth is the evidence that warmth has value in predicting behavior outcomes in children. The authors suggested that the FMSS being a cost effective and time efficient research tool to measure critical and overinvolved EE, should include the measure of positive emotional attitudes, especially with children, into future versions (Vostanis & Nicholls, 1995).

Conclusion. The evolution of the concept of EE strongly suggests that the presence of criticism and emotional overinvolvement in family members places a mentally ill relative at risk for exacerbation of symptoms. What continues to be lacking is an explanation of the directionality or causation of the mental illness. Remaining unanswered is whether high EE is a contributory factor toward the etiology of the illness or a coping response in dealing with difficult and socially unacceptable symptoms associated with mental disease (Kanter, Lamb & Loeper, 1987; Koenigsberg & Handley, 1986). Although the EE constructs have not been previously applied to the mother-infant dyad, research suggests that a negative emotional response from the caregiver can contribute to an increase in emotional and behavioral problems in preschool children (Brandt et al., 1992; Campbell, Breaux, Ewing & Szumowski, 1986; Campbell, March, Pierce, Ewing & Szumowski, 1991; Garner & Power, 1996; Greenspan & Porges, 1984: Koniak-Griffin & Verzemnieks, 1994). Again, in these research studies, maternal negative emotion was measured concurrently with the presence of more emotional and behavioral problems in the child. There continues to be a lack of longitudinal research to identify which emotions expressed by the mother effect the development of emotional and behavioral problems in the child.



A major problem identified in the EE literature is that both critical and emotional overinvolved EE are placed into a unitary category. Furthermore, the technique of classifying families as high or low EE instead of utilizing the original frequency counts for criticism and the 6-point global scale for overinvolvement limits the understanding that EE brings to families. With the high/low dichotomy, researchers have the ability to adjust cut-off points to enhance their findings which has become one of the major criticism of the EE results (Kanter et al., 1987). The meaning attached to a critical parent is very different from the meaning associated with emotionally overinvolved interactions, especially in populations utilizing young children. Researchers measuring EE in families with children suffering from mental illness have expressed difficulty in detecting the over-involved construct even after modifications were made to adjust for the younger age group (Asarnow et al., 1993; Asarnow et al., 1994; Vostanis et al., 1994). In addition, past research has omitted the assessment of warmth and positive comments in adult populations, although more recently investigators have included these constructs and have found them to show differences between children with emotional/conduct disorders and their controls utilizing the CFI (Vostanis et al., 1994). By turning the focus to criticism and overinvolvement and omitting positive comments and warmth, the EE research has become an index that stresses negative family relations. This lack of focus on a more comprehensive approach to family emotional expression that may serve to assist in the recovery of mental illness, limits the full understanding of family dynamics and interactions. Families that are highly critical versus overinvolved would demonstrate radically different clinical family dynamics. Applying the meaning of high EE to the course of the illness has and continues to be a struggle in the field.

In search for this meaning, the development and utilization of the CFI and FMSS continue as an approach to identifying the amount of EE in families whose spouse or child is suffering from a psychiatric disorder. The methodology which originated from Brown and his colleagues over 30 years ago has evolved through the CFI and FMSS into tools which have demonstrated strong psychometric abilities in identifying that EE is related to psychiatric morbidity. It is because of this strong association that researchers have become creative in integrating EE concepts into existing theories from the cognitive, interpersonal, psychobiological, attachment and cross-cultural realms with good success. Attaching the EE constructs to theoretical underpinnings is imperative to fully understand the meaning that EE brings to the family dynamics.



Expressed Emotion and Attachment

Diamond and Doane (1994) drew clear linkages between concepts of attachment, EE and Affective Style (AS) in their study of severely disturbed adolescents and their families. Affective Style is a measure of negative affect expressed by parents in face-to-face family interaction tasks which has been associated with poor outcomes in adult schizophrenic patients. Concepts such as overinvolvement from the EE literature, were linked to the disorganized/disoriented pattern of attachments where a role reversal occurs and the child displays parenting behaviors toward the parent or the parent continues to provide care to the child that is no longer appropriate. Primary attachment figures who express negative affect, are highly critical and rejecting in face-to-face interactions and also run an increase risk of having children with insecure attachment patterns (Ainsworth et al., 1978). Utilizing attachment theory to guide the research, they found a significant association between disturbances in the mother's attachment to her own mother and the

degree of negative affect directed at the child. They hypothesize that the parent's own internal burden stemming from dysfunctional intergenerational attachment patterns may be the driving force behind negative affect displayed in the family interaction. This is a positive attempt to describe what psychological process may be fueling the behavior patterns associated with high EE which could lead to more appropriate intervention strategies. Furthermore, this study sheds new light on the ability to provide directionality to the EE construct and is congruent with attempts in the attachment literature to find associations between disturbed attachment patterns and the development of psychopathology.

Cultural Influences on Expressed Emotion

Jenkins and Karno (1992) argued that even though there may be a psychobiological human response to schizophrenic illness, the nature of EE is clearly grounded in culturally specific habits and practices. The two principal factors, critical comments and emotional overinvolvement, are by nature and meaning responded to in ways specific to cultural rules and norms. These theorists went further to hypothesize that merely associating culture and psychiatric illness is not enough but what is needed is a systematic approach to understanding the meaning behind EE. This systematic approach coincides with the anthropological view of the cultural differences that exist in understanding psychosis, the display of emotion, behavioral rules and norms and family structure and identification. The existence of family variations within diverse cultures complicates the process that is essential to fully understanding the complex nature of the response relatives make to their ill member. These authors called for future research to analyze the meaning of EE within the cultural context which is also imperative when

intervening with at risk families. The cultural factor associated with the expression of overinvolved EE could explain the difficulty in the EE literature to detect and consistently measure this construct in children.

Conceptual Framework

When viewing the EE constructs as a maternal response stemming from an attachment theory perspective, criticism/hostility, positive/warmth and overinvolvement can be seen as an indicator of the primary caregiver's internal working model of attachment. The internal working model of the caregiver is carried transgenerationally to the relationship with the infant during the formation of the infant's attachment response. Negative EE may therefore be an indicator of a parental response to the infant that would place the infant at risk for developing an insecure attachment and later emotional and behavioral problems. It is an assumption of this study that mothers of securely attached infants would express positive comments to their infants and display more warmth. Avoidant infants with mothers labeled "dismissing" would express less warmth and/or an aversion to physical contact. They may also be inconsistent in their comments toward their infants. Similarly, mothers labeled "preoccupied" may be inconsistent in their emotional expression and may even express more anger or resentment toward their infants. Mothers with infants classified as disorganized/disoriented in their attachment patterns may have confusion about their role as the parent and may display emotional overinvolvement.

The attachment literature strongly suggests that an overall positive maternal response toward an infant during the first year of life is predictive of healthier socioemotional outcomes and less emotional and behavioral problems in the child. A

negative maternal response has been associated with more emotional and behavioral problems in the offspring. Critical/hostile EE in family members is clearly linked to an increase in mental health symptoms in children suffering from psychiatric illness. Lack of warmth expressed to children has been linked to an increase in behavioral and emotional problems in preschool children and found to be present in mothers whose children suffer from conduct disorders. Therefore, maternal emotions that are negative or resemble criticism and hostility expressed toward an infant during the first year of life are likely to contribute to an increase in the development of emotional and behavioral problems by two years of age. Conversely, maternal emotions that are positive or resemble positive remarks and warmth will contribute to a decrease in the development of emotional and behavioral problems in the child. Traditionally, the FMSS categorized parents who expressed both criticism and overinvolved emotions into the high/low EE classification. Although emotional overinvolvement may be considered a high emotional expression, it is not necessarily negative. Maternal expression of overinvolvement may in fact be a parental response to the birth of a low birth weight infant that buffers or protects the baby and therefore prevents the development of emotional and behavioral problems. Therefore, because the specific components of criticism and emotional overinvolved EE represent very different forms of maternal expression, there is a need to examine them separately. Emotional overinvolvement is likely to impact the development of emotional and behavioral problems in the child, but the direction of the effect is not predicted.

Figure I displays a visualization of the research model used to guide the research. Maternal EE is measured at 6 months of the infant's age and the presence of emotional

and behavioral problems is measured at 2 years of age. The variables which may modify the development of behavioral and emotional problems in the child are infant temperament, history of separation and the presence of other caregivers in the child's life.

Research Question and Hypotheses

The specific research question which directed this study is:

To what degree does maternal Expressed Emotion predict low birth weight infant's emotional and behavioral problems, after controlling for the infant's temperament, history of separation, and the presence of another caregiver in the baby's life?

Three hypotheses were tested:

1). There is a significant positive relationship between the amount of a caregiver's negative EE and the extent of a child's emotional and behavioral problems at 2 years of age.

2). There is a significant negative relationship between the amount of a caregiver's positive EE and the extent of a child's emotional/behavioral problems at 2 years of age.

3). The caregiver's expression of emotional overinvolvement has a significant relationship to the number of emotional and behavioral problems in the child but, the direction of the effect is not predicted.

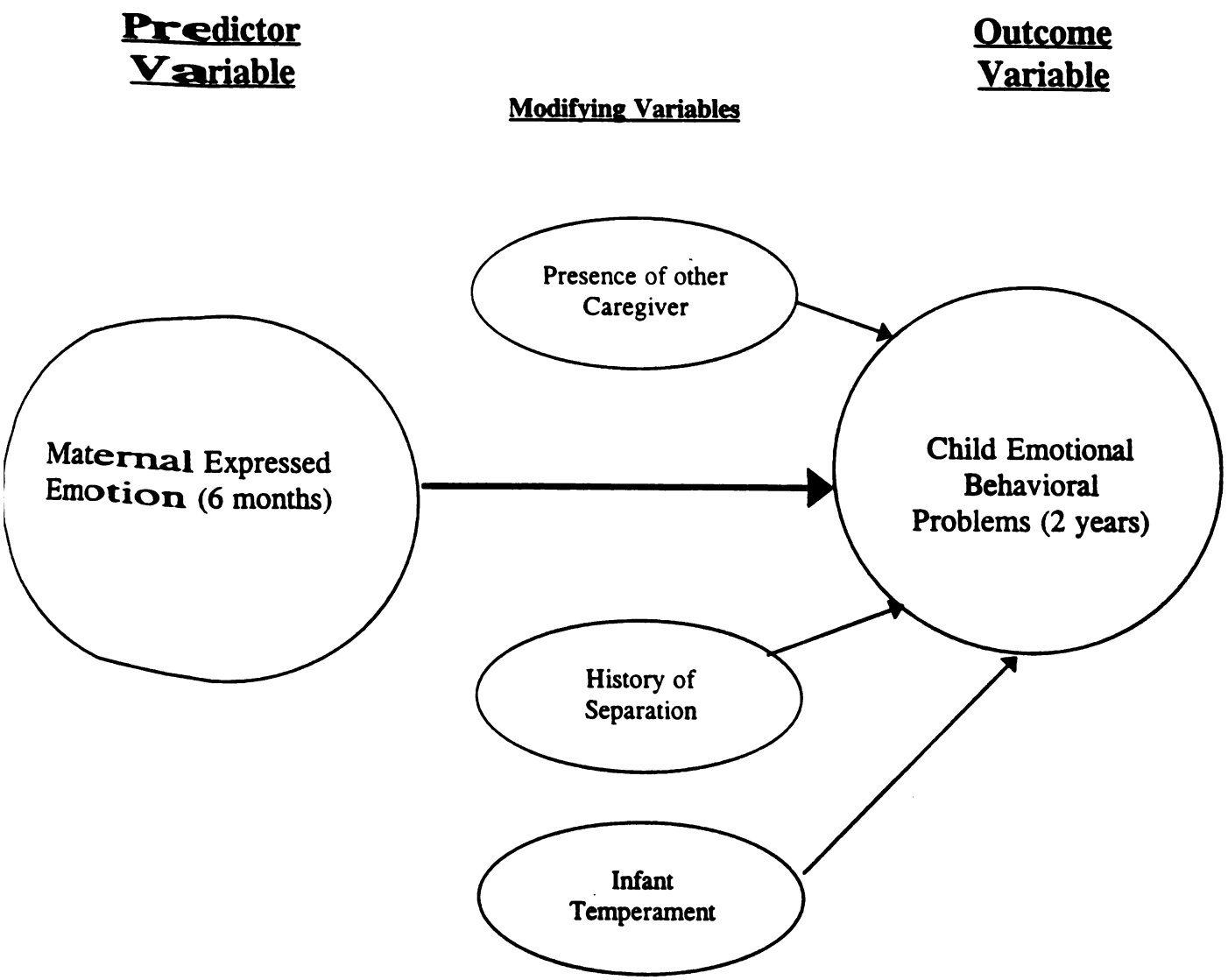

Predictor Variable
Outcome Variable
Modifying Variables
Presence of other Caregiver
Maternal Expressed Emotion (6 months)
Child Emotional Behavioral Problems (2 years)
History of Separation
Infant Temperament

Figure I.

CHAPTER 3

METHODOLOGY

The research design was a two year longitudinal study with mothers and their infants who were born of low birth weight (< 2500 grams). Collection of data occurred through videotaping of maternal Expressed Emotion (EE) during a mother-infant interaction, interviews with the mother, and standardized questionnaires. The predictor or independent variable was maternal EE and was measured when the infant was 6 months of age. The dependent variable was the presence of emotional and behavioral problems rated in their two-year-olds. Infant temperament, history of separation, and presence of alternative caregivers were also measured as potential modifying variables when the infant was 6 months old. This study was a substudy from an NIH grant entitled: "The Effects of Family Environment and Perinatal Vulnerability on Health Outcomes for High Risk Infants" under the overall direction of Dr. Sandra Weiss.

Sampling

A subsample was taken from the umbrella study that consisted of 83 mother-infant dyads. To meet selection criteria, the subjects had to have the same data collection points. Each dyad had a 3 month home visit which included the R-FMSS as well as the 6 month home visit. This was part of the protocol for the umbrella study. In addition, each mother had to have a completed the CBCL/2-3 for the child. The original study recruited 189 mother-infant pairs out of a total of 246 who met enrollment criteria. Of the 189 that agreed to participate, only 140 had 3 month data and 153 had 6 month data. Not all of the subjects were discharged from the hospital by 3 months of age which explains the discrepancy between the 3 month and 6 month data. At the two year data collection

point, 110 subjects had complete CBCL/2-3 data. From the 110 subjects, 83 dyads had a 3 month and 6 month videotaping of the speech sample needed to measure EE, which comprised the final sample. To test for a selection bias, t-tests were performed to compare the 27 subjects with CBCL/2-3 scores from the original study to the 83 subjects used in this study. There was not a significant difference between the two groups for internalizing ($t = .45$, $p < .65$), externalizing ($t = .56$, $p < .58$) and total problems ($t = .16$, $p < .87$) as measured by the CBCL/2-3.

The 83 mother-infant pairs were composed of both single and two parent families. Babies that were discharged from the hospital after 4 months of age were omitted from the sample due to the effects of long-term separation on the ability of the mother-infant pair to form a relationship prior to 6 months of age. Singleton, twin and triplet babies were included as long as they met the low birth weight status of < 2500 grams. Potential subjects were approached within a few days after the birth of the infant at one of three sites in the San Francisco Bay Area. The sites included a university hospital, county facility and a community hospital in a rural setting. The diversity of the populations served enhanced the generalizability of the findings across ethnicity and socioeconomic status. All three hospitals have an intensive care nursery that accommodates babies born with low birth weights. Both English and Spanish speaking parents were included and recruited by research assistants who were fluent in that particular language.

Measures

The Independent Variable

Description of the Expressed Emotion Measure

Revised Five Minute Speech. A Revised Five Minute Speech Sample (R-FMSS) was created and utilized for this study by adapting the original FMSS (Magana et al., 1986). The R-FMSS is a series of questions asked to the parent about the baby during a short video segment (5-10 minutes) in the family's home. Although the mother was specifically asked to talk about the baby for up to five minutes, coding segments ranged from 4 to 10 minutes. The research assistant (RA) directed the questions as if she was in a conversation with the parent to reduce the unnatural effects of being videotaped. The RA began by telling the mother that she would like to get her thoughts and feelings about the baby and to take the next five minutes to, "Tell me what your baby is like and how the two of you get along." If a parent was unable to speak for the full 5 minutes, the RA used prompts to maintain the flow of the conversation. These prompts included, "Tell me how the baby's personality is developing and what he/she will be like when they grow up," "Is there anything you would add about what your baby is like?" Finally, at the end of the speech sample, the parent was asked, "What is it like to be a parent to this baby?" The intention was to evoke the parent's feelings and thoughts about her role in caring for the baby. The prompting in the R-FMSS by the RA, elicited a more natural conversation and allowed the mother to address each question in a standardized fashion.

The Revised Five Minute Speech Sample (R-FMSS) was utilized to measure three categories of maternal behavior: 1) Negative EE (hostility and criticism), 2) Positive EE (positive remarks and warmth) and, 3) Overinvolved EE as expressed both verbally

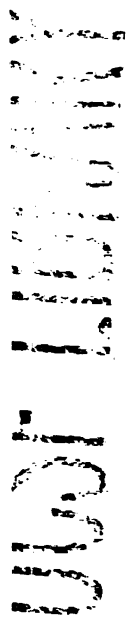
and nonverbally by the mothers to their infants. Criticism was tallied for each statement of dislike, disapproval or resentment of the baby's characteristics, behavior or their relationship. Hostility was coded for each negative, rejecting body movement or facial expression toward the baby. This was measured by the presence of frowning toward the baby, jerking or pushing the baby away from the mothers body. Positive remarks were tallied for statements of praise, approval or appreciation of the baby. Warmth was tallied for behaviors of sympathy, concern and empathy for the baby such as kissing, hugging, snuggling, or smiling at the baby. Emotionally overinvolved behaviors or statements were tallied for evidence of self-sacrificing or over-protective behavior, crying, exaggerated praise, or excessive detail about the past. In addition to the critical/hostile positive/warm, and overinvolved tallies, the quality of the initial statement was also scored. The initial statement was asked in a standardized fashion, "Tell me what your baby is like and how the two of you get along." The initial response is believed to be particularly important as it reflects a strong feeling or attitude toward the infant. This initial statement was separately coded and was not included in the subsequent tallying for the remaining speech sample. Each initial statement was rated as either positive, neutral or negative (see Appendix A).

Scoring criteria for a Negative EE (critical/hostile) rating was based on any one of the following: 1) a negative initial statement, 2) (51%) or more of the statements reflecting critical remarks based on content or, 3) (51%) or more of the speech reflecting observations of hostility. Positive EE (positive remarks/warmth) criteria included any one of the following: 1) a positive initial statement, 2) (51%) or more positive comments during the interview or, 3) (51%) or more of the speech reflecting warmth. To

be considered to have an Overinvolved EE rating, the caregiver had to demonstrate 51% or more of the following categories of behavior during the interview: 1) an emotional display during the interview, 2) overprotective or self-sacrificing behavior, 3) excessive detail about the past, or 4) exaggerated praise. Appendix A includes the coding record that was utilized to score the number of critical and positive remarks, amount of hostility and warmth, and the number of overinvolved statements and behaviors made by the caregiver toward the infant.

The measure described above was revised from the original FMSS in several ways. First, the coding record was adjusted to accommodate the mother-infant population which included changing wording in the opening statement to reflect the feelings about the baby. Second, the coding scheme was modified to include both auditory (verbal) and visual (nonverbal) data that was obtained by the videotape. The measurement of nonverbal behavior was essential in order to gain an accurate understanding of the mother to infant communication of feelings and attitudes. This is due to the nature of a mother-infant interaction requiring nonverbal communication through physical contact and facial expressions. A third and major change was including the expression of hostility, positive remarks and warmth. The original FMSS was developed from the CFI (Vaughn & Leff, 1976) to measure only critical remarks and to make a global rating of emotional overinvolvement. Positive remarks were included in the R-FMSS to measure the impact of positive maternal emotional expression on the development of emotional and behavioral problems in the infant. Hostility and warmth were used to measure both negative and positive nonverbal expression of maternal emotion toward the infant. In the CFI, hostility and warmth were rated on a global scale

and positive remarks were coded by frequency counts. The R-FMSS criteria for rating the constructs hostility, positive remarks and warmth were adopted directly from the CFI. Finally, although the FMSS has been valuable for screening families with high EE, it does misclassify 30% of individuals as low EE in relation to being classified as high on the CFI (Magana et al., 1986). Also, in the original FMSS criteria for a high EE critical rating was based on only one of the following: a) a negative initial statement, b) an overall negative relationship rating or, c) one criticism based on content or tone. To be considered to have high emotional overinvolved EE rating, the relative would demonstrate only one of the following categories: a) an emotional display during the interview, b) report overprotective or self-sacrificing behavior or, c) excessive detail about the past, a statement of attitude or exaggerated praise. This practice of coding only one statement in order to categorize the maternal EE as criticism or overinvolvement could have contributed to the 30% false ratings when the FMSS was compared to the CFI. Therefore, a percentage of the spoken content and visual behavior demonstrated on the video that represents the five constructs of criticism, hostility, positive remarks, warmth and emotional overinvolvement was used to enhance the validity and reliability of the data. For example, to be considered negative EE, criticism or hostility needed to be expressed 51 % or more of the entire speech sample.



Training

The R-FMSS data was collected by this writer (n = 48) and 3 other research assistants [RA (n = 35)]. The research assistants were enrolled in graduate nursing studies with specialties in child mental health nursing or maternal-child nursing. A written protocol outlining the opening questions (as described above) and order of

administration of each question in the R-FMSS was provided to each RA. This protocol was straightforward and easy to follow. The Spanish speaking mothers were assigned to the RAs who were fluent in the language to assist in the mother's proper understanding of the questions. A team meeting was held to orient the data collectors to the written protocols and to assure accurate understanding of the administration of the R-FMSS procedures. Three other team meetings were held throughout the two year data collection period in order to maintain consistency in the administration of the tool.

Reliability and Validity

Psychometrics of the original FMSS. Reliability and validity studies and data utilizing the original FMSS have been conducted and continue to be published in the literature, which strengthens its application as a sound psychometric tool. Concurrent validity with the CFI was replicated, confirming Magana et al. (1986) findings that high critical EE on the FMSS corresponded to high critical EE on the CFI with a 30% false positive rating for low EE with the FMSS (Malla, Kazarian, Barnes & Cole, 1991). Predictive validity of the FMSS with children suffering from depressive, anxiety and disruptive disorders has just begun to emerge in the literature (Asarnow et al., 1993; Asarnow et al., 1994; Stubbe et al., 1993). The FMSS has been shown to provide close approximation to the CFI in both Spanish, English and German speaking relatives (Leeb, Hahlweg, Goldstein, Feinstein, Mueller, Dose, Magana-Amato, 1991; Magana et. al., 1986). Furthermore, Leeb et al. (1991) demonstrated the ability to reach an interrater reliability in German researchers at (k = .80), and similar concurrent validity findings with the CFI as Magana et al.(1986) and Malla et al. (1991). They also report stable data with the FMSS over a 4-5 week test-retest period. McGuire and Earls (1994) report

similar test-retest findings utilizing the FMSS in both English and Spanish speaking, low-income subjects but only after including borderline EE scores into the high EE categories. Based on these psychometric strengths, and in spite of the large percent of false positive low EE ratings, the FMSS has emerged in the literature as a cost-effective research tool for screening high EE families at the greatest risk for poor emotional health outcomes.

Reliability testing of the R-FMSS. Two RAs, this writer and a bilingual RA who spoke Spanish fluently and was familiar with the nuances of expression from that culture performed the coding of the R-FMSS. A 30 hour training period with revision of the tool occurred on 20-30 tapes not eligible for this study but part of the original NIH grant. Four different reliability tests were conducted, each 7 hours in length to pilot the coding record. Minor revisions in the protocol were made after each test in order to enhance the reliability of the instrument and ensure that both coders were approaching the data in the same way. Detailed coding instructions were written and read prior to each coding segment to assure consistent understanding of the definitions of each of the five EE constructs--criticism, hostility, positive remarks, warmth and emotional overinvolvement. These instructions are listed in Appendix B. Specific interrater difficulties encountered during the training periods were for those mothers that expressed both negative and positive EE or videotapes where there were distractions occurring in the environment during the speech sample. When this occurred, coders were instructed to set the data of these subjects aside for the research team to discuss and code later as a group. Weekly contact was maintained between the coders to discuss any concerns regarding administration of the tool.

Intercorrelation between criticism, hostility and Negative EE ($r = .58$ to $.64$, $p < .001$) were significant, as were the correlation between positive remarks, warmth and Positive EE ($r = .51$ to $.63$, $p < .001$). Criticism/hostility/Negative EE and positive remarks/warmth/Positive EE were also significantly correlated but in a negative direction ($r = -.52$ to $-.70$, $p < .001$). For the final reliability test, Cohen's Kappa, percent agreement was performed on 20 videotapes. Interrater reliability for the three nominal variables was high: Negative EE (95%), Positive EE (95%) and Overinvolved EE (100%). Percentage of agreement on spoken content for each of the five EE constructs was moderate: criticism (71%), hostility (71%), positive remarks (62%), warmth (75%), and emotional overinvolvement (67%).

Validity Testing for the R-FMSS. Because the R-FMSS was modified for use with low birth weight infants in this study, validity and reliability of the revised tool were examined. Concurrent validity testing examined the relationships between the R-FMSS and two other conceptually related measures: the Barnard (1976) NCAST Feeding Scale and the Mother Parental Acceptance-Rejection Questionnaire (Rohner, 1975). The Crowne-Marlowe Scale of Social Desirability—"20 items" was included to test whether the subjects were modifying their emotional expression in order to please the RA (Strahan & Gerbasi, 1972).

The Barnard (1976) NCAST Feeding Scale measures the maternal-infant interaction during a videotaped feeding sequence in the family's home. The social-emotional growth fostering subscale of the NCAST concurrently measures affective states and congruent responses in the caregiver through voice tone/pitch and facial expression. This includes the caregivers use of positive and negative comments made to the baby,

nonverbal behavior such as smiling, humming, laughing, frowning, grimacing, hitting, and shaking that occurs during a feeding interaction. Reliability and validity of the NCAST feeding scale has been well established and is outlined in the training manual (Barnard, 1976). The tool has been utilized for the past 15 years, yielding large normative samples for Caucasian, African-American, and Hispanic populations. It was hypothesized that concurrent validity of the R-FMSS would be supported if negative or positive EE rated with the R-FMSS corresponded respectively with low or high social-emotional growth fostering behavior in the caregiver as measured by the NCAST.

Findings indicated that only Positive EE was significantly correlated with the social-emotional growth fostering contingency item in the NCAST ($r = .29$, $p < .009$). The contingency items in the NCAST are a measure of the communication pattern from the caregiver that elicits or promotes healthy behaviors in the infant. For example, when the caregiver speaks, the infant turns to engage. The contingency item in the social-emotional growth fostering subscale assesses if the caregiver smiles, verbalizes or touches the infant within five seconds of the infant smiling or vocalizing at the caregiver. This item was significantly correlated with the Positive EE score from the R-FMSS. However, Negative EE was not significantly correlated with a lower score on the NCAST social-emotional growth fostering subscale. The NCAST scales are based on observation of certain behaviors in the mother and are not a frequency count of repeated behavior. Also, the amount of verbal expression toward the baby may have been less during the feeding episode than during the speech sample. This may have contributed to the lack of correlation between Negative EE and the social-emotional growth fostering subscale in the NCAST.

The Mother Parental Acceptance-Rejection Questionnaire [(PARQ) Rohner, 1975] is a self-report instrument of 55 items that measures the mother's perception of her acceptance or rejection of her infant. Five of the items that applied to older children were dropped from the original 60-item version of the PARQ and the wording was changed from child to baby to accommodate the infant population of this study. For the participants who spoke Spanish as their primary language, an English version of the questionnaire was translated to Spanish by a professional translator and back translated by a second professional translator who is a native to that culture. The PARQ consists of 4 scales: a) warmth/affection, b) aggression/hostility, c) neglect/indifference, and d) rejection. The Warmth/Affection scale is a measure of the parent's perception of the amount of love or affection she expresses to the child. On the other hand, parental aggression/hostility, neglect/indifference and rejection are negative forms of expression and at the other end of the warmth spectrum. The PARQ has been utilized in a variety of studies and demonstrates strong validity and reliability (Rohner, Saavedra & Granum, 1979). It was hypothesized that concurrent validity of the R-FMSS would be supported if there was a relationship between ratings of Positive EE as measured by the R-FMSS and higher scores on the warmth/affection scale of the PARQ. Conversely, it was hypothesized that there would be a relationship between ratings of negative EE and the PARQ scales of hostility and rejection. Unfortunately, the correlation between negative and positive EE and the PARQ scales did not yield significant findings. This may be related to differences in the types of measurement afford by the two tools. The PARQ measures perceived self-report warmth from the mothers and the R-FMSS measures expressed emotion as it is observed in behaviors toward the infant. The PARQ also

reflects internal values about childcare as perceived by the mothers while the R-FMSS reflects feeling states directed toward the infant.

The short version of the Marlow-Crowne Social Desirability Scale (M-C SDS) is a 20 item, true/false questionnaire that assess the extent to which a subject response in a socially desirable fashion. The short version was reduced from the original 33 item first developed by Crowne and Marlowe (1960) due to the lack of contribution to the overall measure from several of the items (Strahan & Gerbasi, 1972). The original scale was developed from a panel of faculty and graduate students with over 90% agreement on each item that reflected cultural approval, and that described minimal pathological behaviors. Internal consistency of the items was .88 and the scale correlated significantly ($r = .35$, $p < .01$) with the Edwards Social Desirability Scale (Edwards, 1957). The short version correlated significantly ($r = .90$, p not reported) with the original M-C SDS and is currently the preferred social desirability scale utilized (Strahan & Gerbasi, 1972).

An analysis of variance was performed for each of the EE subscores to compare mothers who were high and low on the subscale for their scores on social desirability. There was not a significant difference in social desirability across groups for the verbal expression of criticism ($F = 1.14$, $p < .35$), positive remarks ($F = .55$ $p < .70$) and emotional overinvolvement ($F = 1.56$ $p < .19$). For example, mothers that scored on the extremes for criticism or positive remarks as measured during the speech sample were not significantly different from the subjects that fell in the middle ranges.

Dependent Variable

Description of the Measure

Child Behavior Checklist/2-3. The Child Behavior Checklist/2-3 [(CBCL/2-3) Achenbach, Edelbrock, Howell, 1987] was used to measure the emotional/behavioral problems displayed by the child at 2 years of age. The CBCL/2-3 measures six syndrome scales: anxious/depressed, withdrawn, sleep problems, somatic problems, aggressive behavior, and destructive behavior, all as observed by the mother over the past 2 months. Factor analysis of the six syndromes yielded 2 prominent groupings for the syndromes--Internalizing and Externalizing behaviors. Internalizing problems include the anxiety/depression and withdrawn scales, while externalizing encompasses the aggressive and destructive syndrome scales. In addition to the internalizing and externalizing groupings, the CBCL/2-3 measures a total problem score. The raw score for each syndrome grouping, and a total problem score, can be obtained from a computer-scored profile, which reflects a normal, borderline and clinical range for each subject. The questionnaire includes 99 items on a 3-point scale, and it requires a 5th grade reading level for accurate comprehension and completion by the study subjects. The mother completed the questionnaire at home and gave the form directly to the RA.

Reliability and Validity

Achenbach (1992) revised the manual for the CBCL/2-3 which described the strong psychometric properties utilized to develop the tool. A normative sample was drawn from a national sample (n = 321) and T scores were calculated to allow researchers the ability to compare at risk populations to normative samples. Ethnicity for the normative sample was 78% Caucasian, 14% African American and 8% other or mixed.

The lack of cultural diversity in the normative sample limits generalizability across ethnic groups. Test-retest reliability for the CBCL/2-3 is reported as high ($r = .71$-$.85$, $p < .01$) over a one week period (Achenbach, 1992; Crawford & Lee, 1991). Inter-parent agreement for 2-year-olds is ($n = 64$, $r = .63$, $p < .01$), slightly higher than mean correlations ($r = .59$) of other behavior checklists.

Clinically referred children scored significantly higher than demographically matched nonreferred samples on the problem items, which demonstrated strong content validity. In order to demonstrate convergent validity, the only available instrument for this age population is the Behaviour Checklist (BCL) developed by Richman, Stevenson and Graham (1982). Although the scales differ significantly in the quantity and content of behaviors measured, convergence between the two tools for both parents ($r = .58$, $p < .001$) and teachers ($r = .77$, $p < .001$) was high. Spiker, Kraemer, Constantine and Bryant (1992) reported similar correlations between the CBCL/2-3 and BCL total problem scores at 36 months for mothers ($r = .56$, $p < .0001$), teachers ($r = .77$, $p < .0001$) and teacher assistants ($r = .74$, $p < .0001$). The CBCL/2-3 scores showed a moderately low correlation ($r = .23$, $p < .03$) in African American and Puerto Rican samples of adolescent mothers with behavioral ratings from videotaped mother-child play observations (Leadbeater & Bishop, 1994). Correlations were computed between the CBCL/2-3 and the Bayley Mental Scale at age 2, the McCarthy General Cognitive Index at age 3 and the Minnesota Child Development Inventory obtained at ages 2 and 3 years. These scales are a measure of developmental and cognitive abilities in children. No concurrent correlations were significant at either age. Therefore, the CBCL/2-3 shows discriminant

validity in terms of its ability to measure emotional/behavioral symptoms and not developmental or cognitive ratings.

Modifying Variables

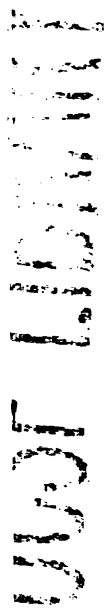
Three additional metrics were used to assess the potential modifying variables: infant temperament, history of separation, and the presence of alternative caregivers.

Infant Temperament

The Revised Infant Temperament Questionnaire (RITQ) was completed by the parent for the assessment of the infant's temperament at 6 months of age (Carey & McDevitt, 1978). The questionnaire was completed after the 6 month video taping in the mother's home and took approximately 30 minutes for completion. The tool was developed utilizing the temperamental constructs from Thomas and Chess (1970) for utilization by pediatricians as a screening device of infants with a difficult temperament. The majority of past studies exploring the question of temperament have used the RITQ (Koniak-Griffin & Rummell, 1988). The questionnaire is a 95 item, six-point scale that assesses nine dimensions of temperament: activity, rhythmicity, approach, adaptability, intensity, mood, persistence, distractibility, and threshold. Medoff-Cooper, Carey and McDevitt (1993) define the nine dimensions of temperament as follows: 1) Activity is a measure of the amount of physical motion during normal activities, such as sleep, eating, play and/or dressing. 2) Rhythmicity is the regularity of physiologic functions such as hunger, sleep, and elimination. 3) Approach reflects the infant's nature in regarding initial responses to new stimuli: people, situations, places, toys, etc. 4) Adaptability is the ease or difficulty with which the infant can modify in desirable ways reactions to stimuli. 5) Intensity is the energy level of responses regardless of quality or direction. 6)Mood

measures the amount of pleasant and friendly or unpleasant and unfriendly behavior from the infant in various situations. 7) Persistence reflects the infant's attention span, which is the length of time particular activities are pursued by the infant with or without obstacles. 8) Distractibility is the effectiveness of outside environmental stimuli in interfering with ongoing behaviors. 9) Sensory threshold, which is the amount of stimulation necessary to evoke discernable responses in the infant.

The revision of the original Infant Temperament Questionnaire was pilot tested and items with a low correlation ($r = .30$) were revised or discarded (Carey & McDevitt, 1978). Internal consistency reliability between the nine categories ranges from (.49-.71) with a total internal consistency coefficient at (.83). Test-retest reliability at a two-week interval (.72-.93) and at a 25 day interval (.66-.81) were strong. Koniak-Griffin and Rummell (1988) found that infant temperament scores from the RITQ remained stable from 4 to 8 months of life (median $r = .31$, $p < .05$). Construct validity of the tool has been established since its development stems from the temperamental constructs as described by the classic work of Thomas and Chess (1977). Other forms of external validity have been hard to verify due to the lack of other strong observational psychometric measures of temperament in the field.



History of Separation

History of separation, which includes infant hospitalization or placement in foster care and/or mother hospitalization or incarceration, was measured as part of the demographic data that was collected at two years of age. The demographic questionnaire assessed standard descriptive data on the mother, along with any changes that had occurred in the family leading to a mother-infant separation, over the two-year time

period. The demographic questionnaire asked, "Any changes we should know about over the last two years?" This gave the mother an opportunity to identify any significant changes that had occurred over the two years of the infant's life, including periods of separation from the infant. In addition, history of separation was assessed during the monthly phone contacts and recorded on a health inventory form. Based on evidence of any separation, infants were classified into one of 3 groups according to their length of separation from the mother after the first month of life: Group 1 (1 to 4 weeks), Group 2 (1 to 3 months) and Group 3 (more than 3 months). Additionally, infants with a separation history were divided according to whether the separation was a result of the infant's hospitalization or due to the mother's absence from the infant because she was unable to give care to the infant. Infant hospitalization included not only hospitalization during the two years of the child's life, but also if the infant remained in hospital for over one month of age, then this prolonged stay was included as part of the separation data.

Alternative Caregiver

To determine the presence of an alternate caregiver, the two year demographic questionnaire included questions about daycare usage and the presence of a significant alternative caregiver (> 20 hours per week). These included: "Since the baby was born, has anyone other than the mother been important in taking care of the baby? How old was the baby? How many hours per week? Relationship to the baby? How many people all together helped take care of him/her?" Field notes were also made after every home visit to record any significant changes in the infant's caregiving environment. A range from O to 5 was determined for how many caregivers other than the mother or father the baby has had since birth. The number of hours of that care per week ranged from 5 to 50

hours per week. The age at which the infant was placed in alternative care ranged from one to 21 months of the infant's age. A preliminary analysis was performed to determine 1) the distribution of the sample for the number of alternative caregivers, hours in outside care, and the age at which the infant was placed in the care, and 2) potential groupings in the distribution which were related to behavior problems.

Procedure

Figure II outlines the time frame for each participant over the two year period.

Initial contact

The first contact with the parent occurred in the Intensive Care Nursery at one of the 3 research sites. Upon consent to enter the study, the mother completed a demographic questionnaire which included standard descriptive data such as maternal age, educational level, annual income less than $12, 000 and the presence of a live-in partner. Monthly phone contact occurred by the RA to inventory the infant's illnesses and notes were taken on any other significant changes to the environment or caregiving situation over the two year period. This monthly contact also strengthened the relationship between the assistant and the families which assisted in lowering attrition.

Six month visit

At 6 months of the baby's age, the RA made a home visit, which took approximately one and a half to two hours to complete, to videotape the feeding interaction and the R-FMSS. To control for the effects of the presence of the videotape, the RAs were instructed to set up the camera and leave it on during the entire visit. Interaction and conversation were initiated with the least amount of attention placed on the equipment. The relationship with the families began at the infant's birth, which we

TIME FRAME

Birth	6 Months	2 Years
• Initial Contact	• Videotape - Five Minute Speech Sample (FMSS) Expressed Emotion	• Achenbach Child Behavior Check List
• Signed Consent	• Feeding and Teaching Sequence	• Demographic Questionnaire
• Demographic Questionnaire	• Acceptance-Rejection Questionnaire	
	• Infant Temperament Questionnaire	

Monthly phone contact for assessment of separation history and alternative caregivers will occur over the two year period.

Figure II.

believe increased the comfort level of the parents during the videotaping. The sequence for the taping procedures was structured although the infant's schedule frequently forced the RA and parent to make modifications. Usually, the R-FMSS occurred after the feeding episode which gave the parents an additional amount of time to become comfortable with the video. After the videotaping, the mother completed the Parent Acceptance-Rejection Questionnaire and the Revised Infant Temperament Questionnaire. Field notes were recorded after each visit ranking the order of administration of each instrument, significant separations, and any changes in the caregiving situation that had occurred since the infant's birth.

Two years of age

When the child turned 2 years old, the family was mailed the Child Behavior Checklist/2-3 and a two year demographic form for completion. The caregiver brought these forms to the clinic when a developmental evaluation was performed for other outcome data falling under the umbrella study. The RA reviewed the forms for accurate completion.

DATA ANALYSIS

Scatter plots and residual analyses were utilized to assure that the data met the necessary assumptions and criteria for regression analysis. In addition, correlations and t-tests were used to measure the role of various demographic statistics for both the independent and dependent variables. For comparing differences between groups a Bonferroni ($p < .05$) test was used to determine the significance level.

Preliminary analyses were performed to examine the effect of the modifying variables on the dependent variable. For the effect of the infant's temperament, Pearson

correlations for each of the nine categories of temperament were compared to the internalizing, externalizing and total problem score on the CBCL/2-3. History of separation was examined according to 3 different categories: separation duration, number of separations and the infants age at the time of the separation. Analysis of variance (ANOVA) was used to compare 3 time periods for the duration of the separation (group 1 = one-four weeks, group 2 = one-three months, and group 3 = three months or more). Frequency distributions were analyzed to determine the final groupings for the number of separations and the age at which the separations occurred. Based on these findings, ANOVAs were calculated to determine the effect the number of separations and infant's age at the separation had on the score for emotional and behavioral problems. Alternative caregiving was examined according to the number of alternative caregivers, the care giving hours and the age at which the child was placed in alternative care. Frequency distributions were performed to determine the appropriate groupings and statistical test necessary to examine the alternative caregiving data. Based on these findings, t-tests and ANOVAs were performed to determine what effect the number of alternative caregivers, the caregiving hours and the age of the infant when placed in alternative care had on the dependent variable.

Multiple regression techniques were utilized to test the conceptual model regarding the effects of Negative EE, Positive EE, and Overinvolved EE on the child's emotional/behavioral problems. Three separate regression equations were tested using the externalizing, internalizing and total problem scores of the Child Behavior Checklist/2-3 as the dependent variable. Scores for temperament were entered at the first step to control for their effects. History of separation, and presence of alternative

caregivers were entered at the second step since they were hypothesized to modify the effects of EE on children's behavior. The third step included 3 separate scores for EE--Negative EE (critical/hostile), Positive EE (positive remarks/warmth), and Overinvolved EE.

Based on the testing of the theoretical model, a second set of multiple regression equations was developed to improve the parsimony and predictability of the models. These 3 alternative equations also included 3 steps with the temperament variables entered at the first step, select EE scores entered as the second step, and specific interaction variables entered as the last step. These equations became the empirical models used to test the effect of EE on the child's emotional and behavioral problems.

CHAPTER FOUR

RESULTS

The results of this study are organized in the following way. First, the sample characteristics are presented along with descriptive statistics for the independent, dependent and modifying variables. The findings related to the research questions are then described, including regression outcomes for both the initial theoretical models and empirical models for the data.

Sample Characteristics

The sample consisted of 81 mother-infant pairs and 1 grandmother with twin infants making a total sample size of 83 pairs (59 singletons and 24 twins). Ethnicity of the participants was 45% Caucasian, 23% Hispanic (13% Mexican, 3% Central American, 1% South American, 6% other Hispanic), 25% African American and 7% other (Asian, Dutch and American Indian).

Characteristics of the Mothers

Mean age of the mothers was 29.48 and ranged from 16 to 44 years. There was a significant difference in maternal age between singleton ($\bar{x} = 28$) and twin ($\bar{x} = 32$) groups in that the mothers of twins were older in age ($p < .05$). Years of formal education ranged from 3 to 20 years, with a mean of 13 years (equivalent to one year of college beyond high school). The percentage of mothers that reported that they live with a partner was 80%. Ninety-seven percent of Caucasian mothers lived with a partner while only 57% of African-American mothers reported the presence of a partner. Thirty-five percent of the participants reported a family income below $12,000 per year, which

was not significantly different across the ethnic groups. As shown in Table 1, there was a significant difference across ethnic groups for maternal age and years of education.

Table 1.

Maternal Demographic Data

Maternal Characteristic	Caucasian	Hispanic	African American	Other	F
Maternal Age	32	27	28	23	4.89*
Years of Education	15.2	8.5	12.6	11.4	21.65*

*$p < .05$

Characteristics of the Infants

The mean gestational age was 32.5 with a range from 24 to 40 weeks. The mode and median were also 32 weeks. The mean birth weight was 1724 grams and ranged from 670 to 2490 grams. Twenty-four percent of the sample had a very low birth weight (< 1500 grams). Gender was fairly equally distributed with 52% males (n = 43) and 48% females (n = 40).

Descriptive Statistics

The Independent Variable

Maternal Expressed Emotion. All of the 5 EE constructs exhibited an asymmetrical distribution. Criticism was skewed to the right due to a higher percentage of mothers rated as having no or a small portion of critical comments. Thirty-four percent made no critical comments while 56% made them less than 50% of the time. Hostility had the least amount of variance with 96% of the mothers showing no or slight amounts of hostility. There were 3 mothers who were consistently hostile toward their infant and were rated as a 5 on the hostile scale, which automatically qualified them for a Negative EE score. In contrast, positive remarks were skewed to the left, with 75% of

the mothers verbalizing positive feelings towards the infants during more than half of the speech sample. Only one mother did not make a positive remark about her infant during the interview. Warmth (as with positive remarks) was skewed to the left. Seventy-four percent of the mothers displayed warm behavior more than half the time. The overinvolved subscore was skewed to the right due to 63% of the mothers not verbalizing or displaying any overinvolved behaviors during the speech sample. Thirty percent were rated as overinvolved for less than half of the speech sample.

Table 2 displays the percentage of subjects that fell into the main categories for Expressed Emotion. Ninety-two percent of the mothers were in the Positive EE category. Only 18% of the mothers were classified as Negative EE and even fewer mothers were defined as Overinvolved EE (7%). Of the 18% of mothers that were classified as Negative EE, 9% were also rated as Positive EE. This was due to the fact that those mothers spoke critically of their infants at points throughout the interview also displayed warmth at other times.

Table 2.

Expressed Emotion Descriptive Data

EE Construct	N	%
Negative EE		
Yes	15	18%
No	68	82%
Positive EE		
Yes	76	92%
No	7	8%
Overinvolved EE		
Yes	6	7%
No	77	93%

Relationships between maternal demographic variables and EE scales were examined, yielding 3 items that were significant or that demonstrated a trend. Maternal age significantly correlated with the EE subscores of criticism ($r = -.22$, $p < .05$), hostility ($r = -.24$, $p < .03$), positive remarks ($r = .33$, $p < .002$) and warmth ($r = .30$, $p < .005$), indicating that older mothers were less critical and hostile, and more positive and warm. Mothers with female infants showed a trend toward more overinvolvement ($t = 1.76$, $p < .08$) and more hostility was detected in mothers with male infants ($t = 1.70$, $p < .10$). Mothers with infants who had a higher than 1500 gram birth weight, showed a tendency to express more criticism to the infant ($t = 1.92$, $p < .06$). Paired t-tests were performed to determine if differences in maternal emotional expression existed between twin infants. There was a significant difference between twin 1 ($\bar{x} = 2.17$) and twin 2 ($\bar{x} = 1.67$) for criticism only. Finally, there was not a significant difference found between the EE scores based on ethnicity or socioeconomic status of the mothers.

The Dependent Variable

Emotional and behavioral problems. Descriptive data for the presence of the child's emotional and behavioral problems are displayed in Table 3. Mean scores for all of the subscales and the scales for Internalizing, Externalizing, and Total Problem scores were slightly higher than the reported norms for other children who have not been referred to clinicians for any emotional or behavioral problems. However, the sample means are within normal range on all scales. All scales were significantly intercorrelated and had a normal distribution. Relationships between infant demographics and CBCL Scores were examined. There were no differences in emotional and behavioral problems for infants born less than 1500 grams and those above 1500 grams. There was also no

difference based upon gestational age. However, there was a significant difference between male and female infants in numbers of both externalizing and total problems. Male infants received higher scores for both externalizing and total problems (see Table 4).

Table 3.

Child Behavior Checklist/2-3 Descriptive Data

CBC Scale, N = 83	Mean	Standard Deviation	Non-Referred Mean	Standard Deviation
Internalizing	8.60	6.21	8.0	5.2
Anxious/Depressed	4.79	3.08	4.5	3.0
Withdrawn	3.80	3.74	3.5	2.8
Externalizing	13.77	8.19	12.8	8.3
Aggressive Behavior	9.33	6.07	8.6	5.7
Destructive Behavior	4.45	2.72	4.1	3.3
Other Problems	7.64	4.90	NA	
Sleep Problems	3.36	2.86	3.2	2.8
Somatic Complaints	3.34	3.24	2.4	2.4
Total Problems	36.71	21.44	33.8	19.9

Table 4.

Mean Differences Between Male and Female Infants on the CBCL/2-3

CBC Scale, N = 83	Male Mean	Standard Deviation	Female Mean	Standard Deviation	T
Internalizing	9.05	6.95	8.15	5.37	.66
Anxious/Depressed	4.93	3.33	4.70	2.85	.34
Withdrawn	4.11	4.17	3.45	3.24	.82
Externalizing	15.74	8.81	11.78	7.03	2.26*
Aggressive Behavior	10.88	6.40	7.75	5.32	2.42*
Destructive Behavior	4.86	3.07	4.03	2.25	1.41
Other Problems	8.87	5.26	6.42	4.18	2.33*
Sleep Problems	3.86	3.23	2.88	2.32	1.61
Somatic Complaints	3.77	3.74	2.78	2.34	1.46
Total Problems	41.28	24.01	32.00	17.42	2.02*

*$p < .05$

The differences between ethnic groups on the CBCL/2-3 scores were examined through an analysis of variance. There was a significant difference between Caucasian ($\bar{x}$ = 5.92), African American ($\bar{x}$ = 11.09) and Hispanic mothers ($\bar{x}$ = 10.90) for internalizing problems ($F = 4.89$, $p < .05$). Both African American and Hispanic children had a higher score for internalizing problems than the Caucasian children. For externalizing problems, there was a significant difference between only Caucasian ($\bar{x}$ = 11.08) and African American ($\bar{x}$ = 17.85) mothers ($F = 3.42$, $p < .05$). There was also a significant difference for the total problem score between all three ethnic groups ($F = 4.99$, $p < .05$), both African American ($\bar{x}$ = 46.43) and Hispanic ($\bar{x}$ = 44.27) children received a higher total problem score than the Caucasian children ($\bar{x}$ = 27.95).

Modifying Variables

Infant temperament. Table 5 presents the descriptive data for the infant temperament scores. The mean scores for this sample were higher (except for activity) than the norms established by the RITQ for term infants. The intercorrelations between the items were all significant, except for adaptability which did not significantly correlate with intensity ($r = .17$, $p < .12$), persistence ($r = .17$, $p < .12$) or threshold ($r = .08$, $p < .45$). Rhythmicity, approach, adaptability and distractibility were over 2 standard deviations from the published norms. In order to identify the salient temperament characteristics to control for in the final analysis, correlations were computed between the 9 infant temperament scales and the 3 scale scores of the CBCL/2-3: internalizing, externalizing, and total problems. Persistence was significantly correlated with all CBCL/2-3 scales: internalizing($r = .38$, $p < .0004$), externalizing ($r = .29$, $p < .007$) and total problems ($r = .34$, $p < .002$). Adaptability correlated with the externalizing ($r = -.29$,

$p < .007$) and total problem scales ($r = -.23$, $p < .04$) but in a negative direction. Because of their potential significance, both persistence and adaptability were included in the final regression models.

Table 5.

Descriptive Statistics for Infant Temperament

Temperament Type: N = 83	Mean	Standard Deviation	RITQ Mean	Standard Deviation	Difference in Standard Deviations Between Means
Activity	4.34	.49	4.40	.56	0
Rhythmicity	3.84	.60	2.36	.68	2.5
Approach	3.54	.54	2.27	.78	2.4
Adaptability	3.65	.63	2.02	.59	2.5
Intensity	3.98	.62	3.42	.71	0.9
Mood	3.83	.61	2.81	.68	1.7
Persistence	3.87	.75	3.03	.82	1.1
Distractibility	3.90	.59	2.23	.61	2.8
Threshold	3.82	.50	3.79	.76	0

History of separation. Three variables were examined for the separation data: the number of separations, the duration of the separations and the type of separation. The number of separations ranged from 0 to 7, with the distribution falling into one of 3 groups: no separations, one separation and two or more separations. Preliminary ANOVAs (see Table 6) showed that infants experiencing two or more separations had significantly higher scores on all 3 scales of the CBCL/2-3. These findings indicated that this separation variable should be included in the regression model. Seventy-six percent of the separations occurred as a result of hospitalization from the time the baby was born ($n = 38$). The number of other types of separations was too few to allow for this variable to be included in any regression analysis. The duration of the separation showed no

significant effect on the CBCL/2-3 scores, and therefore, was not included in the final models.

Table 6.

History of Separation Descriptive Data

	N	Percentage	CBCL/Int.	CBCL/Ext.	CBCL/Tot.
Number of Separations					
None	39	47%	8.28	13.46	36.36
One	37	45%	7.89	12.89	33.30
Two or more	7	8%	14.29*	20.86**	57.86*
Duration of Separation					
1-4 weeks	3	7%	8.0	15.0	36.0
1-3 months	27	66%	8.11	13.51	34.8
> 3 months	11	27%	11.72	16.82	46.5
Type of Separation					
Hospitalization					
Infant	42	76%			
Mother	1	2%			
Custody	10	18%			
Change	2	4%			
Incarceration					

*p < .05, ** p < .06

Alternative caregivers. Descriptive statistics for the number of alternative caregivers, hours placed in alternative care and the age at which the infant was placed in alternative care are displayed in Table 7. The numbers of alternative caregivers ranged from 0 to 5 with just over one-half of the infants having no other caregivers. The number of hours in alternative care ranged from 5 to 50 hours per week with a somewhat even distribution across this range. Two-thirds of these infants didn't receive alternative care until they were over 6 months of age. Neither the number of alternative caregivers, hours placed in care or the age placed in the care were significantly correlated with the emotional and behavioral problems. However, a t-test comparing behavior problems of infants who had no or one alternative caregiver (n =63, $\bar{x}$ = 9.2) to problems for babies

with two or more caregivers (n =19, $\bar{x}$ = 6.5) showed a significant difference for the internalizing scale ($p < .02$). Infants that were placed with two or more alternative caregivers were reported to have fewer internalizing problems. The only other finding was a trend toward infants receiving alternative care for more than 35 hours a week (n = 18, $\bar{x}$ = 5.67) to have fewer internalizing problems than infants receiving less than 35 hours per week (n = 21, $\bar{x}$ = 9.33) of alternative care ($t = 1.94$, $p < .06$). Based on these findings, the number of alternative caregivers was the only variable placed in the final regression equation.

Table 7.

Alternative Care Descriptive Statistics

	N	Range	Percentage
# of Alternative Caregivers		0-5	
None	43		52%
One	20		24%
Two or More	19		24%
# of Alternative Caregivers			
No or one	63		9.21
Two or More	19*		6.53
Hrs. in Alternative Care		5-50 hrs.	
< 24 hours	17		44%
> 24 hours	22		56%
< 35 hours	21		54%**
> 35 hours	18		46%**
Age in Alternative Care		1-21	
< 7 months	26	months	67%
> 6 months	13		33%

*$p < .05$, ** $p < .06$ (for internalizing only)

Hypothesis Testing

To test the hypotheses put forth, two sets of multiple regression models were examined. The first set was based upon the conceptual model originally proposed for this

study. Then a more exploratory approach was used to develop empirically based models which had the greatest predictive potential.

Theoretical Models

To analyze the theoretical models, the infant's temperament characteristics (persistence and adaptability) were first entered into Step 1 to control for their effects. The modifying factors that were controlled for (number of alternative caregivers and number of separations from the mother) were then forced into Step 2. In Step 3, the three EE scores (Negative EE, Positive EE and Overinvolved EE) were entered. The sample size for each equation was 82 due to missing data for one subject on the number of alternative caregivers.

CBCL/2-3 Internalizing Score

The data analysis for the internalizing score can be found in Table 8. The total amount of variance contributed by the model was 30% ($F = 4.52$, $p < .0003$). For step 1, the 2 temperament variables explained 18% of the variance ($F = 8.92$, $p < .0003$). The squared semi-partials in Table 8 show that persistence explained most of the variance in the model ($F = 16.18$, $p < .0001$) while the contribution of adaptability was much smaller ($F = 3.82$, $p < .05$). The direction of the beta scores indicate a negative relationship between adaptability and behavior problems. In step 2, alternative care and number of separations explained 4% of the variance ($F = 1.99$, $p < .14$). Neither alternative care nor the number of separations contributed significantly to the variance. The final step included Negative EE, Positive EE and Overinvolved EE. This step explained 8% of the variance ($F = 2.73$, $p < .05$). Negative EE contributed significantly to the number of internalizing problems ($F = 7.70$, $p < .007$). There was a trend for Positive EE to

contribute to the internalizing problems but it had a positive beta (F = 3.48, p < .07), indicating that more Positive EE from the mother predicted more internalizing problems. Overinvolved EE did not significantly contribute to the internalizing problems.

Table 8.

Multiple Regression Results of the Theoretical Model for Internalizing Problems

Variable	Beta	Squared Semi-Partial	R^2	F	P
Step 1					
Persistence	.42	.167*	.18	9.74	.0002
Adaptability	-.20	.039*			
Step 2					
Alternative care	-.17	.026	.22	1.99	.14
# of Separations	.10	.008			
Step 3					
Negative EE	.32	.073*	.30	2.73	.05
Positive EE	.22	.033**			
Overinvolved EE	.02	.002			

Note: Model F = 4.52, p < .0003
*p < .05, **p < .10

CBCL/2-3 Externalizing Score

Table 9 illustrates the regression results for the externalizing score. The total model explained 29% of the variance (F = 4.34, p < .0004). Step 1, the temperament variables explained 21% of the variance (F = 10.93, p < .0001). Persistence (F = 12.27, p < .0008) and adaptability (F = 12.18, p < .0008) both explained an equal part of the variance. Again, adaptability was in the negative direction. Alternative caregivers and number of separations, entered into step 2, were not significant to the equation explaining only 4% of the variance (F = 1.89, p < .16). For step 3, the 3 EE scores explained 5% of the variance but were not significant as a group in predicting externalizing behaviors (F = 1.58, p < .20). However, Negative EE alone was a significant predictor, explaining almost all of this variance (F = 4.46, p < .04).

Table 9.

Multiple Regression Results of the Theoretical Model for Externalizing Problems

Variable	Beta	Squared Semi-Partial	R^2	F	P
Step 1					
Persistence	.36	.12*	.21	10.93	.0001
Adaptability	-.35	.12*			
Step 2					
Alternative care	-.10	.01	.25	1.89	.16
# of Separations	.16	.02			
Step 3					
Negative EE	.25	.04*	.29	1.58	.20
Positive EE	.11	.01			
Overinvolved EE	.09	.01			

Note: Model F = 4.34, $p < .0004$
*$p < .05$,

CBCL/2-3 Total Problem Score

Table 10 presents the data analysis for the total problem score. For this model, 30% of the variance in the total problems was explained ($F = 4.51$, $p < .0003$). Step 1 explained 20% of the variance ($F = 10.54$, $p < .0001$) with persistence explaining almost twice the variance ($F = 14.67$, $p < .0002$) as adaptability ($F = 8.17$, $p < .005$). Again, these 2 variables showed opposite relationships to behavior problems. Alternative care and number of separations were not significant, explaining only 4% of the variance in the model ($F = 2.19$, $p < .12$). In step 3, Negative EE, Positive EE and Overinvolved EE explained 6% of the variance ($F = 2.03$, $p < .12$). Consistent with the previous models, Negative EE was the only variable in the model that contributed significantly to the total problem score ($F = 5.84$, $p < .02$).

Table 10.

Multiple Regression Results of the Theoretical Model for Total Problems

Variable	Beta	Squared Semi-Partial	R^2	F	P
Step 1					
Persistence	.39	.15*	.20	10.54	.0001
Adaptability	-.29	.08*			
Step 2					
Alternative care	-.15	.02	.24	2.19	.12
# of Separations	.14	.02			
Step 3					
Negative EE	.28	.06*	.30	2.03	.12
Positive EE	.19	.03			
Overinvolved EE	.08	.01			

Note: Model $F = 4.51$, $p < .0003$
*$p < .05$,

In order to better understand the role of the different EE subscores in the contribution of the 3 major scores, t-tests were performed to determine potential differences in behavior problems between children who received high versus low amounts of maternal EE. For criticism, positive remarks and warmth children were divided between those with 50% or less and those receiving 50% or more of the particular category of EE. Because of the data's distribution, hostility was divided into groups of children receiving no hostility and those receiving any hostility at all. There was a significant difference for criticism between the two groups on internalizing problems ($t = 1.90$, $p < .06$), externalizing problems ($t = 2.44$. $p < .02$) and total problems ($t = 2.49$, $p < .01$). There was a trend toward differences in externalizing problems ($t = 1.71$, $p < .09$) between children who were treated hostile and those who were not, related primarily to the number of aggressive behaviors noted in the child ($t = 2.08$, $p < .04$). There were no differences between groups for positive remarks, or warmth. Lastly, children were divided into groups based on whether their mothers made any overinvolved

comments or none at all. There was not a significant difference for externalizing and total problems, but a trend toward differences between internalizing problems. Those mothers that made at least one overinvolved statement during the speech sample reported less internalizing problems in their infant ($t = 1.74$, $p < .09$).

Empirical Models

Based on the results of the theoretical models, alternative regression equations were developed to generate more predictive empirical models that better fit the data. In all 3 empirical models, the number of alternative caregivers and number of separations were dropped from the analysis since they appeared to play no significant role. Overinvolved EE was also dropped from the equations due to its lack of contribution to the variance. In addition, interaction variables were created to examine the synergistic effect of the relationship between temperament and the two significant EE scores (Negative EE and Positive EE) on emotional and behavioral problems. Preliminary analyses were performed to determine any potential contributions of these interactions to the variance in the children's problems. Those interactions that contributed significantly to the variance were included in the final empirical models. The sample size for all of the models was 83 mother-infant dyads.

CBCL/2-3 Internalizing Score

The empirical model for the internalizing score included: step 1-persistence and adaptability, step 2-Negative EE and Positive EE, step 3-interactions of Negative EE with both persistence and adaptability and the interaction of Positive EE with persistence. Results are presented in Table 11. The total model explained 39% of the variance for the internalizing outcome ($F = 6.79$, $p < .001$). Step 1, persistence and adaptability,

explained 18% of the variance for the total model (F= 11.18, p < .0001). Negative EE and Positive EE, in step 2, contributed to a total of 8%of the variance for the internalizing score (F = 4.48, p < .01). As shown in Table 11, Negative EE was a more significant variable in the model (F = 7.60, p < .007) than Positive EE (F = 2.84, p < .10). In Step 3, the interaction variables contributed to 13% of the explained variance in the model (F = 5.4, p < .002). The data for the squared semi-partials indicates that all of the interactions played a role in predicting internalizing problems. The interaction between Negative EE and persistence was significant at F = 4.47, p < .04. The interaction between Negative EE and adaptability explained a bit more of the variance (F = 7.24, p < .008). Positive EE's interaction with persistence was the most predictive of the three (F = 8.55, p < .005).

Table 11.

Multiple Regression Results of the Empirical Model for Internalizing Problems

Variable	Beta	Squared Semi-Partial	R^2	F	P
Step 1					
Persistence	.41	.17*	.18	11.18	.0001
Adaptability	-.20	.04*			
Step 2					
Negative EE	.32	.07*	.26	4.48	.01
Positive EE	.19	.03**			
Step 3-Interactions					
NegEE/Persistence	1.16	.04*	.39	5.40	.002
PosEE/Persistence	2.93	.07*			
NegEE/Adaptability	1.57	.06*			

Note: Model F = 6.79, p < .001
*p < .05, **p < .10

CBCL/2-3 Externalizing Score

For the externalizing score, the significant variables comprising the model included: step1-persistence and adaptability; step 2-Negative EE; step 3-the interaction

between Negative EE and adaptability. Results are displayed in Table 12. Twenty-seven percent of the variance was explained from by empirical model ($F = 7.25$, $p < .001$). Step 1, the temperament variables, explained 21% of the variance ($F = 11.08$, $p < .0001$). Persistence ($F = 12.19$, $p < .0008$) and adaptability ($F = 12.25$, $p < .0008$) each explained half of the variance in step 1. Negative EE contributed to 3% of the variance in step 2 ($F = 3.67$, $p < .06$) and the interaction between Negative EE and adaptability explained 3% of the variance in this model ($F = 3.16$, $p < .08$).

Table 12.

Multiple Regression Results of the Empirical Model for Externalizing Problems

Variable	Beta	Squared Semi-Partial	R^2	F	P
Step 1					
Persistence	.35	.12*	.21	11.08	.0001
Adaptability	-.35	.12*			
Step 2					
Negative EE	.19	.03**	.24	3.67	.06
Step 3-Interactions					
NegEE/Adaptability	1.02	.03**	.27	3.16	.08

Note: Model $F = 7.25$, $p < .001$
*$p < .05$, **$p < .10$

CBCL/2-3 Total Problem Score

Table 13 displays the results generated from the empirical model for the total problem score. The model included: step 1-persistence and adaptability; step 2-Negative and Positive EE; step 3-the interactions of Negative EE with persistence and adaptability and the interaction between Positive EE and adaptability. This model explained 34% of the variance in the total problem score ($F = 5.41$, $p < .001$). Step 1, persistence and adaptability explained 20% of the variance ($F = 11.12$, $p < .0001$) and step 2, Negative EE and Positive EE explained 4% of the variance in the model ($F = 2.69$, $p < .07$).

Negative EE was the variable in step 2 that significantly contributed to the total problems ($F = 4.92$, $p < .03$). Step 3 explained 10% of the total variance ($F = 3.43$, $p < .02$). The interaction variables in the model that significantly affected the total problems were Negative EE and adaptability ($F = 5.66$, $p < .02$) and Positive EE and adaptability ($F = 4.79$, $p < .03$). Although Positive EE in isolation did not predict the total problem score, the interaction between Positive EE and adaptability was strongly significant. The interactions between the EE scores and temperament were more predictive of problems for children than the EE scores alone.

Table 13.

Multiple Regression Results of the Empirical Model for Total Problems

Variable	Beta	Squared Semi-Partial	R^2	F	P
Step 1					
Persistence	.39	.15*	.20	11.12	.0001
Adaptability	-.29	.08*			
Step 2					
Negative EE	.26	.05*	.24	2.69	.07
Positive EE	.14	.01			
Step 3-Interactions					
NegEE/Persistence	.83	.03	.34	3.43	.02
NegEE/Adaptability	1.51	.05*			
PosEE/Adaptability	2.51	.04*			

Note: Model $F = 5.41$, $p < .001$
*$p < .05$, **$p < .10$

Scatter plots were utilized to gain a full understanding of the relationship between Negative and Positive EE and the temperament variables, persistence and adaptability. Results for internalizing problems indicated that infants who had difficulty with persistence were significantly more likely to have behavior problems if they received Negative EE from their mothers ($r = 55$, $p < .03$) than if they did not ($r = .17$, $p < .17$).

Also, infants who had difficulty with persistence were more likely to have internalizing problems if they received Positive EE from their mothers ($r = 40$, $p < .0003$) than if they did not ($r = -.30$, $p < .51$). On the other hand, Negative EE and adaptability had a less significant association for internalizing problems ($r = .32$, $p < .24$). Although, for externalizing problems those infants that showed an ability to adapt to environmental changes were likely to develop externalizing problems if they received Negative EE ($r = .36$, $p < .002$). This finding was also true for the total problem score. Those infants that received Negative EE and adapt more readily to stimuli had more emotional and behavioral problems than less adaptable children ($r = -.26$, $p < .03$). As with the internalizing score, the total problems for babies having problems with persistence was higher if they received Negative EE ($r = .56$, $p < .03$) than if they did not ($r = .22$, $p < .19$). The scatter plots reflected a weaker association between Positive EE and adaptability for the total problems score ($r = -.18$, $p < .12$).

Summary of Hypothesis Results

1. Hypothesis 1 predicted that there would be a significant positive relationship between the amount of a caregiver's Negative EE and the extent of a child's emotional and behavioral problems at 2 years of age. There was a significant positive relationship between Negative EE and the reports of emotional and behavioral problems for internalizing, externalizing and total problems. The impact of Negative EE was most substantial for infants with temperaments that adapted more readily to the demands of their environment or who had more difficulty persisting with a task or activity.
2. Hypothesis 2 predicted that there would be a significant negative relationship between the amount of a caregiver's Positive EE and the extent of a child's emotional

and behavioral problems at 2 years of age. This hypothesis was not supported. In contrast, infants who adapted more readily to the environment or had difficulty persisting with activities were more likely to display more emotional and behavioral problems if they received Positive EE.

3. Hypothesis 3 predicted that the caregiver's expression of emotional overinvolvement would have a significant relationship to the number of emotional and behavioral problems in the child, but with no direction of the relationship predicted. This hypothesis was not supported. Overinvolved EE did not have a significant relationship in any direction to a child's emotional and behavioral problems as measured by the CBCL/2-3.

CHAPTER FIVE

DISCUSSION

Significance of the Findings

The results of this study suggest that maternal Expressed Emotion (EE) does significantly predict the extent of emotional and behavioral problems reported for the child at two years of age. However, only Negative and Positive EE appear to contribute to the incidence of problem behaviors, and the nature of their impact is substantially different from one another. The data indicate that Overinvolved EE plays no significant role in the development of emotional and behavioral problems.

Negative Expressed Emotion

The results clearly show that Negative EE contributes significantly to children's problems. This maternal behavior appears to have a direct effect regardless of the child's temperament, and an additional salience for children with specific types of temperament. As with previous research, criticism demonstrated the strongest predictive power toward the Negative EE score (Vaughn & Leff, 1976). Although there were three mothers who scored high on the hostility scale, they were also high on the criticism scale, which would have also qualified them for the Negative EE score. Some of the more common critical remarks made by the mothers about the babies were that the baby was "a mean or bad baby." The findings indicate that negative emotional expression, primarily criticism, can contribute to emotional and behavioral problems in the developing child.

The negative impact of maternal criticism is congruent with previous literature that explored the effect of criticism on the exacerbation of mental health symptoms in latency age children. Maternal criticism has been associated with persistent depression in

children, and is significantly higher in mothers whose children suffer from conduct disorders (Asarnow et al., 1993; Asarnow et al., 1994; Vostanis & Nicholls, 1995; Vostanis & Nicholls, 1992; Vostanis et al., 1994). The findings of this study build on this previous research by exploring the presence of maternal criticism during the first year of the infant's life. Over the first year of life, the mother-infant relationship shifts from the caregiver having control over the communication patterns of the dyad to increasingly joint control over the interactive behavior with clearer autonomy on the part of the infant (Kaye, 1982; Stern, 1985). However, at 6 months of age the mother-infant relationship is just beginning and the infant is dependent on the mother to learn how to respond to their needs in an appropriate manner. Criticism may reflect the mother's internal working model of attachment and/or may be considered a maternal trait, as has been indicated by other research (Diamond & Doane, 1994; Vostanis & Nicholls, 1995). If maternal criticism is present during the first year of the infant's life and contributes to problem behaviors in toddlers, then it could be playing a causal role in the development of depression and conduct disorders in children. Furthermore, it is recognized that the biological etiology of depression contributes significantly to the onset of the illness, however, early maternal criticism may be increasing the severity and continuity of the symptoms.

The findings indicate that Negative EE had the most significant effect on the internalizing problems reported in the child at 2 years of age. Internalizing problems include anxiety/depression and withdrawn behavior in the child. This finding is congruent with other research that shows a correlation between maternal criticism and the presence of depression in latency aged children (Asarnow et al., 1993; Asarnow et al.,

1994; Schwartz et al., 1990). Maternal criticism may play a role in the development of a negative sense of self which is commonly found in children suffering from depression (Asarnow & Bates, 1988). To compound the problem, over 50% of these children had been hospitalized for over 1 week during the first few months of life. The painful and invasive procedures necessary to maintain low birth-weight infants' health states can lead to anxiety and social withdrawal (Clunn, 1991). The anxiety and withdrawn behavior may have been a learned response during the child's hospitalization, which now serves as a dysfunctional coping mechanism for the child in the face of critical parenting.

Although Negative EE had a positive relationship toward the development of externalizing problems, it was to a lesser degree than was for internalizing problems. Nevertheless, the impact of negative emotional expression on the child can not be over-looked. High criticism has been found previously in mothers with school-age children who are reported to have more externalizing problems and suffer from conduct disorders (Vostanis & Nicholls, 1992; Vostanis et al., 1994; Vostanis & Nicholls, 1995). Some children who experience high amounts of maternal criticism may develop a more aggressive stance toward the negative and rejecting behaviors in the mother, explaining the externalizing problems. It is important to remember the age and health status of the low birth weight sample used in this study when drawing conclusions. The measure of behavior problems occurred at two years of the infant's age. This is the time period where children are moving into the "terrible twos" and individuation from the mother is just beginning. With the low birth weight infant's gestational age being significantly lower than term infants, their chronological age may be delayed. Externalizing behaviors

may not have emerged in the child and, therefore, may not have been observed by the mothers.

Negative EE and temperament. An important finding that is consistent with the Barnard Model, was the effect that the interaction between the infant's temperament and the expression of negative emotions in the mother had on the presence of problems in the child (Barnard, 1976). The interactional effects were stronger than the EE score alone, and this was particularly true for internalizing problems. Low birth weight infants who experience criticism from their mothers and have particular traits related to persistence and adaptability were found to be at risk for displaying more anxiety, depression and withdrawn behaviors. This finding is also strongly supported in the temperament literature that stresses the "goodness if fit" between the mother and infant temperaments as being instrumental in predicting outcomes in children (Thomas & Chess, 1984). Infants with difficult temperaments have been found to negatively affect patterns of interaction with the mother which can contribute to behavior problems and insecure attachments (Seifer & Schiller, 1995; Thomas & Chess, 1984). It is the combination of negative maternal expression and difficult infant temperamental challenges that seem to place the child at the most risk.

Persistence is a temperament variable that measures the infant's attention span or the length of time the infant can pursue an activity with or without distractions (Medoff-Cooper, Carey & McDevitt, 1993). Infants that scored high on the persistence scale had shorter attention spans and were unable to stay focused with activities or events. The inability to maintain long periods of attention may have prevented the infant from engaging in reciprocal interactions with the mother that would enhance the development

of secure attachment behaviors. According to the Barnard Model, this in combination with the mothers negative emotional expression can cause an interruption in the adaptive process between the mother and infant that is necessary for a child's healthy growth and development (Barnard, 1976). Also, if the infant is unable to maintain adequate periods of attention, a negative response may be triggered in the mother, whereas an infant with an easier temperament may receive less criticism from this same mother. This is congruent with the conclusion drawn by Vostanis and Nicholls (1995) that in, addition to maternal criticism being an internal trait, it may also be a maternal state in response to a difficult temperamental quality in the infant.

The effect of Negative EE on internalizing and externalizing problems in the child was also augmented for those babies with problems in adaptability. Adaptability is the ease with which an infant can effectively modulate external stimuli (Medoff-Copper, Carey & McDevitt, 1993). The data clearly suggests that infants who tend to more readily accommodate to external demands are more vulnerable to the effects of negative stimuli from the mother. It may be that these infants actually are experiencing the detrimental effects of maternal criticism because they are more sensitive to the negative stimuli coming from the mother. Infants that modulate or adapt less readily to their environment may be less sensitive to the criticism coming from the mother. These infants may be focused instead on internal regulation and less aware of the negative emotional expression from the mother. If this is true, the inability to modulate external stimuli in the first 6 months of life could be a protective factor for the infant against rejecting parenting.

Positive Expressed Emotion

The results do not indicate that maternal Positive EE has much effect on the development of emotional and behavioral problems, in general. However, it must be noted that 92% of the mothers were classified as Positive EE, yielding little variance and predictive power. Still, the attachment literature stresses the importance of maternal sensitivity as a predictor of fewer problems in the child (Ainsworth, 1973; Bell & Ainsworth, 1972; Barnard, 1976; Belsky et al., 1984; Blehar et al., 1977; Clarke-Stewart, 1973; Isbella & Belsky, 1991; Sroufe, 1985). And, sensitivity and positive, warm behavior are two different things. Whether a mother is more positive or warm may not be significant for most infants, as long as the mother is sensitive and responsive to the infant's cues. Seifer and Schiller (1995) emphasized this conclusion by stressing that maternal sensitivity is a technical behavior which requires adaptability and accurate reading of the infant's signals, and does not represent love, warmth or affection. Furthermore, the original EE literature with adult schizophrenics also found that positive remarks and warmth lack predictive power for the symptom relapse outcome (Vaughn & Leff, 1976). As with previous literature, it is the negative emotional expression by the mother that seems to be a critical factor. The data suggests that as long as a child's environment is "good enough" and devoid of rejection, then the child will probably not develop major emotional or behavioral problems.

However, this assumption appears to apply only to infants with robust temperaments. The results indicate that, when infants have difficulty adapting to their environments or persisting in the face of setbacks, positive remarks and warmth may be contributing to the development of problems. Positive emotional expression if not

regulated to meet the need of the infant may in fact over-stimulate those infants who are having difficulty maintaining attention and are exerting energy to adapt to external stimuli. Again, positive emotional expression may not represent maternal sensitivity. The inability of the mother to regulate emotional expression, whether negative or positive during the interaction with the infant may contribute to the development of problem behaviors in the child.

Overinvolved Expressed Emotion

The results indicate that Overinvolved EE had neither a positive nor a negative relationship with the number of emotional and behavioral problems in the child. Consistent with other studies (Asarnow et al., 1993; Asarnow et al., 1994; Vostanis et al., 1994), there were only a few overinvolved mothers (n = 6) in this study. The low sample size could have resulted in a lack of predictive power in the Overinvolved EE score. It is also important to bear in mind that interrater reliability for the overinvolved subscore was only 67% agreement. The trained coders expressed difficulty in differentiating normal protective parenting from over-dramatic, excessive, and over-protective behavior as displayed by the mothers. These methodological limitations may have precluded any reliable assessment of the impact of Overinvolved EE. Still, the data suggest that it plays no significant role in the development of emotional and behavioral problems, neither as a risk nor a protective factor. It is unclear whether Overinvolved EE may reflect a maternal style in response to a preterm infant that is conducive toward the child's development. Low birth weight infants have lower levels of responsiveness and involvement with their caregivers than do term infants (Barnard & Hammond, 1984). Emotional overinvolvement may be an exaggerated maternal response that enhances the

interaction with a low birth weight infant. However, future research with a larger sample of Overinvolved EE mothers is necessary to fully understand the role that this type of maternal expression plays for low birth weight infants.

It is interesting to note that five out of six infants whose mothers were rated as overinvolved were females. On the other hand, all three of the mothers who were rated "5" on the hostile scale had male infants. One might question whether such gender differences may relate to certain cultural beliefs that females need more protection and males are tougher and can handle harsher expression. Furthermore, there was not a significant difference found in emotional overinvolvement for Hispanic mothers in this study as was described by previous research (Stubbe et al., 1993). In order to determine if gender or ethnicity had a significant impact on the mother's expression, a larger sample size would be necessary.

Temperament as a Major Predictor of Problems

The large role of the infant's temperament in the development of emotional and behavioral problems in the child was striking. Persistence and adaptability explained the most significant portion of variance in the regression equations. Children who have difficulties maintaining their attention and persisting with a task are at higher risk for the development of emotional and behavioral problems, regardless of parenting styles. In contrast, infants who were perceived as more adaptable had a greater likelihood of developing problems. The results for persistence reaffirm the important role of attention in the development of mental health problems for children. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) attention deficit and distractibility are significant contributors to anxiety, disruptive behavior and attention deficit

hyperactivity disorders (American Psychiatric Association, 1994). However, the findings for adaptability are more complex. Infants who are viewed as more adaptable seem to be at greater risk. Low birth weight infants who more easily or readily modify their own behavior in response to stimuli may constitute a particular "temperament type" which is more accommodating of their own needs. In other words, the infant may adapt when, in fact, it would be better for them to maintain their existing behavioral orientation to a situation.

Confounding the understanding of the meaning of persistence and adaptability in predicting emotional and behavioral problems in the child is the lack of previous research that examines temperament as nine separate categories. Most research utilizing the RITQ groups the nine qualities of temperament into general categories of easy or difficult temperament. This general approach makes it difficult to understand how the particular qualities in the infant affect the developing child. The findings of this study suggest that there may be specific qualities which support and others that inhibit the child's development of problems.

The Importance of Maternal and Infant Characteristics

Maternal age was found to be a significant variable in this study. Caregivers who were more critical and hostile were younger than caregivers who were warm and made positive remarks. Although maternal age has not been reported as a significant demographic variable in the EE literature utilizing child populations (Asarnow et al., 1994; Hibbs et al., 1990; Schwartz et al., 1990; Stubbe et al., 1993; Vostanis, & Nicholls, 1995; Vostanis et al., 1994), maternal age has been reported as significant when measuring maternal sensitivity and responsiveness (Barnard, 1976). Previous

research supports the findings of this study that older mothers are found to be significantly more sensitive and responsive to their infants than younger mothers.

Birth weight and twin status had a significant relationship to the number of critical remarks made by the mother to the infant. There were less critical comments made by mothers toward those infants initially weighing less than 1500 grams. This may demonstrate the attempts of mothers who had infants of very low birth weight to protect them to some extent. Many mothers of extremely low birth weight infants expressed concern for the infant's survival, and their long-term health outcomes. Their comments indicated relief over the infant's return home from the hospital. These emotions may have reduced any critical expression that would have been brought forth if the infants were less fragile at birth. For the twins, mothers expressed more criticism toward one baby than they did toward the other. There was a strong tendency for the mothers to compare the twin infants and polarize their differences into "bad or good" categories during the speech sample. Although there was a significant difference in the amount of criticism expressed toward each twin, there was not a significant difference between the twins for the overall Negative EE score and the number of emotional and behavioral problems.

Finally, the results indicate that male children have a higher incidence of externalizing problems than female children. In this study, it was the aggressiveness of the male children that distinguished them from their female counterparts. This finding is consistent with other studies utilizing the CBCL/2-3 with preschool populations and the CBCL/4-18 with school age children (Achenbach, 1992; Achenbach & Edelbrock,

1983). Male children are reported to display more externalizing behaviors throughout the course of the child's development.

The Role of Alternative Caregivers and Maternal Separation

The findings for the number of alternative caregivers and caregiving hours in the preliminary analyses were not the expected outcome. Infants who were placed in more than one daycare versus those who had no or one alternative care situation had fewer internalizing problems not more. In addition, those infants placed in over 35 hours of outside care had fewer internalizing problems. Once the effect of a child's temperamental vulnerabilities were controlled for, alternative care seems to play no significant role in the development of behavior problems in the final regression equations. These findings suggest that the role of alternative care on the developing infant is confounded by many extraneous variables and is not explained by the placement of the baby in outside care alone. The most recent daycare research suggests it is the interaction between insensitive maternal care and poor quality daycare that significantly impacts the development of insecure attachments in the child not the variety or number of hours placed in outside care (National Institute of Child Development Early Child Care Research Network, 1996). Future research exploring maternal variables should consider including the quality of the alternative care as a modifying variable rather than number of alternative caregivers or hours placed in that care.

Although not a significant predictor, preliminary analyses suggested that the number of a child's separations from the mother were related to the child's later development of externalizing problems. Since only 7 infants experienced 2 or more separations, this sample lacked the power to contribute to the variance in problems once

the contribution of with persistence and adaptability were removed. Larger sample sizes are needed to examine the effect of more than one separation and to determine the differential effects of different types of separations have on the development of emotional and behavioral problems.

Limitations

Limitation of the Data Base

An unexpected result was the negative relationship between adaptability and the CBCL/2-3 externalizing and total problem score. Although this was an interesting finding, its clinical significance is questionable. The mean score for adaptability was 2.5 standard deviations away from the reported norms for 4-11 month-old infants. The adaptability score for this sample was skewed toward the high end of the scale and therefore, lacked the variance necessary to draw sound conclusions. This may also explain adaptability's lack of correlation with temperamental variables of persistence, intensity and threshold, all of which fell closer to the reported established norms for this sample's scores. Further complicating the interpretation of this finding is that the established norms reported are for full-term infants, not low birth weight infants. Low birth weight infants have more difficulty regulating stimuli than term infants, which supports the finding that this sample of infants had much higher scores on the adaptability scale. Even those infants within the study sample who had an easier time modifying stimuli still did not fall close to the norm for adaptability.

Limitations in the Methodology

One limitation to the study is that mothers who expressed their feelings and attitudes toward their child in the Expressed Emotion speech sample also reported on

temperament and emotional and behavioral problems. It could be argued that mothers who are highly critical of their infants during an interview at 6 months of age would rate their infants as more difficult for temperament, and would continue to be critical of their behavior when rating the child on the CBCL/2-3. Unfortunately, mothers who had a Negative EE score did not have fathers available to perform inter-rater reliability and testing for a rater bias in the mother for the RITQ and the CBCL/2-3 (this was due to either the mother being single or the fathers refusal to participate). Future research utilizing these measures should include an observational assessment of the child's characteristics to assure the validity and reliability of the maternal report.

A second limitation was related to the R-FMSS, which was modified for use with this infant population by including a category for positive remarks, and nonverbal assessment for hostility and warmth. First, there was a lack of adequate variance in the EE scores. The Negative EE score had the most variance (15 = no, 68 = yes) and predicted the presence of emotional and behavioral problems. Positive EE (7 = no, 76 = yes) and Overinvolved EE (77 = no, 6 = yes) had very little variance, with likely negative effects on their predictive power. Of the 15 Negative EE mothers, 7 also were rated as Positive EE because of their demonstration of warmth during the speech sample. In general, the mothers in this sample were warm toward their infants. The lack of variance could also explain why the R-FMSS scores did not correlate significantly with the PARQ when testing for concurrent validity.

Finally, the effects of any historical variables occurring between the 6 month and 2 year data collection points were not measured. The occurrence of therapeutic interventions seems most important. If the mother received therapy or the infant attended

a specialized program, this could affect the number of emotional and behavioral problems developed in the child. The research protocol called for the RAs to make referrals for those families at risk of harm, and although attempts were made, the lack of available resources for this age group prevented any referral for intervention during the two year data collection time frame. However, if the mother sought out any professional assistance on her own accord, it was not recorded and taken into account. If an intervention had occurred during the data collection time frame which was aimed at enhancing the parenting approach, there might have been a reduction in the number of emotional and behavioral problems seen in the child.

Future Research

Future research is needed to determine the long-term emotional and behavioral outcomes of children who are exposed to significant amounts of maternal criticism. Longitudinal research is necessary throughout the life of the developing child to determine the impact that negative emotional expression has on the development of later emotional and behavioral difficulties. If maternal criticism begins at birth and remains a continuous expression throughout the child's formative years, the impact on the development of mental health difficulties in the child could be profound. Past research indicates that criticism is more prevalent in school age children suffering from depression and disruptive behavior disorders (Asarnow et al., 1994; Vostanis & Nicholls, 1995). Results of this study suggest that maternal criticism, in combination with certain types of infant temperament, could be a contributor to the development of emotional and behavioral problems in children. Future research is needed to determine if maternal EE is

a continuous variable, and if so, what long-term implications it has on the development of depression and behavior problems in children.

A multitude of factors can contribute to poor mental health outcomes in children, which are carried into adulthood. Criticism by a parent is only one factor that places a child at risk. A child with a critical parent and temperamental qualities which yield poor coping skills, could be at risk for a poor outcome if they develop a mental illness. A child exposed to long-term criticism may lack the resources to adequately cope with the onset of a mental health disorder. This could explain the high relapse rates in children who suffer from a mental illness. An important direction for future research will be toward understanding how maternal criticism, the child's temperament, and coping strategies that act as resiliency factors may interrelate. This understanding can best occur through triangulated methodology that includes self-report, parent-report and observational data collection techniques measured throughout the formative years of the child.

A better understanding of the effect that maternal negative emotional expression has on the development of attachment patterns in infants is also needed. Research should be geared toward understanding the role that temperament plays in the development of different types of insecure attachments (resistant, avoidant, and disorganized or disoriented) and its relationship to the development of internalizing versus externalizing problems. Resistant and disorganized forms of insecure attachment could reflect temperamental traits that are associated with externalizing problems in the child. Internalizing behaviors may be associated with insecure-avoidant patterns of attachment. If the types of emotional and behavioral problems in the child are related to various

patterns of insecure attachment, interventions that are sensitive to the child's temperament can be geared toward reducing maternal criticism and enhancing attachment behaviors in the dyad during the first year of life. Future research is needed to fully understand the role that attachment patterns play in the formation of emotional and behavioral problems in the child.

Also, understanding the role of criticism in the development of attachment behaviors would assist in determining the internal mechanisms that may be driving the expression of criticism from the mothers. Discovering if maternal criticism reflects the mother's internal working model of attachment, which is passed down through generations, would assist in the development of interventions geared toward reducing the negative maternal response. This might be accomplished through correlational studies with the Adult Attachment Interview (George et al., 1985) to relate a parent's attitude and feelings about their own attachment figures to the attachment classifications of their infants.

Future research is imperative to test appropriate interventions geared towards lowering maternal criticism. Psychoeducational approaches have been successful with a variety of populations whose children suffer for schizophrenia, depression, and conduct disorders (Anderson, Reiss & Hogarty, 1986; Vostanis & Nicholls, 1995; Webster-Stratton, 1990). Understanding the factors that lead to excessive criticism in a parent is essential for developing appropriate interventions with families at risk. If maternal criticism is a transgenerational pattern acquired from their parents and/or reflects the mother's attachment or temperamental qualities, educational interventions can be developed to assist the parents in understanding the origin of negative patterns and their

effect on the developing child. Other important information in the interventions might include: a) the role of temperament and the "goodness of fit" between parents and children, b) age-appropriate developmental behavior c) parental responses to developmental behaviors that would promote self-esteem and healthy coping skills. Future research is needed to test the effects of psychoeducational interventions on maternal criticism in order to prevent the development of emotional and behavioral problems in children.

The amount of maternal stress is one alternative explanation that may have affected the amount of maternal criticism and the emotional and behavioral problems in the child (Campbell & Ewing, 1990). The stress of giving birth to a low birth weight infant can by itself, elicit an inappropriate response in the mother. The EE measure was taken at 6 months of age to help prevent a bias from the stress of the baby's birth in affecting the emotional expression in the mothers. However, environmental stresses could have played a role in the amount of negative emotional expression from the mothers and the development of emotional and behavioral problems in the child. These would include single parenthood, marital discord, poverty, and financial difficulties. Future research should explore the effects of maternal stress on emotional expression and the interaction of these variables with maternal EE needs to be examined.

Maternal mental illness, if present, could also impact maternal emotional expression and the development of emotional and behavioral problems in the child. Affect disturbances, anxiety, psychosis or substance abuse can alter emotional states and can have a strong impact on the developing child. Mothers distracted by mental illness or substance addiction can have trouble meeting the needs of the child, which could increase

the number of emotional and behavioral problems present in the child. Mental illness may exacerbate Negative EE or interact with certain traits of the infant to augment the impact of Negative EE on the child. Future research is needed to gain a complete understanding of the relationship between maternal stress and mental illness, the infant's characteristics and maternal EE.

Finally, future refinement of the R-FMSS is necessary to enhance the likelihood of better discrimination across maternal behaviors, and to improve inter-rater reliability in the 5 subscores--criticism, hostility, positive remarks, warmth, and emotional overinvolvement. Consideration should also be given to dropping hostility and warmth from the Negative and Positive EE scores and to return to the original approach of using criticism and positive remarks. These subscales clearly had stronger predictability. Furthermore, the tool needs further concurrent validity testing with the Camberwell Family Interview or other observational measures of maternal emotional expression. Future research is needed to refine the R-FMSS as a reliable and valid tool in measuring EE with mother-infant populations.

Significance to Nursing Practice

The early identification of a maternal factor, such as criticism, will enhance nurses' ability to detect those families at risk for poor mental health outcomes. A strength of the criticism construct is its predictability across socioeconomic and ethnic groups. Early assessment can allow nursing to identify families at risk across a wide range of populations. Nursing is in the prime position for identifying children at risk for the development of emotional and behavioral problems in the nursery after the infant's birth and during well-baby visits occurring within the first year of life. Nurses can assess

maternal and infant characteristics through observation of the mother-infant interaction and by parental interview.

Opportunities associated with assessment and early identification of at risk families are twofold. First, there is a need to assess infants who are vulnerable due to their temperamental qualities. In particular, infants with the inability to persist with activities such as engaging in reciprocal social interactions with the mother and/or infants exhibiting short attention spans during feeding or play activities may be at risk for the development of problem behaviors. This would also be true for infants that adapt to readily or easily to environmental stimuli such as changes in routines or caregivers. Second, is the assessment of the mother's feelings and attitudes toward the infant. This can occur by engaging in conversation with the mother about her feelings towards the infant's personality and behaviors. If the mother expresses a significant amount of criticism toward the baby, then this child may be at risk for poor mental health outcomes. This would be particularly true for low birth weight infants with certain temperaments.

Intervention with families during the first year of the child's life is currently confounded by the lack of early identification of those at risk by primary care providers and the limited access of this age population to mental health care providers. Generally, parents and pediatricians take the stance that early behavior problems will be out grown, and, therefore, referral of behavior problems is deferred until the child reaches school age (Tarnowski, 1991). Imperative to the intervention strategies delivered by mental health nurses is the need to educate primary care providers and day care professionals on the importance of early identification and intervention during the first years of the infant's life. If the presence of criticism can be detected in families, appropriate referrals made,

and interventions applied during this vulnerable time period in the child's development, emotional and behavioral problems in children may be prevented.

Once those families at risk are identified, intervention programs can be developed to reduce maternal criticism and enhance maternal sensitivity. Community based programs such as therapeutic day care, parish nursing centers and home visits can be developed in under served areas, while existing physical health programs for children can be augmented with a mental health focus. Nursing interventions might include family education on infant temperament and appropriate interactions to enhance the child's development. Educating families on the developmental needs of the child would assist the parents in delivering an appropriate response to behaviors that are necessary for his/her growth and development. Psychoeducational approaches may be utilized to assist the parent in identifying the responses to the infant that may be placing them at risk for the development of emotional and behavioral problems. Understanding the transgenerational nature of the maternal response can help motivate the parent toward change and alleviate any guilt associated with feeling inadequate as a parent. Finally, nurses can offer supportive feedback and reinforce positive maternal behaviors. This can best occur through the development of a caring and nurturing relationship with the mother while role modeling appropriate maternal responses to the infant.

Early identification and intervention with families at risk will allow nursing to deliver a preventative model of care. If interventions that reduce maternal criticism can occur during the child's first year of life, prevention of emotional and behavioral problems will take place. This will enable nursing to impact later problem behaviors in preschool children and in children suffering from disruptive behavior disorders and

depression across the life span. Although, the biological nature of many mental illnesses may prevent alleviation of all mental health problems, the severity and continuity of the symptoms can be minimized through early nursing interventions.

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Appendix A

FIVE MINUTE SPEECH SAMPLE

Coding Record

ID Code_____ RA_____ Coding Date_____

Opening statement by RA (exact words):

1. Initial Statement. Circle one

positive neutral negative

2. Criticism. **Tally** (1) mark for each statement of dislike, disapproval, or resentment of the baby's behavior, characteristics or their relationship.

_____

Estimate the proportion of spoken content demonstrating the amount of criticism in the FMSS.

1	2	3	4	5
1= none	2 = 1-25%	3 = 26-50%	4 = 51-75%	5 = 76-100%

3. Hostility. **Tally** (1) mark for each behavior demonstrating negative, rejecting body movements or posture (pushing or jerking baby away from the body, frowning or avoidance of eye-to-eye gaze).

_____

Estimate the proportion of observed behavior demonstrating the amount of hostility in the FMSS.

1	2	3	4	5
1= none	2 = 1-25%	3 = 26-50%	4 = 51-75%	5 = 76-100%

CODE #_____

Neutral Statements _____

4. Positive Remarks. **Tally** (1) mark per positive statement of praise, approval or appreciation of the baby's behavior, characteristics or their relationship.

_____

Estimate the proportion of spoken content demonstrating the amount of positive remarks in the FMSS.

1	2	3	4	5
1= none	2 = 1-25%	3 = 26-50%	4 = 51-75%	5 = 76-100%

5. Warmth. **Tally** (1) mark for each behavior demonstrating positive affect toward the baby including love, sympathy, concern and empathy (eye-to-eye gaze, hugging, kissing, snuggling, and smiling at baby).

_____

Estimate the proportion of observed behavior demonstrating the amount of warmth expressed in the FMSS.

1	2	3	4	5
1= none	2 = 1-25%	3 = 26-50%	4 = 51-75%	5 = 76-100%

6. Emotional Overinvolvement. **Tally** (1) mark for each observed behavior or recorded statement demonstrating self-sacrificing or over-protective behavior, crying, exaggerated praise, or excessive detail.

_____

Estimate the proportion of spoken content or observed behavior demonstrating the amount of emotional overinvolvement in the FMSS.

1	2	3	4	5
1= none	2 = 1-25%	3 = 26-50%	4 = 51-75%	5 = 76-100%

CODE

SCORE

Negative EE	Overinvolved EE	Positive EE
negative initial statement	crying	positive initial statement
51% or more critical	self-sacrificing	51% or > positive remarks
51% or more hostile	excessive detail of past	51% or more warmth
(any of above)	exaggerated praise	(any of above)
	overprotective	
	(51% or more of above)	

COMMENTS: (any distractions or disruptions, i.e. baby crying, presence of sibling or other baby, strange noises, variations in questions by RAs and own impression of interaction):

Appendix B

FMSS CODING INSTRUCTIONS

1. Play the video tape and record the subject number seen on the screen onto the FMSS coding form. Now, turn down the brightness or turn the TV to inhibit you from seeing the mother or viewing the screen while at the same time allowing you to hear the mother speak clearly. Without a picture of the mother, follow the instructions under #2 and #3 exactly. For #4, tally the number of critical, positive and overinvolved statements you hear from the mother about the baby. Next review the tape with both the sound and picture on, and code the mother's nonverbal hostile, warm and overinvolved (crying) behavior as described under #4.
2. Write out, in detail, the opening statement by the RA in her exact words. Write all the statements up to the mother's comments. Feel free to rewind and re-listen to the opening in order to write down the RA's exact words. If there is <u>not an opening</u> statement by the RA **and** the mother just starts talking about the baby, code what the mother first says as the initial statement (on some tapes the RA had the recorder turned off during the opening or mothers with twins and triplets were only asked once and then answered separately for each baby). In these cases please write out, **"No opening statement"** or **"No opening statement, this is a twin."** Including whether or not this mother has twins or triplets is important for measuring a bias. If the mom is doing another task at the beginning of the tape (like feeding or the game), wait until you hear the RA begin the FMSS before you start the coding record.
3. Next, code the initial statement made by the mother. It is coded as positive, neutral or negative. This is <u>only</u> the first thought expressed by the mother. Code the initial

statement up to the first pause, or change in the mother's voice, such as chuckling or laughter. For example, if the mother states, "He's a happy baby....hyper though," then the first thought expressed is positive so rate this mother positive on the initial statement. A **positive initial statement** is a positive remark or a positive statement about the baby or the relationship with the baby. It reflects that the mother feels and views the baby in a positive manner. See the scoring criteria under positive remarks and warmth below to gain an understanding of the criteria for scoring a positive initial statement. A **neutral initial statement** is one that does not give enough information to be scored as positive or negative. These initial statements may be descriptive or factual without any affective tone. A **negative initial statement** is defined as a negative statement about the baby or relationship with the baby that reflects disapproval or dislike for the baby. A statement describing a negative attribute of the baby would also be coded as negative. See the scoring criteria under critical comments and hostility to gain an understanding of a negative initial statement. Tone is an important consideration when scoring the initial statement as negative.

4. After the initial statement, tally the number of statements you hear that fall under the criticism, positive remarks, and emotional overinvolvement categories. Then re-play the video with, also, full view of the picture (sound on) and give a tally for each observed behavior under hostility, warmth and overinvolvement.

   Criticism. A tally mark is given for criticism when the mother makes a statement toward the baby of dislike, disapproval, or resentment of the baby's behavior or characteristic. For example, "I don't like the way he cries all the time," "He is a spoiled baby." A statement that they have a negative relationship would also be

given a tally mark. For example, if the mother states "we don't get along very well," or "he is hard to get along with." A criticism tally would also be given if the mother describes the baby using words that are socially undesirable. For example, "He is mean or a bad baby." Don't rate all negative feelings expressed by the mother as critical comments about the baby. If the mother simply states that she gets tired, frustrated, or finds it hard being a mother, this does not reflect criticism of the baby. If she states the baby seems sad or frustrated, this would be given a tally only if the mother indicated she disliked or didn't approve of the behavior or characteristic.

Hostility. Hostility is a rating of the mother's negative nonverbal expression toward the baby. A tally mark is coded when the mother demonstrates negative, rejecting body gestures or facial expressions. This would include pushing or jerking the baby away from the body, frowning and/or avoiding eye contact with the baby. Tone of voice and facial expressions can help determine a hostile expression toward the baby. Frequently, a tally mark will be given for hostility which coincides with a critical comment but not always. There will be times when a mother's verbal statements will be incongruent with her nonverbal behavior. Therefore, hostile behavior can be observed during positive comments. Lack of warmth and insensitivity to the baby's cues are not the same as hostility There has to be present a nonverbal expression of negative feelings toward the baby to be given a hostile tally.

Positive Remarks. A tally mark is given for each statement made by the mother that indicates she approves, likes and/or appreciates the baby's behavior or

characteristics or their relationship. For example, "It is a wonderful baby," "I love my baby," "We get along great," "I think it is neat he makes those sounds," "I love it when he snuggles me or recognizes me." There has to be present in the sentence a word that indicates the mother approves, likes and/or appreciates the baby's qualities. Don't code mere descriptions of the baby as positive remarks. For example, "He likes to take a bath." This statement describes what the baby likes, not the mother. If she were to say, "It's great the way he likes to take a bath," then a tally mark should be made. Also, give a tally if the mother describes the baby with a socially desirable word like, "He's a happy or brilliant baby."

Warmth. Warmth is a measure of the mother's positive nonverbal expression toward the baby. A tally mark is given for each behavior demonstrating positive affect toward the baby including love, sympathy, concern and empathy. This includes eye-to-eye gazing, kissing, snuggling, hugging, soothing strokes and/or smiling at the baby. Tone of voice and facial expression can be an indicator that the behavior demonstrates warmth. Frequently, a tally mark will be given for warmth which coincides with a positive remark, but not always. There will be times when a mother's verbal statements will be incongruent with her nonverbal behavior. Therefore, warm behavior can be observed during critical comments.

Emotional Overinvolvement. A tally is given for each statement from the mother with exaggerated praise, crying, self-sacrificing and devoted behavior, and/or extreme overprotective behavior. For each episode of crying seen on the video, a tally mark would be given. Statements demonstrating self-sacrificing or over-protective behavior would include, "I stay up all night worrying," "He sleeps

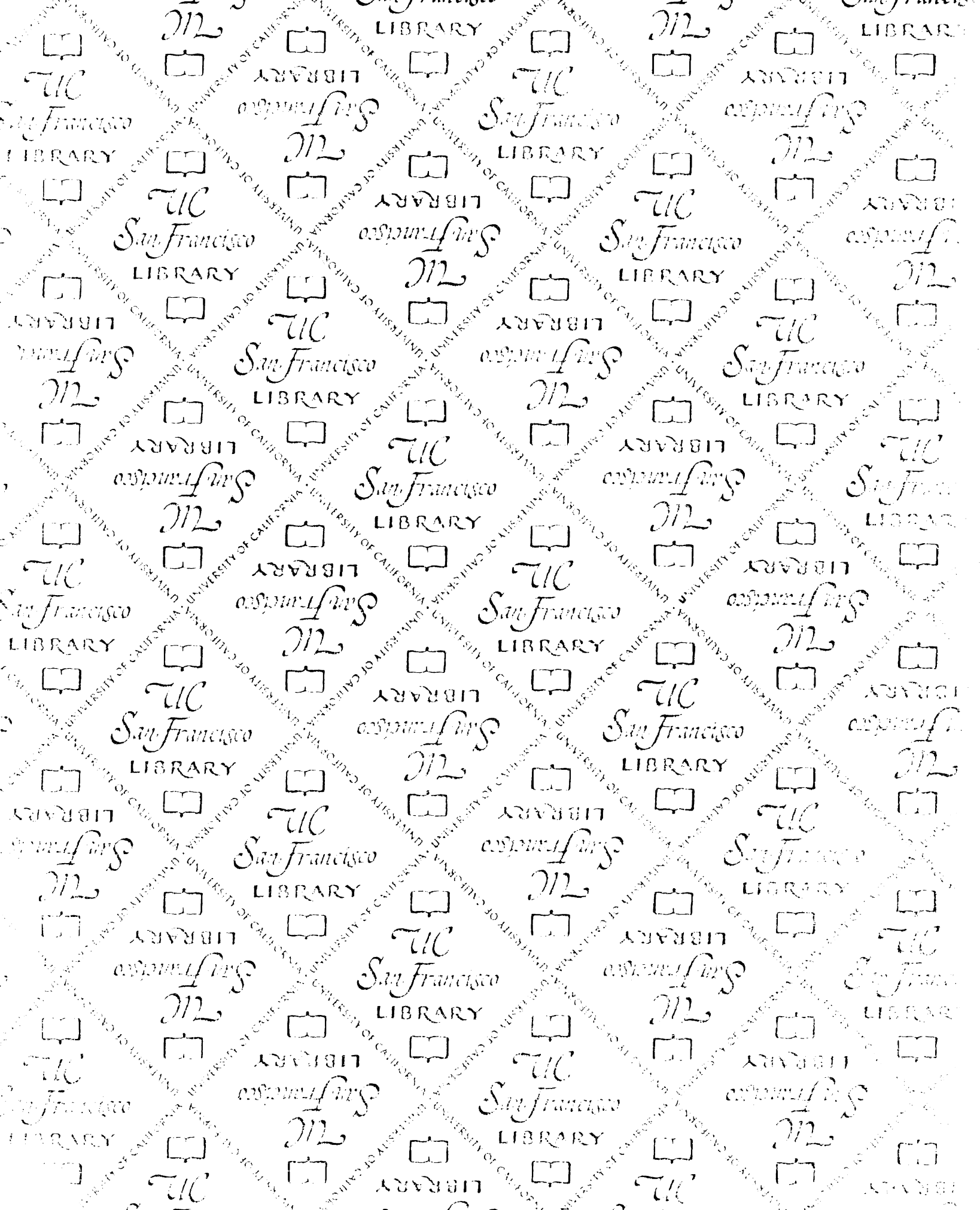
with me because I am scared to leave him alone," "I can't leave him with anyone so I don't go out." Also, statements that reflect how the baby feels about the mother would be given a tally mark here. For example, "He really loves me." Exaggerated praise includes statements like, "There is no baby better in the world than this baby." Excessive detail and rambling on about the baby's characteristics or excessive focus on the impact the baby has on the mother would be given a tally mark. Over dramatization of trivial incidents would also be marked as overinvolved. Code any of the above even if you think it is a normal comment for mothers to make about babies in general. In the comment section, make a note if you found the overinvolved behavior to be normal considering the situation. Also, write the mother's specific statement or behavior to assist with analyzing this data.

5. After reviewing the whole tape and making the appropriate tally marks, estimate the portion of spoken content for each of the five categories. For example if you heard critical comments from the mother 76-100% of the time during the entire speech sample, circle (5). If only 26-50% of the time, circle (3). Do this for all of the categories-critical comments, hostility, positive remarks, warmth and emotional overinvolvement. Remember to include neutral statements as part of the total spoken content when doing the estimations. A section to tally neutral statements is on the top of the second page to assist you in determining the amount of EE compared to neutral statements made by the mother.
6. Next, give each subject a score as either Negative, Positive or Overinvolved EE. Circle Negative EE if any one of the following occurs: a negative initial statement,

51% or more of critical comments or 51% or more of hostile behaviors. Positive EE would be circled if any one of these occurred: a positive initial statement, 51% or more positive remarks or 51% or more warmth demonstrated in the segment. Overinvolved EE would be circled only if the mother demonstrated overinvolved behavior 51% of the entire speech sample. Rate the mother on all three categories.

7. At the end of the form record any comments you feel are significant in analyzing this data. For example, situations that may be influencing the mother's statements, i.e. leading statements by the RA, inaccurate translations to the Spanish speaking moms, etc. Stress or distractions the mom may be experiencing during the FMSS should also be noted. For example, a crying baby, other siblings or visitors in the room, phone ringing, dog barking, etc. Include any comments you think are important or your own impression of the interaction. For example, overinvolved EE seems normal for the mother, or comment on the mother's ability to adequately read the baby's cues.
8. Be sure to re-read these instructions prior to each time you start to code segments on the video. It is easy to create variations in coding procedures as RAs become experienced in the research procedures.
9. If a mother were to make 3 consecutive statements that are similar, give a tally for each statement. For example, "He's a happy baby...He's just happy...Happy, that's how I would describe him." These statements would be given 3 separate tallies.
10. Keep aside any mothers that were difficult to rate. For example, they had a negative initial statement but then were positive 51% or more of the FMSS. There may be mothers whose expression and content is subtle and hard to determine. Set those

moms aside and the research team (a panel of experts) will view the segments separately to make the determination.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