

THE EFFECTS OF THE MOTHER'S APPRAISAL OF HER EMPLOYMENT
STATUS ON THE PRETERM INFANT'S DEVELOPMENT AT 3 MONTHS

by

JoAnne M. Youngblut

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Nursing)
in The University of Michigan
1989

Doctoral Committee:

Assistant Professor Carol J. Loveland-Cherry, Chair
Assistant Professor Lauren Aaronson
Professor Lois Hoffman
Assistant Professor Susan S. Jay
Professor Deborah Oakley

**RULES REGARDING THE USE OF
MICROFILMED DISSERTATIONS**

Microfilmed or bound copies of doctoral dissertations submitted to The University of Michigan and made available through University Microfilms International or The University of Michigan are open for inspection, but they are to be used only with due regard for the rights of the author. Extensive copying of the dissertation or publication of material in excess of standard copyright limits, whether or not the dissertation has been copyrighted, must have been approved by the author as well as by the Dean of the Graduate School. Proper credit must be given to the author if any material from the dissertation is used in subsequent written or published work.

©

JoAnne M. Youngblut
All Rights Reserved

1989

ACKNOWLEDGMENTS

There are many people I would like to thank for their help and support, not only during the dissertation process, but throughout my doctoral program. First, I would like to acknowledge the efforts of several faculty members, especially Dr. Carol Loveland-Cherry and Dr. Susan Jay. Both have helped me through some trying times as a doctoral student. In addition, Dr. Loveland-Cherry and Dr. Mary Horan were very gracious in allowing me to add a piece to their study for the dissertation research.

I want to thank my dissertation committee members for their help through the dissertation process. Their suggestions were thoughtful and directed at improving the quality of the work. My ideas for the study began during the socialization course that Dr. Hoffman taught. Her expertise in maternal employment has been very helpful both then and now. In addition to Dr. Loveland-Cherry and Dr. Jay, Dr. Oakley has been a source of support for me during my doctoral study as well as during the dissertation process. Finally, Dr. Aaronson's statistical help was invaluable.

I also would like to acknowledge the faculty and staff of the Community Health Nursing, Parent-Child Nursing, and Center for Nursing Research departments and the staff in the

Office of Graduate Studies for their help, support, and encouragement throughout my doctoral program. I often felt that each department adopted me and was looking after me.

Finally, but most importantly, I want to acknowledge my husband, Bill, and our children, Alex and Alicia. Without Bill's instrumental aid with the house and the children and his emotional support, encouragement, understanding and patience during the rough times, completion of doctoral study would have been nearly impossible.

During my doctoral study I was supported in part by a National Research Service Award individual predoctoral fellowship, #F31-NR06152, awarded by the National Center for Nursing Research, National Institutes of Health.

TABLE OF CONTENTS

ACKNOWLEDGMENTS	ii
LIST OF FIGURES	v
LIST OF TABLES.	vi
LIST OF APPENDICES.	vii
CHAPTER	
I. INTRODUCTION.	1
II. REVIEW OF THE LITERATURE.	7
Reasons for Mothers' Return to Work	
Effects on Child Development	
Effects of Premature Birth on the	
Parents	
The Child's Experience	
III. CONCEPTUAL FRAMEWORK.	44
Operational Definitions	
Research Questions	
IV. METHODOLOGY	57
Sample	
Procedure	
Instruments	
Data Analysis	
V. DISCUSSION.	99
Discussion of the Results	
Study Limitations	
Implications for Nursing Science	
Implications for Nursing Practice	
Recommendations for Future Research	
APPENDICES.	117
REFERENCES CITED.	141

LIST OF FIGURES

Figure

1.	Theoretical Model	46
2.	Full LISREL Model	89
3.	First LISREL Model Tested	90
4.	Final LISREL Model.	96

LIST OF TABLES

Table

1.	Neonatal Morbidity Scale.	69
2.	Comparison of Intercorrelations for Original and Categorized Morbidity Indicators. . . .	71
3.	Comparison of Demographic Variables by Employment Status using Analysis of Variance.	74
4.	Mothers' Occupational Classifications	75
5.	Comparison of Employment Related Variables by Employment Status using Analysis of Variance	77
6.	Comparison of Infants on Indicators of Neonatal Morbidity and of Developmental Progress.	83
7.	Categorical Comparisons of Babies across Employment Groups (Frequency Counts). . . .	84
8.	Relationship between Hours Worked and Developmental Outcomes controlling for Choice, Satisfaction, Cohesion, Adaptability Relationships, and Mother-Child Interaction	86
9.	Intercorrelations of the Latent Exogenous Variables	92
10.	Direct, Indirect, and Total Effects of each Latent Variable on Preterm Infant Development	97

LIST OF APPENDICES

Appendix

A.	Consent Form.	118
B.	Instruments Used.	120

CHAPTER I
INTRODUCTION

Nursing traditionally has been interested in the health and wellbeing of individuals and groups, an interest which is embodied in nursing's metaparadigm of person, environment, health, and nursing (Fawcett, 1984). For various reasons, health can be defined differently for different groups of people. In the case of children, health includes not only absence of illness but also patterns of growth and development. While children experience many different types of environments, probably the most important one is the family because of its role in the socialization process and as the child's provider and protector. Therefore, it is important and appropriate for nursing research to investigate factors that could alter or disrupt the family's ability to function effectively and subsequently affect the child's health.

One such factor is maternal employment. While studies on this topic were completed as early as the 1950's (Etaugh, 1974), research generally focused on two parent, middle class families. Recently researchers have begun to investigate the effects of maternal employment under other conditions, such as in single parent families, divorced families, and lower socioeconomic families; however, only one study has been reported that investigated the effect of

maternal employment on preterm infant development (Cohen, 1978). With the increasing number of mothers employed outside the home (Hoffman, 1984) and the improved survival rate for preterm infants (Minde, 1984), an important next step is to investigate the effects that maternal employment may have on infants born prematurely.

Critical illness in neonates is an increasingly important topic for nurses. With technological advances in the health care field, more preterm infants survive the initial period of an otherwise fatal illness and are hospitalized in newborn intensive care units (Warshaw & Hobbins, 1983). These infants experience a wide range of physiologic insults. Some of these, such as respiratory distress syndrome, necrotizing enterocolitis, and intraventricular hemorrhage, are related to the prematurity itself, while others including congenital anomalies, gestational insults such as maternal diabetes, infection, or drug ingestion, and birth-related trauma and illness, such as meconium aspiration, asphyxia, and persistent fetal circulation, are not.

Intensive care admission of an infant is a stressful time for parents and other family members. Although some of these admissions are anticipated, many are unexpected and emergent. The infant's early birth, critical illness and hospitalization often interfere with daily routines and plans and expectations for the future. Parental work and leisure patterns, siblings' school attendance, child care

arrangements, and financial needs may change quickly and dramatically.

In the past fathers were the ones who usually felt the ambivalence about whether to take time off from work during the infant's NICU confinement and, if so, how long their absence from work should last. Since the number of mothers with infants who are employed outside the home has increased steadily to nearly 50% in 1985 (Hayghe, 1986), more mothers also are likely to experience the stress of deciding about their employment status following the early birth of an infant. Although the societal context of mothers working outside the home has changed over the years (Hoffman, 1984), the expectations of others regarding the mother's employment status may change due to the infant's early birth and uncertain future. Since a man's role in society is centered on working, the father who continues to work or who returns to work may receive more support for his decision than the mother who acts similarly.

The phenomenon of maternal employment following the premature birth of an infant is an important and appropriate area for nursing research for several reasons. First, as noted earlier, the conceptualization of the phenomenon of interest reflects nursing's metaparadigm of person, environment, health, and nursing (Fawcett, 1984) and is evident in two of the three major themes that have remained constant throughout nursing's history:

1. Concern with principles and laws that govern the life processes, well-being, and optimum functioning of human beings-sick or well.
2. Concern with the patterning of human behavior in interaction with the environment in critical life situations.
3. Concern with the processes by which positive changes in health status are affected (Donaldson & Crowley, 1978, p. 113).

The stance taken in this study is that maternal employment represents a change in patterning for both the infant and the mother in interaction with the family environment. In addition, the process by which this change in patterning may affect the infant's development is seen as more important than simply the outcome of that process for the infant. By identifying the process, nurses can design more appropriate interventions targeted at a particular link in the process at a given point in time.

Second, research on maternal employment following the premature birth of an infant would result in an expansion of nursing's scientific knowledge base and provide information necessary for the development of descriptive as well as prescriptive theories for nursing practice. As stated above, knowledge of the process by which maternal employment may affect infant outcomes improves the identification and execution of specific nursing interventions to help families avoid or overcome possible deficits.

In addition, the phenomenon can be conceptualized within a nursing conceptual model. Rogers' (1970) assumptions about the interaction of the human and environmental fields, description of humans as sentient,

thinking beings, wholeness, and the goals for nursing intervention are important to the conceptualization of maternal employment following the premature birth of an infant.

The essence of these three assumptions is reflected in the current conceptualization of the phenomenon. The infant and the mother are the two human fields of interest. The environmental field for each is the family, which includes the mother in the infant's environmental field and the infant in the mother's environmental field. Since women and children are feeling, thinking beings, psychological and emotional variables as well as structural variables are included in the conceptual model for the study. Wholeness of the human and environmental fields means that humans and families are indivisible wholes and, as a whole, represent more than the sum of their parts. Although human thoughts and feelings may be considered "parts", it is expected that the actual impact of maternal employment is not completely captured by a simple additive model, that a dynamic conceptualization is more descriptive.

The goals for professional nursing practice defined in Rogers' model (1970) include "[promoting] symphonic interaction between man and environment, [strengthening] the coherence and integrity of the human field, and [directing] and [redirecting] patterning of the human and environmental fields for realization of maximum health potential" (p. 122). Because nurses have more contact with a preterm

infant's family than other health care workers do, parents may confide in and seek advice from nurses about whether to return to work. In order to strengthen the human field and to enhance interaction of the human and environmental fields, nurses need to be knowledgeable about the issues and effects of maternal employment following premature birth of the infant so that they may provide accurate information and appropriate support to the parents.

The purpose of this study is to describe the relationship between variables related to the mother's employment status and the preterm infant's developmental progress at three and six months chronological age and to test the conceptual model developed to explain the process by which maternal employment may affect the child.

Specifically, this investigation seeks to:

1. Describe differences in demographic, employment-related and attitudinal variables between women who have returned to work by the time the child is 3 months old and those who have not.
2. Describe differences between preterm infants with working and nonworking mothers on indicators of morbidity in the neonatal period and of growth and development at three and six months of age.
3. Identify factors that mediate the relationship between maternal employment status and infant developmental outcomes at three and six months of age, such as the mother's appraisal of her employment status and the quality of interactions between mother and infant and among family members.
4. Test the fit of the causal model developed for the study to the data.

CHAPTER II

REVIEW OF THE LITERATURE

More and more mothers with young children work outside the home. As a result, the number of mothers with critically ill children who want or need to return to work during and/or after the child's illness will increase. In order to understand the effects of maternal employment following the infant's early birth, several areas of research need to be reviewed. First, mothers' reasons for returning to work will be explored. Second, the outcomes for the child, centering on attachment, parent-child interaction, and cognitive development, will be considered. Third, research regarding preterm infant development and the mother-preterm infant relationship will be reviewed.

Reasons for Mothers' Return to Work

Understanding why mothers work outside the home is important for understanding the stress women experience when making the decision to return to work in light of their infant's changing health status. Unfortunately, all of the research in this area has been conducted with mothers who are married and have husbands present in the home. Although the findings are inconclusive, several factors have been identified as either explaining or predicting mothers'

employment outside the home. These factors can be categorized into three groups: financial necessity, employment-related variables, and attitudinal variables.

Financial need generally is assumed to be the most important reason for mothers to work. While its influence often is statistically significant, the magnitude of the inverse relationship is generally very weak (Weil, 1961; Dowdall, 1974; Smith-Lovin & Tickamyer, 1978; Molm, 1978; Hiller & Phillaber, 1980; Eggebeen, 1988). One possible explanation for this is that the impact of financial need may covary with other variables that were not considered in these studies.

For example, Gordon and Kammeyer (1980) controlled the ages of children in the family and found a stronger relationship, $r = -.46$, between husband's income and mother's employment. Greenstein (1986) controlled for both family life cycle stage and number of children and found that women whose husbands' incomes were classified as high returned to work sooner following the birth of their first child than women with low income husbands. However, using the same dataset, McLaughlin (1982) found very little effect for husband's income on the level and timing of mother's return to work when controlling for her education and work experience.

Although the direction of the relationships is generally the same, the effects of employment-related variables are significant in some studies but not in others.

Mothers' employment history is frequently reported as strongly related to current employment status (Smith-Lovin & Tickamyer, 1978; Weil, 1961; Gordon & Kammeyer, 1980). The longer women worked before the birth of their first baby, the earlier they went back to work after that baby's birth, controlling for education (McLaughlin, 1982). Women who were currently working or had worked in the past reported wanting to work when their children were older whether or not they needed the money (Ferree, 1976).

Characteristics of the job also influence a woman's decision to work outside the home. Women who held professional, technical, or managerial positions before marriage are more likely to work after marriage (Weil, 1961). Hiller and Philliber (1980) concluded that the most important reason for women in their study to be working was job potential, with higher status jobs being more inviting than lower status positions.

Differential effects of women's education on maternal employment have been reported. In most cases, the more education a woman has, the greater the likelihood that she worked outside the home (Eggebeen, 1988; Greenstein, 1986; Hock, Gnezda, & McBride, 1984; McLaughlin, 1982; Smith-Lovin & Tickamyer, 1978; Weil, 1961). This impact of education on employment status has become stronger over time (Eggebeen, 1988). In some studies, the effects of educational attainment interacted with other employment-related variables. When the husband's income was either low or

moderate, the wife's higher education decreased the likelihood of her working outside the home, $r=-.11$ and $-.15$, respectively; however, when the husband's income was high, the direction of the effects was reversed ($r=.16$) (Gordon & Kammeyer, 1980).

The effect of education on maternal employment is evident in women's work patterns around the time of her first child's birth. Women with more education leave the workforce later in their pregnancies and return to work sooner postnatally (McLaughlin, 1982). In an earlier study, education had no effect on employment when the mother had preschool children, but did show a positive effect when the youngest child at home was school-aged or older (Molm, 1978).

Attitudinal variables also have been found to have a significant impact on maternal employment. Women are more likely to work when they approve of women working (Molm, 1978; Greenstein, 1986), when their husbands have positive attitudes toward their working (Weil, 1961) and when their husbands help with housework and child care (Weil, 1961; Safilios-Rothschild, 1970). However, Smith-Lovin and Tickamyer (1978) used the same data as Molm but found sex role attitudes were not a significant predictor of maternal employment. This discrepancy may be due to the way the scales were defined in the two studies. While Molm used 6 items which related solely to career and its effects on the family, Smith-Lovin and Tickamyer used a 15 item scale that

addressed both career roles and mothering roles. The question can be raised whether these two types of roles lie at opposite poles on the same continuum, or whether each role can be conceptualized on its own continuum, ranging from low career commitment to high career commitment and from low orientation to mothering to high.

Hock, et al, (1984) developed two scales, Exclusive Maternal Care and Home/Employment Orientation, to measure mothering and career commitment, respectively. They found different relationships for each scale among the demographic variables in their sample of first time mothers. Women who scored higher on the Exclusive Maternal Care scale were younger and planned to stay home. There were no significant education effects for this scale. Women who were more home oriented on the Home/Employment Orientation scale were less educated (12 years or less of school) and planned to stay home. Age effects were not significant on the Home/Employment scale. Regardless of their scores on the two scales, women reported increased salience of the maternal role in the first three months postpartum. Unfortunately, Hock et al did not report the degree of correlation between the two scales.

In summary, financial need variables, work-related and demographic variables and attitudinal variables were each related to maternal employment. Differences in the sophistication of the analyses may account for some of the discrepancies found. The use of control variables and

grouping variables in some studies helped to further explicate the relationships between predictor variables and maternal employment. Unfortunately, no study adequately combined all of the variables identified with the appropriate use of statistical control or control by design.

Another major methodological criticism of the studies reviewed is that only three studies (Ferree, 1976; Plunkett, 1980; Alvarez, 1985) actually asked women directly why they were working. Although financial reasons were important, 85% of mothers in one study cited personal choice as having an influence on their decision to work. Only 15% stated that they were working for purely financial reasons (Alvarez, 1985). Women in all three studies cited an increased sense of autonomy and social contact with other adults as important reasons why they worked. The other studies tried to predict women's employment status with financial, structural, or attitudinal variables. An enhanced sense of autonomy and the increased social contact that outside employment provides were not included in the possible determinants of maternal employment in these studies.

Effects on Child Development

Concerns about nonmaternal care of children, especially in infancy, stem from the work of three theorists: Spitz (Spitz & Wolf, 1945/1973; Spitz, 1945/1973, 1965), Ainsworth (Ainsworth, Bell, & Stayton, 1974), and Bowlby (1969/1982).

Indeed, much of the research on effects of maternal employment during the preschool years is based on attachment theory.

Attachment is seen as a survival mechanism with the goal of maintaining proximity and contact with the mother-figure and as the basis for successful relationships in the future (Bowlby, 1969/1982). Attachment behaviors are triggered in times of distress in order to reestablish proximity and contact with the attachment figure. Attachment behaviors differ according to the child's age and the situation, and are best observed when the child is frightened, ill or tired (Ainsworth, et al, 1974). The "Strange Situation" protocol described by Ainsworth, Blehar, Waters, and Wall (1978) was designed to produce increasing amounts of fear in the 12 to 18 month old child so that the quality of attachment could be assessed.

Ainsworth et al (1978) classified the quality of the child's attachment to the mother based on the reunion behavior that the child exhibited toward the mother at the end of the strange situation protocol. Children who are securely attached to the mother (group B) seek close contact upon her return and are comforted by her. Reunion behavior of children with insecure avoidant attachments (group A) is characterized by aborted attempts at approach and refusal to make eye contact. Insecure resistant children (group C) seek contact and proximity but resist comforting efforts by their mothers. In research that has been done with middle

class 1 year olds, approximately 70% of infants have been classified as secure, 18% as insecure avoidant and 12% as insecure resistant (Matas, Arend & Sroufe, 1978).

Effects on Attachment

A large body of literature exists regarding the effects of nonmaternal care on the child's attachment to the mother using the strange situation; however, the results are conflicting. Some studies found no differences between home care children (children cared for by their mothers at home) and day care children (Caldwell, Wright, Homig, & Tannenbaum, 1970; Doyle, 1975; Moskowitz, Schwarz, & Corsini, 1977; Roopnarine & Lamb, 1978; Hock, 1980; Owens, et al, 1984; Easterbrooks & Goldberg, 1985). Most of these studies reported very little if any resistant babies and few avoidant babies. Unfortunately, samples were small in some cases.

Other studies have found differences between day care and home care children. Blehar (1974) reported that 60% of day care children showed resisting behavior at 40 months of age while a control group of home care children showed none. Blehar's group of 30 months old day care children showed markedly higher amounts of avoidant behavior compared to controls.

Vaughn, Gove, and Egeland (1980) also found differences in attachment classification based on maternal employment status. Although the secure to insecure ratio was comparable to other studies, many more of the insecure

attachme... This was
especial...rk
before t...rk
status i...rk
structur...rk
babies f

Sev... of
avoidant...rk
1983), e...rk
Belsky &...rk
Molitor, ...rk
associat...rk
mother r...rk
returnin...rk
of life

Whe...rk
insecure...rk
infants, ...rk
male and...rk
more oft...rk
three mo...rk
describe...rk
mothers...rk
supports...rk
adjustme...rk
Easterbr...rk
more ins...rk

attachments were avoidant rather than resistant. This was especially true for babies whose mothers returned to work before their first birthdays. Unfortunately, employment status in this lower SES sample was confounded by family structure, since 65% of the insecure attachments were for babies from single parent families.

Several studies have found an increased incidence of avoidant attachments among day care children (Schwarz, 1983), especially males (Hock & Clinger, 1980; Benn, 1986; Belsky & Rovine, 1988) or first-borns (Barglow, Vaughn, & Molitor, 1987). Insecure avoidant attachments have been associated with lower maternal integration of work and mother roles, lower sensitivity and acceptance, and mothers returning to work in the last half of the child's first year of life (Benn, 1986).

When Belsky and Rovine (1988) compared their 25 insecure day care infants with the 33 secure day care infants, they found that more of the insecure babies were male and that mothers of babies later classified as insecure more often rated their babies as fussy and difficult at three months of age. Mothers of insecure babies were described as less sensitive and empathetic. That these mothers rated their marriages as less positive than desired supports a previously reported association between marital adjustment/harmony and type of attachment (Goldberg & Easterbrooks, 1984). However, Belsky and Rovine obtained more insecure attachments between fathers and daughters with

nonemployed mothers than has been found in other studies. This anomalous finding raises concerns about either their methodology or their sample.

An important question regarding the maternal employment and attachment research is whether attitudes and behaviors of the mother other than those described by Ainsworth, et al (1974) are involved in how the child reacts to separation. Hock (1980) reported a larger study (N=97) where employed mothers returned to work by the child's third month of age. While she found no differences in quality of attachment between children with working mothers and those with nonworking mothers, she did find that mothers' attitudes about the effects of separation on the child interacted with maternal employment status. Nonworking mothers who were anxious about separation had babies who demonstrated a very high amount of proximity seeking. These infants were more distressed by the stranger and less likely to interact with the stranger during the testing (Hock and Clinger, 1980). For working mothers, anxiety about separation was associated with more negative reunion behaviors. Results of a subsequent study with employed mothers substantiated these findings (Hock, 1984).

From these studies, it seems that high levels of maternal anxiety about separation are transferred to the child, making adjustment to separation very difficult for the child. As further support for this relationship, Hock (1984) cites the results of an unpublished doctoral

dissertation by Martin-Huff (1982) which investigated the relationship between maternal separation anxiety and children's behavior upon entering kindergarten. As expected, the greater the mother's separation anxiety, the lower the child's adjustment as rated by their kindergarten teachers.

Effects on Parent-Child Interaction

Since security of attachment is hypothesized to be based on aspects of mother-child interactions (Ainsworth, et al, 1974; Bowlby, 1969/1982), it is important to investigate the effects of maternal employment on parent-child interactions directly rather than to infer changes in process from quality of attachment.

One area that could be affected by employment status is the parent's perception of the child (Bronfenbrenner, Alvarez, & Henderson, 1984). Mothers of three year old children who worked full time were less enthusiastic in their descriptions of sons than nonworkers or part time workers. However, the more the mother worked, the more approving she was of her daughter. Girls declined in favor dramatically if the mother had less than a high school education. In fact, for a woman with less than a high school education, the more hours she worked, the less favorable her reports of her 3 year old child were, regardless of sex of child. Fathers showed a similar pattern, although not as strong. While mothers expressed very few negative comments across employment status groups,

fathers reported more negative comments about the child as the number of hours the mother worked increased.

In some studies, the effects of maternal employment are not simply due to working or not working, but are found to vary with attitudes of either mothers or fathers. After finding no differences between working and nonworking mothers regarding childrearing philosophy and practices and reported relationships with children, Yarrow, Scott, de Leeuw, and Heinig (1962) investigated the effects of the mother's satisfaction with her employment status. Mothers who were not working but who wanted to work reported less clarity in limit setting, extreme inconsistency between childrearing principles and practices, more problems with control, and lower scores on a summative measure of adequacy of mothering. Employed mothers who expressed dissatisfaction also demonstrated problems with limit setting and consistency, but did not score lower on the summative measure. Among the four groups, mothers dissatisfied with not working reported the greatest problems with childrearing.

Support for these findings was obtained in a recent study. Children, especially sons, in families where the mother worked by choice did not experience some of the negative effects reported by others (Bronfenbrenner, et al, 1984). Working mothers who saw their work as maintaining their sense of self described their children more positively. Mothers' education attenuated negative results

for the children when women worked because of financial necessity or experienced role conflict (Alvarez, 1985).

Other studies have found relationships between attitude-behavior congruence and parenting. Greater parental reports of negative affect have been reported when the mother's employment status did not match the parents' attitudes toward women working (Stuckey, McGhee, and Bell, 1982). Hock (1980) hypothesizes that a good fit between work status and mothers' attitudes about separation and exclusive maternal care enhance mother-child interaction.

Studies investigating the effects of maternal employment on specific aspects of parent-child interaction have provided mixed results. Schubert, Bradley-Johnson, & Nuttal (1980) observed 30 mother-infant pairs in a 12 minute free play session in the lab. Although some differences between the working and nonworking dyads were apparent during the first and second 4 minute block, all differences had disappeared by the third 4 minute block.

In their sample of 92 four month old babies, Field and associates found that working mothers touched, vocalized and displayed exaggerated faces less often than nonworking mothers; however, infants of the working mothers displayed less motor activity and less distress brow than infants with nonworking mothers. It is difficult to know whether differences in the actions of the two groups of mothers were due to the infant behaviors, or whether the differences in infant behaviors were due to longstanding characteristics of

the mother or the mother-child relationship (Field, Stoller, Vega-Lahr, Scafidi, & Goldstein, 1986).

Zaslow and associates conducted two studies to investigate quantity of specific behaviors in relation to maternal employment. In the first study, there were no differences between frequencies of behaviors exhibited by the mothers when with fathers; however, nonworking mothers engaged in mutual visual regard more than working mothers when fathers were not present (Zaslow, Pedersen, Suwalsky, Cain, & Fivel, 1985).

In a follow-up study, men with employed wives demonstrated less mutual visual gaze and smiling with their infants than men in the homemaker group. There was a negative correlation between number of hours the wife worked and the frequency with which fathers presented objects to and encouraged their infants. The fathers with working wives expressed less satisfaction with the wife's work status than husbands of homemakers. These fathers also felt that they participated in child care and household tasks more than others because of their wives' working. The observation data for amount of child care did not support their perception (Zaslow, Pedersen, Suwalsky, Rabinovich, & Cain, 1986). While the generalizability of both of these studies is compromised by small samples and highly educated parents (mean was college degree or above), the results suggest that maternal employment may change the way in which fathers interact with their infants, especially if the

father is not happy with his wife's employment status.

Cohen (1978) investigated the effects of maternal employment on mother-child interaction with 44 premature infants and their mothers. Testing was done at 21 months in the lab. Nonworking mothers demonstrated more positive attentiveness to the child. The child vocalized more and the dyad engaged in more reciprocal positive behaviors.

Since there were more single mothers in the employed mother group, Cohen (1978) analyzed her data for two parent families only. Differences between groups in maternal positive attentiveness and reciprocal positive interaction disappeared, indicating that the differences observed between groups was a function of family structure rather than of the mother's employment status. Controlling for number of parents in the home, infants of working mothers continued to show less vocalization than infants of nonworking mothers.

Since babies in the employed mother group were smaller at birth, Cohen used birth weight as a covariate; however, the differences observed remained. Length of hospitalization was not significantly different for the two groups. Gestational age was not mentioned, although it could have been different for the two groups based on the birth weights reported. Cohen did not report the relationship between weight and gestational age for the infants; therefore, the differences in birth weight between the two groups also could indicate a higher number of small

for gestational age (SGA) infants in the employed mothers group. If this is true, the differences in vocalization could be due to the slower progress often reported for SGA babies (Rubin, Rosenblatt, & Balow, 1973) rather than to maternal employment status.

Effects on Cognitive Development

Many researchers reported results of cognitive testing, but often as a covariate and not as an outcome measure (Caldwell, et al, 1970; Doyle, 1975; Schacter, 1981; Stith & Davis, 1984; Siegal & Storey, 1985; Hock, 1980). Results from this line of research, like that on attachment, are inconclusive.

Out of nine studies reporting cognitive testing, only two reported that the children with nonemployed mothers scored higher than those with employed mothers (Schacter, 1981; Cohen, 1978). In Schacter's study, 32 children had mothers who were employed and 38 children had mothers who were not employed; however, all 70 children attended the same nursery school two days a week for 2.5 hours each time. When tested at a mean age of 29 months, children of nonemployed mothers scored higher on the Stanford-Binet IQ test than children whose mothers worked.

In a sample of 36 premature infants, Cohen (1978) found that children of employed mothers scored significantly lower on the Bayley Mental scales at 18 and 25 months and on the Gesell at 24 months. However, as Cohen points out, mothers and infants in each group differed on variables that could

have influenced the results obtained. First, there were many more single mothers in the employed group than in the nonemployed group. In addition, the mean birth weight for infants in each group differed by almost 400 grams (employed $M=1698$ gms, nonemployed $M=2081$ gms). Although differences remained when birth weight was entered as a covariate, possible differences in gestational age and birth weight for gestational age concordance between the two groups of infants that were mentioned earlier may have affected the results obtained.

Two of the studies reviewed reported that children with working mothers scored higher on cognitive measures (Doyle, 1975; Zimmerman & Bernstein, 1983). Doyle used the Cattell developmental test with 12 day care and 12 matched home reared children whose ages ranged from 5 to 30 months. However, due to the small sample size and the diverse ages represented, generalizability of the study is limited. In their study of 200 families with 6 year olds, Zimmerman and Bernstein found a trend for children with employed mothers to score higher on the WISC-R IQ test; however, differences were significant only for children living in social contract and commune families. Differences were not significant for children of married parents or single parents.

For the remaining three studies, no differences were obtained for children based on employment status of the mother (Caldwell, et al, 1970; Stith & Davis, 1984; Hock, 1980; Zimmerman and Bernstein, 1983). The finding of no

differences was obtained despite different age groups and different measures.

To summarize, conflicting results have been obtained for the effects of maternal employment on the child's cognitive development. Based on the results from the two largest studies (Hock, 1980; Zimmerman & Bernstein, 1983), it is reasonable to conclude that research does not support the hypothesis that maternal employment adversely affects the child's cognitive development. In fact in some cases, maternal employment may have a positive effect.

Critique

Several methodologic critiques of the studies reviewed are apparent. First is the frequently small sample size used. The one study with only one group had less than 35 subjects in the sample (Benn, 1986). In studies where the sample was divided into two or more groups, less than 25 subjects were in each group (Caldwell, et al, 1970; Blehar, 1974; Schwarz, et al, 1974; Doyle, 1975; Moskowitz, et al, 1977; Roopnarine & Lamb, 1978; Cohen, 1978; Hock & Clinger, 1980; Schwarz, 1980; Schubert, et al, 1980; Rubenstein, Howes, & Boyle, 1981; Stuckey, et al, 1982; Field, et al, 1984; Owens, et al, 1984; Stith & Davis, 1984; Siegal & Storey, 1985; Zaslow, et al, 1985; Zaslow, et al, 1986). Because of the instability of the correlation coefficients based on small samples and the large confidence intervals for these coefficients due to the small N, results obtained in one study may not be replicated in another study (Masters

& Wellman, 1974).

In addition, many of the studies on the effects of maternal employment on attachment contain major methodologic flaws, such as raters who were not blind to study purpose, hypotheses, and group membership (Phillips, McCartney, Scarr & Howes, 1987) and the absence of a pre-employment or pre-day care measure to rule out pre-existing differences (Roopnarine and Lamb, 1978). Lastly, since the strange situation protocol for measuring attachment was originally validated with mothers and children cared for at home, the construct validity of the measure for children experiencing nonmaternal care needs to be established.

Effects of Premature Birth on the Parents

Premature birth of an infant may affect parent-child and mother-father interactions in several ways. If the mother has experienced problems during pregnancy, labelling the pregnancy "high risk" may alter the prenatal process of maternal role attainment described by Rubin (1967), and men may question their competence as a father and as a provider (Penticuff, 1982). Most authors report that parents are upset by a premature birth, viewing it as a negative event (Kaplan & Mason, 1960; Benfield, et al, 1976; Christenson, 1977; Hawkins-Walsh, 1980; Penticuff, 1982; Trause & Kramer, 1983). However, women who have experienced many reproductive failures may see preterm birth as a positive event, compared to miscarriage or stillbirth (Kaplan & Mason, 1960).

Stereotypes of what a preterm infant is like may hinder the formation of the parent-child relationship, especially in the early period after birth. Indeed, Stern and Hildebrandt (1986) found that mothers who played with full term infants (not their own) labelled as preterm perceived the infants to be smaller, finer featured and less cute compared to ratings of mothers who were told that the infant with which they were playing was full term.

The parents' initial impressions of their infant's appearance may be less favorable, characterized by descriptions such as "a 'turtle without a shell', a 'frog', or a 'chicken'" (Kaplan & Mason, 1960, p. 542) or a "tiny, purple, blurred image" (Christenson, 1977, p. 34). Indeed, when college students were asked to rate composite drawings of younger preterm (31-34 weeks gestation), older preterm (35-37 weeks) and full term infant faces, they consistently rated the drawing of the young preterm's face least favorably and were less willing to interact with the younger preterm (Maier, Holmes, Slaymaker, and Reich, 1984).

The cry of the premature infant also may cause negative reactions in the parents. Parents of normal five month old infants shown videotapes of infants crying reported feeling more irritated, annoyed and disturbed by the preterm cry, especially when the preterm cry was paired with the preterm face (Frodi, Lamb, Leavitt, Donovan, Neff, & Sherry, 1978).

Parent-Child Interactions

Research has been conducted to identify the effects of

prematurity on the mother-child relationship. Some studies have looked at preterms in general, while others have classified infants based on morbidity ratings. Different findings have resulted when infant morbidity is considered.

An example of these different findings is the conflicting results obtained in the attachment studies. When considered as a group, the distribution of types of attachment obtained for preterm infants is the same as for full term infants (Rode, Chang, Fisch, Sroufe, 1981; Frodi & Thompson, 1985; Goldberg, Perrotta, Minde, & Corter, 1986; Macey, Harmon, & Easterbrooks, 1987; Field, Dempsey, & Shuman, 1983). However, when grouped according to severity of illness, different distributions for security of attachment are obtained (Plunkett, Meisels, Stiefel, Pasick & Roloff, 1986). While the distribution for healthy preterms approximated that obtained for full term infants, preterms with moderate to severe respiratory illness had a higher incidence of insecure-resistant attachments than expected. While Goldberg et al (1986) also found differences in attachment for preterms with different amounts of illness, infants in the securely attached group were sicker than those in the insecure attachment group. Use of gross indicators of morbidity such as birth weight and gestational age did not discriminate between infants with secure and insecure attachments (Plunkett et al, 1986; Rode et al, 1981).

The degree of illness influences the mother's

interaction with the infant (Minde, Whitelaw, Brown, & Fitzhardinge, 1983; Greene, Fox, & Lewis, 1983; Goldberg, et al, 1986). However, the direction of this influence is questionable. Minde, et al, found that decreases in maternal behavior were related to infant morbidity. Mothers of sick preterm infants and mothers of long stay infants touched, smiled, and looked en face less during NICU hospitalization than mothers of well or moderately ill preterm infants. Two of these differences for mothers of sick preterms, smiling and touching, and two for the longer stay group, looking en face and vocalizing, persisted at the post-discharge observations. In another study, however, there were no differences in maternal responsivity between mothers of healthy preterms and mothers of sick preterms (Greene, et al, 1983).

The Child's Experience

Critically ill infants endure many negative events when hospitalized in a neonatal intensive care unit. These include endotracheal intubation and mechanical ventilation, tracheal, nasal, and oral suctioning, pain, immobility often through the use of restraints, insertion of intravenous lines, chest tubes, nasogastric tubes, and urinary catheters, repeated blood draws, separation from parents, isolation, interrupted sleep patterns and high levels of noise (Lewandowski, 1984; Lipsky, 1979; Sammons & Lewis, 1985). The following review of empirical and theoretical

literature will focus on the preterm infant's response to the NICU and the long term developmental outcomes.

NICU as Environment

The noise level in the NICU often impresses the adult visitor soon after entering the unit. Sounds of the intensive care unit emanate from IV pumps, ventilators, and cardiorespiratory monitors including alarms from each, isolettes, people talking both within and outside the unit, and from activities performed by nurses, physicians, secretaries and housekeepers. Noise levels inside the isolette were measured at 55 to 62 dB(A) on average over a 24 hour period when life support equipment was in use (Bess, Peek & Chapman, 1979; Newman, 1981). For comparison, normal speaking voice is about 70 dB(A) (Peterson & Gross, 1978), and the allowable noise level for an eight hour exposure for adult workers in industry is 90 dB(A) (Occupational Safety and Health Administration, 1988). While safe limits for newborns have not been established, continuous noise at the levels obtained raises concerns about possible hearing loss, especially when combined with the ototoxic effects of some commonly used drugs (Bess, et al, 1979).

It has been suggested that diurnal patterning is important to the infant's growth and development (Lawson, Daum, & Turkewitz, 1977). While levels of noise showed little diurnal variation, speech and nonspeech sounds from within the room did show cyclic patterns of two to four hours in length. Frequency of infant handling showed some

variation, although not in an obvious repeating pattern. Since lights within the NICU were kept on continuously, diurnal patterns in amount of light are dependent on whether the NICU has windows that allow sunlight to enter the nursery. If diurnal patterning is important to normal growth and development, the lack of cyclical change in many aspects of the NICU may have a negative effect on the infant.

Effects of Prematurity on Infant Development

Most researchers have found a lag in cognitive development for premature infants measured by several different tests. Preterms tend to score lower than full terms on the Bayley Scales of Infant Development up to 24 months of age (Field, Dempsey, & Shuman, 1981; Crnic, Ragozin, Greenberg, Robinson, & Basham, 1983; Siegel, 1983). Scores on the Gesell through 22 months and the Stanford-Binet at 3 years were significantly lower for preterms (Ungerer & Sigman, 1983; Bakeman & Brown, 1980). In many cases, when the scores are calculated using conceptional age, these differences disappear (Siegel, 1983; Crnic, Ragozin, et al, 1983; Ungerer & Sigman, 1983).

In addition to the prematurity, medical conditions can influence cognitive development. Infants with severe respiratory distress syndrome (high risk group) characterized by resolution of the respiratory illness after three weeks of age and NICU hospitalization for longer than two months have the poorest outcomes according to their

scores on the Bayley mental and motor scales (Meisels, Plunkett, Pasick, Stiefel, & Roloff, 1987). These investigators also report a higher number of developmentally delayed infants in their high risk group.

Sostek, Smith, Katz, & Grant (1987) examined the relationship between grade of intraventricular hemorrhage (IVH) and cognitive development. Grades of IVH range from none to grade IV, representing a large and diffuse intracranial bleed. At one year of age, infants with grade IV bleeds had significantly lower Bayley mental and motor scores, while babies with grade III bleeds had significantly lower motor scores. Means for these groups were below 80, a level often used to indicate developmental delay (Meisels et al, 1987). By two years of age, mean scores for all groups were greater than 80 on both mental and motor scales. Infants with grade IV bleeds continued to score lower than other infants, although the difference was not significant. In addition, more children with grade IV bleeds were classified as developmentally delayed than children with other grades of IVH.

Sugar (1977a, 1977b) compared a large sample of low birth weight preterms, larger preterms and full term infants on the age at which certain developmental milestones appeared. Stranger and separation anxiety, sound pursuit, various indicators of language development, following and eye-hand coordination appeared at the same time in preterms and full terms. However, preterm infants started walking,

sitting, crawling, teething, smiling, and recognizing mother's voice and face significantly later than full terms. For the most part, there was a one to two month difference in ages of onset. Teething and smiling were more closely related to birth weight, while sitting, crawling, and walking were more affected by length of NICU stay. Later recognition of mother's voice and face was related both to birth weight and length of NICU stay (Sugar, 1977b).

While Sugar (1977a, 1977b) found no differences on language development, other investigators have reported delays in this area (Rubin, et al, 1973; Ungerer & Sigman, 1983; Field, et al, 1981). Differences between preterm and full term infants in the Ungerer and Sigman study disappeared after age correction for prematurity. It is unclear whether Field and associates age corrected their respiratory distress syndrome (RDS) babies for the language testing. Although Meisels and associates (1987) obtained no differences in language development across severity groups, they did not compare their preterms with full term infants.

Preterms often are described as less sociable and possibly more difficult to parent. At one year, preterms were noted to smile less and avert their gaze from the mother more often than full terms (Crnic, Ragozin, et al, 1983; Field, et al, 1981). Preterms also vocalized less, were less responsive and more fretful, and provided less clear cues (Crnic, Ragozin, et al, 1983; Crawford, 1982).

Results of studies that investigated the relationship

between mother-infant behaviors and cognitive development of the preterm have been mixed. Despite multiple measures of infant and maternal behaviors, Beckwith, Cohen, Kopp, Parmelee, & Marcy (1976) found no relationship between maternal and preterm infant behaviors observed at one month conceptional age and the Gesell Developmental Quotient (DQ) at nine months conceptional age. However, they did find a relationship between higher nine month Gesell DQ scores and the infant's spending less time in physical care at one and three months, more infant looking at mother at one month, and more mutual gaze and vocalization to caregiver at eight months. Mothers who were more critical and gave more commands at three months had infants with higher Gesell scores at nine months.

In a follow up study, Cohen and Beckwith (1979) found that social interactions between mother and infant at one, three and eight months of age were significantly related to higher Gesell scores at 24 months. Positive attentiveness by the mother at 24 months was positively correlated with Gesell scores, language skills and Bayley mental scores at 24 months. Cohen and Beckwith found no relationship between medical complications and test performance.

Using a larger sample, Cohen and Parmelee (1983) investigated correlates of developmental progress in English speaking, Spanish speaking and "other" families (those speaking Korean, Indian, or other non-English language). Gestational age, birth weight, length of stay and neonatal

events were not predictive of Stanford-Binet scores at five years corrected age. Mother-infant interaction was a better predictor of competence at 9 and 24 months than maternal education for all language groups. In the English speaking group, mother-infant interaction at two years was a better predictor of competence at five years than maternal education. Because it avoided some of the methodological flaws that occurred in their previous study (Cohen & Beckwith, 1979), these results more strongly support the hypothesis that mother-infant interaction is important to the child's development.

Watt and Strongman (1985) found few differences in maternal and infant behaviors and in mother-child interaction between small groups of full term and preterm infants. Mothers of full term infants interacted more with their infants when the infant was in a wakeful/alert state and overall than mothers of preterm infants at three months conceptional age. However, these differences in interaction did not impact on the baby's development at four months.

In a follow-up study, Watt (1986) again found few significant differences between mother-preterm infant dyads and mother-full term infant dyads at six months gestational age. Levels of simultaneous interaction were higher for preterm mother-infant dyads; however, preterm infants initiated interaction less often than full term infants at six months of age. Effects of infant, maternal, and interactional variables measured at two and three months on

mental development at 10 months were minimal.

Watt (1986) obtained significant correlations for preterm infants between six month observational measures and 10 month mental scores on the Bayley. Oddly, these correlations were negative in sign, indicating that higher frequencies of interactive behaviors were associated with lower mental scores at 10 months gestational age. All of these correlations were either opposite in sign or not significant for full term infants (Watt, 1986).

Differences on measures of cognitive development have been related to the quality of the home environment measured with the HOME (Bakeman & Brown, 1980; Siegel, 1982; Schraeder, 1986). In Siegel's study, five of the six HOME scales (responsivity, avoidance of restrictions and punishment, availability of play materials, maternal involvement, and variety in daily stimulation) were significantly correlated with Stanford-Binet IQ scores at three years. In Schraeder's study, maternal responsivity was the best predictor of development at 12 months, followed by length of ICU stay and the other five HOME scales. Responsivity was also the best predictor of cognitive abilities at one, two and three years of age in Bakeman and Brown's study. No differences were found between the HOME scores of families with preterms and those with full term infants (Siegel, 1982).

Following a large sample of full term and preterm infants and their families through five years of age, Siegel

(1984) continued to find few significant differences between full term and preterm families in the home environment measured by the HOME scales. When negative correlations occurred between the HOME scales and developmental tests, Siegel concluded that mothers of preterms were providing more stimulation to less developmentally able children, thereby responding to the needs of their infants. After correcting scores on developmental tests for prematurity, correlations between Bayley scores and HOME scores were more like those for the full term infants. Siegel's hypothesis about parents of preterms providing more stimulation in response to their infants' needs could explain the negative correlations obtained by Watt (1986).

Although their sample was small (13 males and 7 females), Rocissano and Yatchmink (1983) found a relatively strong relationship between linguistic skills and maternal sensitivity at 24 months of age. They noted that in dyads where the toddler had higher mean utterance lengths there was more synchronous interaction between mother and child. These dyads also shared a joint topic more often than dyads where the toddler had shorter mean utterance lengths. Mothers who followed their child's lead in the conversation had toddlers with stronger linguistic skills.

Bakeman and Brown (1980) found no relationship between mother-infant interaction measures and Bayley mental scale scores at 12 and 24 months and Stanford-Binet scores at 3 years of age. However, maternal emotional and verbal

responsivity at 20 months was related to the Stanford-Binet at 3 years. While infants in this study were low birth weight (1000 to 1950 grams, gestational age not mentioned), they were essentially healthy since one criterion for inclusion in their sample was that the baby was not in the NICU at 24 hours of age. Rode et al (1981) report no differences in Bayley mental and motor scores for securely and insecurely attached infants. This could be due in part to the fact that although all infants in the study were hospitalized in the NICU, the gestational age range (28 to 43 weeks) included full term infants.

Plunkett and Meisels (Plunkett, Klein, & Meisels, 1988; Plunkett & Meisels, in press) investigated the effects of security of attachment and medical risk status on different outcomes for preterm infants. Scores on McCarthy's cognitive index and on Zimmerman's language scale corrected for prematurity did not differ across risk status groups at three years of age. Differences on these outcome measures by attachment classification were not reported. Preschoolers in the high risk group had more disorganized or poorly focused activity when confronted with a frustrating task than children in the moderate and low risk groups. Security of attachment did not predict how children handled the frustrating task. Security of attachment, not risk status, did predict the behavior of mothers and children in the teaching task. Mothers in securely attached dyads were more sensitive and supportive teachers and their children

were more enthusiastic toward the task and more affectionate with their mothers.

These findings are consistent with results of another study with the same sample (Plunkett, Klein, & Meisels, 1988). Preterms at three years old were placed in a room with their mothers for a free play session. When a stranger was introduced to the situation, securely attached children coped better with successively more intrusive behavior by the stranger than insecurely attached children. Although high risk preschoolers demonstrated poorer coping behaviors in the frustrating task, their behavior with the stranger was not different from the behavior displayed by low and moderate risk preschoolers. The differences in maternal availability between the two situations may explain the seemingly contradictory findings. In the frustrating task, the mother was instructed to encourage the child to solve the problem without her help, while in the situation with the stranger, mothers were able to react naturally and to provide support to the child as needed.

Field et al (1983) studied preterms with RDS ($N=56$), healthy full terms ($N=81$), and post-term postmature infants ($N=57$) from birth through five years of age. Preterms consistently scored lower on Bayley scales, McCarthy scales, and language tests, although scores for preterms fell in the normal range for all but the language skills by two years of age. Field et al ran several stepwise regressions to determine which variables were most predictive of

developmental scores at one through five years of age. The eight month Bayley motor scale score was most predictive of the one year and two year Bayley mental scale scores. The two year Bayley mental scale score was the best predictor of the McCarthy mental score at three and four years of age. While not a significant predictor in the early years, the rating of mother-infant interaction at four months of age and maternal education became significant predictors of cognitive development at three, four, and five years of age. Field et al interpret this as a "sleeper" effect of early mother-child relationships. Unfortunately, these regressions were not done separately for preterms, postterms, and full terms. Therefore, the performance of these variables for each group in the study sample is unknown.

Critique

Several methodological problems are apparent from the review of the literature. First, the definition of preterm is not consistent. Some studies include infants who are less than 37 weeks gestation while others limit the sample to infants less than 34 weeks. The problem comes when very short gestation infants (27-30 weeks) are grouped with 36 or 37 week infants. In addition, some studies defined premature infants solely by birth weight. Most studies have such a wide range for both of these variables that significant relationships for a subset of preterms may be hidden by the lack of control for gestational age and birth

weight in sampling or in the analysis.

The other aspect of gestational age and birth weight that is often not considered is whether the infant's birth weight is appropriate (AGA) or small (SGA) for the infant's gestational age. Small for gestational age infants suffer from intrauterine growth retardation which results either from inadequate nutrient supply in utero or from chromosomal or congenital anomalies. Small for dates infants, except those with anomalies, have been nutritionally deprived in utero which may have a negative impact on their subsequent development (Freedman & Warshaw, 1983). Therefore, low birth weight AGA infants have better developmental outcomes than infants who are SGA (Rubin, et al, 1973). Since researchers have not considered this variable in their design and analysis, significant effects again may be masked by not controlling the composition of the sample. This problem is pervasive throughout the preterm literature and is especially problematic for earlier studies which used only a weight criterion to define prematurity.

In addition to the lack of control regarding birth weight, gestational age, and appropriateness of weight for age, the effects of varying levels of infant morbidity, including the types of interventions the infant experiences, often are not investigated. Some preterms are small but healthy, while others may be larger but severely ill. Gross categories such as birth weight, gestational age, and length of stay are important variables regarding development;

however, they do not adequately describe the experience nor the level of morbidity for a particular preterm in the NICU. When investigators did group preterm infants by degree and type of illness, differences in developmental progress were apparent (Stiefel, Plunkett, & Meisels, 1987; Meisels et al, 1987; Sostek et al, 1987). The importance of morbidity as a predictor of outcomes is emphasized by the contradictory results of Plunkett et al (1986) and of Rode et al (1981) regarding attachment classifications.

A final concern involves the practice of calculating scores on developmental measures based on the child's conceptional age. While this is a common practice and may make sense when comparing preterms with full terms, age correcting may mask important differences in rate of growth, which then makes identification of factors affecting developmental progress difficult.

In general, review of the literature regarding characteristics of preterm infants suggests that preterms are different from full terms in many ways. In addition to differences in appearance and cry, preterms have characteristics that may make them more difficult to parent. Cognitive development is often delayed. Although many of these differences disappear statistically when corrected for prematurity, the fact that their infant is not doing what other infants do at a particular age may be stressful for parents. Differences in state regulation and orientation (Ferrari, Grosoli, Fontana, & Carazzuti, 1983; Greene et al,

1983; Field et al, 1981) may make the preterm less predictable. Parents whose infant smiles less and has less positive affect and mood may derive less pleasure and satisfaction from taking care of the infant. Preterms often eat more frequently than full terms and may take longer to feed (Minde, Perrotta, & Marton, 1985; Field, et al, 1981). This may be frustrating for parents and leave them with little time to accomplish other tasks. Specific maternal behaviors and aspects of mother-child interactions are related to developmental outcomes for preterm infants, as they are with full term infants. There appear to be differences between full term dyads and preterm dyads on infant behaviors, maternal behaviors, and mother-child interaction. However, these differences often have not been related to different child outcomes for preterms.

To summarize, the effects of maternal employment on attachment, mother-infant interaction and the child's cognitive development have been investigated, but with conflicting results. Some of these studies suffer from major methodological problems, such as small samples and instruments whose reliability and validity with children of employed mothers has not been tested. In addition, intervening variables such as the mother's attitudes about working and mothering often have not been considered.

Research regarding the effects of prematurity on the child's development, the mother-child relationship and attachment also has obtained conflicting results. These

studies also suffer from major flaws. The definition of prematurity is not consistent across studies, and the infant's neonatal morbidity and NICU experiences often are not considered.

CHAPTER III
CONCEPTUAL FRAMEWORK

Most of the research reviewed considered maternal employment status as a simple dichotomy, working versus not working. While this is a straightforward, appealing way to measure maternal employment, its simplicity may have contributed to the conflicting results reported by researchers studying the effects of maternal employment on children. Given these mixed results, it is important to investigate the impact of specific aspects of the mother's employment status on her child's development and to try to identify the mechanism by which these factors operate (Marotz-Baden, Adams, Bueche, Munro, & Munro, 1979). An examination of the underlying beliefs about the mother-child relationship provides clues about what factors may influence the link between maternal employment and child outcomes.

Concern about maternal employment seems to be based on the assumption that frequent separation of the child from the mother results in increased stress and a less than optimal environment for the child. Although mothers are assumed to provide the best possible environment, a considerable amount of literature suggests that this is not always so (see Sameroff & Chandler, 1975 for a review). This literature points to the mother's attitudes about the child and child-rearing as important factors in predicting

child outcomes. In light of these findings, it is reasonable to ask whether maternal attitudes about employment status have an impact on child outcomes.

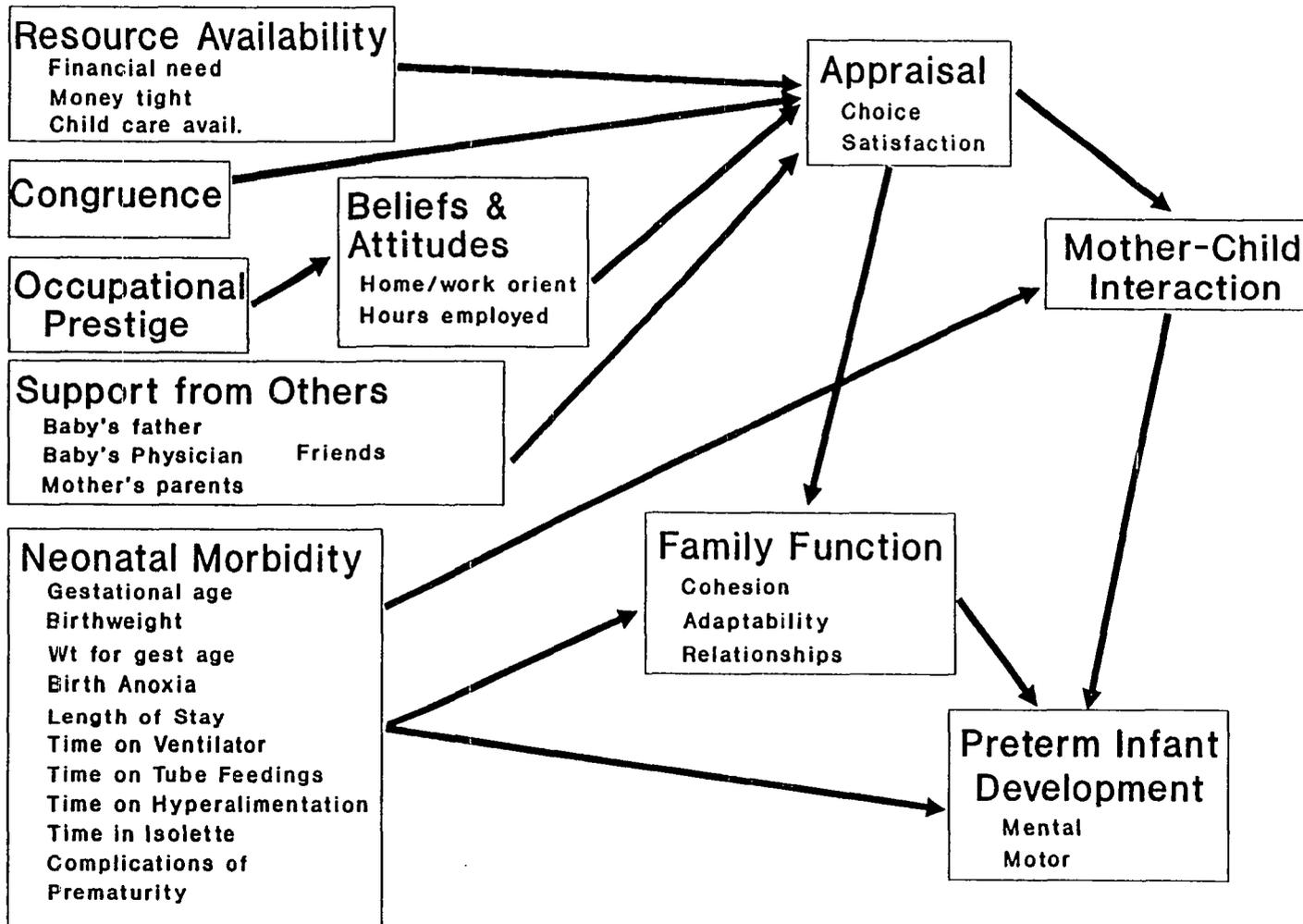
A causal model was developed for this study to explain the mechanism by which maternal employment status may have an impact on preterm infant development (see Figure 1). The model is based on theoretical literature and on the results from studies conducted regarding maternal employment and the preterm infant's NICU experience and subsequent growth and development.

Operational Definitions

According to Lazarus and Folkman's theory (1985) of stress and coping, a person's appraisal of a particular situation is defined as whether the person perceives the situation as stressful. The appraisal depends on characteristics of the situation and on the person's beliefs and attitudes. Since the person's appraisal determines the actions she takes, different outcomes result from different appraisals.

For this study, the mother's appraisal of her employment status is defined by how stressful the mother thinks her employment situation is. Indicators of appraisal are the mother's rating of the degree of choice she had about her employment status and of her satisfaction with her decision about employment. It is the mother's appraisal of her employment status, instead of whether she works or does

Figure 1. Effects of Maternal Employment on Preterm Infant Development



not work, that is expected to determine whether her employment status constitutes a stress on the family system and on the child (Yarrow, et al, 1962; Ferree, 1976; Alvarez, 1985).

Determinants of appraisal are posited to be the availability of resources, congruence, beliefs and attitudes about mothering and working, and perceived support from significant others (Weil, 1961). Resource availability refers to the mother's perception of her family's financial need (Gordon & Kammeyer, 1980) and degree of financial comfort as well as the availability of child care (Jacobson, 1982).

Congruence is defined as the consistency between the mother's prenatal employment plans and her actual employment behavior at three months postpartum. Investigators who have considered desire to work in relationship to actual employment status have found differences based on these classifications. Hoffman (1961) categorized mothers according to actual and desired employment status. She found differences in childrearing practices and in school-aged children's behaviors among the four groups. Farel (1980) found more problems in children's school adjustment and competence for children whose mothers wanted to work but did not.

Beliefs and attitudes about mothering and working are reflected by the mother's home vs. work orientation (Molm, 1978; Hock, Christman, & Hock, 1980; Hock, et al, 1984) and

by the actual number of hours per week she is employed outside the home (Bronfenbrenner, et al, 1984). Occupational prestige is expected to have an indirect effect on appraisal through its impact on the mother's beliefs and attitudes (Weil, 1961; Hiller & Philliber, 1980).

In her studies with younger children, Hock (1984) found that employment status interacted with the mother's attitudes about separation. Infants were more stressed by separation when the mother was anxious about separation and was not working, and more negative on reunion with employed mothers who were anxious about separation. These results suggest that the mother's attitudes regarding her employment status are important in determining the type of environment that the mother provides for her child and the amount of stress experienced by the child.

Perceived support for her work status from significant others consists of the mother's perceptions of what her spouse/partner, friends, parents, and the baby's physician think she should do. It is expected that working mothers who perceive greater support for working will have a higher appraisal than nonworking mothers.

When the factors are consistent with each other, the mother will have a more positive appraisal of her employment status than when two or more factors compete with each other. For example, a mother with a low work orientation, a support system that expects her to stay home, low resource availability, and an employment status that is congruent

with her desires will have a higher appraisal of her employment status if she is not working than if she is employed outside the home.

The mother's appraisal of her employment status is posited to be positively related to mother-child interaction and to family functioning. The link to mother-child interaction is supported by the work of Benn (1986), Yarrow et al (1962), Bronfenbrenner et al (1984), Alvarez (1985), Stuckey et al (1982), and Hock (1980). All of these researchers found a relationship between quality of mother-child interaction and degree of consistency between the mother's attitudes toward employment and her employment status.

The link between the mother's appraisal and family functioning has not been studied; however, it can be supported with more general empirical and theoretical literature. In this model, family functioning is comprised of three concepts: cohesion, adaptability, and relationships. The concepts of cohesion and adaptability are taken from the Circumplex Model of family functioning described by Olson and McCubbin (1982). Cohesion is defined as the emotional bonding between family members. Adaptability refers to the family's ability to change "its power structure, role relationships, and relationship rules in response to situational and developmental stress" (p. 51). Families who fall in the middle on each of these continuums are expected to function more effectively than

those who are at either end on one or both dimensions.

In terms of the current phenomenon, a mother with a negative appraisal of her employment status is likely to increase the amount of tension and stress in the family. According to the Circumplex Model, families who experience a stressful event will move toward the extremes on one or both continuums. Therefore, the mother's negative appraisal is posited to have a negative impact on family functioning as indexed by family cohesion and family adaptability.

The relationships concept of family functioning refers to the quality of relationships within the family and between the family and the community (Roberts & Feetham, 1982). While research which examines the link between the mother's appraisal of her employment status and the family's relationships (as a whole) has not been reported, research has been done which looks at the effects of women working on the marital relationship. As with the maternal employment literature regarding effects on child development, the results of research investigating effects of wives' employment on their husbands is conflicting. Some find no adverse effects on the husband's wellbeing (Fendrich, 1984) and marital satisfaction (Locksley, 1980; Staines, Pleck, Shepard, & O'Connor, 1978), while others do find negative effects on the husband's wellbeing (Kessler & McRae, 1982) and marital satisfaction, at least for a subgroup (Hardesty & Betz, 1980). The effects of women's employment on their own marital satisfaction is also conflicting (Locksley,

1980; Staines, et al., 1978; Kessler & McRae, 1982). Husbands with employed wives have been found to be more involved with housework and child care than husbands whose wives do not work (Ericksen, Yancey, & Erickson, 1979; Weingarten, 1978). While these studies focus on working vs. not working rather than appraisal of that employment status, the conflicting results raise the question of whether an important variable, such as how the mother evaluates her employment status, has been omitted and therefore adds support to the link between appraisal and family relationships. Unfortunately, since these studies are all cross-sectional, the direction of the influence is speculative.

In addition to resource availability, congruence, beliefs and attitudes, and support, one other exogenous variable in the proposed conceptual framework is the degree of morbidity experienced by the preterm infant during the neonatal period. Increased morbidity is expected to have a direct, negative influence on mother-child interaction, family functioning, and the child's development. The neonatal morbidity construct is comprised of traditional indicators such as gestational age, birth weight, weight for gestational age concordance, birth anoxia reflected by 1 and 5 minute APGAR scores, and length of stay. The neonatal morbidity construct also includes experiential variables such as length of time in an isolette, length of time mechanically ventilated, length of time receiving tube

feedings, and number of complications of prematurity present (intraventricular hemorrhage (IVH), bronchopulmonary dysplasia (BPD), necrotizing enterocolitis (NEC), retinopathy of prematurity, apnea and bradycardia spells, and hyperbilirubinemia). Inclusion of indicators other than the traditional ones for infant morbidity is advocated in a recent review by Meisels and Plunkett (1988), and is supported by research that finds poorer outcomes for sicker babies (Meisels, et al, 1987; Plunkett, et al, 1986; Meisels, Plunkett, Roloff, Pasick, & Stiefel, 1986; Plunkett & Meisels, in press).

Research generally supports the position that prematurity negatively affects the mother-child relationship (Kaplan & Mason, 1960; Minde, et al, 1983; Stern & Hildebrandt, 1986; Frodi, et al, 1978; Maier, et al, 1984). However, these negative effects are likely to vary with the degree of morbidity (Greene, et al, 1983; Plunkett, et al, 1986; Goldberg et al, 1986).

Increasing infant morbidity is expected to have a negative impact on family functioning. This link is supported by the frequently expressed belief that preterm birth and critical illness are experienced as a crisis situation by the parents and other family members (Kaplan & Mason, 1960; Benfield, et al, 1976; Penticuff, 1982; Christenson, 1977; Hawkins-Walsh, 1980; Trause & Kramer, 1983). Again, Olson and McCubbin (1982) expect families who experience a stressful event to move toward the extremes on

family cohesion and family adaptability.

Degree of illness and prematurity is posited to have a negative impact on the child's developmental progress. Healthy preterms are often reported to have lower scores on developmental tests when compared with full term, chronological agemates (Field, et al, 1983; Crnic, et al, 1983; Siegel, 1983; Ungerer & Sigman, 1983; Bakeman & Brown, 1980; Cohen & Parmelee, 1983). Degree of morbidity further handicaps preterm infant development (Meisels et al, 1987; Sostek, et al, 1987; Catto-Smith, Yu, Bajuk, Orgill, & Astbury, 1985; Goldson, 1983; Meisels et al, 1986).

In addition to neonatal morbidity, mother-child interaction and family function are posited to have a direct impact on the child's development. Both are expected to have a positive effect, with better mother-child interaction and better family functioning resulting in better child developmental outcomes.

The link between mother-child interaction and child development is supported by the work of Cohen and Beckwith (1979), Cohen and Parmelee (1983), Field et al (1983), Rocissano and Yatchmink (1983). In addition, investigators have found a relationship between maternal behaviors, such as responsivity measured by the HOME, and infant cognitive development (Bakeman & Brown, 1980; Siegel, 1982; Schraeder, 1986).

Research has not been reported that investigates the relationship between family functioning and preterm infant

development. However, the proposed link can be supported with theoretical and related empirical literature. The family is seen here as an important environment or context in which child development occurs. While most research on the child in the family has focused on the mother-child relationship, broadening the perspective to consider other family members and the family as a system has been advocated by Bronfenbrenner (1985) and by Maccoby (1984). The construct of family functioning goes beyond mother-child to include other dyadic relationships, notably father-child, mother-father, and child-child, and triadic relationships such as mother-father-child.

Family functioning approaches the family as a system. As such, the family is considered to have properties of its own that are different than a mere sum of the characteristics of its members or its dyadic or triadic relationships. When considered in terms of the infant, family cohesion and family adaptability are concepts of family that are closely aligned with maternal attachment and responsivity, respectively. Since these two aspects of the mother-child relationship have been correlated with developmental outcomes of the infant, it is reasonable to hypothesize that the corresponding characteristics of a family also would be related to child outcomes.

The relationships dimension of family quantifies the dyadic and higher order relationships within the family and between the family and others (friends, neighbors, schools,

work). Dyadic relationships within the family have been related to child outcomes, as has how the family interacts with external people and systems (Maccoby & Martin, 1983).

To summarize, maternal employment is expected to be indirectly related to the infant's developmental outcome through the effect of the mother's appraisal of her employment status on family functioning and mother-child interaction. The mother arrives at this appraisal by considering availability of resources, congruence between her prenatal plans and her actual working behavior postnatally, her beliefs and attitudes about employment and mothering, and perceived support from significant others. The mother's appraisal is posited to have an indirect effect on child outcomes, with the effect being mediated by mother-child interaction and by family functioning. Both direct and indirect paths, through mother-child interaction and family functioning, are proposed for the effect of the child's perinatal health status on developmental outcomes.

Research Questions

Several research questions can be asked based on the review of the literature and on the causal model developed for the study. 1) Do working and nonworking mothers differ on demographic variables? 2) Do working and nonworking mothers differ on the determinants of appraisal (financial necessity, financial comfort, availability of child care, occupational prestige, congruence, home/work orientation,

perceived support from spouse/partner, friends, parents, and the baby's physician)? 3) Do working and nonworking mothers differ on degree of choice regarding their employment status and satisfaction with that choice? 4) Do working and nonworking mothers differ on observational ratings of mother-child interaction and on family function? 5) Do infants with working and nonworking mothers differ on indicators of neonatal morbidity and on developmental outcomes at three and six months of age? 6) What variables covary with employment status and developmental outcomes? 7) Do appraisal, mother-child interaction and family function mediate the effects of maternal employment on the child's development? 8) Does the causal model developed for the study adequately fit the data?

CHAPTER IV
METHODOLOGY

The study was designed to investigate the effects of the mother's employment status and her appraisal of that employment status on the developmental progress of the preterm infant at three and six months of age. It improves on previous work on preterm infants and their families and in the area of maternal employment in several ways. First, the complexity of the child's relationships with others in the family unit is incorporated into the model with the inclusion of family functioning as a determinant of child outcomes. Second, the child's level of morbidity, defined by both global and experiential indicators, is identified as contributing to later child development. Finally as in some previous work (Hock et al, 1984; Yarrow et al, 1962; Bronfenbrenner et al 1984; Alvarez, 1985), the mother is treated as a thinking, feeling person rather than as simply a child care provider.

The direction of causality was posited as depicted in the model because of the study's stated goal of describing the effect of maternal employment on the child's development. It is plausible that feedback loops may develop in the proposed model over time. For example, child development may affect the mother's appraisal of her employment situation, as well as the mother-child

interaction and family function. While investigation of these loops is interesting and important, it is not central to the stated goals of the current study. However, since the project from which this study comes is longitudinal, the direction of causality can be investigated in future analyses of the dataset.

Sample

The sample of preterm infants and their families was obtained from an ongoing longitudinal study of families with preterm infants. This study was conducted using data collected when the infant was three months ($N=110$) and six months ($n=82$) of age. Families were recruited from two level-III intensive care nurseries. Criteria for inclusion in the study were that the infant: 1) was less than 37 weeks gestation, 2) was appropriate for gestational age, 3) was hospitalized in the NICU for more than one week but less than three months, 4) was free of anomalies that would preclude developmental progress, and 5) had a mother who was living with a male partner acting as the father, whether or not he is the biological father.

A description of the sample demographics follows. In 95.5% of the families ($n=105$), the parents were married. Parents in four families (3.6%) were living together, but were not married. The parents in the last family were separated at the 3 month interview, but were living together by the 6 month interview. The range for years living

together was 0 to 22 years, with a mean of 5.4 years (\underline{sd} =3.95). Two thirds of the families had been together for four or more years.

Almost 94% of the parents in the sample are white (103 mothers and fathers). Three mothers and fathers (2.7%) are black. Two fathers (1.8%) are hispanic. One mother (0.9%) is asian and one (0.9%) is a native American. Two fathers and mothers (1.8%) identified their race as "other". Parents were asked to identify their religious affiliation. Fifty six mothers (50.9%) and 48 (43.6%) fathers are Protestant. Thirty four mothers (30.9%) and 37 fathers (33.6%) are Catholic. Thirteen mothers (11.8%) and 18 fathers (16.4%) listed their religion as "other". Seven mothers and fathers (6.4%) said they had no religious affiliation.

At the three month interview, ninety nine percent (\underline{n} =109) of the fathers were employed. Four (3.6%) of these were working part time. One father was not employed. Forty (36.4%) of the mothers were working outside the home, thirty (27.3%) of them full time. Fifteen mothers (13.6%) stated that they were on a leave of absence. The remaining 55 mothers (50%) identified their employment status as not working at three months postpartum.

Family income ranged from under \$10,000 to \$50,000 and over. Four families (3.8%) had incomes less than \$10,000 a year. Twenty one families (19.4%) fell in the \$10,000 to \$19,999 category. Twenty families (18.3%) had incomes in

the \$20,000 to \$29,000 range. Thirty one families (28.3%) were in the \$30,000 to \$39,000 category. Nine families (8.3%) identified their yearly income as between \$40,000 and \$49,000. Twenty four families (21.9%) had incomes of \$50,000 and above.

The sample as a whole is fairly well educated. Only four mothers (3.6%) and six fathers (5.5%) did not finish high school. Forty-six mothers (41.8%) and 36 fathers (32.7%) listed high school graduation as the highest level of education completed. Fifty mothers (45.5%) and 46 fathers (41.8%) had completed some college or some type of specialized training. Eight mothers (7.3%) and 17 fathers (15.5%) had college degrees. In addition, two mothers (2.7%) and five fathers (4.5%) had completed a graduate degree.

Socioeconomic status (SES) was calculated using Hollingshead's four factor index (Hollingshead, 1975). Different levels of education are assigned numbers ranging from 1 (less than seventh grade) to 7 (graduate degree). Occupations are classified into groups ranging from 1 (farm laborers and menial service) to 9 (higher executives, major professionals). The education score multiplied by three is added to the occupational group score multiplied by five. For dual-worker families, both the mother's and father's education by occupational group products are calculated. The two scores are added and divided by two to get an average SES score for the family. When one parent is

working, the SES score is based on that parent only.

Based on Hollingshead's classification system, nine families (8.2%) are in the highest SES group, major business and professional. Forty families (36.4%) are in the medium business, minor professional, and technical group. Forty six families (41.8%) are in the skilled craftsmen, clerical, and sales group. Twelve families (10.9%) are classed as machine operators and semiskilled workers. The lowest SES group, unskilled laborers and menial service, contains three families (2.7%).

Procedure

Potential subjects were identified by a neonatologist at each site based on study criteria. Families were approached by the neonatologist about one week before the infant's discharge. After briefly describing the study to the family, the neonatologist asked whether the family would be willing to be contacted by study personnel. All of the families who were approached by the neonatologist agreed to be contacted. Names of families to be contacted were sent to the project office. A letter was sent to the family that briefly described the study again and identified the interviewer who had been assigned to the family and who would be contacting them. The family was then contacted by telephone by the interviewer to ascertain whether they were interested in participating in the study, to obtain consent to go to the family's home, and to arrange a time for that

visit.

At the first visit, the interviewer reviewed the procedure for the study and answered any questions that the family might have. Both parents were then asked to sign the consent form (see Appendix A). The majority of data were collected in the home. Information about the infant's NICU stay was collected from the infant's hospital record after the first home visit by the research assistant at each site. Since the interviewers did not abstract the hospital record data and did not have access to the information collected, their knowledge of the infant's neonatal course was limited to what the families told them.

Instruments

A copy of the instruments used in this study can be found in Appendix B. The Bayley Scales of Infant Development are not included in the appendix because of copyright, but can be obtained from the Psychological Corporation. There are five exogenous variables and five endogenous variables in the conceptual model developed for the study (see Figure 1, p. 45). Four of the exogenous variables (resource availability, congruence, occupational prestige, and support from others) and one endogenous variable, beliefs and attitudes, are identified as predictors of the mother's appraisal of her employment status, an endogenous variable. Appraisal is expected to have a direct effect on two of the endogenous variables,

family functioning and mother-child interaction, and an indirect effect on the fifth endogenous variable, preterm infant development. The remaining exogenous variable, neonatal morbidity, is hypothesized to have an indirect effect, through family functioning and mother-child interaction, and a direct effect on infant development.

Measures of Model Constructs

Appraisal. The mother's appraisal of her employment status is reflected by two items on the questionnaire that were designed by the investigator. Mothers were asked to rate the degree of choice regarding their employment status and their satisfaction with that choice on a ten point scale in two separate items. These items range from 1 as "no choice" or "not at all satisfied" to 10 as "totally my choice" or "very satisfied".

Resource Availability. One of the determinants of the mother's appraisal, resource availability, is reflected by three items designed by the investigator. Mothers rated availability of child care, financial comfort and financial necessity on an eight point Likert scale ranging from "strongly agree" as 1 to "strongly disagree" as 8. The items regarding financial comfort and availability of child care were reverse scored.

Congruence. Mothers were asked to indicate what their prenatal plans for postnatal employment were in terms of the child's age when they expected to return to work and the number of hours they expected to work when they did return.

The dichotomous congruence variable was created from the mothers' recall of when they planned to return to work. Women who planned to return to work by three months of age and who were working at the first interview received a score of 1, as did women who did not expect to return by three months and who were not working by this time, indicating congruence. Women who had planned to be back to work and were not and women who had not planned to be working at three months but who were working received a score of 0, indicating incongruence.

Occupational Prestige. Occupational prestige was not assessed directly. However, mothers were asked to indicate their line of work which was classified on the Hollingshead occupational status groups, ranging from 0 (housewife) to 9 (professional). The groups were recoded to range from 1 to 10. While not providing information on specific aspects of the job such as flexibility in scheduling, hours of the day employed, etc., the Hollingshead groupings do indicate the relative social status of the jobs the mothers currently hold, a variable that was related to the decision to work in previous studies (Weil, 1961; Hiller & Philliber, 1980).

Beliefs and Attitudes. Indicators of the mother's beliefs and attitudes are hours employed and home/work orientation. While hours employed per week is not an attitude, it is often reflective of the mother's attitude toward working and mothering. Hours per week employed was asked directly with mothers supplying the exact number of

hours. For the home/work orientation scale, mothers were asked to rate 10 items on an eight point Likert scale ranging from "strongly agree" as 1 to "strongly disagree" as 8. Some of the items were taken from Hock's published scales (Hock, et al, 1984) on exclusivity of maternal care and work/home orientation, while the remainder of the items were taken from a questionnaire currently being used by Wortman and associates (1987). A factor analysis was performed which supported the extraction of one factor. Two items, "my infant needs things only I can provide" and "working makes me too tired", had low factor loadings. The scale was created by summing the remaining eight items. Cronbach's alpha for the eight item scale was 0.80.

Support from Others. The final determinant of the mother's appraisal of her employment situation is support from others. Mothers were asked to rate the four investigator-designed items regarding perceived support on an eight point Likert scale ranging from "strongly agree" as 1 to "strongly disagree" as 8. The items that reference spouse, parents, and the baby's physician were asked in the direction of support for staying home, while the "friends" item was asked as support for working. Therefore, the "friends" item was reverse scored and the items were summed to yield a scale score. The internal consistency for the four item scale was very low, 0.34. Test-retest reliability was not done; however, this may be a more appropriate measure of reliability since the support that one receives

from one person in the network is not necessarily correlated with the support received from another person in the network.

Family Functioning. The dimensions of family functioning were measured with instruments which have been widely used and for which estimates of psychometric properties are available. Family cohesion and family adaptability were measured using the FACES III, developed by Olson, Portner, and Lavee (1985). The instrument consists of 20 items. Summative scores are obtained by adding the even numbered items for the adaptability scale and adding the odd numbered items for the cohesion scale. Respondents rate each item on a 5 point scale ranging from "almost never" as 1 to "almost always" as 5. Olson et al report internal consistency coefficients of 0.77 for Cohesion and 0.62 for Adaptability. Test-retest reliability was not reported for the FACES III. Cronbach's alphas computed for the current sample are similar to those reported by Olson et al. The cohesion scale has an alpha of 0.80 and the adaptability scale has an alpha of 0.58.

The relationships dimension of family functioning was measured with the Feetham Family Functioning Survey (Roberts & Feetham, 1982). The questionnaire uses the Porter format which asks three questions about each item: a. How much is there? b. How much should there be? c. How important is this to you? Respondents rate each of the three questions for 25 items on a 7 point scale from 1 "little" to 7 "much".

A discrepancy score is then calculated by subtracting responses to (a) from (b) and adding the absolute values. The discrepancy score can range from 0 to 150, with lower scores indicating higher satisfaction with family function. Roberts and Feetham report an internal consistency coefficient of 0.81 and a test-retest reliability of 0.85 for the discrepancy score. Internal consistency reliability for this study was calculated to be 0.80. Data from question (c) were not used in this study.

Mother-Child Interaction. A summative score of ratings for five items based on the HOME (Caldwell, 1978), amount of eye contact, amount of holding during the interview, ability to comfort, responsivity to infant cry, and the amount of age appropriate toys available, was used to index mother-child interaction. At both the three and the six month visits, interviewers rated the mother on amount of time she held the baby, amount of eye contact and ability to comfort on a three point likert-type scale. Responsivity was rated on a five point scale. Amount of toys was rated on a four point scale. Because items were rated on scales with different ranges, all items were recoded on a nine point scale. Scale scores were calculated by adding the rescaled responses for the five items. Internal consistency reliability was estimated at 0.52 for the three month ratings and 0.36 for the six month ratings. Interrater reliabilities are not available since mother-child interaction was not the major focus in the larger study.

Neonatal Morbidity. The infant's neonatal morbidity is indexed by information gathered from the infant's NICU hospital record. As stated earlier, these variables include gestational age (GA), birth weight (BW), length of time on a ventilator (VENT), length of time on tube feedings (NGFED), length of time on hyperalimentation (HAL), length of time in isolette (ISOLT), length of NICU stay (LOS), amount of birth anoxia reflected by the 1 and 5 minute APGARs (APG1 and APG5, respectively), and presence of neonatal complications (COMPL). The complications included are bronchopulmonary dysplasia (BPD), intraventricular hemorrhage (IVH), necrotizing enterocolitis (NEC), apnea and bradycardia spells, retinopathy of prematurity, and hyperbilirubinemia. Weight for gestational age concordance was not included since 100 infants (90.9%) were appropriate for gestational age.

The neonatal morbidity scale was constructed from the traditional and experiential indicators. The values for the original variables were categorized based on the clinical judgement of the investigator and a nurse expert in the care of high risk newborns. The categories were ordered from lowest to highest morbidity for each variable and assigned numbers so that higher numbers indicate higher morbidity (see Table 1). The score for each of the ten items was summed. The resulting scale ranges from 6 as "lowest

 Table 1. Neonatal Morbidity Scale.

Birthweight	Complications
1=2500 gms & above	0=None
2=2000 to 2499 gms	1=One
3=1500 to 1999 gms	2=Two
4=1000 to 1499 gms	3=Three
5=less than 1000 gms	4=Four
	5=Five or Six
Gestational Age	Days on a Ventilator
1=36.0 to 36.5 wks	0=None
2=34.5 to 35.5 wks	1=1 to 3 days
3=32.5 to 34.0 wks	2=4 to 7 days
4=30.0 to 32.0 wks	3=8 to 14 days
5=27.0 to 29.5 wks	4=15 to 30 days
	5=31 days or greater
Apgar at 1 Minute	Apgar at 5 Minutes
1=9 and 10	1=9 and 10
2=7 and 8	2=7 and 8
3=5 and 6	3=5 and 6
4=3 and 4	4=3 and 4
5=0 to 2	5=0 to 2
Length of NICU Stay	Days on NG feedings
1=1 to 14 days	0=None
2=15 to 30 days	1=1 to 7 days
3=31 to 45 days	2=8 to 14 days
4=46 to 60 days	3=15 to 30 days
5=61 days or greater	4=31 to 45 days
	5=46 days or greater
Days in an Isolette	Days on Hyperalimentation
1=1 to 7 days	0=None
2=8 to 14 days	1=1 to 7 days
3=15 to 30 days	2=8 to 14 days
4=31 to 45 days	3=15 to 30 days
5=46 days or greater	4=31 to 45 days
	5=46 days or greater

morbidity" to 50 as "highest morbidity". Internal consistency reliability is estimated at 0.86 using coefficient alpha.

In order to evaluate how closely the categorized indicators represented the original data, each of the original indicators was correlated with its categorized score. The correlations ranged from 0.90 to 0.96 in absolute value. The categorized complications variable and the original complications variable are identical because none of the babies had experienced all six complications. Therefore, a perfect correlation was obtained when the relationship between the two was explored.

In addition, the inter-correlations of the original indicators were compared with those of the categorized indicators (see Table 2). Some of the correlations between pairs of original variables were negative as expected. For example, gestational age and days in the NICU were expected to be inversely related. All of the correlations between the categorized variables were positive. These changes in sign were expected, since the categorized variables were constructed so that low numbers always referred to lower morbidity and high numbers to higher morbidity.

The amount of difference between the pairs of correlations ranged from 0.001 to 0.274. Of the 45 comparisons made, only 8 of the categorized correlations were higher than the original correlations. Categorizing "days on ventilator" and "days in isolette" produced the

Table 2. Comparison of Intercorrelations for Original and Categorized Morbidity Indicators.

	GA	LOS	APG1	APG5	VENT	NGFED	HAL	ISOLT	COMPL
BW	.730 .747	-.653 .607	.024 .004	-.056 .089	-.303 .164	-.572 .544	-.303 .259	-.710 .637	-.373 .343
GA		-.745 .645	.202 .170	.205 .098	-.558 .371	-.721 .681	-.442 .386	-.836 .696	-.519 .499
LOS			-.128 .096	-.148 .099	.664 .554	.779 .636	.678 .664	.910 .636	.439 .448
APG1				.702 .604	-.107 .207	-.160 .091	-.088 .099	-.186 .085	-.120 .114
APG5					-.120 .177	-.095 .043	-.180 .152	-.178 .035	-.191 .190
VENT						.552 .395	.648 .640	.663 .507	.343 .386
NGFED							.311 .220	.820 .693	.425 .423
HAL								.590 .548	.217 .242
ISOLT									.449 .366

*Correlations for the categorized variables are below those for the original variables.

most disturbance in the correlations. The differences between six of the nine pairs of correlations for each of these two variables was 0.1 or greater. This could be due to outliers in the original variables.

Infant Outcome. Developmental status was measured with the Bayley Scales of Infant Development (BSID) (Bayley,

1969). In constructing the scales, Bayley used items from several other developmental tests. The resulting tool was administered to a sample of 1400 children between the ages of 1 and 15 months. After further refinement based on these data, the current scales were standardized on 1262 children aged 2 to 30 months recruited from different areas in the United States.

The Mental Scale has 163 items and assesses sensory-perceptual, verbal communication, and early cognitive development (object permanence, problem-solving, formation of generalizations and classification). The Motor Scale, which has 81 items, assesses the development of gross motor and fine motor control. Split-half reliabilities range from 0.81 to 0.93 for the Mental Scale (MDI) and from 0.68 to 0.92 for the Motor Scale (PDI) in previous studies (Bayley, 1969). Bayley reports the percentage of agreement on test-retest as 76.4% for the MDI and 75.3% for the PDI. Interrater reliabilities for this study ranged from 76% to 86%. Split-half reliabilities were not calculated for the current study because only the total score for each scale was entered into the dataset.

Raw scores on both scales were converted to standardized scores according to Bayley's recommendations (1969). Scores based on the infant's chronological age were used. While uncorrected scores do not take into account the child's gestational age at birth, these scores more accurately reflect the child's actual development. Since it

is developmental progress that is being explored in this study, the use of corrected scores is inappropriate because true differences in actual development may be hidden. In addition, infants "catch up" to their agemates at different rates, making it difficult to know at what age to stop correcting for prematurity.

The BSID has been widely used in research with preterm infants to describe developmental progress at the time of administration. It is used here with the same intent, that of comparing development of infants at the time of assessment. Since preterm infants as a group are generally considered to be at increased risk for developmental delay when compared to full term infants, it is important to investigate whether the mother's appraisal of her employment status places the infant at further risk in the early postnatal period.

Data Analysis

Data analysis was conducted using the Statistical Package for Social Sciences (SPSSx) version 3.0 (SPSS, Inc., 1988) except where specified. Results to be presented are organized according to the specific aims identified earlier.

Specific Aim #1

Describe differences in demographic, employment-related and attitudinal variables between women who have returned to work by the time the child is 3 months old and those who have not. The study sample was divided into three groups

based on their employment status at three months: working mothers, leave of absence mothers (LOA), and nonworking mothers. Responses of women in each group were compared using analysis of variance with Scheffe tests for post hoc comparisons. No significant differences were obtained for the demographic variables (see Table 3).

Table 3. Comparison of Demographic Variables by Employment Status using Analysis of Variance.

	Employed (<u>n</u> =40) <u>M</u> (<u>SD</u>)	Nonemployed (<u>n</u> =55) <u>M</u> (<u>SD</u>)	LOA (<u>n</u> =15) <u>M</u> (<u>SD</u>)
Mother's age	27.23 (4.04)	28.46 (5.51)	29.53 (5.66)
Father's age	29.80 (5.53)	31.22 (6.32)	31.13 (6.61)
Mother's educational category	4.68 (0.62)	4.47 (0.66)	4.93 (1.34)
Father's educational category	4.65 (0.92)	4.82 (0.88)	5.20 (1.01)
SES category (father only)	3.25 (1.08)	3.33 (0.96)	3.53 (1.06)
SES category (both parents)	3.35 (0.66)	-	-
Number of children	2.03 (1.05)	2.24 (0.98)	1.60 (0.63)
Number of reproductive failures	0.53 (1.36)	0.58 (0.96)	0.67 (0.90)

Women in the three employment groups were compared on sex of infant and on whether the pregnancy was planned.

Twenty-one employed mothers (52.5%), 28 nonemployed mothers (50.9%), and 10 leave of absence mothers (66.7%) had male infants, $\chi^2(2, 110)=1.21$, $p=NS$. For the sample as a whole, there were slightly more male infants ($n=59$) than female ($n=51$). Twenty-seven employed mothers (67.5%), 28 nonemployed mothers (50.9%), and 10 leave of absence mothers (66.7%) reported that the pregnancy was planned, $\chi^2(2, 110)=3.05$, $p=NS$. For the sample as a whole, 59.1% of the pregnancies were planned.

Mothers were asked what sort of work they usually did. The occupations that they reported were classified into nine groups according to Hollingshead's schema (Hollingshead, 1975) (see Table 4). Only 28 (50.9%) of the 55 women who were not employed identified themselves as housewives. Although not currently working, none of the leave of absence mothers identified themselves as housewives. In addition,

Table 4. Mothers' Occupational Classifications.

	Employed ($n=40$)	Nonemployed ($n=55$)	LOA ($n=15$)
Housewives	-	28	0
Farm laborers/mental service	0	0	0
Unskilled workers	1	1	2
Machine operators, semiskilled	8	4	1
Skilled manual, craftsmen	3	4	4
Clerical, sales	12	6	1
Technicians, Semiprof.	9	8	2
Managers, Minor prof.	4	3	3
Administrators, lesser prof.	2	1	1
Higher executives, major prof.	1	0	1

for mothers who gave their occupation as something other than housewife, 40% ($n=16$) of the employed mothers, 44.4% ($n=12$) of the nonemployed mothers, and 46.6% ($n=7$) of the LOA mothers reported jobs higher than clerical and sales.

On employment related variables, significant differences across groups were obtained (see Table 5). Mothers who were employed or on a leave of absence postnatally worked more hours per week prenatally than mothers who were not employed postnatally, $F(2, 106)=29.8$, $p<.00005$. The difference between employed and leave of absence mothers was not significant. In addition, there was a significant association between prenatal employment status and postnatal status, $\chi^2(2, N=109)=28.05$, $p<.00005$. Thirty nine (97.5%) of the employed mothers, 30 (55.6%) of the nonemployed mothers and 15 (100%) of the leave of absence mothers were employed prenatally.

The mothers were asked about their prenatal plans for working after the baby's birth. Of the women who said they planned to return to work at some point, employed mothers planned to return to work sooner, $F(2, 69)=7.59$, $p=.001$, than the nonemployed mothers. In addition, employed and leave of absence mothers reported plans to work more hours postnatally than nonemployed mothers who planned to return at some point, $F(2, 68)=4.60$, $p=.01$.

Significant differences were obtained when the groups were compared on determinants of appraisal (see Table 5). Resource availability was measured with three items

Table 5. Comparison of Employment Related Variables by Employment Status using Analysis of Variance.

	Employed (<u>n</u> =40) <u>M</u> (<u>SD</u>)	Nonemployed (<u>n</u> =55) <u>M</u> (<u>SD</u>)	LOA (<u>n</u> =15) <u>M</u> (<u>SD</u>)
Hrs. employed prenatally	39.43 ^a (11.61)	17.72 ^{ab} (17.87)	38.67 ^{b****} (4.05)
Not financially necessary to work (range=1-8)	5.93 ^a (2.34)	3.64 ^a (2.64)	4.67 ^{***} (2.77)
Money is tight (range=1-8)	2.95 (2.11)	3.98 (2.86)	2.80 [*] (1.47)
Child care available (range=1-8)	3.88 (2.79)	5.15 (2.67)	5.33 [*] (2.74)
Prenatal plans ¹ :			
When return (baby's age in months)	2.95 ^a (1.89)	12.36 ^a (15.75)	7.00 ^{***} (4.49)
Number of hours (per week)	34.56 ^a (10.56)	23.77 ^a (16.00)	30.54 ^{**} (14.32)

Fairs of letters indicate significantly different pairs on post hoc testing.

Significance levels for F tests:

* $p < .10$ ** $p < .01$ *** $p < .001$ **** $p < .00005$

¹Only women who planned to return are included.

regarding financial necessity, financial comfort, and availability of child care. Ratings of 1 to 4 indicate agreement with the statement, while ratings of 5 to 8 indicate disagreement. Employed mothers disagree with the statement that "It is not financially necessary for me to work outside the home." Nonemployed mothers agreed with the

statement, while leave of absence mothers were in between the other two. While mothers in all three groups agreed that money was tight, the trend was for employed and leave of absence mothers to agree more strongly. Employed mothers agreed that child care was available while nonemployed and leave of absence mothers disagreed, a difference that approached significance.

Congruence between prenatal plans and actual postnatal employment status was investigated. Twenty-nine (72.5%) of the employed women had planned to be working by the time the child was three months old. Forty-seven (85.5%) of the nonemployed women had planned to be nonemployed at the three month birthday. Only three (20%) of the leave of absence women had planned to be working by this time. There was a significant association between prenatal plans and actual behavior at three months, $\chi^2(2, N=110)=35.6, p<.00005$. Since neither group was working, leave of absence women were combined with nonemployed women to look at agreement between plans and actual behavior. Cohen's Kappa showed a moderately strong agreement between prenatal plans and actual behavior, $k=0.57$. OSIRIS.IV was used to calculate Cohen's Kappa (Survey Research Center, 1986).

Comparisons were made across groups regarding the mother's beliefs and attitudes about working and mothering. Employed ($M=33.38, SD=12.23$) and leave of absence ($M=31.36, SD=13.74$) mothers expressed a significantly higher work orientation than nonemployed mothers ($M=21.98, SD=10.73$),

$F(2,100)=11.19$, $p<.00005$. In addition, employed ($M=6.13$, $SD=1.62$) and leave of absence ($M=6.2$, $SD=2.15$) mothers had a significantly higher occupational prestige score than nonemployed mothers ($M=3.49$, $SD=2.76$), $F(2, 107)=17.93$, $p<.00005$). This is due in part to the 28 nonemployed women who identified themselves as housewives, since the indicator for occupational prestige is the Hollingshead groupings and housewives are rated "1", the lowest on the scale. When women who identified themselves as housewives were omitted, the differences were no longer significant, $F(2, 79)=0.03$.

The last exogenous determinant of appraisal is perceived support from others regarding the mother's employment status. Three of the four items were stated in the direction of support for staying home. The "friends" item was worded as support for working outside the home and was reverse scored. Significant differences were obtained for only one item, what the husband/partner thinks, $F(2,107)=3.30$, $p=.04$. On post hoc testing, however, no group was significantly different than another. Ratings of 1 to 4 indicate agreement, while ratings of 5 to 8 indicate disagreement. Mothers agreed that their friends thought they should stay home ($M=3.29$, $SD=2.22$) but disagree that their parents ($M=5.14$, $SD=2.68$), husband ($M=4.7$, $SD=2.44$), and the baby's doctor ($M=6.99$, $SD=2.06$) advocated staying home. When groups were compared on scores for the summative support scale, significant differences were obtained. Employed mothers ($M=21.9$, $SD=4.76$) perceived more support

for working than nonemployed mothers ($M=18.85$, $SD=5.84$), $F(2,105)=3.74$, $p=.03$. The mean for leave of absence mothers ($M=19.8$, $SD=4.95$) was not significantly different from the means for the other two groups.

Appraisal was measured with two items regarding choice and satisfaction on a 10 point scale. Employed mothers reported having less choice about their decision to work or to stay home ($M=5.08$, $SD=3.63$) than nonemployed mothers ($M=8.76$, $SD=2.45$), $F(2,107)=17.69$, $p<.00005$. The mean for the leave of absence group ($M=7.07$, $SD=2.89$) fell between the other two groups and was not significantly different than either employed or nonemployed mothers. In addition, employed mothers ($M=6.35$, $SD=2.89$) and leave of absence mothers ($M=6.87$, $SD=2.90$) were less satisfied with their decision than nonemployed mothers ($M=8.75$, $SD=1.96$), $F(2,107)=11.76$, $p<.00005$. Means for all three groups on both choice and satisfaction were above the midpoint of the scale.

No significant differences were obtained when mothers in each group were compared on ratings of mother-child interaction at three and six months. The mother-child interaction scale has a possible range of 5 to 45, with lower scores indicating better mother-child interaction. At three months, means ranged from 9.91 ($SD=3.50$) for the employed group to 10.20 ($SD=5.45$) for the nonemployed group to 12.21 ($SD=6.65$) for the leave of absence group. At six months, the means were 8.86 ($SD=3.65$), 9.19 ($SD=3.88$) and

10.18 ($SD=5.38$) for the employed, nonemployed, and leave of absence mothers respectively.

Unfortunately, the data for the items used to construct the mother-child interaction scales were skewed. Therefore, the items were recoded as dichotomous variables. A score of one was retained for mothers who were originally rated as "1". All other ratings except "unable to assess" were given a score of two. The recoded items were then summed. The resulting distribution of scores was less skewed for both three and six month mother-child interaction. However, the differences on the three month and six month scales between groups remained nonsignificant, $F(2, 107)=0.70$ and $F(2,79)=1.20$, respectively. In light of the improved distribution for the categorical scales, they were used instead of the original scales for the other analyses to be described.

Mothers in each group were compared on the indicators of family function: cohesion, adaptability, and relationships. There were no significant differences across groups on any of the indicators. Mothers in each group scored high on adaptability, with means of 30.28 ($SD=5.38$), 30.73 ($SD=6.41$), and 31.57 ($SD=4.64$) for employed, leave of absence and nonemployed mothers respectively. The means for cohesion also were slightly high, ranging from 38.2 ($SD=8.53$) for leave of absence mothers to 40.7 ($SD=5.91$) for nonemployed mothers to 40.83 ($SD=5.26$) for employed mothers. The relationships dimension has a possible range of 0 to

150, with lower numbers indicating less discrepancy between real and ideal. Means were 25.19 (SD=12.6) for nonemployed mothers, 26.60 (SD=11.87) for leave of absence mothers, and 27.68 (SD=13.05) for employed mothers.

Specific Aim #2

Describe differences between preterm infants with working and nonworking mothers on indicators of morbidity in the neonatal period and of growth and development at three and six months of age. In order to address the second goal of the study, the sample again was divided into three groups based on the mother's employment status at three months. The infants in each group were compared on indicators of infant morbidity and of infant development (see Table 6). Analysis of variance with Scheffe tests for post hoc comparisons was used to detect significant differences regarding gestational age, birth weight, 1 and 5 minute APGAR scores, length of NICU stay, length of time receiving mechanical ventilation, hyperalimentation, and tube feedings, length of time in an isolette, number of complications of prematurity present and scores on the Bayley mental and motor scales at three and six months chronological age. No significant differences were obtained.

Chi square tests were performed to investigate whether employment status is associated with the presence of hyperbilirubinemia, mechanical ventilation, IVH, NEC, BPD,

 Table 6. Comparison of Infants on Indicators of Neonatal Morbidity and of Growth and Development.

	Employed (n=40) <u>M</u> (<u>SD</u>)	Nonemployed (n=55) <u>M</u> (<u>SD</u>)	LOA (n=15) <u>M</u> (<u>SD</u>)
Gestational age (wks)	32.64 (2.22)	32.66 (2.49)	32.40 (2.29)
Birthweight (gms)	1841.93 (545.41)	1788.64 (552.42)	1613.67 (350.48)
Birth anoxia			
1 minute APGAR	6.73 (1.83)	6.53 (1.74)	6.53 (1.81)
5 minute APGAR	8.20 (1.11)	8.16 (1.05)	8.33 (0.98)
Length of stay (days)	31.43 (16.81)	30.96 (15.24)	34.60 (21.00)
Days on ventilator	5.33 (8.82)	5.22 (9.30)	5.67 (12.06)
Days on tube feedings	19.36 (14.91)	19.24 (14.28)	20.07 (18.39)
Days on hyperalimentation	6.83 (12.60)	4.09 (8.22)	8.40 (13.37)
Days in isolette	21.90 (13.62)	22.63 (14.00)	24.47 (19.25)
Number of complications of prematurity	1.90 (1.08)	2.09 (0.70)	1.93 (1.10)
Bayley scores:			
3 month mental	86.18 (15.45)	83.89 (17.13)	82.53 (15.82)
3 month motor	95.95 (24.78)	90.78 (22.73)	93.40 (26.01)
6 month mental	77.17 (15.10)	83.73 (16.84)	79.92 (17.24)
6 month motor	85.62 (13.26)	85.83 (12.08)	81.92 (17.09)

apnea and bradycardia episodes, home apnea monitoring and type of delivery (see Table 7). None of the chi squares calculated was significant.

Table 7. Categorical Comparisons of Babies across Employment Groups (Frequency Counts).

	Employed (n=40)	Nonemployed (n=55)	LOA (n=15)
Hyperbilirubinemia	34	53	12
Mechanical ventilation	27	29	6
Intraventricular hemorrhage	4	5	3
Necrotizing enterocolitis	1	0	0
Bronchopulmonary dysplasia	2	1	2
Apnea/bradycardia spells	30	45	11
Patent ductus arteriosus	5	11	1
Hyperalimentation	18	23	7
Home apnea monitor	26	33	11
Caesarian section	22	33	8

Specific Aim #3

Identify factors that mediate the relationship between maternal employment status and infant developmental outcomes at three and six months of age, such as the mother's appraisal of her employment status and the quality of interactions between mother and infant and among family members. In order to evaluate the effect of controlling for specific variables, zero order correlations between the number of hours that the mother works and the infant's three month and six month scores on the Bayley mental and motor scales were calculated. Hours worked was weakly correlated with three month scale scores, $r=0.083$, $p=NS$ and $r=0.1366$, $p=.08$ for the mental and motor scales, respectively, and with six month scale scores, $r=-0.174$, $p=.06$ and $r=-0.0667$,

$p=NS$, respectively. Only the correlations between the number of hours worked at three months and the three month motor scale and the six month mental scale approached significance.

Partial correlations were calculated in order to further investigate the effect of working on the infant's development. Variables identified as control variables are those that lie between hours worked and developmental outcomes in the causal model. Control variables include degree of choice and satisfaction regarding the employment status decision, mother-child interaction categorical scale, and indicators of family functioning, the cohesion, adaptability, and relationships scales.

None of the zero order correlations between hours worked and developmental outcomes were significant at the 0.05 level (see Table 8). Controlling for the indicators of appraisal, mother-child interaction, and family functioning did not change any of the correlations for three month mental and six month motor scores enough to raise the first order correlations to the level of significance. Therefore, the finding of no relationship between hours employed and three month mental and six month motor development remains.

Controlling for cohesion, adaptability, relationships, and mother-child interaction for the three month motor scale produced first order correlations that were essentially unchanged from the zero order relationships. In addition, controlling for cohesion and mother-child interaction for

Table 8. Relationship between Hours Worked and Developmental Outcomes Controlling for Choice, Satisfaction, Cohesion, Adaptability, Relationships and Mother-Child Interaction.

	Zero Order Correlations	
	Hours worked with:	
	Mental	Motor
At 3 months (N=110)	.0830	.1366*
At 6 months (N=82)	-.1740*	-.0667

Control Variable	First Order Correlations	
	Hours worked with:	
	3 mo. Mental (N=110)	3 mo. Motor (N=110)
Choice	.1099	.1844**
Satisfaction	.1251*	.1622**
Cohesion	.0833	.1369*
Adaptability	.0756	.1313*
Relationships	.0740	.1317*
Mother child interaction	.0828	.1330*

Control Variable	Hours worked with:	
	6 mo. Mental (N=82)	6 mo. Motor (N=82)
Choice	-.1194	-.0241
Satisfaction	-.1309	.0246
Cohesion	-.1739*	-.0665
Adaptability	-.1921**	-.0780
Relationships	-.1723*	-.0688
Mother-child interaction (3 months)	-.1756*	-.0644
Mother-child interaction (6 months)	-.1795*	-.0666

* $p < .10$ ** $p < .05$

the six month mental scale also resulted in very small changes from the zero order correlations. Therefore, these variables have little effect on the nonsignificant

relationship between hours employed and mental and motor development at three and six months.

At three months, controlling for choice and satisfaction strengthened the relationship between hours worked and motor development, producing a significant first order correlation. While choice and satisfaction had suppressor effects at three months, controlling for each at six months decreased the magnitude of the correlation between hours worked and the mental score, suggesting that choice and satisfaction mediate the effects of employment on development. This finding is consistent with the underlying hypothesis of the study. Since the zero order correlation with the mental score only approached significance, the decrease in its first order correlation must be interpreted with caution. Adaptability has a suppressor effect at six months, resulting in a statistically significant first order correlation for the mental scale.

Partial correlations were then calculated controlling for choice, satisfaction, cohesion, adaptability, relationships, and mother-child interaction as a group. The resulting sixth order correlation between hours worked and the three month mental scale, $r=.105$, $p=NS$, and between hours worked and the three month motor scale, $r=.176$, $p=.05$, were higher than the zero order correlations. However, the sixth order correlations calculated between hours worked and six month Bayley mental and motor scores were lower than the zero order correlations, $r=-.14$, $p=NS$ and $r=-.02$, $p=NS$.

Specific Aim #4Test the fit of the causal model to the data.

Structural modeling techniques using LISREL VI (Joreskog & Sorbom, 1986) were used to test the fit of the proposed model to the data (see Figure 2). However, the model contained too many parameters given the number of cases available to be tested as pictured. Bentler and Chou (1988) recommend a minimum of 5 to 10 cases per free parameter. In order to improve the parameters to cases ratio, scales, rather than individual indicators, were used for the neonatal morbidity, support from significant others and mother-child interaction latent variables. A description of these scales was provided earlier in this chapter under "instruments". The categorical version of the mother-child interaction scale was used. The actual LISREL model tested is pictured in Figure 3. The parameters for all paths connecting a single indicator to a latent variable were fixed at 1.0. This resulted in 52 parameters which LISREL needed to estimate, giving 2.1 cases per parameter.

Since many different models could be estimated with the same data, it is important to assess how well the tested model represents the original data, that is, the fit of the model. Fit of a model to the data is determined by the fit statistics calculated by LISREL as well as by the actual parameters estimated. Three measures of fit are available directly from the output. The first is the X^2 goodness of fit statistic. Since the object is for the model to

Figure 2. Full LISREL Model

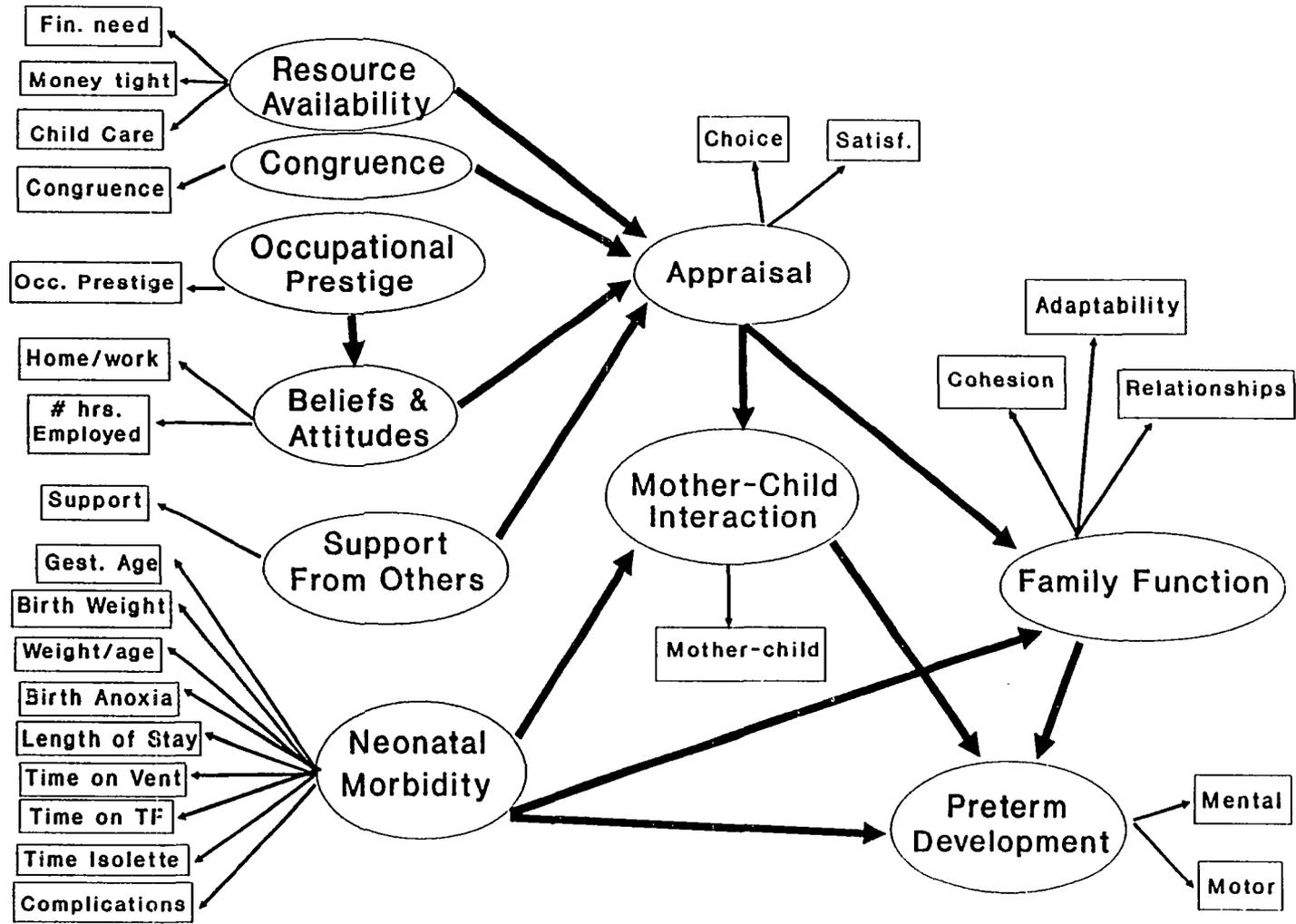
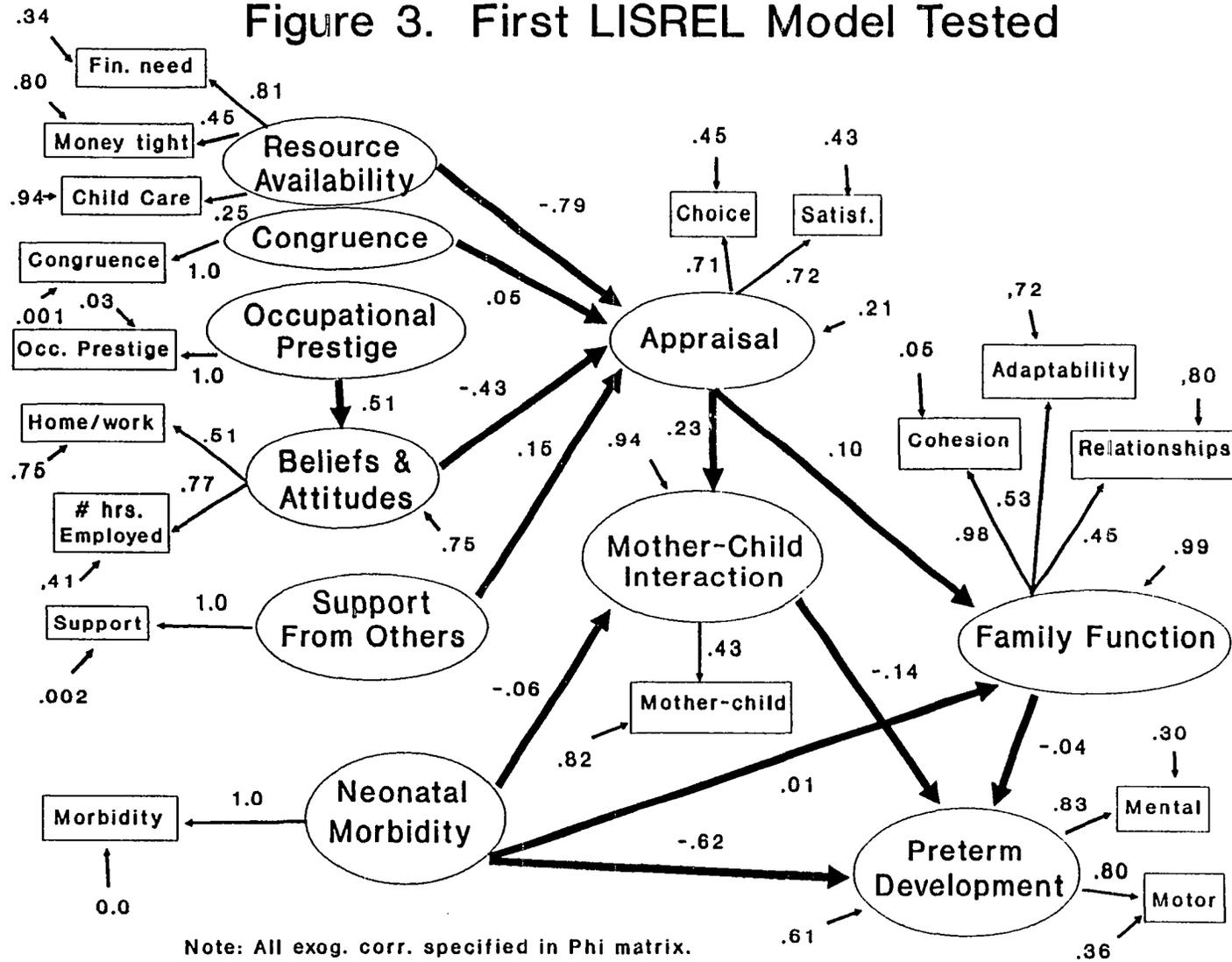


Figure 3. First LISREL Model Tested



Note: All exog. corr. specified in Phi matrix.

represent the data as closely as possible, a nonsignificant χ^2 indicates good fit. Although chi square's sensitivity to sample size makes obtaining a nonsignificant value difficult with large samples, Wheaton (1987) suggests that χ^2 may be appropriately used with samples of about 100.

The second measure of fit is the goodness of fit index (GFI). The value for the GFI varies between zero and one, with fit improving as the value approaches one. The last measure calculated by LISREL is the adjusted goodness of fit index. This measure is the GFI adjusted for the degrees of freedom in the model (Joreskog & Sorbom, 1986).

In addition to fit statistics, the parameters should be inspected to detect impossible values or signs that are opposite in direction from that expected. Obtaining a negative variance is an example of an impossible value. If the signs are opposite from what is expected, it may mean a theoretical misspecification or an error in the programming instructions. Problems of this type must be addressed despite what the GFI might indicate about the fit of the model.

When the proposed model was tested, a negative variance (-0.002) was obtained for the error term (θ_{δ}) for the indicator of the morbidity construct. Since this latent variable had a single indicator which was fixed to 1.0 and since the value obtained was very close to zero, the θ_{δ} for the morbidity indicator was fixed to zero in a subsequent run. This change decreased the number of

parameters to be estimated by one. The $\chi^2(102, N=110)$ was 142.25, $p=.005$. The GFI was 0.877, with an adjusted GFI of 0.815. The parameter estimates obtained for the model are depicted in Figure 3. The correlations of the latent exogenous variables are in Table 9.

Table 9. Intercorrelations of the Latent Exogenous Variables.

	Resource	Congruence	Occupational Prestige	Support
Resource	1.000			
Congruence	-.216	1.000		
Occupational Prestige	.146	-.237	1.000	
Support	.360	-.075	.216	
Morbidity	.141	-.066	-.007	<-.0005

Further modifications to the model were made in an attempt to improve the fit of the model to the data. There are several ways to do this. First, one can inspect the modification indices that LISREL calculates for fixed parameters. The modification index suggests the amount of strain LISREL experienced by not being able to estimate a particular parameter. If theoretically sound, fit of the model can be improved by freeing the parameter in a subsequent run. If the parameter for a particular path is very low, a second way to improve fit is to fix that parameter to zero. This is the same as saying that there is no direct relationship between the two variables.

The highest modification index obtained for the second

model tested suggests a direct path from resources to beliefs and attitudes. While not originally specified, a direct effect of resources on beliefs and attitudes about working and mothering makes sense conceptually. With hours employed as a strong indicator of beliefs and attitudes, including this path in the model can be supported by the work of Gordon and Kammeyer (1980) who found a moderately strong relationship ($r=-.46$) between the father's income and the mother's employment status.

Adding the path from resources to beliefs and attitudes increased the number of estimated parameters by one, but improved the fit of the model by almost 12 points for a one degree of freedom change, $\chi^2(101, N=110)=130.88, p=.024$. This represents a significant improvement in fit. In addition, the GFI increased to 0.886 from 0.877. Unfortunately, while the fit improved, three negative theta deltas were obtained. All three were for single indicator variables (congruence, occupational prestige and support from others) and all three were close to zero ($-.001, -.01, -.001$, respectively).

Two changes were made in the next run in an attempt to further improve the fit of the model to the data. Since three theta deltas were negative and close to zero, they were fixed to zero. The second method described above for identifying possible model modifications, looking for weak paths, was used to select the changes to be made. In examining the correlations among the latent exogenous

variables, it was noted that the relationship between morbidity and each of the other exogenous variables was small. The correlations were: resource, $r=.137$, congruence, $r=0.066$, occupational prestige, $r=-.007$, and support, $r<.0005$. Therefore, these paths were set to zero.

When these changes were made, the $X^2(108, N=110)$ increased slightly to 132.96. Since the degrees of freedom also increased by seven, the significance level rose, $p=.052$. While the change in X^2 is not significant for a 7 degree of freedom change, the fact that the significance level rose suggests that the changes should be retained. In addition, these modifications decreased the number of parameters to be estimated to 45, bringing the number of cases per parameter to 2.4.

Modification indices were not helpful in determining further changes to improve fit. The two highest indices suggested paths that were not defensible conceptually. For example, the highest index suggested that the home vs. work orientation scale be placed as an indicator of family function. In addition, occupational prestige would have had a direct effect on mother-child interaction if the modification suggested by the next highest index would have been made.

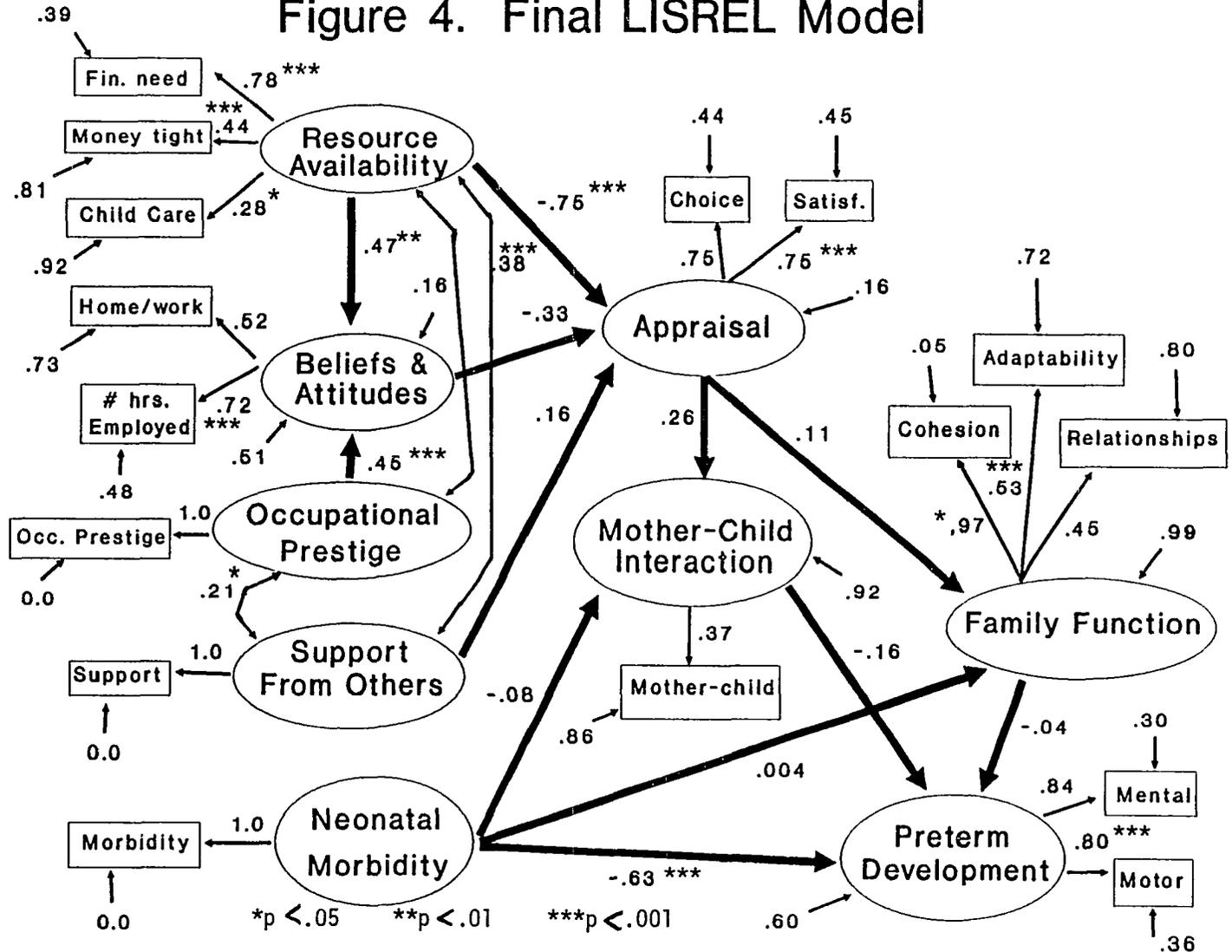
Instead of adding paths that were not conceptually sound, the parameters were examined in order to identify which paths could be fixed at zero. Several weak paths exist; however, some are of major interest in the study and

are based on previous theory and research. Wheaton (1987) suggests that leaving paths in the model in this case is standard practice. Specifically, the paths from morbidity to both mother-child interaction and family functioning and the paths from mother-child interaction and family functioning to developmental outcomes are very weak, and consequently nonsignificant. While they could be set to zero to improve the fit of the model, the fact that the parameters are so low is of substantive interest. In addition, since the model will be tested with developmental outcomes measured at 9, 12 and 18 months, it is important to retain them so that any change in the magnitude of the path coefficients over time can be investigated.

Weak paths that are not as central to the model are those involving the exogenous latent variable congruence. The parameter for the path from congruence to appraisal is very low, 0.045. In addition, its correlations with the other exogenous variables are weak also (resource, $r=-.201$, occupational prestige, $r=-.231$, and support, $r=-.074$). Therefore, the congruence variable was dropped from the model, which resulted in an improvement in fit, $\chi^2(95, N=110)=110.98$, $p=.126$, GFI=.895. This final model is depicted in Figure 4.

Evaluation of the final model. Once an acceptable model has been defined, the parameters can be evaluated for quality of explanation. For the most part, the indicators

Figure 4. Final LISREL Model



are well connected to the latent variables. The exceptions are child care, money tight, mother-child interaction, and relationships. The residuals on the endogenous variables can be thought of as unexplained variance of the endogenous variables. Two endogenous variables, beliefs and attitudes and appraisal, are well explained by their predictors. Infant development is the next best explained, although the residual is high. Mother-child interaction and family functioning are very poorly explained by the model.

In order to understand the impact that each latent variable has on the outcome variable, preterm development, total effects for each were calculated (see Table 10).

Table 10. Direct, Indirect and Total Effects of each Latent Variable on Preterm Infant Development.

Latent Variable	Direct	Indirect	Total Effects
Resource	.0	.2066	.2066
Occupational Prestige	.0	.0068	.0068
Support	.0	.0074	.0074
Beliefs & Attitudes	.0	.0152	.0152
Appraisal	.0	.0460	.0460
Mother-Child Interaction	.16	.0	.1600
Family Functioning	.04	.0	.0400
Morbidity	.63	.0130	.6430

Total effects are a result of the direct and indirect

effects in the model (Pedhazur, 1982). As might be expected at such a young age, neonatal morbidity has the greatest impact on the infant's developmental outcomes at three months. Availability of resources has the next largest total effects, with mother-child interaction having the third greatest effects. The total effects for each of the other latent predictors are very small.

CHAPTER V

DISCUSSION

The purpose of this study was to describe the relationship between variables related to the mother's employment status and the preterm infant's developmental progress at three and six months chronological age and to test a conceptual model developed to explain the process by which maternal employment may affect the child. Four aims were identified for the study which were used to guide the analysis. The discussion of the results also will be organized according to the specific aims identified.

Discussion of the Results

The first aim was to describe differences in demographic, employment-related and attitudinal variables between women who have returned to work by the time the child is 3 months old and those who have not. Although the analysis plan called for two groups of mothers, working and non-working, some mothers described their employment status as "leave of absence". Rather than putting these women into one of the other categories or excluding them from the analysis, a third group was formed. While this approach is different than that used in previous studies, it is consistent with the premise of the study that how the mother appraises her employment situation is of more importance

than the actual number of hours she is employed outside the home.

When compared on demographic variables, employed, nonemployed, and leave of absence women did not differ significantly on mother's age or education, socioeconomic status, and number of children. These findings are consistent with those of other studies (Eggebeen, 1988; Greenstein, 1986; Hock, et al, 1984; McLaughlin, 1982; Smith-Lovin & Tickamyer, 1978; Safilios-Rothschild, 1970; Weil, 1961). In addition, families across groups did not differ on the father's age or education, number of years living together, or number of reproductive failures.

Significant differences were obtained across groups on many of the employment related variables. More employed and leave of absence mothers worked prenatally compared to nonemployed mothers. Employed mothers worked more hours prenatally and planned to return to work sooner and for more hours postnatally than nonemployed mothers. Employed mothers were more work oriented than nonemployed mothers. These findings are consistent with previous research which explored reasons why some mothers work and why others do not (Weil, 1960; Smith-Lovin & Tickamyer, 1978; Gordon & Kammeyer, 1980; McLaughlin, 1982; Ferree, 1976; Hock et al, 1984; Molm, 1978; Greenstein, 1986).

Nonemployed mothers felt that it was not financially necessary for them to work outside the home, while employed mothers felt their employment was financially necessary.

Employed mothers tended to agree that money was tight and that acceptable child care was available. Nonemployed mothers felt they had more choice about their employment status and were more satisfied about their decision than employed mothers.

Several investigators have looked at the impact that financial necessity, based on the husband's income, has on the mother's employment status. As noted earlier, their results are conflicting. Results from this study cannot help clarify the issue. Differences in income across groups were not investigated in the current study because the data available regarding income referred to total family income without delineating each parent's contribution. However, the differences obtained regarding perceived financial necessity and financial comfort for employed and nonemployed mothers suggests that perceptions, rather than the actual income, may play a significant role in the mother's decision process, especially for women in middle class families.

The finding that working women in this study reported more financial need and less choice about their employment may be influenced by social desirability. The infants in the study were sick in the newborn period. In addition, they were young, only three months old, at the time of data collection. It may be that mothers in this situation who want to work receive more support and fewer sanctions when attributing their employment to financial necessity, rather than to their desire for outside employment. The findings

that working mothers perceived both more financial necessity to work and more support for working than nonemployed mothers provides some support for this hypothesis. Thus, it is difficult to know whether financial necessity influenced the decision to work or whether the desire to work affected the women's perceptions of their families' financial situations.

Leave of absence mothers seem to have some conflicting beliefs and attitudes. On some of the variables, leave of absence women were more closely aligned with employed women. For example, women in these two groups did not differ on home vs. work orientation nor on the number of hours they planned to return to work postnatally. In other instances, the leave of absence mothers were more like the nonemployed mothers. For example, women in these two groups tended to believe that quality child care was not available for their child. Several questions about these mothers can be raised. Why do some mothers who are not currently working identify their employment status as nonemployed and others as leave of absence? Do leave of absence women feel more ambivalent about their decision to stay home? Does a leave of absence classification help these women to deal with wanting to work but staying home for the child?

The issue regarding the effects of social desirability also can be raised with leave of absence women. On many work related variables, the mean for the leave of absence group fell between the means for the other two groups. Are

these women more sensitive to the prevailing societal norms? Their responses to the work-related items may have been influenced by what they believe women are expected to say. It may be that these women would prefer to stay home, but feel that they are expected by society or by significant others to return to work.

Mothers in the three groups did not differ on indicators of mother-child interaction or family function. That there was no difference across groups on mother-child interaction is consistent with previous work. Schubert et al (1980) obtained differences on mother-child interaction measures between the groups in the first eight minutes of the observational period, but found that the differences disappeared by the last four minutes. Zaslow, et al (1985) found no differences on maternal behaviors when the fathers were present; however, differences were apparent when the fathers were not present. While Cohen (1978) found differences between groups, they disappeared when controlling for family structure. The conditions under which the differences were not observed are especially pertinent to the current study for three reasons. First, observation of the mother-child interaction took place over a period of several hours. Second, fathers were always present during the three month interview and often during the six month interview. Third, all of the families in the current study contained a parental dyad, with the majority of these dyads being married.

The distribution of scores for mother-child interaction was highly skewed in favor of good mother-child relationships. This is consistent with previous research which has found no detrimental effects of prematurity on mother-child interaction for healthy preterms (Minde, et al, 1983; Greene, et al, 1983).

The lack of differences across groups on mother-child interaction also may represent the increased salience of the maternal role that Hock et al (1984) described during the first three months postpartum. If maternal employment does affect the mother-child relationship as some suggest, it may be that its impact is softened in the early months by this honeymoon period.

The mean scores on family adaptability and cohesion are above the midpoints for each scale. Olson, et al (1985) suggest cut points for each dimension for different types of families. Since cut points for families with new babies are not reported, scores for these families must be compared with the "all stages" category. The families in this study would be classified as "separated" on the cohesion dimension, which is considered to be a normal or healthy degree of cohesion. However, their high mean on adaptability places them in the "chaotic" group. According to Olson and McCubbin (1982), chaotic families are less functional than families who score midrange on the adaptability dimension. This perspective has been challenged by Beavers and Voeller (1983), who believe that

adaptability is a linear rather than a curvilinear process. Indeed, in families with a three month old infant, being very flexible may be more appropriate considering the changing needs and patterns of behaviors characteristic of infants at that age.

The second aim was to describe differences between preterm infants with working and nonworking mothers on indicators of morbidity in the neonatal period and of growth and development at three and six months of age. The purpose behind looking at differences in level of morbidity was to see whether mothers with sicker babies tended to stay home rather than return to work. Again, the three groups were compared. The lack of significant differences across employment groups suggests that the mother's employment decision was not a result of the infant's level of morbidity. This conclusion should be considered tentative for two reasons. First, logistic regression, a more powerful technique which would have directly investigated the impact of the infant's neonatal morbidity on the mother's employment status, was not used since predicting the mother's employment group was not the main focus of this study. In addition, the relative homogeneity of the sample regarding level of morbidity may obscure the effect of the infant's neonatal health status on the mother's employment decision.

It is interesting to note that women in the LOA group had infants with a lower mean birth weight and a slightly

longer average length of stay in the NICU. Although the differences were not statistically significant, the lower means suggest that the women in this group had sicker infants than women in the other groups. As noted earlier, this group of women seems to experience more conflict between their attitudes toward working and their attitudes about mothering. Did the infant's prematurity and compromised health status tip the balance between these conflicting attitudes for LOA women? Did these women delay their return to work because of their infants' health status? If so, the lack of congruence between wanting to work and feeling the need to stay home may have a bigger influence for LOA women than for the nonemployed mothers, especially in conjunction with the seemingly increased morbidity.

Comparison of this study's findings regarding neonatal morbidity with previous research does not help to clarify the issue since only one study was found that investigated the effects of maternal employment on preterm infants (Cohen, 1978). Cohen compared the infants in the two groups (employed and nonemployed mothers) on two indicators of morbidity, birth weight and length of stay. Differences between groups were reported for birth weight but not for length of stay. While Cohen's birth weight finding is contrary to that obtained in the current study, the difficulties that Cohen had regarding small sample size and the confounding of employment status with marital status

were not a problem in the current study. These methodologic differences could account for the discrepant findings.

In addition, babies in each group were compared on developmental indicators at three and six months of age. Differences across groups were not significant. This finding suggests that maternal employment may not have a negative effect on the child's development. However, negative effects cannot be ruled out, since developmental testing was done at a very early age. It may be that negative (or positive) effects are not manifested until some time in the future.

The third aim for the study was to identify factors that mediate the relationship between maternal employment status and infant developmental outcomes at three and six months of age. Variables that were hypothesized to lie between hours per week employed and the child's developmental outcomes were used as control variables in the partial correlations. Both zero order and first order correlations between hours worked and infant outcomes were weak. None of the zero order and only three of the first order correlations were significant.

Controlling for choice and satisfaction at three months strengthened the positive correlation between hours employed and motor development. This suggests that when choice or satisfaction is held constant, preterm infants experience more motoric stimulation as the number of hours their mothers work increases. Several hypotheses can be posed to

explain this relationship. First, it may be that the mother's employment outside the home increases the amount of contact the father has with the infant. Second, it may be that mothers who work play with their babies more because they need to plan time to do so, while nonworking mothers do not. Third, it may be that having an alternative caregiver during part of the day increases the amount of motoric stimulation for the baby, since both mother and caregiver could provide the needed attention. Fourth, questions can be raised about the effect of working on the type of play in which mothers engage. It has been noted that mothers and fathers play with their infants in very different ways, with fathers engaging in more gross motor play (Ruble, 1984). Is this style difference related to the parent's gender or to the parent's sex role identity? Does working outside the home affect the woman's role identity so that rough and tumble play becomes more satisfying? Or are women who engage in motoric play more likely to work outside the home? Lastly, the finding could be an artifact of the measurement instrument, since the relationship between employment and development at six months is in the opposite direction.

While three of the partial correlations were significant where the zero order correlations were not, the changes in the relationships were small. This finding suggests that the control variables have little effect on the relationship between hours employed and infant developmental outcomes at three and six months of age. It

may be that factors other than those in the model mediate the relationship, such as quality of child care and characteristics of the infant (for example, temperament, personality). It also may be that the developmental measure used was not sensitive to the types of changes that occur when the mother works.

The fourth aim was to test the fit of the causal model to the data. The original model was tested and modified to arrive at a model that adequately represents the data. The latent variable that had the highest total effects was neonatal morbidity. While availability of resources and mother-child interaction had the next highest total effects, these effects were much lower than those for neonatal morbidity. The remaining latent variables had very weak effects on infant development at three months.

That morbidity had the greatest effects on preterm infant development at three months is not surprising. It is reasonable to expect that the NICU experiences would have a stronger effect at this point than other variables. However, it also is reasonable to expect that this influence will diminish over time and that the influence of the child's home environment will become more and more important.

Congruence was dropped from the final model because doing so improved the fit of the model. However, the basic underlying premise of the study was that negative effects on the infant will occur when the mother's attitudes and

behaviors regarding employment are incongruent. There are several possible explanations for the improved fit when congruence was dropped. First, it could be due to the fact that congruence is a dichotomous variable. This reduced range can diminish the correlations and underestimate the true relationships. Perhaps measuring the concept directly on a scale with more range rather than creating a dichotomous variable would yield a more useful measure. Second, for most of the women in the study, employment status was congruent with their planned employment status at three months. Perhaps this variable was measured too late, after the time during which the women resolved their conflict. It also may be that having a healthy preterm does not alter the mother's plans significantly. Finally, it may be that the effect of congruence on development is not manifested until later in the child's life. Perhaps the impact of congruence will be greater when the effects of the NICU diminish. In addition, if these mothers do experience a honeymoon period during the first few months, the impact of incongruence may be suppressed during this time.

Study Limitations

Three limitations of the study are apparent. First, the sample is small for the use of structural modeling techniques. The recommendation of five to ten cases per parameter to be estimated by LISREL was not met. Therefore, the parameters are more unstable than would be true with a

larger sample. In an attempt to improve the cases to parameters ratio, indicators for several latent variables, such as neonatal morbidity and support from significant others, were combined to form single indicator scales. While this approach improved the stability of the estimates, it made it impossible to explicate the behavior of specific indicators.

Second, the instruments used to measure mother-child interaction, support from significant others and home/work orientation were not used prior to this study. While the internal consistency reliability for the home/work orientation scale was good, coefficient alphas for the other two scales were low. The fact that these variables were related to other variables in the model as expected supports the construct validity of the scales; however, more evidence for their validity and reliability is necessary.

Third, infant outcomes were narrowly defined in this study. Only mental and motor development, measured with the Bayley Scales of Infant Development, were investigated. Effects of maternal employment on other aspects of development, such as language, moral or social development, were not measured. In addition, the finding of no adverse effects at three and six months of age in the current study does not rule out the possibility of effects surfacing at a later age. Following families until the child is school age or older would be necessary in order to explicate the relationship between employment related variables and child

outcomes.

Implications for Nursing Science

This study increases nursing's knowledge base in two ways. First, it broadens nursing's understanding of premature infants and their families. Second, it provides more information about the effects of the early NICU experiences for the infant.

Until now, research regarding premature infants and their families has had a limited focus. Most of the research has investigated relationships among traditional indicators of neonatal morbidity (gestational age, birth weight, and length of stay), mother-child interaction and child outcomes. Little attention has been focused on events or relationships outside the mother-child dyad.

Although preterm infants and their families have a different perinatal experience than full term infants and their families, they may encounter similar experiences in their day-to-day existence. The effects that these more common experiences may have on preterm infants need to be explicated and compared with the effects seen in full term infants. If preterm infants are at increased risk for adverse effects due to these everyday occurrences, nursing interventions can be designed to prevent or minimize negative outcomes. Therefore, it is appropriate for nursing research to shift the focus to these common events experienced after discharge from the NICU.

Another contribution that this study makes to nursing knowledge is its considering indicators of neonatal morbidity that are more descriptive of the infant's experience in the NICU. This perspective has been advocated by several investigators (Meisels & Plunkett, 1988; Als, 1986). It is especially important for nursing to consider experiential indicators since many of the experiences are a result of nursing procedures or are the focus of nursing care.

Implications for Nursing Practice

In light of the study's limitations, recommendations for practice are made cautiously. Nurses need to be aware that some mothers of preterm infants will return to work soon after the infant's birth. Talking with the mothers about the circumstances surrounding their employment status may help them with their decision. Since evidence regarding negative effects is conflicting in the general literature and lacking in this study, nurses can support the mother in her decision process. Blanket warnings about returning to work can be tempered so that the mother's needs and wants are considered. Unfortunately, the state of the research with full term or preterm infants is not such that families can be reassured or warned about the effects of the mother's employment status on their child's development.

Recommendations for Future Research

A considerable amount of work needs to be done in the area of maternal employment when the child is not healthy. Future research could investigate the effects of maternal employment on preterm infants at a later age and with a broader array of developmental indicators. Longitudinal study may help to explicate further the process by which the mother's employment or her appraisal of her employment status may affect the child.

Second, future research needs to include families with preterm infants that are more severely affected than those in this study. Healthy preterms may be more resilient to the effects of the mother's employment status or her negative appraisal of that employment status. Having a sicker preterm infant may force the mother into an employment status that is not consistent with her beliefs and attitudes about mothering and working. In addition, a higher level of infant morbidity may have a more negative effect on mother-child interaction and family functioning, thereby exaggerating the effects of a negative appraisal.

Third, determinants of appraisal need to be investigated further. Potentially important variables that were not considered in this study include division of labor at home and specific aspects of the job, such as amount of autonomy, hours of the day employed, and flexibility of hours. While availability and acceptability of child care and support received from others regarding the mother's

employment status were included in the model, investigating these concepts in more detail may provide insight into the role each plays in the mother's appraisal.

Since this is the first study to use more advanced statistical procedures to control variables that may intervene between hours employed and developmental outcomes, replication of this study with a larger sample is necessary. In addition, the model could be tested with a sample of full term infants and their families. Comparisons between full term families and preterm families on the employment related variables could be made to see if the experience of having a preterm infant has an impact on maternal employment patterns and attitudes.

In conclusion, this study was designed in order to address two major gaps in the literature. The first was the lack of research which used more sophisticated methods of analysis. The traditional statistical approach of investigating differences across groups is based on rather simple theoretical models. Reality is often more complex. Thus, the model used to represent it needs to include more complex relationships. By specifying a model with both direct and indirect effects on child outcomes and by using a statistical technique which can estimate the relationships simultaneously, the process by which a predictor affects an outcome can be described more fully. This study represents an extension of previous work in explicating and understanding the process by which maternal employment may

affect the child.

The second gap in the maternal employment literature addressed by this study is the almost exclusive focus on families with healthy children. While the infants in this sample were healthy for preterm infants, their early birth presented the parents with special problems and concerns. It is important to understand how these deviations from normal or from the anticipated path affect the mothers' plans and expectations. Likewise, it is important to understand how mothers' decisions, attitudes, and behaviors affect the premature infant. The results of this study provide preliminary evidence that maternal employment itself does not have negative consequences for the preterm infant's development at three and six months of age. While this study increases nursing's knowledge base regarding premature infants and their families, further research is necessary before clear implications for nursing practice are available.

APPENDIX A
CONSENT FORM

CONSENT FORM

Families with Premature Infants Project

I, the undersigned, agree to participate in a study of family adjustment to the birth of a premature infant. The study is being conducted by Carol Loveland-Cherry, Ph.D., R.N., Assistant Professor, School of Nursing, University of Michigan and Mary Horan, Ph.D., R.N., Associate Professor/Director, Kirkhof School of Nursing, Grand Valley State College. I understand that my participation is voluntary. I have been reassured that the care my baby receives will not be affected in any way. I am free to withdraw my consent at any time during the study and have any information collected from me removed from the study.

I understand that I will not be identified by name at any time during or after the study and that any information obtained about me will be held in confidence. The questionnaires will have only code numbers on them.

The interviewer will answer any question I may have, or I may call the researchers at the numbers listed below. I may choose not to answer any question(s) (I decide not to) without explaining why.

My participation will involve interviews and assessments of my baby's development in my home at my convenience. My baby will be scheduled for appointments at the Developmental Assessment Clinic. I understand that I will not have to pay for the clinic visits. I also give permission for use of information from my baby's hospital and clinic records. If I request, the results of the study will be made available to me upon completion of the project.

I agree to participate in the study as outlined above.

Signature

Signature

Date

If you have any concerns or questions, please feel free to contact either of us at:

Dr. Loveland-Cherry [redacted]
Dr. Horan - (616) [redacted]

APPENDIX B
INSTRUMENTS

Family ID _____

Card _____

Site _____

Section II A
Mother's Interview #1

1. What is your age? _____ (25-26)
(Hand respondent the card)

2. What is the highest level of schooling you have completed?
Less than 7th grade - - - - -1
Junior high school - - - - -2
Some high school - - - - -3
High school graduation - - - - -4
Some college - - - - -5
College graduation - - - - -6
Masters degree - - - - -7
Doctorate - - - - -8
Technical/vocational program - - - - -9
Other (Please specify _____) (27-28)

3. What race do you consider yourself to be?
Black - - - - -1
Caucasian - - - - -2
Hispanic - - - - -3
Asian - - - - -4
Native American - - - - -5
Other(Specify) _____ 6 (29)

4. Would you please describe the sort of work you usually do?
Occupation: _____ (30-32)
Industry: _____ (33)

5. Are you currently employed?
a. Yes 1 No 2. (34)

Family ID _____

Section II A

9. How often do you attend religious services?

- Never- - - - - -1
- Seldom - - - - - -2
- Frequently - - - - - -3

(42)

10. a. Sometimes parents of premature babies find sources of support outside their friends or family. It could be clergy, a visiting nurse, a parent support group, or professional counselling. Have you used any of these kinds of supports since the baby was born?

Yes 1 No 2 (Go to Question 11)

(43)

b. Please list all outside sources of support that you have used:

- | | | | |
|----|---------|-----|---------|
| 1. | _____ | 6. | _____ |
| | (44-45) | | (52-53) |
| 2. | _____ | 7. | _____ |
| | (46-47) | | (54-55) |
| 3. | _____ | 8. | _____ |
| | (48-49) | | (58-59) |
| 4. | _____ | 9. | _____ |
| | (50-51) | | (60-61) |
| 5. | _____ | 10. | _____ |
| | (52-53) | | (62-63) |

c. How helpful did you or do you find these support people to be?

1 _____ 10
[_____]

Not at all
Helpful

Very Helpful

(64-66)

d. If more than one service was used, which was the most useful?

(67-68)

Family ID _____

Section II A

e. Which was the least useful?

(69-70)

f. Do you or did you see any of these support people on a regular basis, that is did you have a scheduled time to meet with the person/group?

Yes 1 No 2 (Go to 10 h) _____
(71)

g. How often do you or did you use their services?

(Hand card to respondent.)

- One time only - - - - -1
- More than once a week - - - - -2
- Once a week - - - - -3
- Every two weeks - - - - -4
- Every three weeks - - - - -5
- Every month - - - - -6
- Less than once a month - - - - -7

h. Are you still using these services? _____
(72)

No 1 Yes 2 (Go to #11).

i. When did you stop using these services? _____
(73)

Baby's age when stopped _____

Time after discharge from NICU _____
(74-75)

when stopped _____
(76-77)

11. Is there anything else you would like to share with us about your baby or your family that would be important for us to know? (Use back also for additional information.)

PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

124-127, Mother's Interview 1

U·M·I

Family ID _____

Section VII

6. How many hours per week do you spend in school (high school, trade school, college, etc.)? _____ hours per week
(23-24)
7. How many hours per week did you spend in paid employment before the baby was born? _____ hours per week
(25-26)
8. How many hours per week did you spend in volunteer work, such as church, school, clubs, before the baby was born? _____ hours per week
(27-28)
9. How many hours per week did you spend in school (high school, trade school, college) before the baby was born? _____ hours per week
(29-30)

Now please think about the time before the baby was born. We would like to know what your plans were for going to work or school after the baby's birth.

10. Had you planned on going to work or school after the baby's birth? Please CIRCLE the word.

Yes 1 No 2 (skip questions 11 and 12) _____
(31)

11. When had you planned on returning to work or school after the baby's birth? when the baby is _____ months old _____ months
(32-34)
12. How many hours per week had you planned to work or go to school after the baby's birth? _____ hours per week
(35-36)

Family ID _____

Section VII

The following statements are reasons that women often give as factors that influence their decisions about working outside the home or staying home with the baby. Please rate each reason on the scale from 1 to 8 to indicate how each one applies to you. WRITE THE NUMBER ON THE LINE NEXT TO THE QUESTION.

1	2	3	4	5	6	7	8	
strongly agree							strongly disagree	
13.	Working outside the home makes me more interesting and intellectually stimulating to my husband/partner.						_____	(37)
14.	My parents think I should stay home with the baby.						_____	(38)
15.	Working outside the home helps me to better appreciate the time I spend with my child(ren).						_____	(39)
16.	My life would not be complete without a career.						_____	(40)
17.	Quality child care is readily available for my child(ren).						_____	(41)
18.	Working outside the home causes or would cause me to miss out on some of the rewarding aspects of being a parent.						_____	(42)
19.	If I stayed home, it would be difficult to go back to my job/career later.						_____	(43)
20.	I prefer staying home with my child(ren).						_____	(44)
21.	My friends think I should work outside the home.						_____	(45)
22.	My baby is sicker than a full term baby.						_____	(46)
23.	It is not financially necessary for me to work outside my home.						_____	(47)
24.	My baby needs things that only I can supply.						_____	(48)
25.	Working outside the home makes me feel good about myself.						_____	(49)
26.	My husband/partner does not want me to work outside the home.						_____	(50)
27.	I find self-fulfillment in being a full time mother.						_____	(51)

Family ID _____

Section VII

Please continue to use the 1 to 8 rating scale, with 1 as strongly agree and 8 as strongly disagree.

28. Money is tight right now. _____
(52)
29. The baby's doctor told me that I should not work
outside the home. _____
(53)
30. Working outside the home often causes or would cause
me to be tired, irritable, or short-tempered with my
family. _____
(54)

Family ID _____
 Interview # _____
 Interviewer _____
 Site _____

PROBLEMS AND CONCERNS
 Interview #1

1. Mark 1 for "Yes" and 2 for "No".

Mother	Father	Did the respondent ask questions about:
<u> </u> (65)	<u> </u> (66)	infant's health/condition
<u> </u> (67)	<u> </u> (68)	infant care
<u> </u> (69)	<u> </u> (70)	infant feeding
<u> </u> (71)	<u> </u> (72)	infant behavior
<u> </u> (73)	<u> </u> (74)	infant's growth/size
<u> </u> (75)	<u> </u> (76)	Mother's health
<u> </u> (77)	<u> </u> (78)	birth control methods
<u> </u> (79)	<u> </u> (80)	possibility of having another premature baby
<u> </u> (7)	<u> </u> (8)	health of other family members

Other concerns or questions (please specify):

1.
(9-10)
2.
(11-12)
3.
(13-14)

2. Order of tool administration:
- | | |
|-------------------------|-------------------------|
| <u> </u>
(15) | Interview schedule |
| <u> </u>
(16) | Self administered tools |
| <u> </u>
(17) | Bayley Scales |

3. Bayley scores
- | | |
|--------|----------------------------|
| Motor | <u> </u>
(18-20) |
| Mental | <u> </u>
(21-23) |

Family ID _____

Section VII

INTERVIEWER OBSERVATIONS

4. Number of people present in home during interview: (24-25)
5. Describe the home, including type of neighborhood, condition of home, cleanliness, neatness, etc.
- Neighborhood- (26-27)
- Condition of home:
- Cleanliness (28-29)
- Neatness (30-31)
- Other:
1. (32-33)
2. (34-35)
3. (36-37)
6. Did the respondent appear:
- | | Mother | Father |
|-----------|-------------|-------------|
| Eager | <u>(38)</u> | <u>(39)</u> |
| Relaxed | <u>(40)</u> | <u>(41)</u> |
| Anxious | <u>(42)</u> | <u>(43)</u> |
| Hesitant | <u>(44)</u> | <u>(45)</u> |
| Resistant | <u>(46)</u> | <u>(47)</u> |
7. Describe the type of interaction between the parents, such as supportive, argumentative, strained, distant, etc.
- (48-49)
- (50-51)
- (52-53)

Family ID _____

Section VII

8. Describe the parent-child interaction.
Mark number of applicable statement for both mother and father.
- | | Mother | Father |
|----|--------|--------|
| A. | | |
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| | _____ | _____ |
| | (54) | (55) |
| B. | | |
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| | _____ | _____ |
| | (56) | (57) |
| C. | | |
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| | _____ | _____ |
| | (58) | (59) |
| D. | | |
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| | _____ | _____ |
| | (60) | (61) |

Family ID _____

Section VII

- E. 1. Many available age appropriate toys
- 2. Some available age appropriate toys
- 3. Few available age appropriate toys
- 4. No available age appropriate toys

(62)

- F. 1. Many age appropriate books
- 2. Some age appropriate books
- 3. Few age appropriate books
- 4. No age appropriate books

(63)

Describe any other observations about the parent-child interactions and home environment that seem appropriate.

- 1. _____
(64-65)
- 2. _____
(66-67)
- 3. _____
(68-69)

Describe the baby's room, including condition of bed/crib, colors, crib toys, etc.

- Condition of crib _____
(70-71)
- Colors _____
(72-73)
- Toys _____
(74-75)
- Other: _____
- 1. _____ 2. _____
(76-77) (78-79)

Please explain any situations where you were unable to assess the item.

REFERENCES CITED

REFERENCES CITED

- Ainsworth, M.D.S., Bell, S.M., & Stayton, D.J. (1974). Infant-mother attachment and social development: 'Socialisation' as a product of reciprocal responsiveness to signals. In M.P.M. Richards (Ed.), The Integration of a Child into a Social World. Cambridge: Cambridge University Press.
- Ainsworth, M.D.S., Blehar, M.C., Waters, E. & Wall, S. (1978). Patterns of Attachment. Hillsdale, N.J.: Erlbaum.
- Als, H. (1986). A synactive model of neonatal behavioral organization: Framework for the assessment of neurobehavioral development in the premature infant and for support of infants and parents in the neonatal intensive care environment. Special Issue: The High Risk Neonate. Physical and Occupational Therapy in Pediatrics, 6(3-4), 3-53.
- Alvarez, W.F. (1985). The meaning of maternal employment for mothers and their perceptions of their three-year-old children. Child Development, 56, 350-360.
- Bakeman, R. & Brown, J.V. (1980). Early interaction: Consequences for social and mental development at three years. Child Development, 51, 437-447.
- Barglow, P, Vaughn, B.E., & Molitor, N. (1987). Effects of maternal absence due to employment on the quality of infant-mother attachment in a low-risk sample. Child Development, 58, 945-954.
- Bayley, N. (1969). Bayley Scales of Infant Development. New York: Psychological Corporation.
- Beavers, W.R. & Voeller, M.N. (1983). Family models: comparing and contrasting the Olson circumplex model with the Beavers systems model. Family Process, 22(1), 85-98.
- Beckwith, L., Cohen, S.E., Kopp, C.B., Parmelee, A.H., and Marcy, T.G. (1976). Caregiver-infant interaction and early cognitive development in preterm infants. Child Development, 47, 579-587.
- Belsky, J. & Rovine, M.J. (1988). Nonmaternal care in the first year of life and the security of infant-parent attachment. Child Development, 59, 157-167.

- Benfield, D.G., Leib, S.A., Reuter, J. (1976). Grief response of parents after referral of the critically ill newborn to a regional center. New England Journal of Medicine, 294, 975-978.
- Benn, R.K. (1986). Factors promoting secure attachment relationships between employed mothers and their sons. Child Development, 57, 1224-1231.
- Bentler, P.M. & Chou, C.-P. (1988). Practical issues in structural modeling. In J.S. Long (Ed.), Common Problems/Proper Solutions: Avoiding Error in Quantitative Research. Newbury Park, Calif.: Sage.
- Bess, F.H., Peek, B.F., & Chapman, J.J. (1979). Further observations on noise levels in infant incubators. Pediatrics, 63(1), 100-106.
- Blehar, M.C. (1974). Anxious attachment and defensive reactions associated with day care. Child Development, 45, 683-692.
- Bowlby, J. (1982). Attachment and Loss, Volume 1: Attachment. 2nd Ed. New York: Basic Books. (Original work published in 1969).
- Bronfenbrenner, U. (1985, April). Organism-environment interaction from an ecological perspective. Paper presented at the meeting of the Society for Research in Child Development, Toronto, Ontario.
- Bronfenbrenner, U., Alvarez, W.F., Henderson, C.R., Jr. (1984). Working and watching: Maternal employment status and parents' perceptions of their three-year-old children. Child Development, 55, 1362-1378.
- Catto-Smith, A.G., Yu, V.Y.H., Bajuk, B., Orgill, A.A., & Astbury, J. (1985). Effect of neonatal periventricular haemorrhage on neurodevelopmental outcomes. Archives of Disease in Childhood, 60, 8-11.
- Caldwell, B.M. (1978). Home observation for measurement of the environment (HOME). Little Rock, AR: University of Arkansas.
- Caldwell, R.M., Wright, C.M., Honig, A.S., & Tannenbaum, J. (1970). Infant day care and attachment. American Journal of Orthopsychiatry, 40(3), 397-412.
- Christensen, A.Z. (1977). Coping with the crisis of a premature birth - One couple's story. The American Journal of Maternal Child Nursing, 2, 33-37.

- Crawford, J.W. (1982). Mother-infant interaction in premature and full-term infants. Child Development, 53, 957-962.
- Crnic, K.A., Ragozin, A.S., Greenberg, M.T., Robinson, N.M., & Basham, R.B. (1983). Social interaction and developmental competence of preterm and full-term infants during the first year of life. Child Development, 54, 1199-1210.
- Cohen, S.E. (1978). Maternal employment and mother-child interaction. Merrill-Palmer Quarterly, 24(3), 189-197.
- Cohen, S.E. & Beckwith, L. (1979). Preterm infant interaction with the caregiver in the first year of life and competence at age two. Child Development, 50, 767-776.
- Cohen, S.E. & Parmelee, A.H. (1983). Prediction of five-year Stanford-Binet scores in preterm infants. Child Development, 54, 1242-1253.
- Donaldson, S.K. & Crowley, D.M. (1978). The discipline of nursing. Nursing Outlook, 26(2), 113-120.
- Dowdall, J.A. (1974). Structural and attitudinal factors associated with female labor force participation. Social Science Quarterly, 55(June), 121-130.
- Doyle, A.B. (1975). Infant development in day care. Developmental Psychology, 11(5), 655-656.
- Easterbrooks, M.A. & Goldberg, W.A. (1985). Effects of early maternal employment on toddlers, mothers, and fathers. Developmental Psychology, 21(5), 774-783.
- Eggebeen, D.J. (1988). Determinants of maternal employment of white preschool children: 1960-1980. Journal of Marriage and the Family, 50, 149-159.
- Ericksen, J.A., Yancey, W.L., Ericksen, E.P. (1979). The division of family roles. Journal of Marriage and the Family, 41, 301-313.
- Farel, A.M. (1980). Effects of preferred maternal roles, maternal employment, and sociodemographic status on school adjustment and competence. Child Development, 51, 1179-1186.
- Fawcett, J. (1984). Analysis and evaluation of conceptual models of nursing. Philadelphia: F.A. Davis.

- Fendrich, M. (1984). Wives' employment and husbands' distress: A meta-analysis and a replication. Journal of Marriage and the Family, 46, 871-879.
- Ferrari, F., Grosoli, M.V., Fontana, G., & Cavazzuti, G.B. (1983). Neurobehavioural comparison of low-risk preterm and fullterm infants at term conceptional age. Developmental Medicine & Child Neurology, 25, 450-458.
- Ferree, M.M. (1976). Working-class jobs: Housework and paid work as sources of satisfaction. Social Problems, 23, 431-441.
- Field, T., Dempsey, J., & Shuman, H.H. (1983). Five year follow-up of preterm respiratory distress syndrome and post-term postmaturity syndrome infants. In T. Field & A. Sostek (Eds.), Infants Born at Risk: Physiological, Perceptual, and Cognitive Processes. New York: Grune & Stratton.
- Field, T., Stoller, S., Vega-Lahr, N., Scafidi, F., & Goldstein, S. (1986). Maternal unavailability effects on very young infants in homecare vs. daycare. Infant Mental Health Journal, 7(4), 274-280.
- Field, T.M., Dempsey, J.R., & Shuman, H.H. (1981). Developmental follow-up of pre- and postterm infants. In S.L. Friedman & M. Sigman (Eds.), Preterm Birth and Psychological Development. New York: Academic Press.
- Freedman, R.M. & Warshaw, J.B. (1983). The low-birth-weight infant: An overview. In J.B. Warshaw and J.C. Hobbins (Eds.), Principles and Practice of Perinatal Medicine: Maternal-Fetal and Newborn Care. Menlo Park, Calif.: Addison-Wesley.
- Frodi, A. & Thompson, R. (1985). Infants' affective responses in the strange situation: Effects of prematurity and of quality of attachment. Child Development, 56, 1280-1290.
- Frodi, A.M., Lamb, M.E., Leavitt, L.A., Donovan, W.L., Neff, C., & Sherry, D. (1978). Fathers' and mothers' responses to the faces and cries of normal and premature infants. Developmental Psychology, 14(5), 490-498.
- Goldberg, S., Perrotta, M., Minde, K., & Corter, C. (1986). Maternal behavior and attachment in low-birth-weight twins and singletons. Child Development, 57, 34-46.

- Goldberg, W.A. & Easterbrooks, M.A. (1984). Role of marital quality in toddler development. Developmental Psychology, 20(3), 504-514.
- Goldson, E. (1983). Bronchopulmonary dysplasia: Its relation to two-year developmental functioning in the very low birth weight infant. In T. Field & A. Sostek (Eds.), Infants born at risk: Physiological, Perceptual, and Cognitive Processes. New York: Grune & Stratton.
- Gordon, H.A. & Kammeyer, K.C.W. (1980). The gainful employment of women with small children. Journal of Marriage and the Family, 42, 327-336.
- Greene, J.G., Fox, N.A., Lewis, M. (1983). The relationship between neonatal characteristics and three-month mother-infant interaction in high-risk infants. Child Development, 54, 1286-1296.
- Greenstein, T.N. (1986). Social-psychological factors in perinatal labor-force participation. Journal of Marriage and the Family, 48, 565-571.
- Hardesty, S.A. & Betz, N.E. (1980). The relationships of career salience, attitudes toward women, and demographic and family characteristics to marital adjustment in dual-career couples. Journal of Vocational Behavior, 17, 242-250.
- Hawkins-Walsh, E. (1980). Diminishing anxiety in parents of sick newborns. The American Journal of Maternal Child Nursing, 5, 30-34.
- Hayghe, H. (1986). Rise in mothers' labor force activity includes those with infants. Monthly Labor Review, 109(2), 43-45.
- Hiller, D.V. & Philliber, W.W. (1980). Necessity, compatibility and status attainment as factors in the labor-force participation of married women. Journal of Marriage and the Family, 42, 347-354.
- Hock, E. (1980). Working and nonworking mothers and their infants: A comparative study of maternal caregiving characteristics and infant social behavior. Merrill-Palmer Quarterly, 26(2), 79-101.
- Hock, E. (1984). The transition to day care: Effects of maternal separation anxiety on infant adjustment. In R.C. Ainslie (Ed.), The Child and the Day Care Setting: Qualitative Variations and Development. New York: Praeger Press.

- Hock, E., Christman, K., & Hock, M. (1980). Factors associated with decisions about return to work in mothers of infants. Developmental Psychology, 16, 535-536.
- Hock, E. & Clinger, J.B. (1980). Behavior toward mother and stranger of infants who have experienced group day care, individual care, or exclusive maternal care. The Journal of Genetic Psychology, 137, 49-61.
- Hock, E., Gnezda, M.T., McBride, S.L. (1984). Mothers of infants: Attitudes toward employment and motherhood following birth of the first child. Journal of Marriage and the Family, 46, 425-431.
- Hoffman, L.W. (1961). Effects of maternal employment on the child. Child Development, 32, 187-197.
- Hoffman, L.W. (1984). Maternal employment and the young child. In Perlmutter, M. (Ed.), Parent-child interaction and parent-child relations in child development. Vol. 17. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Hollingshead, A.B. (1975). Four factor index of social status. Unpublished paper. Department of Sociology. Yale University.
- Jacobson, S.F. (1982). Psychosocial stresses of working women. Nursing Clinics of North America, 17(1), 137-145.
- Joreskog, K.G. & Sorbom, D. (1986). LISREL VI. Chicago: National Education Resources.
- Kaplan, D.M. & Mason, E.A. (1960). Maternal reactions to premature birth viewed as an acute emotional disorder. American Journal of Orthopsychiatry, 30, 539-552.
- Kessler, R.C. & McRae, J.A. (1982). The effect of wives' employment on the mental health of married men and women. American Sociological Review, 47, 216-227.
- Lawson, K., Daum, C., & Turkewitz, G. (1977). Environmental characteristics of a neonatal intensive-care unit. Child Development, 48, 1633-1639.
- Lazarus, R.S. & Folkman, S. (1985). Stress, Appraisal, and Coping. New York: Springer.
- Lewandowski, L.A. (1984). Psychosocial aspects of pediatric critical care. In M.F. Hazinski (Ed.), Nursing Care of the Critically Ill Child. New York: Mosby.

- Lipsky, K. (1979). Psychosocial aspects of pediatric intensive care: The patient. In D.L. Levin, F.C. Morriss, & G.C. Moore (Eds.), A Practical Guide to Pediatric Intensive Care. St. Louis: Mosby.
- Locksley, A. (1980). On the effects of wives' employment on marital adjustment and companionship. Journal of Marriage and the Family, 42, 337-346.
- Maccoby, E.E. (1984). Socialization and developmental change. Child Development, 55, 317-328.
- Maccoby, E.E. & Martin, J.A. (1983). Socialization in the context of the family: Parent-child interaction. In P. Mussen (Ed.), Handbook of Child Psychology. New York: Wiley.
- Macey, T.J., Harmon, R.J., & Easterbrooks, M.A. (1987). Impact of premature birth on the development of the infant in the family. Journal of Consulting and Clinical Psychology, 55(6), 846-852.
- Maier, R.A., Holmes, D.L., Slaymaker, F.L., & Reich, J.N. (1984). The perceived attractiveness of preterm infants. Infant Behavior and Development, 7, 403-414.
- Marotz-Baden, R., Adams, G.R., Bueche, N., Munro, B., & Munro, G. (1979). Family form or family process? Reconsidering the deficit family model approach. The Family Coordinator, 5-14.
- Masters, J.C. & Wellman, H.M. (1974). The study of human infant attachment: A procedural critique. Psychological Bulletin, 81(4), 218-237.
- Matas, L., Arend, R.A., & Sroufe, L.A. (1978). Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. Child Development, 49, 547-556.
- McLaughlin, S.D. (1982). Differential patterns of female labor-force participation surrounding the first birth. Journal of Marriage and the Family, 44, 407-420.
- Meisels, S.J. & Plunkett, J.W. (1988). Developmental consequences of preterm birth: Are there long-term effects? In P.B. Baites, D.L. Featherman, & R.M. Lerner (Eds.), Life-Span Development and Behavior. Hillsdale, N.J.: Laurence, Erlbaum Associates.

- Meisels, S.J., Plunkett, J.W., Pasick, P.L., Stiefel, G.S., & Roloff, D.W. (1987). Effects of severity and chronicity of respiratory illness on the cognitive development of preterm infants. Journal of Pediatric Psychology, 12(1), 117-132.
- Meisels, S.J., Plunkett, J.W., Roloff, D.W., Pasick, P.L. & Stiefel, G.S. (1986). Growth and development of preterm infants with respiratory distress syndrome and bronchopulmonary dysplasia. Pediatrics, 77(3), 345-352.
- Minde, K.K. (1984). The impact of prematurity on the later behavior of children and on their families. Clinics in Perinatology, 11(1), 227-244.
- Minde, K., Perrotta, M., & Marton, P. (1985). Maternal caretaking and play with full-term and premature infants. Journal of Child Psychology and Psychiatry, 26(2), 231-244.
- Minde, K., Whitelaw, A., Brown, J., & Fitzhardinge, P. (1983). Effect of neonatal complications in premature infants on early parent-infant interactions. Developmental Medicine and Child Neurology, 25, 763-777.
- Molm, L.D. (1978). Sex role attitudes and the employment of married women: The direction of causality. The Sociological Quarterly, 19, 522-533.
- Moskowitz, D.S., Schwarz, J.C., & Corsini, D.A. (1977). Initiating day care at three years of age: Effects on attachment. Child Development, 48, 1271-1276.
- Newman, L.F. (1981). Social and sensory environment of low birth weight infants in a special care nursery: An anthropological investigation. The Journal of Nervous and Mental Disease, 169(7), 448-455.
- Occupational Safety and Health Administration. (1988). Federal Register. (Dept. of Labor Publication No. 1910-29CFR). Washington, D.C.: U.S. Government Printing Office.
- Olson, D.H. & McCubbin, H.I. (1982). Circumplex model of marital and family systems V: Application to family stress and crisis intervention. In H.I. McCubbin, A.E. Cauble, & J.M. Patterson (Eds.), Family Stress, Coping, and Social Support. Springfield, Ill.: Charles C. Thomas.

- Olson, D.H., Portner, J., & Lavee, Y. (1985). FACES III. St. Paul: University of Minnesota Family Social Science.
- Owen, M.T., Easterbrooks, M.A., Chase-Lansdale, L., & Goldberg, W. (1984). The relation between maternal employment status and the stability of attachments to mother and father. Child Development, 55, 1894-1901.
- Pedhazur, E.J. (1982). Multiple Regression in Behavioral Research. 2nd Ed. New York: Hold, Rinehart, & Winston.
- Penticuff, J.H. (1982). Psychologic implications in high-risk pregnancy. Nursing Clinics of North America, 17(1), 69-78.
- Peterson, A.P.G. & Gross, E.E., Jr. (1978). Handbook of Noise Measurement. 8th Ed. Concord, Mass.: GenRad.
- Phillips, D., McCartney, K., & Scarr, S. (1987). Child-care quality and children's social development. Developmental Psychology, 23(4), 537-543.
- Phillips, D., McCartney, K., Scarr, S., & Howes, C. (1987). Selective review of infant day-care research: A cause for concern. Zero to Three, 7(3), 18-21.
- Plunkett, J.W., Klein, T., & Meisels, S.J. (1988). The relationship of preterm infant-mother attachment to stranger sociability at 3 years. Infant Behavior and Development, 11, 83-96.
- Plunkett, J.W. & Meisels, S.J. (in press). Socio-emotional adaptation of preterm infants at three years. Journal of Infant Mental Health.
- Plunkett, J.W., Meisels, S.J., Stiefel, G.S., Pasick, P.L., & Roloff, D.W. (1986). Patterns of attachment among preterm infants of varying biological risk. Journal of the American Academy of Child Psychiatry, 25(6), 794-800.
- Plunkett, M.W. (1980). Meanings of work for mothers. In D.G. McGuigan (Ed.), Women's Lives: New Theory, Research and Policy. Ann Arbor: The University of Michigan Center for Continuing Education of Women.
- Roberts, C.S. & Feetham, S.L. (1982). Assessing family functioning across three areas of relationships. Nursing Research, 31, 231-235.

- Rocissano, L. & Yatchmink, Y. (1983). Language skill and interactive patterns in prematurely born toddlers. Child Development, 54, 1229-1241.
- Rode, S.S., Chang, P.N., Fisch, R.O., & Sroufe, L.A. (1981). Attachment patterns of infants separated at birth. Developmental Psychology, 17(2), 188-191.
- Rogers, M.E. (1970). An introduction to the theoretical basis of nursing. Philadelphia: F.A. Davis.
- Roopnarine, J.L. & Lamb, M.E. (1978). The effects of day care on attachment and exploratory behavior in a strange situation. Merrill-Palmer Quarterly, 24(2), 85-95.
- Rubin, R. (1967). Attainment of the maternal role. Part I. Processes. Nursing Research, 16, 237-245.
- Rubin, R.A., Rosenblatt, C., & Balow, B. (1973). Psychological and educational sequelae of prematurity. Pediatrics, 52(3), 352-363.
- Rubenstein, J.L., Howes, C., & Boyle, P. (1981). A two-year follow-up of infants in community-based day care. Journal of Child Psychology and Psychiatry, 22(3), 209-218.
- Ruble, D.N. (1984). Sex-role development. In M.H. Bornstein & M.E. Lamb (Eds.), Developmental Psychology: An Advanced Textbook. Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Safilios-Rothschild, C. (1970). The influence of the wife's degree of work commitment upon some aspects of family organization and dynamics. Journal of Marriage and the Family, 32, 681-691.
- Sameroff, A.J. & Chandler, M.J. (1975). Perinatal risk and the continuum of caretaking casualty. In F. Horowitz, M. Hetherington, S. Scarr-Salapatek, & G. Siegel (Eds.), Review of Child Development Research (Vol. 4, pp 187-244). Chicago: University of Chicago Press.
- Sammons, W.A.H. & Lewis, J.M. (1985). Premature Babies: A Different Beginning. St. Louis: Mosby.
- Schachter, F.F. (1981). Toddlers with employed mothers. Child Development, 52, 958-964.
- Schraeder, B.D. (1986). Developmental progress in very low birth weight infants during the first year of life. Nursing Research, 35(4), 237-242.

- Schubert, J.B., Bradley-Johnson, S., & Nuttal, J. (1980). Mother-infant communication and maternal employment. Child Development, 51, 246-249.
- Schwarz, P. (1983). Length of day-care attendance and attachment behavior in eighteen-month-old infants. Child Development, 54, 1073-1078.
- Siegel, M. & Storey, R.M. (1985). Day care and children's conceptions of moral and social rules. Child Development, 56, 1001-1008.
- Siegel, L.S. (1983). Correction for prematurity and its consequences for the assessment of the very low birth weight infant. Child Development, 54, 1176-1188.
- Siegel, L.S. (1984). Home environmental influences on cognitive development in preterm and full-term children during the first 5 years. In A.W. Gottfried (ed.), Home Environment and Early Cognitive Development (pp. 197-234), Orlando, Fla.: Academic Press.
- Siegel, L.S. (1982). Reproductive, perinatal, and environmental factors as predictors of the cognitive and language development of preterm and full-term infants. Child Development, 53, 963-973.
- Smith-Lovin, L. & Tickamyer, A.R. (1978). Nonrecursive models of labor force participation, fertility behavior and sex role attitudes. American Sociological Review, 43, 541-557.
- Sostek, A.M., Smith, Y.F., Katz, K.S., & Grant, E.G. (1987). Developmental outcome of preterm infants with intraventricular hemorrhage at one and two years of age. Child Development, 58, 779-786.
- Spitz, R.A. (1973). Hospitalism: An inquiry into the genesis of psychiatric conditions in early childhood. In L.J. Stone, H.T. Smith, & L.B. Murphy (Eds.), The Competent Infant (pp. 775-786). New York: Basic Books. (Original work published in 1945).
- Spitz, R.A. (1965). The First Year of Life. New York: International Universities Press.
- Spitz, R.A. & Wolf, K.M. (1973). Anaclitic depression: An inquiry into the genesis of psychiatric conditions in early childhood. In L.J. Stone, H.T. Smith, & L.B. Murphy (Eds.), The Competent Infant (pp. 775-786). New York: Basic Books. (Original work published in 1945).
- SPSS, Inc. (1988). Statistical Package for the Social Sciences, Version 3.0. Chicago: SPSS, Inc.

- Staines, G.L., Pleck, J.H., Shepard, L.J., & O'Connor, P. (1978). Wives' employment status and marital adjustment: Yet another look. Psychology of Women Quarterly, 3(1), 90-120.
- Stern, M. & Hildebrandt, K.A. (1986). Prematurity stereotyping: Effects on mother-infant interaction. Child Development, 57, 308-315.
- Stiefel, G.S., Plunkett, J.W., & Meisels, S.J. (1987). Affective expression among preterm infants of varying levels of biological risk. Infant Behavior and Development, 10, 151-164.
- Stith, S.M. & Davis, A.J. (1984). Employed mothers and family day-care substitute caregivers: A comparative analysis of infant care. Child Development, 55, 1340-1348.
- Stuckey, M.F., McGhee, P.E., & Bell, N.J. (1982). Parent-child interaction: The influence of maternal employment. Developmental Psychology, 18(4), 635-644.
- Sugar, M. (1977a). Five early milestones in premature infants. Child Psychiatry and Human Development, 8(1), 11-24.
- Sugar, M. (1977b). Some milestones in premature infants at 6 to 24 months. Child Psychiatry and Human Development, 8(2), 67-80.
- Survey Research Center. (1986). OSIRIS.IV. Ann Arbor, MI: The Institute for Social Research.
- Trause, M.A. & Kramer, L.I. (1983). The effects of premature birth on parents and their relationship. Developmental Medicine and Child Neurology, 25, 459-465.
- Ungerer, J.A. & Sigman, M. (1983). Developmental lags in preterm infants from one to three years of age. Child Development, 54, 1217-1228.
- Vaughn, B.E., Gove, F.L., & Egeland, B. (1980). The relationship between out-of-home care and the quality of infant-mother attachment in an economically disadvantaged population. Child Development, 51, 1203-1214.
- Warshaw, J.B. & Hobbins, J.C. (1983). Principles and practice of perinatal medicine: Maternal-fetal and newborn care. Menlo Park, Calif: Addison-Wesley.

- Watt, J. (1986). Interaction and development in the first year. I. The effects of prematurity. Early Human Development, 13, 195-210.
- Watt, J. & Strongman, K.T. (1985). Mother-infant interactions at 2 and 3 months in preterm, small-for-gestational-age, and full-term infants: Their relationship with cognitive development at 4 months. Early Human Development, 11, 231-246.
- Weil, M.W. (1961). An analysis of the factors influencing married women's actual or planned work participation. American Sociological Review, 26, 91-96.
- Weingarten, K. (1978). The employment pattern of professional couples and their distribution of involvement in the family. Psychology of Women Quarterly, 3(1), 44-52.
- Wheaton, B. (1987). Assessment of fit in overidentified models with latent variables. Sociological Methods and Research, 16(1), 118-154.
- Wortman, C. (1987). personal communication.
- Yarrow, M.R., Scott, P, de Leeuw, L., Heinig, C. (1962). Child-rearing in families of working and nonworking mothers. Sociometry, 25, 122-140.
- Zaslow, M.J., Pedersen, F.A., Suwalsky, J.T.D., Cain, R.L., & Fivel, M. (1985). The early resumption of employment by mothers: Implications for parent-infant interaction. Journal of Applied Developmental Psychology, 6, 1-16.
- Zaslow, M., Pedersen, F., Suwalsky, J., Rabinovich, B., & Cain, R. (1986). Fathering during the infancy period: Implications of the mother's employment role. Infant Mental Health Journal, 7(3), 225-234.
- Zimmerman, I.L. & Bernstein, M. (1983). Parental work patterns in alternative families: Influence on child development. American Journal of Orthopsychiatry, 53(3), 418-425.