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A COMPARISON OF LIFE CIRCUMSTANCES AND MATERNAL-INFANT FEEDING INTERACTIONS

by

SHERIDAN L. ST. ARNAUD

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled A COMPARISON OF DIFFICULT LIFE CIRCUMSTANCES AND MATERNAL-INFANT FEEDING INTERACTIONS submitted by SHERIDAN LEE ST. ARNAUD in partial fulfillment of the requirements for the degree of MASTER OF NURSING.

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Sheridan St Arnaud

Dear Sheridan,

I am writing to give you permission to duplicate the Difficult Life Circumstance and Nursing Child Assessment Feeding Scale in your thesis appendix.

We are very interested in getting a abstract of your results. Please send to Anita Spietz, Associate Director of NCAST. Box 357920, University of Washington, Seattle, WA 98195-7920.

Sincerely,

Kathryn E. Barnard
Professor of Nursing

Abstract

This study used data obtained from a research project conducted from 1993 to the present in the Faculty of Nursing, University of Alberta in Edmonton. The purpose of the original project was to investigate the effect of selected soothing techniques on infant crying and maternal-infant interactions. The data elicited other questions warranting separate study.

The purpose of this study was to explore the relationship between self-reports of difficult life circumstances and observed maternal-infant interactions within two feeding situations. All subjects from the original project were included in this study. Data from the Difficult Life Circumstances Scale (Barnard, 1989) and the Nursing Child Assessment Feeding Scale (Barnard, 1994) were used to explore relationships. The influence of the parent's sense of competence was included. A correlational design guided the analysis.

Difficult life circumstances had an insignificant negative correlation with maternal-infant interactions at both observational periods. Parental sense of competence and maternal age correlated with difficult life circumstances but were not significantly related to maternal-infant interactions. A treatment effect may have impacted the feeding scores at the second observational period.

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CHAPTER 1

INTRODUCTION

The birth of the first child is a time of great satisfaction coupled with stress and worry. Motherhood has traditionally required an immense physical and emotional investment for women. In addition, this period involves a release from previously selected roles and relationships as well as the adoption, creation and integration of new roles and relationships. Nurses have a unique opportunity for assessment of mother-infant interactions in the early stages of this process.

The purpose of the original study was to examine the effects, in the home environment, of two soothing techniques on caregiver-infant interaction and on the amount of parent-reported infant crying. In one group, the parents used infant massage, in another infants were carried in a soft infant carrier, and in the third group parents both massaged and carried their infants. All the groups, including a control group, completed surveys prior to the birth of their baby and over the first sixteen weeks of the postpartum period. The questionnaires were selected to provide data on parental sense of infant temperament, parental sense of competence, difficult life circumstances and biographical information. Observations of parent-infant interactions during a feeding and teaching activity were recorded by trained research assistants prior to the intervention and again at the end of the intervention period. Parents completed weekly logs or diaries at selected points of the study period to determine the time and duration of cry/fuss episodes and treatment interventions.

The original research project is part of a continuing program of nursing research involving the University of Alberta and the University of Calgary. It represents a continuation of a developing body of knowledge and concerns, specifically infant crying and is geared to the promotion of health in childbearing and childrearing families. (see Appendix A) It is a clinical intervention experimental study supported by theory and

published research findings. Results from the study will be directly applicable to clinical nursing practice in a variety of settings. Appropriate interventions with families of crying infants early in the postpartum period promotes healthier families and is cost-effective to the health system.

Statement of the Problem

The initial post-partum period provides an opportunity to become involved in a nurturing and intimate relationship and to develop and express the warm, caring, selfless aspect of a person that may not otherwise be evident. However, the possibility for conflict and disillusionment must also be considered. Michaels and Goldberg (1988) have identified a number of risk factors that can affect this process such as lack of social supports, financial burdens, poor health and time constraints. With multiple risk indicators, the potential for poor child outcomes increases (Barnard, 1995; Beckwith & Cohen, 1984; Olson, Bates & Bales, 1984; Pascoe & Earp, 1984). Current societal trends towards increasing isolation of nuclear families, shortened hospital stays and limited community resources have eroded the traditional support structures that were once available to most first-time parents. Understanding the factors that may impinge on maternal-infant interactions is an important area for study as a basis for enhancing nursing knowledge of this critical time.

Purpose of the Study

The purpose of this study was to explore and describe the relationship between life circumstances and maternal-infant interactions within a previously identified sample of first-time mothers. The influence of the mother's age, her sense of competence with her new role and the treatment effect were also addressed. Information on the impact of these factors in a relatively low-risk population was obtained from the study.

The following questions were addressed:

1. What is the relationship between reported difficult life circumstances and maternal-infant scores relative to a feeding interaction?

2. Is the relationship between reported difficult life circumstances and maternal-infant feeding interaction scores stable over time?

Definition of Terms

For the purposes of this study, the following definitions were used:

Difficult Life Circumstances

Difficult life circumstances refers to the existence of ongoing chronic problems or stressors in families. These include sensitive issues such as substance abuse, spousal abuse or a criminal record. Other issues such as work commitments, frequent minor illnesses, or long-term debts in addition to a mortgage may also be identified. Difficult life circumstances is a metaphor coined by Barnard (1989) for what has been observed as the "heavy baggage" with which some families have to contend.

Nurturing Behaviors

Nurturing behaviors are behaviors or routines during which the parent offers special attention to the infant which help to provide the framework during which intense, enjoyable interaction may take place. Feeding is an example of a nurturing behavior.

Maternal Sense of Competence

Maternal sense of competence refers to one of the indicators of a mother's feelings of self-trust, certainty or the ability to rely on her own decisions in caring for her infant. Maternal sense of competence may be a contributing factor through which the goal of enhanced parent-infant interaction is affected.

Maternal-Infant Interaction

Maternal-infant interaction refers to maternal and infant behaviors which facilitate synchrony and adaptation of the mother-infant dyad (Barnard, 1976). Maternal behaviors include:

-being sensitive to the infant's cues such as hunger and satiation

-responding to the infant's distress signals such as choking or turning away

-socio-emotional growth fostering activities such as singing or playing games

-cognitive growth-fostering such as providing opportunities that promote eye-hand coordination.

Infant behaviors include: sending clear, easily interpreted cues such as readiness to eat or fatigue; and being responsive to the caregiver by vocalizing, smiling or physically exploring the caregiver

Assumptions

1. Transition to motherhood is a stressful event for first-time mothers.
2. Difficult life circumstances have an influence on maternal role transition as observed in maternal-infant interactions.
3. The mothers will accurately report any perceived difficult life circumstances.
4. Soothing interventions, or treatment effects, may have an effect on the 16 week feeding observation.
5. Parental sense of competence may enhance maternal-infant interactions.
6. The research assistants will have no or minimal effect on the observed mother-infant interaction.

Conceptual Framework

The conceptual framework for this study is a combination of Barnard's (1976) Model and the Child Health Assessment Model (Barnard & Eyres, 1979). The model is based on child developmental theories, empirical studies and Barnard's work in the early 1970's that suggests that the physical, emotional, social and intellectual development of infants is a complex interactive process. The mother, her infant and the life circumstances or environment they operate within each contribute to the interaction process that occurs between the mother and infant. Infants and very young children are dependent on adults to create learning environments and mediate experiences for them.

The optimal characteristics of the infant are the ability to produce clear cues and respond to its' mother. The non-optimal characteristics of the infant are primarily biological and include prematurity, low birth weight and complications of the perinatal period. The mother's optimal characteristics include the ability to interpret and respond to the infant's cues, alleviate distress and provide growth-fostering situations for the infant. Mothers who have positive expectations about the maternal role are more likely to have positive perceptions that are reflected in their nurturing behaviors with their infants (Gibaud-Wallston, 1977; Gojmerac, 1988). The non-optimal characteristics of the mother are primarily social in nature. Mothers who are greatly concerned about other aspects of their lives such as occupational or financial problems, emotional problems or marital stresses, may not have the energy or resources to foster an optimal relationship (Belsky, 1984; Kemper & Reichler, 1976) Thus, the environment can be either directly or indirectly involved in the quality of maternal-infant interaction.

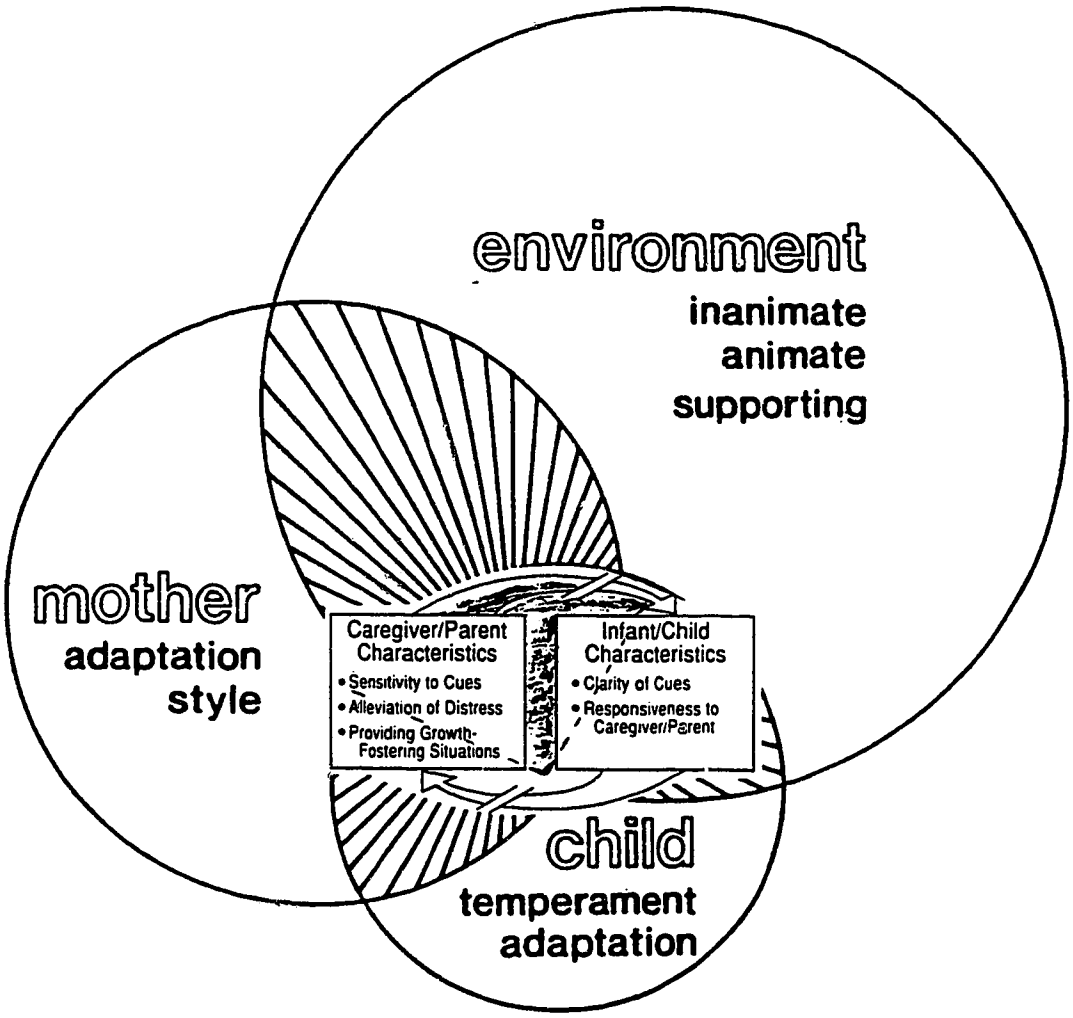
The interactive process between mother, infant and the environment are demonstrated within the three inter-connecting circles in the model (see Figure 1). Maternal-infant interaction reflects the sum of these multiple and interdependent influences (Bee et al., 1982). Barnard (1995) and her colleagues identified that critical to the success of any interaction is the ability of the caregiver and infant to adapt to one

another. In the synchronous mother-infant interaction, there is a process of mutual modification in that the mother's behaviors influence the infant and, in return, the child influences the mother so both are changed. If there is interference in this process, represented by the broken lines in the model, the mother-infant adaptation/interaction process breaks down.

The primary focus of this study is the reciprocal interaction between the maternal-infant dyad and the influence of difficult life circumstances on this process. Difficult circumstances are assumed to have an effect on the interaction by impacting the mother's ability to be sensitive and responsive to her infant.

Figure 1

Child Health Assessment Interaction Model and Barnard Model



CHAPTER 2

LITERATURE REVIEW

Review of Related Literature

The major areas that provided an organizational framework for this study were: attainment of the maternal role, feeding as a nurturing behavior, maternal-infant interaction, environmental risk factors or difficult life circumstances. A rationale for the chosen instruments is included in this chapter.

Maternal Role Attainment

The development of the maternal role has been a dominant focus in parent-infant nursing research (Mercer, 1986; Rubin, 1984; Walker, Crain & Thompson, 1986). From the work of several authors, maternal role attainment can be summarized as the successful process of achieving and integrating the components of mothering: maternal identity, perceived role attainment and demonstrated role attainment into a woman's established role set. It is both a cognitive and social process, influenced by cultural and family context as well as mothers' and infants' traits and characteristics (Grace, 1993).

A study of maternal role attainment in three age cohorts identified adolescents as psychosocially inappropriate for motherhood. Women in their twenties were reported to be at the ideal physiological and social age for having a first child. Women in their thirties were said to have the maturity, life skills and financial and social stability to be competent mothers but had less physical energy and more career/mothering role conflict (Mercer, 1981 cited in Barnard, 1995).

Demonstrated role attainment has been empirically represented in attitudinal reports and by observation of maternal role behaviors (Hauck, Booth & Barnard, 1991; Mercer, 1985). Self-image and perceived control over life events were found to be central to assumption of the maternal role (Mercer & Ferketich, 1994a). Progress in role

attainment was observed from late pregnancy to six months postpartum by reports of increased self-confidence, protective and nurturing behaviors and positive body image although no change was reported in maternal attitude (Ruble, et. al. 1990). Mercer (1985) identified an increase in maternal competency behaviors over the child's first year of life with a peak in mean scores at 4 months of age. This peak in scores coincides with the developmental ability of infants at this age to be extremely sociable.

Feeding as a Nurturing Behavior

A number of childcare tasks such as feeding, bathing, dressing, diapering, soothing and playing with their infants are behaviors incorporated into the role of 'mothering'. Observation of maternal role behaviors during acts of caregiving, such as feeding interactions have been used to rate and measure the development of the role attainment process by a variety of nurse practitioners (Akerson, 1989; Baird, Haas & McCormick, 1993; Barnard, 1995; Bliss-Holtz, 1988; Walker & Montgomery, 1994; Sonuga-Barke, Thompson & Balding, 1993). When an interactive framework is applied to the feeding episode, it moves the activity from the provision of nutrition to a very rich and complex behavioral episode. Barnard's (1994) feeding scale incorporates both the physical 'caretaking' tasks such as positioning and alleviating distress, and the reflective 'knowing' tasks such as commenting on the infant's behavior and encouraging exploration, associated with optimal maternal behaviors.

Feeding is the first joint task of the mother and infant. Immediately following delivery, most infants are now put to their mother's breast. Feeding, therefore, is a universal, observable form of maternal nurturing behavior that begins at birth and continues throughout the child's first year of life (Barnard, 1995; Lerner, 1994). In early infancy, this is also the time that most infants are awake and available to interact. Later, although the type of feeding may vary, the process of mother-infant involvement remains fairly stable (Speitz, 1980). The success of this feeding relationship can set the stage for other maternal-child interactions.

Research studies suggest that warm, sensitive and nurturing caregiving by the mother enhances optimal development of the child (Bee et al., 1982; Campos, Barrett, Lamb, Goldsmith & Stenberg, 1983; Karl, 1995; Olson, Bates & Bayles, 1984). When the feeding experience is perceived as positive, the mother feels competent and secure in her ability to care for her child (Mercer & Ferkeitch, 1994a). If the interaction is perceived as negative, self-confidence and competence in the mothering role may be threatened. However, Barnard (1995) has suggested that maternal-infant interaction is the one process most accessible to change. Improving this relationship accesses a re-occurring cyclical event where positive gains in maternal behaviors are likely to be maintained due to the infant's responsiveness.

Maternal-Infant Interaction

A basic premise of attachment theory is that the quality of early mother-infant interaction is a major factor in the quality of infant attachment and later child outcomes. Although much of the literature acknowledges the active role of the infant within the dyadic interactive process (Barnard, 1976; Bell, 1973; Brazelton, 1973; Censullo, Lester & Hoffman, 1985; Mercer & Ferkeitch, 1994b), maternal responsiveness to infant cues appears to be the critical factor in the success or failure of the process (Barnard, 1993; Bornstein & Tamis-LeMonda, 1994; Crittenden & Bonvillan, 1994; Isabella & Belsky, 1991; Karl, 1995). Maternal responsiveness has correlated with positive child outcomes such as secure attachment to the mother, language acquisition, cognitive ability and school achievement (Bakeman & Brown, 1980; Bee, Hammond, Eyres, Barnard & Snyder, 1986; Bradley & Caldwell, 1976; Kang, 1986).

The developmental tasks of the infant provide the context for maternal behaviors. Initially, the infant is learning to regulate all body systems. The infant is learning to process the sights, sounds and textures of the environment and regulate his/her reactions to it. Patterns of sleep-wake and feeding are emerging. Maternal tasks during this time are to recognize and respond to the infant's cues. Studies have shown that the flow of

this initial stage of dyadic interactions depends primarily on the mother's ability to insert herself into the infant's rhythm (Barnard, Morisset & Spieker, 1993. Crittenden & Bonvillan, 1984).

At four months of age, the infant is becoming a social being. Social smiles are given to any adult who acts in a playful manner. At this age, the language of turn-taking is emerging. However, the mother is still the primary mediator of the child's behavior. Her task is to provide lots of opportunity for face-to-face interaction, social games and conversation (Barnard, Morisset & Spieker, 1993; Papousek & Papousek, 1992; Thomas, 1981).

Environmental Risk Factors or Difficult Life Circumstances

The concept of environmental factors and their relation to maternal-infant health outcomes has enjoyed considerable attention (Barnard, 1991; Bee, Hammond, Eyres, Barnard, & Snyder, 1986; Levitt, Weber & Clark, 1986; Mercer & Ferkeitch, 1994a; Pridham, Egan, Chang & Hansen, 1986). The major conclusion the literature supports is that with multiple risk indicators the potential for poor child outcomes increases. Riciutti (1983) developed an interactional multi-factor high-risk parenting model which summarizes a variety of factors associated with high-risk parenting and adverse developmental outcomes.

The societal level environmental impacts Riciutti identifies are: prospects for jobs, income, housing, schools, support services and health care. Within the family environment are factors such as: disposable income, housing, chronic stress, instability, conflict, intrafamily support and supportive family networks. Many of these factors are captured within the Difficult Life Circumstances Scale. Maternal characteristics such as education/knowledge, age, or health and infant characteristics such as prematurity, low birth weight or a handicapping condition which impact maternal behaviors are the same non-optimal characteristics identified by Barnard. A number of other studies have addressed maternal factors such as age, education and previous experience with children (Mercer & Ferkeitch, 1994b; Mercer, 1986; Pridham & Chang, 1992).

The findings suggest that the major factor affecting the quality of maternal-infant interactions in primiparous women between 20 to 30 years of age was an adequate level

of social support. Social support was defined as positive marital and family relationships, work satisfaction, adequate rest and time. Barnard (1993) identified the mother's level of education to be a significant factor in maternal-infant interactions.

In a comparison of 'daily hassles' versus 'major life events' Kanner, Coyne, Schaefer and Lazarus (1981) reported that daily hassles were more predictive of concurrent and subsequent psychological symptoms. The most frequent 'hassles' reported by the respondents were troublesome neighbors, financial debt, alcohol abuse, employment concerns, physical illness, health of a family member, a sense of too many things to do and crime. These items also appear to be very similar to the items on the Difficult Life Circumstances Scale. They concluded that major life events such as births, deaths or relocation operate by affecting the person's pattern of daily hassles by disrupting social relationships, habits and patterns of activity. Positively-viewed events may serve as interludes from regular stressful encounters, sustainers of coping activity or may contribute to replenishment of depleted resources. Therefore, the birth of the first child may be both a major life event and a positively-viewed event which could impact mother-infant interactions either negatively or positively. Studying the impact of reported risk factors in this population seems a worthwhile undertaking.

Rationale for Chosen Instruments

Instrumentation is a primary factor in a correlational design attempting to clarify the relationships between variables. The psychometric properties of the primary instruments specific to this study, the Difficult Life Circumstances Scale (see Appendix B), the Nursing Child Assessment Feeding Scale (see Appendix C) and the Parental Sense of Competence Scale (see Appendix D) will be described more fully in this section of the thesis. The Difficult Life Circumstances Scale (DLC), the Nursing Child Assessment Feeding Scale (NCAF) and the Parental Sense of Competence Scale (PSOC) were three of the tools chosen by the principal investigators of the original project. A summary of all the measurement instruments used in the original research project and their psychometric properties is attached (see Appendix E).

The intent of using the DLC Scale and PSOC Scale in the original project was to establish equivalency of the intervention and control groups. The NCAF Scale was administered at Week 1, prior to the interventions starting, and at Week 16 to measure the level of parent-infant interaction in each of the groups. The DLC Scale and NCAF Scale were included as the primary data sources for analysis in this study because of the perceived value of information the scores could provide about the impact of environmental variables on mother-infant interactions in a primiparous population. The PSOC scale was included as a secondary data source to determine the effect of maternal self-confidence as a potential protective factor. A defense of the original choice of instruments over instruments designed to measure similar concepts will not be undertaken in this study. However, the tools meet the requirements of a good family assessment instrument in that they are understandable, appropriate for all groups, and are easily administered and scored (Speer & Sachs, 1985). A description of the tools, their development and psychometric properties and their use in other studies is included to establish the rationale for the use of these tools in this study.

Difficult Life Circumstances Scale (DLC)

Description of the Instrument. The DLC Scale is a 28-item binary scale designed to measure the existence of stressors or ongoing chronic problems experienced by high-risk pregnant families. The scale can be used either as a self-report measure or as the framework for recording responses in an interview. Each stem question in the DLC Scale represents sensitive issues and problematic life situations ranging from alcohol addiction, physical abuse, marital conflict, and inadequate housing to not having enough time left over after work for family life. Responses to the questions are the client's perception of whether or not a problem exists.. The respondent places a check in either the "yes" or "no" box to indicate if the problem is one they face. Questions which make respondents uncomfortable do not have to be answered. Completing the tool takes approximately 10-15 minutes. The total score is the sum of the "yes" answers.

Development of the Scale. The items were constructed from Barnard's prior clinical and research experience with high-risk families for use in the Clinical Nursing Models study (Barnard, 1989). In earlier work with high-risk families Barnard had

observed the existence of chronic family problems that were not adequately captured by traditional Life Events Scales. The underlying assumption was that for families with a high level of chronic problems, the maternal child outcomes would be less favorable.

The Clinical Nursing Models sample consisted of women recruited during their pregnancies for a 3-year intervention study. The mean age of the subjects was 21 years: most had not completed high school and 75% were on welfare. Barnard (1989) identified that the DLC Scale "seemed to represent a useful construct that potentially measures both the frequency of chronic problems and also a negative perceptual orientation" (p. 6). Based on her findings from the Clinical Nursing Models 1982 study, she suggested a cut-off score of 6 and above was psychometrically and clinically reasonable in the identification of potential cases at high risk for poor family, parenting and child outcomes (Barnard, 1986).

The major advantages of this instrument are its brevity and predictive validity. A disadvantage is that it does not measure the extent to which the stressors are a problem.

Description of Psychometric Properties. Content validity was established by basing the tool on the author's prior clinical and research experience with high risk families. Concurrent validity was established by comparing the scores on the DLC with other instruments. The total score showed a consistent relationship with the Beck Depression score, a physical symptom checklist and social support measures (r = .20 to .59). High DLC Scale scores correlated with more depression, more negative physical symptoms and less social support (Barnard, 1989). Case-by-case retrospective nursing diagnoses made following 18 months of intervention identified high DLC Scale scores were associated with diagnoses of non-compliance, anxiety, powerlessness, disturbance in self-confidence, alteration in parenting, potential for violence, and ineffective coping.

A diagnosis of diversional activity deficit was associated with a lower DLC Scale score. The Intake DLC Scale score correlated with a number of child outcome measures used at the 2 and 3 year points in the study. High Intake DLC Scale scores were consistently associated with poor child outcomes across physical (number of childhood illnesses and accidents, r = .21), emotional (Stability of Secure Attachment, r = -.23; Achenbach Child Behavior Checklist, r = .22) and cognitive (Bayley Mental

Developmental Index, r = -.39; Preschool Language Scale, r = -.44) domains. A high Intake DLC Scale score was also associated with lower scores on parenting indices such as the HOME Inventory and NCAF Scale scores.

Test- retest procedures are often used to determine the reliability of tools measuring affective and attitudinal domains (Brink & Wood, 1989). Barnard (1989) administered the DLC Scale tool to the women during pregnancy and again when the child of that pregnancy was two and three years of age. Many of the items showed consistency across the three administrations of the tool. Test-retest reliabilities ranged from .40 to .70.

Documented Use of the Tool. The DLC Scale has been used in other studies to measure stressful life circumstances in high risk populations in relation to: the initiation and continuation of prenatal care in battered women (Holthaus, 1994); the identification and validation of psychosocial stressors presented by pregnant women (Ferguson, 1993); predicting parental involvement of preschoolers in substance abuse preventative programs (Hahn, 1995); child behavior outcomes and mothers' social support (Johnson, Booth & Bee, 1989). These studies have continued to address concerns related to the instrument's reliability and validity.

Holthaus (1994) measured verbal and physical abuse by a combination of interview responses and written responses on the DLC tool. Her findings indicated there was an association between physical abuse and continuation of prenatal care. Montana's use of the DLC Scale (Ferguson, 1993) with a sample of 838 women identified consistency between the Montana 1989 study and Barnard's Seattle 1982 study in the frequency of occurrence in six of the top eight items (credit rating, adequate housing , no phone, lack of privacy, arguments with partner and emotional abuse by partner). In addition, "high" scores on the DLC Scale were predictive of smoking during pregnancy, an infant gestational age of less than 39 weeks and a higher incidence of low birthweight infants. Overall, the tool was found to be helpful in identifying women requiring case management services but Ferguson (1993) recommended further study be undertaken relative to the cut-off score of 6 as she found consistent changes at the 3-4 level rather than the proposed 5-6 level of the instrument.

Hahn (1995) measured stress using the DLC Scale in her study and reported internal consistency of .68 with the sample. Correlations of stress as a predictor variable with parental attendance in Beginning Alcohol and Addictions Basic Education classes was found to be significant ($p<.05$) but weak ($r_s = .15$). Johnson, Booth and Bee (1989) reported the scale to be moderately correlated with child behavior problems ($r = .50$) and mothers' social support ($r = -.43$). To date, no studies of low-risk primiparous populations have been reported.

Nursing Child Assessment Feeding Scale (NCAF)

Description of the Instrument. The NCAF Scale is an observational measure consisting of 76 binary items designed to assess the behavioral contributions and characteristics unique to feeding interactions of both caregiver and child during the first year of life. A feeding situation reflects the caregivers' overall behavior toward a given infant and can be used as a reliable indicator of normal family function (Brady, 1976). The items are divided into six sub-scales, four of which relate to the caregiver. They include sensitivity to cues, response to distress, social-emotional growth fostering, and cognitive growth fostering. The remaining two scales relate to the infant. They include clarity of cues and responsiveness to caregivers.

Embedded within the maternal and infant scales are sixteen contingency items. These items reflect the maternal-infant communication patterns in that an action by either of the participants should result in a reaction by the other participant. Demographic information such as maternal age, education, ethnic heritage, partnered status, infant age, sex and birth order are included in the tool. Situational factors such as type of feeding, length and time of feeding, setting and infant's state at the beginning of the feeding are also documented.

A trained observer is required to watch a feeding situation between the caregiver-infant dyad and score it immediately afterward. Total scores and sub-set scores on each of the subscale and contingency items are obtained by adding the number of "yes" responses in each category. Observers are certified through the Nursing Child Assessment Satellite Training (NCAST) office at the University of Washington. After watching videos of caregiver-child dyads, observers must achieve 85% scoring accuracy

with NCAST standards on five different dyads. Barnard recommends frequent reliability and inter-rater reliability checks (Sumner & Speitz, 1995).

Development of the Tool. In the early 1970's Dr. Kathryn Barnard and a research team at the University of Washington's School of Nursing were contracted to study ways of measuring the health and caregiving environments of infants and young children. Dr. Barnard used the conceptualizations and key findings of the Nursing Child Assessment Project to develop two assessment scales. The 1979 revision of the Nursing Child Assessment Teaching and Feeding Scales moved concepts about caregiver-child interaction and observational methods beyond the laboratory and into everyday practice (Barnard, et. al., 1989). Over the past 20 years, the tools have become widely used in clinical practice and research nationally and internationally. The scales are often used together but can be used separately. An approximation of a normative sample has been developed from over 2,000 reliability cases provided by NCAST learners over the past 15 years. The current 1995 scales include minor changes made to clarify meaning and to simplify wording (Sumner & Speitz, 1995).

Description of Psychometric Properties. Items in the scale were adapted from the original Nursing Child Assessment Project feeding scale and reflect the general concepts of the Barnard model. Content validity for items in the current binary scale was established by including items meant to measure parent-child interactions that facilitate communication and learning for both partners in the dyad. Concurrent validity and predictive validity are important types of criterion validity. Barnard reported a moderate correlation between the subsets and total scores of same-time observations of the Feeding and Teaching scales (Barnard, 1976). Moderate correlations were also found when comparisons of the NCAF Scale total and subscale parent scores to the HOME scales, obtained from the Nursing Child Assessment Satellite Training database, were undertaken.

Currently, there are no long-range predictive values of the Feeding Scale on larger samples since Barnard's original version was used in the Nursing Child Assessment Project study. However, a small number of videotapes were re-scored and showed predictive validity ($\underline{R}$ = .30 - .50) of Bayley's Mental Development Index at 12 and 24

months, language development at 36 months, Binet IQ at 48 months and problem behavior at 36 months. Due to the homogenous nature of this subsample, this level of predictive power was felt to be worthwhile. A lack of empirical studies using a hypothetical framework has contributed to some weakness in construct validity of the Feeding scale.

Barnard (1995) reported the Feeding scale demonstrates high internal consistency for the Total score, the Parent score, the Infant/Child score and the Parent Contingency Score. Total parent and child summary score (α = .86) and subscale alphas of above .50 reflect that the entire set of items are measuring a basic dimension of behavior. However, the total scores seem to provide a more reliable basis for group comparison than the subscale scores. The set of 16 items that comprise contingency items are a cohesive set of items with Cronbach's alpha's above .65 (Barnard, 1991). Highly contingent mothers tend to score high on the parent sub-scales but there is no consistency between the parent's contingency scores and the child's scores on contingency items. Test-retest reliability at 4 month intervals from the Nursing Child Assessment Project cohort sample was better for the parent items (.75) than the infant items (.51).

Documented Use of the Tool. The NCAF Scale has been used to reinforce positive interactions (Huber, 1991) to determine at-risk dyads (Crittenden, 1993; Free, Russel & Mills,1989; Sumner & Speitz, 1995) and as an intervention tool (Bristor, Helfer & Coy, 1984; Harrison et. al., 1991). The original feeding scales demonstrated that maternal facilitation was highly related to the child's IQ and linguistic competence at 4 years of age (Barnard, et al., 1989). In a sample of socially at-risk mothers, NCAF scores were predictive of cognitive performance at 24 months and child attachment security behaviors at 13 months (Harrison, Sherrod, Dunn & Olivet, 1991). In a multi-risk sample, Barnard and colleagues (1989) reported a correlation between the Feeding Scale and Bayley's Mental Developmental Index (R= .39). Clinically relevant at-risk scores, those falling below the 10th percentile when compared to a normative group, have now been developed for three ethnic groups for use in outcome evaluation (Barnard, 1995).

Several researchers have incorporated both short and long-term test-retest reliabilities of the Feeding scale with low-risk samples during the peri-natal period (Quillan, 1983), at 4 months of age (Mc Namara, 1987) and from birth to 6 months of age with findings similar to the Nursing Child Assessment Project cohort sample. Sumner and Speitz (1995) suggest that developmental changes may affect the infant items. Bononami (1990) reported total parent (.65), total child (.81) and total score (.84) internal consistency alphas in her study of 15 mothers and their four-month old infants. McNamara's (1985) factor analysis of the feeding scale with infants less than one year, identified the major factors to be: maternal verbalizations, infant vocal and social cues, mutual gaze and tactile stimulation. With the exception of tactile stimulation, all behaviors increased with the age of the infant. More research will help to identify if social-environmental factors are a stronger determinant of developmental outcome than the medical complications most often studied with high-risk dyads.

Parental Sense of Competence (PSOC)

Description of the Instrument: The Parental Sense of Competence Questionnaire is a 17 item Likert scale designed to measure self-esteem in the parenting situation with reference to the respondent's own infant. The scale is designed to be used as a self-report measure and each item is scored on a six-point scale ranging from "strongly agree" to "strongly disagree". The 8 item Skill/Knowledge subscale assesses parents' perceptions of the degree to which they have acquired the skills and understanding to be good parents. The 9 item Valuing/Comfort subscale assesses the parents' perceptions of the degree to which the individual valued parenthood and was comfortable in the role (Gibaud-Wallston, 1977).

Development of the Scale: The scale was designed specifically by Gibaud-Wallston for use in her doctoral dissertation investigating self-esteem and situational stress as factors relating to sense of competence in new parents. Development and testing of the instrument was a major part of her dissertation. The scale was modeled on Wagner

and Morse's Sense of Job Competence Scale with changes in the wording to make it appropriate for a parenting situation.

Description of Psychometric Properties: Gibaud-Wallston based her findings of the PSOC on a voluntary sample of 100 male/female participants. The subjects were primarily Caucasian, first-time parents of ten-week old infants. The couples were in intact marital situations and of middle to upper-middle class socio-economic status. Discriminant and convergent validity were tested by including the use of other scales theoretically related to self-esteem such as social desirability scales, personal feelings scales and parental attitude scales. Although results were inconsistent, Gibaud-Wallston reported they provided some validity to the scale as the majority of items, although not statistically significant, were correlated in the direction of the other measures.

Internal consistency analysis provided an alpha coefficient of .80 for Skill/Knowledge, .69 for Valuing/Comfort and .80 for the combined or total score. Mothers' subscale correlations with the total score were significant ($p < .05$) and ranged from .78 to .86. Although the three test-retest correlations over the seven-month period were not expected to be high due to the variability of the construct during the first months, results ranged from .46 to .82 ($p < .01$).

Documented Use of the Tool: Dickie and Gerber (1980) used the PSOC to measure parental sense of competence in a treatment and control group of parents with 4 to 12 month old infants. Although no significant differences were picked up by the scale, Dickie and Gerber speculated that training may have sensitized subjects to the scale items. Gojmerac (1988) reported that the PSOC was a moderate measure of self-reported findings of confidence but suggested the scale may have measured other constructs in addition to confidence. Subscale alpha reliabilites ranged from .64 - .80 for the PSOC Scale Skill/Knowledge and .69 - .84 for Valuing/Comfort. Test-retest reliabilites over the four time periods were .84 for both subscales. However, inter-item correlations for the complete scale were less than $r = .30$.

CHAPTER 3

METHODOLOGY

Study Design

The design of this study was a combination descriptive/correlational study incorporating an exploration and description of the incidence of reported stressors as measured by the Difficult Life Circumstances tool within a selected sample of partnered women expecting their first child. Based on the existing level of knowledge and the use of a conceptual framework to guide the research questions, an examination of the effects of the variables and the relationships between them over time was undertaken (Brink & Wood, 1988). The major focus of the study was to determine if the reported difficult life circumstances affected maternal-infant interactions. Scores obtained on the Nursing Child Assessment Feeding Scale at the two pre-determined data collection points were used to depict maternal-infant interactions. Random assignment to the intervention and control groups controlled for a treatment interaction effect as well as age and educational influences (Brink & Wood, 1989). The influence of protective factors was considered by exploring the effect of parental sense of competence measures.

The unit of analysis used was mother-infant dyads. The dependent variable was identified as the feeding scores. The independent variable was reported difficult life circumstances. Additional variables explored were perceived maternal sense of competence, maternal age and the intervention of treatment group effect.

Sample

The sample for this study initially included the entire sample obtained for the original project. In the original project, data were collected over a period of 20 months from a non-probability convenience sample of 115 volunteer subjects in hopes of obtaining a minimum of 80 subjects with complete data sets. The sample was obtained from the Edmonton geographic area by recruiting for subjects at prenatal classes,

expectant parent forums and in local newspapers. All mother-infant dyads were selected using the following criteria:

Infants:

-singleton birth of 38-42 weeks gestation

-birthweight equal to or greater than 2500 gms.

-no extensive resuscitation required at birth

-no apparent congenital anomaly or significant birth injury

Mothers:

-uneventful postpartum recovery

-first-time inexperienced primary caregiver

-never used massage in the past

-eighteen years of age or more at the time of delivery

-understand the purpose of the study

-willing and able to sign a written consent.

All dyads meeting the inclusion criteria were eligible to participate in the study.

Subjects were randomly assigned to one of three treatment groups or a control group in the original project. All subjects completed the Difficult Life Circumstances questionnaire used in this study and participated in the initial feeding observation before any treatment interventions were begun. Subjects were aware of which group they had been assigned to but were not aware of the other treatment or control groups.

Data Collection

Instruments. The data used for this study were the output from three sources of information used in the original project. The Difficult Life Circumstances Scale (DLC) was used as a self-report instrument to measure the frequency of chronic ongoing problems or stressors experienced by the subjects (Barnard, 1989). The Nursing Child Assessment Feeding (NCAF) Scale (Barnard, 1994) was used to evaluate mother-infant interactions. This instrument allows trained observers a relatively simple and systematic

way to capture caregiver-child interaction (Barnard, 1995). The Parental Sense of Competence Scale (PSOC) (Gibaud-Wallston, 1977) was used as a self-report instrument to measure the positive dimensions of maternal self-esteem. Based on information gathered from the literature regarding environmental impacts on maternal-infant interaction, these instruments were chosen for their appropriateness in the identification of maternal role attainment, life circumstances and the exploration of possible relationships to maternal-infant scores in a feeding situation. Demographic data were used to provide a description of the sample and to explore the possibility of other confounding effects identified in the literature.

Procedure. Parental knowledge about child caregiving is most appropriately appraised by observation, while the mother's mental health can be evaluated by standardized questionnaires (Carmen, 1994). The data pertinent to this study were collected by a combination of self-report questionnaires and two structured observations. Each participant completed the Difficult Life Circumstances and Parental Sense of Competence questionnaires two to four weeks prior to her expected date of delivery. This was done following an initial visit by the research assistant assigned to the subject. During this visit, the purpose of the study, the study requirements and the prenatal questionnaires were explained. Each participant was asked to complete the questionnaires and return them to the principal investigator in the stamped, self-addressed envelope provided. This method allowed the participant to share information of a sensitive nature without breaching confidentiality and anonymity issues (Brink & Wood, 1989).

The assigned research assistant observed and scored the initial feeding interaction using the NCAF Scale. Prior involvement with the subject by telephone contact and the prenatal visit assisted with establishing a sense of comfort and professional rapport required for this type of observational research (Field & Morse, 1985). In order not to introduce bias into the original project, the final interaction was observed by a research

assistant who was not aware of the subject's group assignment. All observations took place in the participant's home at a time and date that was mutually agreeable to the subject and the research assistant.

All research assistants were trained and achieved an 85% agreement rate for NCAST certification as part of the original research protocol. Inter-rater percentage agreements were conducted on 14 of the subjects during the study. The mean percentage agreement for all observations was 87% with a range of 81% - 95%. Seven inter-rater observations were done for each time period. Mean percent agreement for Week 1 was 88.4% with a range of 81%-95%. Mean percent agreement for Week 16 was 85.6 % with a range of 81%- 93%. Due to the number of inter-rater combinations, an inter-rater reliability could not be calculated (T. Taerum, personal communication, July 16, 1996).

Ethical Considerations

The original research project received ethical approval from both the Faculty of Nursing Ethics Review Committee and the Edmonton Board of Health (see Appendix F & G). Ethical review and consent to proceed with the secondary analysis specific to this study was obtained through the Faculty of Nursing, University of Alberta (see Appendix H). The purpose of this study was discussed with the entire research team and verbal agreement to proceed with the study was obtained. In addition, a letter of agreement was signed by the Principal Investigator of this study (Appendix I) and the Nursing Faculty members of the Thesis Committee.

Consent Procedures

The rights of the subjects were protected in several ways. Participation in the original study was voluntary and subjects could withdraw at any time. Consent forms were maintained in a separate file from the data. Consent for participation in secondary analysis was obtained from each of the subjects in the original study (Appendix J).

Confidentiality/ Anonymity

To maintain confidentiality in the original project, an identification number was used to differentiate each subject's response data. No names or other identifying information was part of the data set used in this study. In accordance with research policy, the researcher will keep the data used for this analysis for seven years. The data set will remain the property of the researcher and may be used for educational purposes or further research.

Risk versus Benefit

There were no perceived risks in the original study. Although there are no direct benefits to the participants in this study, the findings may benefit other mothers and infants and may be of assistance to professionals working with young families.

Data Analysis

Data analysis for this study, and the original study, used the SPSS computerized analysis program (Norusis, 1990). Each item for the original study was treated as a single variable. DLC Scale total scores and NCAF Scale sub-set, contingency, and total scores were assigned variable labels. PSOC sub-scale scores were calculated and assigned variable labels. Each response in a nominal scale was assigned a numerical value. Missing values were identified for all calculations. Data were entered in a fixed format with each variable assigned a label. In the initial data entry, two volunteers were used to enter data for each of the 3-hour time periods. Data were called by one person and entered by the other for one-half the time. The data entry persons then switched roles and verified their data entry. Questions and concerns were addressed to the project manager by the use of a communication book. For the purposes of the secondary analysis, data were entered and an item by item check was undertaken for each case. A random sample of 10% of the cases was then checked using the two-person call-back system.

After cleaning the data, univariate statistical analysis was conducted. Calculation of frequencies and descriptive statistics for each variable was undertaken. Content analysis of the raw data was required for some variables. Preliminary analysis of the data for attrition rates over the study period was undertaken. Only those cases where DLC

Scales and Feeding Scales were available for all time periods were included in further analysis.

A conservative approach was taken regarding the inclusion of missing items. Cross references to other data sources was used when possible. Items reported as "not applicable" on the DLC Scale were coded as "NO". For the NCAF Scale, two missing items were allowed. If less than 3 items were missing on the PSOC Scale, the mean and mode score was calculated across a respondent's valid items to calculate the probable response. Responses to individual items that were not available were reported as missing.

A reliability measure utilizing Chronbach's alpha to determine internal consistency for each of the primary instruments used with this sample was obtained. Based on the findings, a decision to use NCAF parent scores and NCAF total scores as the dependent variables under study was made.

Initially, the distributions of the scores for each of the major variables was graphically analyzed through the use of scatter plots, box plots and Q-Q plots. This helped to portray the distributions and relationships of the variables under study. All cases were evaluated to determine the interactive effects of the DLC Scale score and the treatment group assignment by using two-way analysis of variance techniques. Since no correlational relationship was evident between the DLC Scale scores and the NCAF Scale, regression analysis was not appropriate (Brink & Wood, 1989). Therefore, DLC Scale items were combined to reflect scale item scores addressed in the literature as areas of further study. Finally, DLC Scale scores were combined into categories, suggested by the literature, to investigate possible differences in NCAF Scale scores. Biographical characteristics of the sample and PSOC Scale scores were also included in the comparison of DLC Scale categories. A one-way analysis of variance was used with the significance level set at .05.

CHAPTER FOUR

FINDINGS

This chapter begins with a description of the mothers and infants in the study. The general findings will be reported followed by results specific to each of the research questions. This is followed by discussion of findings from other variables not specifically identified in the research hypotheses. For the purposes of computerized data analysis, variables from the demographic questionnaires and measurement scales were abbreviated. Explanations of the abbreviated forms are provided (see Appendix K).

The data collection period of the original study spanned 20 months, from August 1994 to April 1996. There was an approximate attrition rate of 14% from the first reporting period to the last period. Examination of the characteristics of the dropouts revealed a random pattern in terms of the variables available for study, such as maternal age, treatment group, birthdate of infant, etc. A trend to a higher percentage of dropouts in relation to DLC Scale scores of 6 was noted. Study attrition by DLC Score is reported in Table 1.

Description of the Sample

The 94 mother-infant dyads in this study all resided within Edmonton and its surrounding suburbs. Subjects were equally distributed among the four intervention groups as follows: massage group (26%, $\underline{n} = 25$), carry group (27.1 %, $\underline{n} = 26$), massage and carry group (22.9 %, $\underline{n} = 22$) and control (24%, $\underline{n} = 23$). All mothers were in partnered relationships throughout the study period. Ninety-three percent of the sample was Caucasian. Asian and Middle Eastern women accounted for 5.3 % of the sample and one subject was Native American. Mothers ranged in age from 17.6 years to 40.5 years with a mean age of 29.9 years and a standard deviation of 4.3 years. Fifty percent of the sample was between 28 and 32 years of age. One subject that was included in the study did not meet the age eligiblility requirements of the original project.

Table 1

Attrition of Study Participants from Week 1 to Week 16 by DLC Scale Score

DLC Scale Score	Measurement Time			
	Prenatal	Week 1	Week 16	Rate
Score = 0	38	37	33	13 %
Score = 1	24	24	19	20 %
Score = 2	20	16	16	20 %
Score = 3	13	13	13	0 %
Score = 4	7	7	6	14 %
Score = 5	5	5	4	20 %
Score = 6	3	1	2	33 %
Score = 7	1	1	1	0 %
Total	111	103	94	

Educational preparation of the subjects ranged from participants with Grade 10 high school education to professional and university post-graduate level education. Subjects with less than a high school education ($n = 3$) made up 3.2% of the sample. High school graduates accounted for 8.5 % of the sample. Another 22.3% had an incomplete college or university education. Fifty percent of the sample had college or university undergraduate degrees and 16% had a post-graduate level of education.

The majority of the subjects (69.2%) reported working either full-time or part-time or they were on maternity leave with a position being held for them in their place of employment. Of the 70% of subjects who indicated they planned to return to work, the majority indicated a planned return when their infant was 24 weeks of age, although responses ranged from 0 - 56 weeks. Twenty-six percent of the sample was unemployed and/or on maternity leave with no position being held. Another 4.3% identified themselves as students or self-employed.

Maternal prenatal health was estimated by asking subjects to rate themselves on a 6 point scale ranging from "no concerns" to "serious concerns". A range of concerns from "no concerns" to "only average concerns" were reported by 85% of the sample. Of the subjects reporting "more than average" to "serious concerns", only one subject required hospitalization (premature contractions) at 20 weeks. Other health conditions reported included uterine fibroids, ovarian cysts, mild hypertension, pre-eclampsia, gestational diabetes, spotting, pelvic discomfort, increased fatigue and anxiety and morning sickness. Responses of subjects identifying health concerns did not correlate significantly with affirmative responses to item 16 "a history of frequent minor illnesses" on the DLC Scale. Eighty-nine percent of the mothers and 79% of their partners were non-smokers. There was a higher, but insignificant, incidence of smokers with DLC Scores above four (refer to Table 4).

There were 48 female infants and 46 male infants in the sample. Eighty percent of the infants were born vaginally. Two infants were born at home and the remainder were born in Edmonton area hospitals. All babies were born within 38-42 weeks gestation with the mean gestational age within 6.4 days of the expected delivery date. The infants were healthy babies with a mean birthweight of 3498 gm. and standard deviation of 433gm. The range in birthweights was 2736 gm. to 4862 gm. The usual length of hospital stay was 1-3 days with a mean stay of 2.2 days. All mothers reporting a hospital stay of over 5 days had Caesarean Section deliveries. Babies spent the majority of their time in the mothers' hospital room. Eight babies were reported to have spent time in the hospital special nursery, but no reasons were given.

General Findings

The findings of this study will be outlined beginning with a description of the findings for this sample on each of the study instruments.

Maternal-Infant Feeding Scores

The mean total scores, with standard deviations reported in parentheses, for the first and second observations were 58.93 (6.23) and 62.48 (7.04) respectively (Table 2). The mothers' scores did not appear to change significantly over time. The change in the

total score appears to reflect the change in the infant scores from the first to second observation period. The feeding observations took place in the homes of the subjects and 95% of them coincided with the infants' usual feeding time. Infants were 7-10 days of age at the time of the first observation and 18-20 weeks of age at the time of the second observation. Seventy-seven percent of the infants were in an optimal quiet alert or active alert stage at Week 1 and 85% of the infants were in this stage at Week 16. Ninety-five percent of the Week 1 observations were a breastfeeding. At Week 16, 71.7% were a breastfeeding, 17.4 % were bottle feedings, 5.4% were a solid feeding and 5.4 % were a combination.

Table 2

Maternal-Infant Feeding Scores

NCAFS Score	Week 1		Week 16	
Maternal Scale	M	SD	M	SD
Sensitivity to Cues	14.44	(1.47)	14.54	(2.06)
Response to Distress	10.12	(1.02)	10.12	(1.12)
Social-Emotional Growth	11.52	(1.69)	11.57	(1.82)
Cognitive Growth	6.56	(1.56)	6.87	(1.67)
Total Maternal Subscore	42.64	(4.13)	42.99	(4.34)
Maternal Contingency Score	11.96	(1.99)	11.94	(1.98)
Infant Scale				
Clarity of Cues	10.88	(1.96)	12.30	(1.71)
Response to Caregiver	5.40	(1.76)	7.11	(2.04)
Total Infant Score	16.29	(3.27)	19.48	(3.48)
Total Feeding Score	58.93	(6.23)	62.48	(7.04)

N = 94 at Week 1 and Week 16

Difficult Life Circumstances Scores

Due to the small numbers of respondents with DLC scores above 5, random assignment to the intervention groups did not allow for an equitable distribution of subjects among the four groups. Aggregation of subjects to the categories of 'no risk' (DLC score of 0), 'low risk' (DLC score of 1 or 2) and 'moderate to high risk' (DLC score of 3 to 5) allowed for a more equitable distribution (Figure 2). The mean score, with standard deviations reported in parentheses, for the study sample on the DLC Scale was 1.63 (1.70) with a range of responses from 0 to 7 (Figure 3). Only 3.2% of the subjects with complete data had DLC scores above 6. Scores of 3 to 5 were reported by 24.5% of the sample and 72.3% of the sample had scores between 0 and 2.

The most frequently occurring positive responses were: long-term debts other than a house mortgage (35.1%), partner's work interfering with family life (20.2%) and partner absent from home more than half of the time due to work or other reasons (17%). Another 9.6% of study participants identified as 'difficult' their own work as interfering with their family life or frequent minor illnesses within the past year. Long-term illness of themselves or a household member, verbal and/or emotional abuse from the current partner and being a victim of a crime in the past year were other items identified by 8.5% of the subjects. Items relating to problems with step-children in the household were identified by two of the subjects.

Figure 2

Distribution of Subjects to Group Interventions by DLC Scale Categories

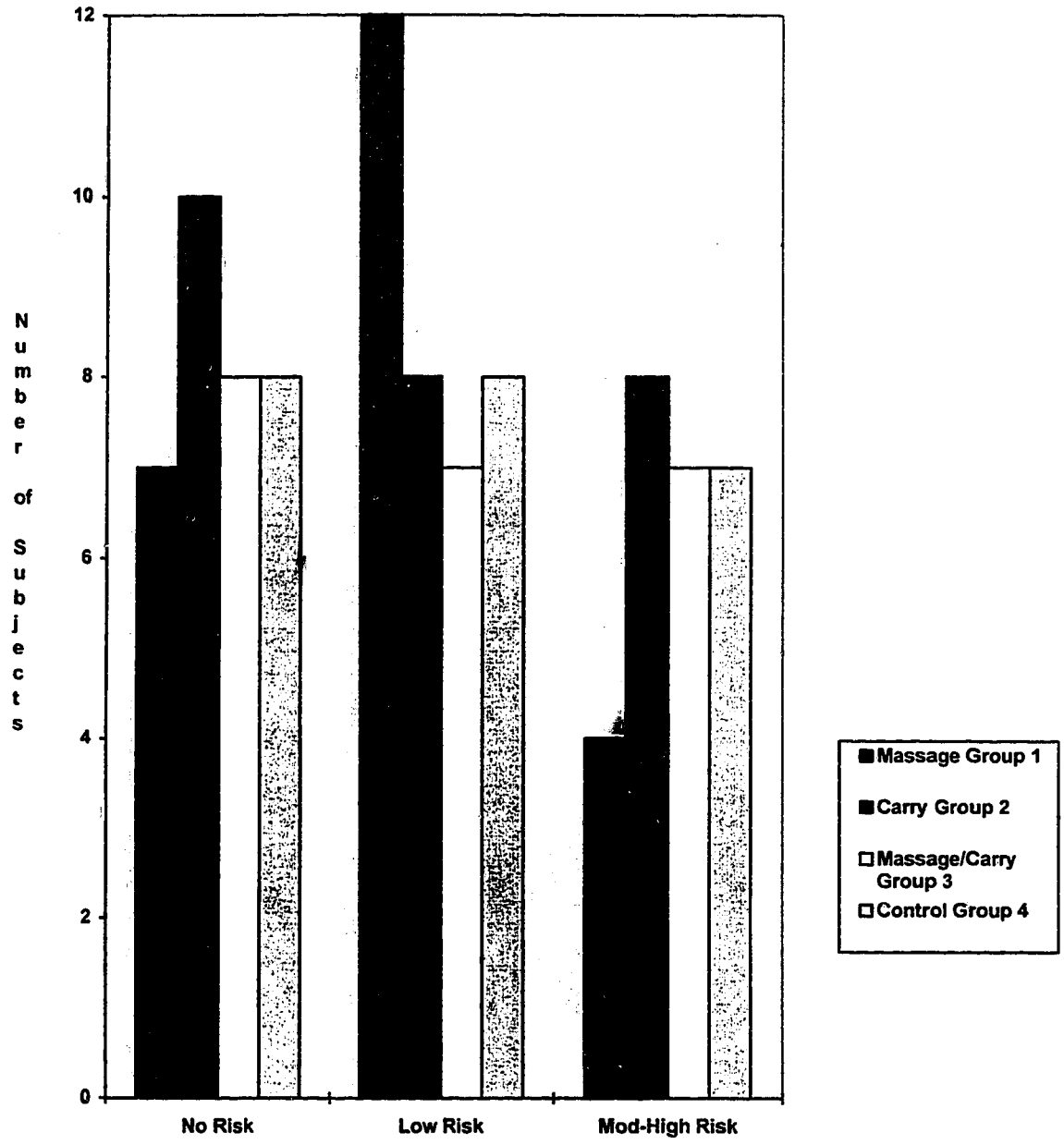
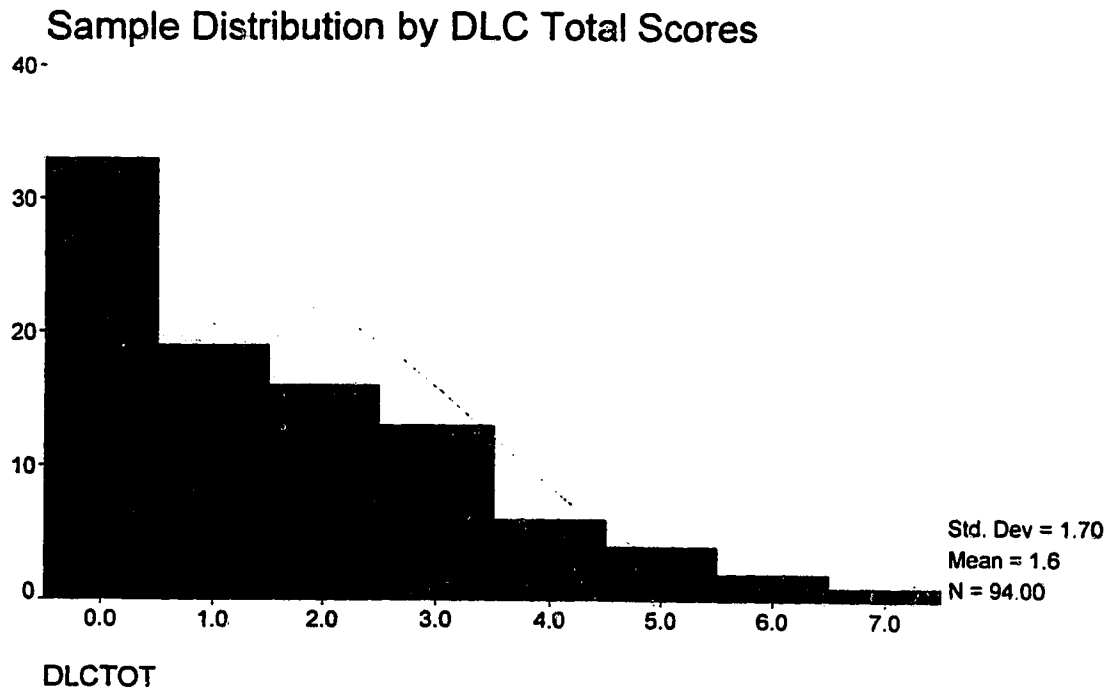


Figure 3

Sample Distribution of DLC Scale Scores



Research Questions and Findings

Relationship Between Difficult Life Circumstances and Maternal-Infant Feeding Scores

Due to the lack of a normal distribution of DLC Scale scores within the sample, a decision to use a non-parametric (Spearman's) correlational analysis was made. Reported DLC Scale scores were negatively correlated at both Week 1 and Week 16 with NCAF Scale maternal scores ($r_S = -.15$, $p = .14$ and $r_S = -.07$, $p = .49$) and NCAF total feeding scores ($r_S = -.15$, $p = .14$ and $r_S = -.12$, $p = .23$) respectively. However, little if any correlation was evident and none of the correlations were significant.

Individual DLC Scale items reflecting a potential for marital discord, such as frequent arguments with one's partner, alcohol and drug problems, physical abuse and verbal abuse demonstrated low inter-item correlations ($r_S = .20$ - $.48$, all were significant at $p = <.05$). Items 4 and 9, reflecting the partner's availability to the family, had a significant low correlation ($r_S = .34$, $p = .001$) but no correlation with the feeding scores. No relationship to feeding scores was found for Items 8 or 9 suggestive of potential maternal conflicts ($r_S = .21$, $p = .04$). However, none of these items were significantly correlated with feeding scores at either observational period. A third level of analysis aggregated items of the DLC score that were frequently identified by respondents with DLC Scale summative scores of 3 through 7 and compared them with the NCAF Scale total feeding scores. Correlations ranged from $r_S = -.04$ to $.09$ and $r_S = -.02$ to $.08$ respectively with no significance of any correlation. Correlations and significance levels for each of the individual and aggregated items are reported in Table 3.

A lower clustering of feeding scores was observed for respondents with a DLC Scale score of 4 in the scatter plots of Week 1 and Weeks 16 as illustrated in Figure 4. Therefore, a more detailed analysis of mean scores was undertaken to investigate this finding. An analysis of the feeding scores and possible observer rating effect on this group did not appear to be a concern. DLC Scale scores were categorized to reflect summative scores from 0 through 4 and an aggregate for DLC Scale scores of 5 to 7.

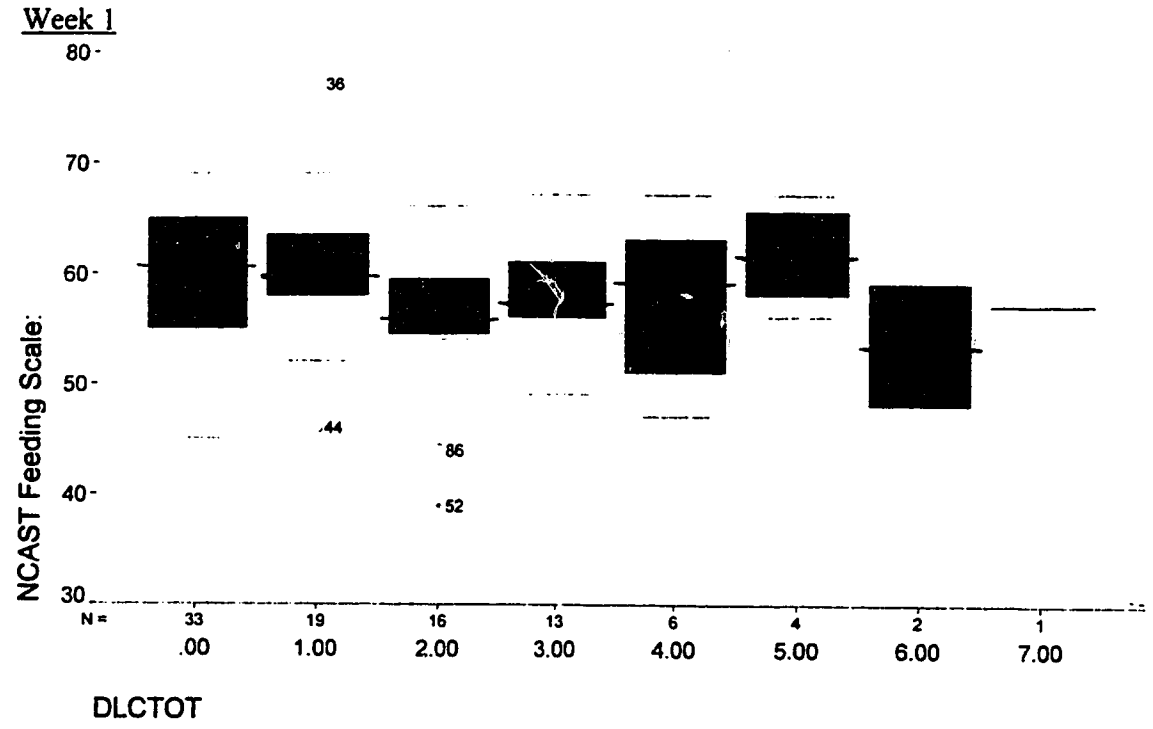
Table 3

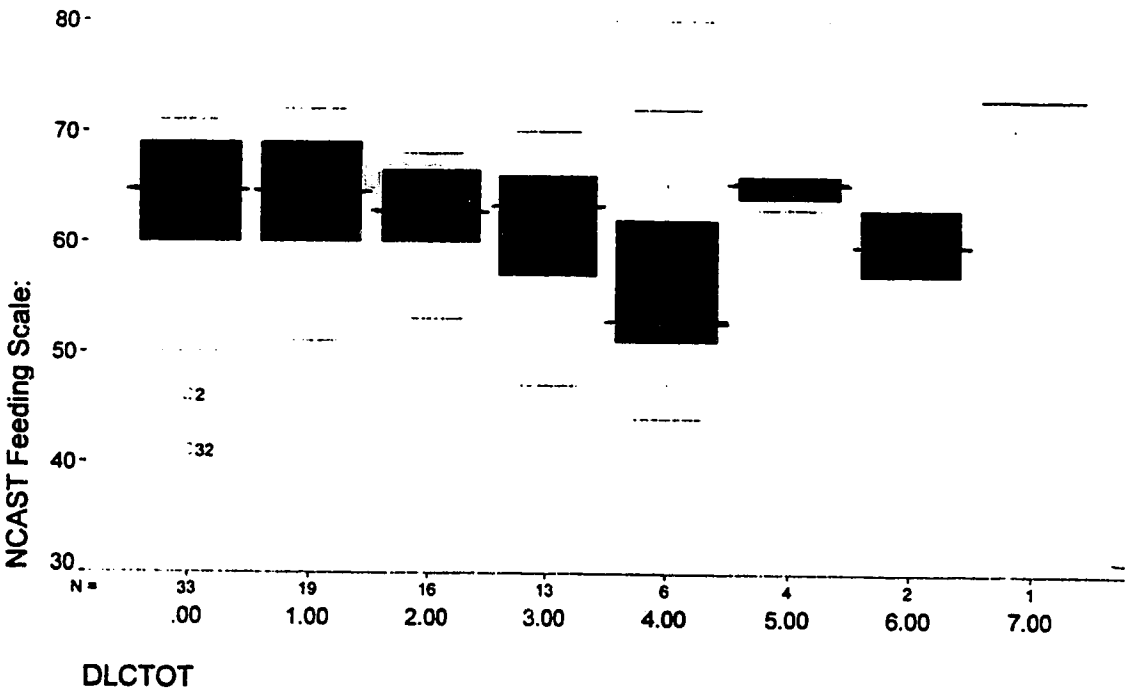
Correlations of DLC Scale Items and Feeding Scale Totals At Week 1 and Week 16

DLC Scale Items	NCAF Score			
	Week 1 Total Feeding		Week 16 Total Feeding	
Marital Discord	Corr.	p value	Corr.	p value
DLC 1 (arguments)	- .12	.24	.08	.42
DLC 18 (substance abuse)	.01	.92	-.19	.06
DLC 21 (physical abuse)	-.10	.36	.11	.31
DLC 22 (verbal/emotional abuse)	-.09	.38	.07	.52
Aggregate Potential for Violence Effect (DLC 21, 22, 26)	-.04	.34	.14	.19
Partner Not Available				
DLC 4 (away from home)	.08	.43	-.05	.64
DLC 9 (work interferes)	.13	.20	-.08	.45
Aggregate Partner Unavailable Effect (DLC 1, 4, 9)	.07	.50	-.02	.85
Maternal Time Conflicts				
DLC 8 (work interferes)	.05	.67	.09	.37
DLC 12 (lack of privacy)	-.04	.67	.08	.46
Aggregate Maternal Time Conflict Effect (DLC 8, 12, 15, 16)	.08	.44	.09	.39

Figure 4

Week 1 and Week 16 NCAF Scale Scores by DLC Scale Scores





Comparisons of biographical data and mean scores of each of the feeding scale subscores were computed and are reflected in Table 4.

An opposite finding was the direction of the two feeding observations (M = 58.0 and 55.83 respectively) in the respondents with DLC Scale scores of 4. All other DLC Scale categories NCAF Scale means increased from Week 1 to Week 16. Feeding scales were combined into three categories: scores below the NCAST cut-off score of 52 for at risk dyads, scores between the cut-off and the mean scores of the sample and scores above the mean sample score and compared across the revised DLC categories. No significant differences were identified between the categories.

Time Effect on Difficult Life Circumstances and Maternal-Infant Feeding Scores

Cross tabulations were obtained for each of the DLC Scale scores and each of the total NCAF Scale scores at the two observation periods. Due to the number of empty cells, the data were aggregated into meaningful categories of 'no risk' (DLC Score = 0), 'low risk' (DLC Score = 1 or 2) and 'moderate to high risk' (DLC Score = 3 through 7). Similarly, the feeding scores were aggregated into no risk (NCAF Score above the sample mean), low risk (NCAF Score between the sample mean and the cut-off score of 52) and at risk (NCAF Score below 52). Chi square analysis demonstrated no relationship between the variables at Week 1 ($p = .72$, $df = 4$). A significant relationship was demonstrated at Week 16 ($p = .03$, $df = 4$). However, this finding has to be viewed with some reservation as 33% of the cells still had counts with an expected frequency of less than 5.

The relationship between individual DLC Scale items and the NCAF Scale total feeding scores reversed direction from Week 1 to Week 16 for the majority of the items investigated (refer to Table 4). Negative correlation coefficients for 'arguments with one's partner', 'physical' or 'verbal abuse' and 'lack of privacy' resulted in positive correlation coefficients with these items by Week 16. Positive correlation coefficients for 'partners' substance abuse', 'work interference' and 'absence from the household' were negative correlation coefficients at Week 16. The exceptional DLC Scale item was 'maternal work interference'. This correlation coefficient remained positive for both

Table 4 a

Comparison of Biographical Data and DLC Scale Categories

Biographical Variables	DLC Scale Categories					
	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5-7
Maternal Age	31.0 (4.12)	30.2 (3.9)	28.7 (3.28)	28.7 (5.83)	27.4 (2.91)	31.2 (5.15)
Maternal Education						
-some highschool				15.4%	16.7%	9.3%
-highschool grad	6.1%	15.8%		15.4%		14.3%
-some college	24.3%	15.8%	31.3%	15.4%	33.4%	14.3%
-college grad	41.6%	52.6%	46.3%	30.8%	50%	67.2%
-post-graduate/prof	18.2%	15.8%	12.5%	23.1%		14.3%
Ethnic Heritage						
- Caucasian	93.9%	94.7%	87.5%	100%	83.3%	100%
- North American	6.1%	5.3%		6.3%	16.7%	
-Other				6.3%		
Employment Status						
-job/mat. leave with return	63.7%	73.7%	81.3%	53.8%	66.6%	85.7%
-no job/mat. leave without return	33.3%	26.3%	6.3%	38.5%	33.4%	14.3%
-other (e.g. student)	3.0%		12.5%	7.7%		
Health Concerns						
- less than average	75.8%	42.2%	33.3%	62.6%	50%	71.5%
- average	15.2%	36.8%	46.7%	23.1%	16.7%	28.6%
- above average	9.1%	21.1%	20%	15.4%	33.3%	
Smoking Habits						
- less than 5/day	3.0%	5.9%	6.7%			
- 5 to 12/day	6.1%		6.7%	7.7%	16.7%	16.7%
- 12 to 25/day			6.7%			
Partner Smoking						
- less than 5/day	3.1%	16.7%			33.3%	
- 5 to 12/day	6.3%	11.1%	7.1%			
- 12-25/day			7.1%	15.4%		42.9%
- 25 +/day			7.1%	15.4%		14.3%

Note: N = 94. Scores are reported in Percentages or Means , with standard deviations in parentheses

Table 4 b

Comparison of Infant Variables and Sense of Competence Scores with DLC Categories

Maternal/Infant Variables	DLC Scale Score Categories					
	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5-7
Sense of Competence Scores						
Skill/Knowledge: Prenatal	22.1 (5.4)	23.7 (5.3)	23.2 (4.8)	23.7 (5.9)	28.8 (6.0)	23.3 (6.6)
Skill/Knowledge: Week 16	17.6 (4.9)	19.3 (6.3)	16.1 (6.5)	15.0 (4.2)	15.0 (3.3)	14.0 (4.7)
Valuing/Comfort: Prenatal	19.4 (5.3)	21.5 (6.4)	19.7 (6.1)	21.0 (5.2)	23.0 (9.5)	19.1 (5.1)
Valuing. Comfort: Week 16	17.9 (5.7)	20.2 (7.1)	18.1 (8.9)	17.1 (5.7)	14.7 (4.4)	17.4 (4.1)
Infant Characteristics						
Gender						
- female	39.4 %	57.9%	62.5%	30.8%	83.3%	42.9%
- male	60.6%	42.1%	37.5%	69.2%	16.7%	57.1%
Birthweight (in grams)	3598(473)	3409(459)	3542(361)	3368(419)	3296(340)	3544(378)
Hospital Stay	2.5 (1.63)	1.9 (1.42)	2.7 (1.7)	1.8 (.87)	1.5 (.63)	1.8 (.49)

Note: N = 94. Scores are reported in Percentages, Actual Figures and Means with standard deviations in parentheses.

Table 4 c

Comparison of NCAF Feeding Score Means with DLC Scale Categories

Feeding Scale	DLC Scale Categories					
	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5-7
Maternal Scales						
Sensitivity to Cues: Wk 1	14.42	14.89	14.06	14.31	14.0	14.70
Sensitivity to Cues: Wk 16	14.76	14.37	14.69	14.23	13.50	15.14
Response to Distress: Wk. 1	10.06	10.11	10.31	10.15	10.33	9.71
Response to Distress: Wk. 16	9.04	10.0	10.38	10.38	8.83	10.0
Soc-Emotional Growth: Wk 1	11.73	11.89	11.19	11.31	10.83	9.71
Soc-Emotional Growth: Wk 16	11.52	11.79	11.75	11.62	9.83	10.0
Cognitive Growth: Wk 1	6.76	7.21	6.13	5.92	6.33	6.29
Cognitive Growth: Wk 16	7.0	7.21	6.88	6.62	5.97	6.86
Maternal Score: Wk 1	42.97	43.32	41.81	41.69	41.50	42.0
Maternal Score: Wk 16	43.18	44.0	43.69	42.85	37.83	44.29
Infant Scales						
Clarity of Cues: Wk 1	10.06	10.63	9.87	11.15	11.50	11.14
Clarity of Cues: Wk 16	12.58	12.32	12.06	11.92	12.0	12.13
Responds to Caregiver: Wk 1	5.79	5.47	4.44	5.62	5.0	5.57
Responds to Caregiver: Wk 16	7.21	7.74	7.0	6.62	6.0	7.0
Infant Total: Wk 1	17.03	16.11	14.31	16.77	16.50	16.71
Infant Total: Wk 16	19.82	20.05	19.06	18.54	18.0	20.28
Total Scale						
NCAF Total: Wk 1	60	60.11	56.13	58.46	58.0	58.71
NCAF Total: Wk 16	63	63.37	62.75	61.38	55.36	64.71
Sample Distribution						
NCAF Total < 52: Wk 1	12.1%	10.5%	12.5%	15.4%	33.3%	14.3%
NCAF Total < 52: Wk 16	9.1%	5.3%		23.1%	50%	14.3%
NCAF Total 52 - M: Wk 1	33.3%	31.6%	62.5%	38.5%	16.7%	42.9%
NCAF Total 52 - M: Wk 16	33.3%	42.1%	50%	7.7%	33.3%	14.3%
NCAF Total > M: Wk 1	54.5%	57.9%	25.0%	46.2%	50%	42.9%
NCAF Total > M: Wk 16	57.6%	52.6%	50%	69.2%	16.7%	85.7%

observational periods. The individual item trend was maintained even though additional items were included in the aggregated DLC item correlations. Both NCAF Scale total feeding scores and maternal subscores were negatively correlated with the summative DLC Scale scores at Week 1 and Week 16.

Additional Findings

Two other areas of investigation were undertaken in this study. The analysis of the scales used to answer the research questions and the influence of factors other than those addressed by the research questions will be discussed.

Scale Reliabilites: The use of previously developed instruments allowed for investigation specific to the use of these instruments with this population. A Cronbach's alpha reliability rating was obtained for each of the instruments. Cronbach's alpha for the Difficult Life Circumstances Scale was .54 for this sample. A summary of the Week 1 and Week 16 NCAF Scale reliabilities is provided in Table 5. Reliabilities for each observation period of the major scales were:

-maternal scales: .67 for Week 1 and .71 for Week 16

-maternal consistency items: .52 for Week 1 and .37 for Week 16

-infant scales: .69 for Week 1 and .66 for Week 16

-total scale: .76 for Week 1 and .79 for Week 16

Protective Factors: An investigation of the influence of protective factors that may serve to buffer the mother and infant was undertaken by incorporating sub-scale scores from the Parental Sense of Competence Scale into the analysis. This scale was completed by the participants as part of the prenatal questionnaires and again at Week 16. Within this sample, the means for both subscales decreased from Week 1 to Week 16 for all categories of DLC Scale scores. The Skill/Knowledge mean, with standard deviations in parentheses, went from $\underline{M}$ = 23.04(5.34) to $\underline{M}$ = 16.06(5.5) over the study period. The Valuing/Comfort mean, with standard deviations in parentheses, went from $\underline{M}$ = 20.31 (5.92) to $\underline{M}$ = 18.08 (6.49). Prenatal Skill/Knowledge subscales had a low correlation with the Week 1 feeding scores (r_S = -.34, p = .001). The Week 16 Skill/Knowledge subscales scores also showed a low negative correlation with the DLC Scale scores at

Table 5

NCAF Scale Reliability for Week 1 and Week 16 with NCAST Normative Data

NCAF Scale	Reliability (Cronbach's Alpha)		
	Week 1	Week 16	Normative
Maternal Scale			
Sensitivity to Cues	.15	.24	.60
Response to Distress	.53	.66	.69
Social-Emotional Growth	.54	.58	.63
Cognitive Growth	.46	.58	.69
Maternal Total	.67	.71	.83
Maternal Contingency Items	.52	.37	.73
Infant Scale			
Clarity of Cues	.57	.36	.56
Responds to Caregiver	.47	.61	.58
Infant Total	.70	.66	.73
Infant Contingency Items	.11	.06	.19
TOTAL SCORE	.77	.79	.86

Week 16 (r_S = -.25, p = .02) but not with the Week 16 feeding scores. All Valuing/Comfort subscale score correlations were not significant.

Maternal Age: Maternal age was also investigated as a possible confounding or "buffer" variable. The Week 16 Skill/Knowledge component of the Sense of Competence subscale had a significant but low correlation with maternal age (r_S = .34, p = .001). Age was negatively correlated with the DLC Scale scores but was not significant (r = -.14, p = .12). An additional finding was the lack of correlation between maternal age and both feeding scales (r_S = - .14 and -.06, p = .18 and .57, respectively).

Treatment Effect: The design of the original research project was to investigate the effect of the treatment interventions of infant massage and carrying of infants as a soothing effect. Additional questions included in the original design was the effect these interventions might have on parent-infant interactions. A two-way analysis of variance was used to determine the possibility of a two-way interaction effect on the feeding scores. The aggregated DLC Scale categories of 'no risk', 'low risk' and 'moderate-high' risk were used for this analysis. Parental Sense of Competence sub-scale scores were entered as covariates. Maternal-infant feeding scores at the Week 1 observation showed no treatment group/DLC category effect but a significant Skill/Knowledge covariate effect was apparent (MS = 292.863, F = .010). The two-way analysis of variance of Week 16 Feeding scores did not demonstrate a significant Skill/Knowledge or Valuing/Comfort covariate effect but a treatment group effect was evident at the .05 significance level (MS = 103.361, F = .055). Further investigation of the PSOC Scale Skill/Knowledge influence on Week 16 Total Feeding scores did identify a significant within-subject difference by DLC category over the two observational periods (MS = 45.89, F = .02).

CHAPTER FIVE

DISCUSSION

The primary purpose of this study was to explore the relationship between prenatal self-reports of difficult life circumstances and observed maternal interactions within two feeding situations. The information for this study was made available from a data base collected from a continuing program of nursing research. The purpose of the original study was to examine the effects, in the home environment, of two soothing techniques on caregiver-infant interaction and on the amount of parent-reported infant crying.

The focus of this study was information provided from subjects, in a partnered relationship, relative to their life circumstances prior to the birth of their first child and observed maternal-infant interactions within a feeding situation on two occasions. Couples from Edmonton and the adjacent geographical area were invited to participate in the original project. Of the 111 subjects who provided prenatal data, 94 subjects had an adequate amount of subsequent data to be included in this study. A summary of the findings and discussion will be undertaken in the form of a comparison of the sample to other findings, answers to the research questions and additional findings described in the previous chapter. Limitations of the study will be addressed. Implications for nursing and recommendations for future studies will be included.

Comparison of Maternal-Infant Interaction Score to NCAST "Normative" Data

The Nursing Child Assessment Feeding Scale was used to measure maternal-infant interactions. It consists of a total score as well as subscores for the mother and infant. Case by case analysis of subjects not fitting the age and educational preparation criteria of the normative data was undertaken. A decision to include these cases in the sample means was made on the grounds that all scores were above the HighEd Adult normative means. In comparing the mean total score and maternal-infant subscores of the study sample to a normative HighEd Adult Caucasian population, this sample did not appear to differ from the normative sample (Table 6).

Table 6

Comparison of the Sample NCAF Scale Scores with Normative Scores

NCAFS Scale	Maternal-Infant Dyads					
	Study Week 1		Study Week 16		Normative*	
Maternal Scale	M	SD	M	SD	M	SD
Sensitivity to Cues	14.44	(1.47)	14.54	(1.41)	13.47	(2.06)
Response to Distress	10.12	(1.02)	10.12	(1.12)	9.96	(1.43)
Social-Emotional Growth	11.52	(1.69)	11.57	(1.82)	11.64	(2.10)
Cognitive Growth	6.56	(1.56)	6.87	(1.67)	6.11	(2.22)
Total Maternal Score	42.64	(4.13)	42.99	(4.34)	41.16	(5.95)
Maternal Contingency Score	11.96	(1.99)	11.94	(1.98)	12.42	(2.52)
Infant Score						
Clarity of Cues	10.88	(1.96)	12.30	(1.71)	12.56	(2.05)
Responds to Caregiver	5.40	(1.76)	7.11	(2.04)	7.64	2.24
Total Infant Score	16.29	(3.27)	19.48	(3.48)	20.20	(3.86)
TOTAL SCORE	58.93	(6.23)	62.48	(7.04)	61.38	(8.74)

*Source: NCAST Caregiver/Parent-Child Interaction Feeding Manual (1995). NCAST Feeding Scales: Differences Among Mothers' Age/Education Groups Controlling for Child's Age. (HighEd Adults: 19-26 years of age with 12 or more years of education. Infants:1-12 months of age)

Barnard (1995) identified total scores of less than 52 on two observations as cause for concern and recommends follow up visits. In reviewing the total scores for the study sample it was noted that 13 mothers scored below the recommended 10th percentile Caucasian cutoff (i.e.<52) at the Week 1 observation and 11 mothers scored below the cutoff at the Week 16 observation. Low scores did not appear to be related to high DLC Scale Scores. However, as Barnard's cutoff score was applicable to infants between 1-5 months of age, a second observation of mothers with low scores at Week 16 in order to corroborate these findings might be appropriate. Alternatively, worrisome Feeding Scale scores could be compared to the same maternal-infant dyad Teaching Scale scores which were part of the original project. These two scales have been reported to show moderate consistency across feeding and teaching episodes for parental behaviors (Barnard, 1995).

Comparison of Difficult Life Circumstances Scores with Literature

The mean score for the study sample on the DLC Scale was 1.63 with a standard deviation of 1.70. Using Barnard's score of six or more positive responses as an indicator of high risk for parent-child outcomes, only 3.2 % of the sample (n = 3) of the 111 subjects had scores above six. Table 7 provides descriptive statistics for this sample compared to samples from Seattle and Montana.

Table 7

Comparisons of Seattle, Montana, Edmonton Sample DLC Characteristics

Population	DLC M	SD	Range	≥ 6	≥3	N
Seattle	5.30	(2.9)	0-14			147
Montana	3.89	(2.9)	0-16	26.4%		838
Edmonton	1.67	(1.7)	0-7	3.2%	27.5%	94

The most frequently identified DLC Scale items in the Edmonton sample was compared with the most frequently identified items in the Montana and Seattle samples. Items were ordered according to the frequency of occurrence. Table 8 presents the top

Table 8

Rank of Eight Highest Items in Three Sites

Item	Description	Rank			n
		Edm.	Montana	Seattle	
5	Long term debts	1	3		33
9	Partners work interferes	2			19
4	Partner excessively away	3	2		16
16	Frequent minor illness	4		7	9
8	Your work interferes	5			9
15	You or household member illness	6			8
20	Victim of crime in past year	7			8
22	Emotional abuse by partner	8	8	4	8
6	Credit rating		1	6	2
11	Adequate housing		4	1	3
25	No phone		5	5	1
12	Lack of privacy		6	3	6
1	Arguments with partner		7	8	6
7	Unemployment			2	2

eight items in the Edmonton sample compared to the other sites. A number of the items occurring in the Edmonton sample were tied for rank, therefore the frequency of occurrence is also included.

More consistency among the items was noted between the Edmonton and Montana samples, but only three of the top eight items were similar to Montana and only two of the top items were similar to Seattle. Items identified by Seattle such 'unemployment' was identified by two Edmonton subjects. The number one item for Montana and number six for Seattle, 'credit rating' was identified by two subjects and a tied item, 'no phone' was identified by one subject. However, two of the other items, 'arguments with your partner' and 'lack of privacy' had six positive responses each. Both the Montana and Seattle samples were pregnant women considered to be "at-risk".

The Seattle sample consisted mostly of young Caucasian women with less than a high school education. Seventy-five percent of the Seattle subjects were on welfare. The Montana sample was recruited from women who were entering the Montana Initiative for the Abatement of Mortality in Infants (MIAMI) project. The profile of subjects in this project typically included access problems such as the lack of health insurance or the lack of physician, medical risk factors such as previous poor pregnancy outcomes or chronic medical problems, and social-behavioral issues such as drug use, homelessness or educationally disadvantaged. In contrast, the women in the Edmonton sample were healthy, primiparous subjects in a partnered relationship. The majority of subjects were college or university educated. Their DLC Scale item responses appear to reflect their relatively secure physical and social environments.

Using the Montana aggregated "potential for violence" items (numbers 21- partner physically abusive, 22- partner verbally/emotionally abusive, 23- abuse by other than one's partner, 26- child abused) as a dichotomous variable where low was a negative response to all of the items (n = 100) and high was a positive response to any of the four items (n =11), all positive respondents had DLC scores ranging from 4 to 6. Four of the eleven subjects had feeding scores below the sample mean. This finding appears to support Ferguson's (1991) suggestion that clusters of items or scores between 3 to 5 may be indicative of concerns. Some of the biographical findings such as a higher incidence

of smokers and lower birthweight babies for subjects with DLC scores of 4 or more. appears to reflect the findings in the Montana study (Ferguson, 1991).

Research Questions

Question One

What is the relationship between maternal-infant scores and maternal-infant interaction scores relative to a feeding situation?

Difficult Life Circumstances Scale summative scores and individual item responses were compared to maternal scores and maternal-infant dyad Nursing Child Assessment Feeding Scale scores. Feeding scores for each of the maternal scale subscores (sensitivity to cues, response to distress, social-emotional growth fostering and cognitive growth fostering) in addition to infant subscores (clarity of cues and responsiveness to caregiver) were incorporated into the initial analysis. Contingency scores within each subscale which reflect the reciprocal behaviors of the mother and infant (Barnard, 1995) were also included in the preliminary stage. Since major differences were not evident in either graphic representation or univariate descriptive statistical analysis, and since the subscales tended to exhibit a lesser degree of internal consistency (Barnard, 1995) they were not included in correlational analysis of DLC Scale scores and NCAF Scale scores. Parental contingency scores were not used based on the low Cronbach's alpha rating for this sample when compared to the NCAF Scale normative score (Barnard, 1991).

Neither item by item analysis, aggregated item analysis or DLC Scale total scores were significantly correlated with the feeding scores. However, DLC Scale summative scores were inversely related to NCAF Scale total feeding scores at both observational periods. This would suggest that high DLC scores, reflective of "heavy baggage", could be related to lower maternal-infant feeding scores. The lack of variance in summative DLC Scale scores in this sample appears to be a factor in the lack of any significant correlations.

Question Two

Is the relationship between reported difficult life circumstances and maternal-infant feeding interaction scores stable over time?

The DLC Scale was designed to measure the existence of chronic, ongoing problems or stressors experienced by high-risk pregnant families. The direction of the relationship between the NCAF Scale total feeding scores and the DLC Scale scores was the same at both observational periods. An inverse relationship is suggested by the negative correlation coefficient sign, although no significant correlation was evident with this sample.

Although the correlations between all DLC Scale measurements and Feeding scores at both time periods were of little or no significance, the direction of the relationship did change on a number of individual items and item aggregates. Within this sample, the directional change in the correlations with some items was of interest. Many of the items identified by the subjects in this study were similar to the shorter-term situational "hassles" identified by Kanner, Coyne, Schaefer and Lazarus (1981). Items such as incongruity between the partners, work overload and role ambiguity appeared to be reflected in the sample responses. Whether this is a reflection of some of these items being of short-term duration within this sample could not be determined, given the small number of positive respondents to these items. A second administration of the instrument may have helped to address this issue.

The differences in the mean scores within the small number of respondents with a DLC Scale score of 4 appears to be an insignificant research artifact. Mean differences would have to have been much larger in order to be significant given the sizes of the comparison groups.

Additional Findings

The additional influences reported in the findings will be discussed at this time. The information will be presented in relation to the impact of maternal age, parental sense of competence, the treatment or intervention effect and the scale reliabilities on the variables under investigation.

Impact of Maternal Age and Education: The impact of age and education have been identified as positive factors in maternal-infant relationships (Barnard, 1995). Today, many couples are postponing the birth of their first child until they are well-established in their chosen careers. Previous studies have suggested that older women having their first child often have the maturity, life skills, and financial and social stability but may experience more career/mothering conflict.

Biographical and demographic data analysis identified this sample to be mainly older women with college or university educations. For this reason, age was chosen as the variable to explore as a way to capture both these factors. The negative correlation between age and DLC Scale scores would be expected, however, the inverse relationship between maternal age and feeding scores was an unexpected finding. It is of interest to note that the mean age of mothers with DLC Scale scores of 5 to 7 was higher than for other DLC Scale categories. However, there was no significant difference in their NCAF Scale scores.

Although older first-time mothers have been described as better educated and economically advantaged, they may have unique issues that affect the ease with which they adapt to the maternal role. Reece (1995) reported that older first-time mothers experienced high levels of global stress up to one year after the birth of their babies. Information such as the subject's comfort level with the actual feeding observation would have been helpful to further explore this finding.

Parental Sense of Competence: Maternal feelings of self-acceptance and positive self-esteem are associated with enhanced maternal-infant interactions (Barnard, 1995; Koniak-Griffin, 1993). Parental sense of competence scores can be used as one of the indicators of a mother's feelings of self-trust, certainty and the ability to rely on her own decisions in caring for her infant. Within this sample, the skill/knowledge component of competence was a significant covariate from Week 1 to Week 16. Contrary to previous research findings (Gibaud-Wallston, 1977; Gojmerac, 1988) scores for this sample did not increase. Walker's (1989) study of primiparous and multiparous mothers, with a mean age of 28.4 years, found global perceived stress to be a major predictor of a woman's perception of competence in the maternal role. This may have been a

contributing factor in the lack of direct correlation with the feeding scores. Further investigation of the link between maternal anxiety, sense of competence and maternal-infant interaction with similar populations would be of interest.

Intervention of Treatment Group Effect: The intervention or treatment effect appears to have also been a contributing influence on association between the DLC scores and the NCAF scores at Week 16. As the impact of the subject's intervention group was the focus of the original research, no further investigation of this factor was undertaken within this study other than to recognize its presence.

Scale Reliabilities: The low scale reliability score obtained for the DLC was of some concern. It was noted that many of the items had an insignificant or low level of inter-item correlation. This lack of consistency is probably best explained by the lack of variance in sample scores. Barnard (personal communication, August 31, 1996) stated that the tool was never developed to capture a single concept and suggested that Cronbach's alpha was not an appropriate measure of the tool's reliability.

Barnard (1995) has identified the maternal sensitivity to cues subscale as the least internally consistent of the NCAF Scale parental scores. The low levels of internal consistency reflected in this sample appear to support her research. The lower reliability scores for the infant subscales were within an acceptable level (Barnard, personal communication, August 31, 1996) and may have reflected the homogeneity of the infants' ages.

Limitations

Several limitations apply to the findings of this study.

1. The voluntary nature of the subjects may segregate them from mothers who do not actively seek out involvement with maternal-infant research. The findings of this study cannot be generalized to the larger population.
2. Maternal age and educational characteristics did not permit generalizing of the findings to a larger population.

3. The research instruments may have been limiting. The DLC Scale may not be sensitive to Canadian middle-class issues. In addition, self-report questionnaires are vulnerable to response bias and observational methods are subject to observer bias.
4. This study was limited to the amount and type of existing information available to answer the research questions.
5. The sample size was adequate but limited in the variability of the independent variable.

Implications for Nursing

The DLC Scale was used in this study to determine if environmental factors played a significant role in maternal-infant interaction. A feeding situation was chosen as the target activity to assess maternal-infant interactions as it is a universal activity for all dyads. In this particular sample, the DLC Scale scores reflected a relatively low-risk group of mothers. Subjects with 'moderate-high risk' DLC Scale scores from 3 - 7 did not have significantly different NCAF Scale scores from the 'no risk' or 'low risk' scores. For this group of women, environmental factors did not play a significant role in maternal-infant interaction.

Maternal-infant interaction is a dynamic and important process of particular relevance to nurses and other professionals who work with new families. Other research has shown that early mother-infant interaction is likely to predict the subsequent style and nature of later interactions. If maternal behavior is the primary catalyst for infant development it is important to understand these processes. Examining the contribution of the environment and its impact on maternal-infant interaction is an important component of a holistic approach to this area of study. Avant (1981) identified that as maternal anxiety levels rose, maternal-infant attachment scores fell. She suggested that since the anxiety scores were associated with affectionate behaviors, teaching mothers how to behave affectionately toward their infants would be appropriate. In her words, "good mothering involves not only the caretaking skills, but the ability to read and respond to the infant's cues" (Avant, 1981, p. 418).

The feeding situation has been identified as an excellent time to observe mothers and infants interact because it places the interaction in context and provides insight into the developing relationship during the first days, weeks, and months of life. However, other more novel activities such as mother-infant play may capture a different element of maternal-infant interaction. Activities which may or may not be identified as stressful, such as consoling a fretful infant, may also be amenable to capturing maternal-infant interactions.

Recommendations for Further Research

Further exploration of the Difficult Life Circumstances Scale with a broader range of subjects is warranted. Incorporating the DLC Scale as one of the tools used to assess new families in the Edmonton area Healthy Beginnings program would capture a broader segment of the population. Current research projects that have utilized the scale to establish equivalence of random assignment of subjects could be potential sources of enriched data specific to the tool. It has been established that women who experience depression are at greater risk for parenting problems (Speitz, 1988). With approximately 3% to 10% of pregnant women developing clinical depression and 10% to 20% of new mothers suffering from severe postpartum depression this is another area where the DLC Scale could be a useful part of a research design.

In addition, some further methodological work on the DLC Scale may be warranted. Individual items and item aggregates may be more revealing than the summative scores. It would be worthwhile to determine if each item does contribute in a cumulative manner to the overall sum, or if the importance of each item lies in its significance to the individual. Further investigation of item subsets, such as the Violence subset identified by Ferguson (1991) or items reflective of marital discord, time constraints, and role ambiguity is also appropriate. A rating scale might be more effective in capturing the effect of life circumstances than the current binary scale. Scale wording could also be addressed to allow for the impact of family issues beyond those members residing in the respondents' household.

The DLC Scale was developed to address issues prevalent in a high-risk population. Investigation of the instrument with this study's sample appeared to substantiate its use as a screening tool for higher risk groups. One could question whether some of the items such as crowded living conditions, lack of a phone and credit problems have the same relevance in a higher socio-economic population. Long-term debts may be quite manageable in families with two incomes. However, items such as loss of employment, income reduction and social support can be issues for first-time mothers in today's society. Concerns relating to blended families or the responsibilities of children residing with previous spouses do not appear to be well addressed by the current instrument. Revisions to the current tool could possibly make the tool more sensitive to a broader population.

Many of the health issues addressed by the DLC Scale are probably more of a concern to an American population than a Canadian population. Currently, health care is not the financial hardship on Canadians of lower socio-economic status that it is on their American counterparts. However, the effect of minor illnesses and/or chronic health problems on first-time mothers emotional and energy demands is a topic for further research.

Contemporary issues such as maternal role conflict and time constraints may also be more evident in research designs of longer duration. Potential variables such as role overload, job satisfaction, or the economic and professional necessity of working might contribute to higher levels of perceived difficulty for employed mothers. In addition, the impact of life circumstances on the paternal role would be of interest, given their increased level of involvement in caring for their infants.

The influence of infant temperament on both parental sense of competence and responsiveness to the caregiver have been recognized by a number of researchers (Barnard, 1994, Belsky, 1984; Riciutti, 1983). Incorporating these factors into the dynamics of maternal-infant interaction research is important. Protective factors or processes, the positive counterpart to risk factors, have been associated with a reduced or lower-than- expected incidence of childhood maladaptation (Pellegrinni, 1990). Factors associated with positive adaptation in the context of vulnerability have been assumed to

serve a protective function. Recent research on childhood resiliency indicates that biologic, environmental and psychosocial circumstances interact in a variety of ways to enhance or stress infant development.

The best predictor of childhood resilience is the caregiver-child relationship (Luther, 1993; Poulsen, 1993). Many of the environmental and personal risk factors appear to be captured within the Difficult Life Circumstances Scale. In addition, one of the major protective factors that promotes resiliency is the mother's ability to cope, her sense of competence and her view of herself as an effective caregiver (Letourneau, 1996; Poulsen, 1993). Support and guidance for families can play a critical role in mitigating the stresses within the family. Use of teaching tools such as the Nursing Child Assessment Satellite Training (NCAST) Keys to Caregiving can assist in emphasizing the individuality of infants and enhance the capacity of the mother to provide an optimally nurturing environment. Further research exploring these factors in the context of their buffering effect on dyads reporting difficult life circumstances seems appropriate.

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Appendix A

ALBERTA FOUNDATION FOR NURSING RESEARCH AFNR-3

SUMMARY OF PROPOSAL

Provide a concise (500 word maximum) SUMMARY of the proposed research. State the applicant's broad and long-term objectives and specific aims of the project. Describe concisely the research design and methods for achieving these goals. Describe the expected contribution of the proposed project to the improvement of nursing practice in Alberta. This abstract should serve as a succinct and accurate description of the proposed work when separated from the total application. (If funded, this summary may be used for publicity purposes.) DO NOT EXCEED THIS PAGE.

GRANT CATEGORY: RESEARCH PROJECT __X__ FACILITATION GRANT: ____ AMOUNT REQUESTED $28,749.56

Names, positions and institutions of the Principal and co-Principal Investigators:

M.R. Elliott, PhD, RN	Professor	Faculty of Nursing, University of Alberta
J. Drummond, PhD, RN	Assoc Professor	Faculty of Nursing, University of Alberta
S. Reilly, PhD, RN	Assoc Professor	Faculty of Nursing, University of Calgary

PROJECT TITLE: Effect of Different Soothing Interventions on Parent-Infant Interaction and on Infant Crying

PROJECT DESCRIPTION:

The deleterious effects of infant crying on both the infant and on the family are undisputed. Parents of crying infants experience feelings of incompetence, may be more anxious and depressed, and/or take a longer time to recover physically from the childbearing experience. Infants who cry, receive less attention from their parents. In the long term this results in decreased attachment and therefore less adequate relationships with others, and in delays in development, especially cognitive development.

The researchers' goal is to test various approaches to infant soothing, and to subsequently develop programs whereby soothing interventions are found to be effective are presented at appropriate times to populations of new parents in Alberta. This study is designed to evaluate the effect of three infant soothing interventions - infant massage, infant carrying and a combination of infant crying - in normal, healthy infants in partnered families. Infant massage, while gaining popularity as a soothing technique, has not been systematically tested in a normal, healthy term infant population. Infant carrying, for more than three hours per day, has recently been shown to reduce the amount of infant crying by a surprising 43%. The researchers plan to replicate this study. Finally, the intervention of carrying and massage together will give evidence as to the efficacy of combining techniques. Combining of techniques has been cited as an approach to successful soothing of infants but few, if any studies have examined massage and carrying.

The basic design is a completely randomized two-way layout with treatment factors - carrying and massage - each at two levels. (Carrying: usual amounts and more than three hours a day. Massage: none and 15+ minutes a day.) Multiple variables will be measured repeatedly in order to assess the effect of the interventions. Variables measured include amount of crying, parent-child interaction, parental competence, and parental assessment of infant temperament. Measures of parental anxiety and parents life circumstances are included to ensure comparability of the groups.

It is expected that the findings from this research will be integrated into early nursing intervention protocols for families with new infants in Alberta. Five nurses, in addition to the researchers, will participate in the study as novice researchers. That is, those nurses will experience the research process as a reality. This will serve to promote the use of findings from nursing research in clinical practice.

Please provide up to 5 key words
infant massage, infant carrying, infant soothing, infant crying, parent-infant interaction.

Appendix B

DLC
DIFFICULT LIFE CIRCUMSTANCES

Date: _____

Name: _____ Marital Status: _____ Age: _____ Race: _____ Sex: _____

Education: _____ Occupation: _____ Number of Children: _____ under 5 yrs: _____ 5-18 yrs

Below are a list of problems. You must decide if a particular one is a problem for you. Check which ones apply. If any of these questions make you uncomfortable, you don't have to answer. We can help you the most by knowing the difficult circumstances you face in your life.

	Yes	No
1. Are you having regular arguments or conflicts with your present partner/steady boy/girlfriend?		
2. Are you having some sort of problem with any one of your former spouses/partners?		
3. Is your partner in jail?		
4. Is your partner away from the home more than half of the time because of a job or other reason?		
5. Do you have long-term debts other than a house mortgage (2 years or more)?		
6. Do you have problems with your credit rating—do you get hassled pretty often by bill collectors or collection agencies?		
7. Have you been looking for a job and have not been able to find one? (score as a no if mother is employed or not looking)		
8. Does your work interfere with your family life? (no if not working or no family)		
9. Does your partner's work interfere with your family life? (no if no partner)		
10. Do you have trouble with your landlord? (no if own home)		
11. Do you have trouble finding a place to live that is suitable and you can afford?		
12. Do you feel that you do not have enough privacy?		
13. Do you have people living with you—relatives or friends —that you wish weren't there?		
14. Do you have neighbors who are really unfriendly or giving you problems?		
15. Do you or someone in your household have a longterm illness?		

	Yes	No
16. Have you had frequent minor illnesses in the past year?		
17. Do you have a problem with alcohol or drugs (prescription or street)?		
18. Does your partner have a problem with alcohol or drugs?		
19. Does someone in your household other than you or your partner have a problem with alcohol or drugs?		
20. Have you been the victim of a crime in the past year?		
21. Has your current partner ever physically abused you? (no if no partner)		
22. Has your current partner ever verbally or emotionally abused you (put-downs, or saying things that make you feel really bad or worthless)?		
23. Is someone other than your present partner presently abusing you sexually, physically, or emotionally?		
24. Have you been hospitalized in the past year for any reason—accident or illness?		
25. Are you without a phone at your present home or apartment?		
26. Is one of your children being abused sexually, emotionally, or physically (by anyone)?		
27. Is one of your children experiencing learning problems or other school problems that require you to consult with the teacher or other school officials?		
28. Has one of your children been having serious emotional or behavioral problems at home (e.g., Repeated nightmares, repeated tantrums, repeated major aggressive outbursts, etc.)?		

TOTAL YES ANSWERS _____

Appendix C

NCAST FEEDING SCALE

Birth to One Year Only

Information applies to parent only

Mother's Ethnic Heritage (See back page)

Marital/Partner Status ☐ Married ☐ Single

Person Observed ____ Age ____ Educ.

☐ Mother ☐ Father

☐ Other ____

Major Caregiver ☐ Yes ☐ No

Type of Feeding ☐ Breast ☐ Bottle ☐ Solid

Usual Feeding Time ☐ Yes ☐ No

Length of Time Feeding *(circle minutes)*

10 or Less 11-19 20-29 30 or more

Setting

☐ Home

☐ Clinic

☐ Other ____

Were Others Present?

☐ Yes

☐ No

If yes, specify ____

Child's Name ____

Child's Age *(in months)* ____

Child's Sex ____

Child's Birth Order *(circle)*

1 2 3 4 5 or More

Child's State at Beginning of Feeding *(circle)*

Quiet Sleep Active Sleep Drowsy

Quiet Alert Active Alert Crying

I. SENSITIVITY TO CUES

	YES	NO
1. Caregiver positions child so that child is safe but can move his/her arms		
2. Caregiver positions child so that the child's head is higher than hips.		
3. Caregiver positions child so that trunk-to-trunk contact is maintained during more than half of the breast or bottle feeding (50%).		
4. Caregiver positions child so that eye-to-eye contact is possible.		
5. Caregiver's face is at least 7-8 inches or more from the child's face during feeding except when kissing, caressing, hugging, or burping the child.		
6. Caregiver smiles, verbalizes, or makes eye contact with child when child is in open-face-gaze position.		
7. Caregiver comments verbally on child's hunger cues prior to feeding.		
8. Caregiver comments verbally on child's satiation cues before terminating feeding.		
9. Caregiver varies the intensity of verbal stimulation during feeding.		
10. Caregiver varies intensity of rocking or moving the child during the feeding.		
11. Caregiver varies the intensity or form of touch during the feeding		
12. Caregiver allows pauses in feeding when the child shows potent disengagement cues or is in the pause phase of the suck-pause sequence of sucking.		
13. Caregiver slows the pace of feeding or pauses when child shows subtle disengagement cues.		
14. Caregiver terminates the feeding when the child shows satiation cues or after other methods have proved unsuccessful.		
15. Caregiver allows child to suck and/or chew without interruption.		
16. Caregiver only offers food when the child is attending.		
TOTAL YES ANSWERS		

II. RESPONSE TO CHILD'S DISTRESS

☐ Yes ☐ No (Potent Disengagement Cues Observed)

17. Caregiver stops or starts feeding		
18. Caregiver changes the child's position.		
19. Caregiver makes positive or sympathetic verbalization.		
20. Caregiver changes voice volume to softer or higher pitch.		
21. Caregiver makes soothing non-verbal efforts.		
22. Caregiver diverts child's attention by playing games, introducing toy, or making faces.		
23. Caregiver avoids making negative verbal responses.		
24. Caregiver avoids making negative comments to home visitor about child.		
25. Caregiver avoids yelling at child.		
26. Caregiver avoids using abrupt movements or rough handling.		
27. Caregiver avoids slapping, hitting, or spanking the child.		
TOTAL YES ANSWERS		

III. SOCIAL-EMOTIONAL GROWTH FOSTERING

	YES	NO
28. Caregiver pays more attention to child during feeding than to other people or things in the environment.		
29. Caregiver is in "en face" position for more than half of the feeding.		
30. Caregiver succeeds in making eye contact with child once during feeding.		
31. Caregiver's facial expression changes at least twice during feeding .		
32. Caregiver engages in social forms of interaction (plays games with child) at least once during the feeding.		
33. Caregiver uses positive statements in talking to child during the feeding.		
34. Caregiver praises child or some quality of the child's behavior during the feeding.		
35. Caregiver hums, croons, sings or changes the pitch of his/her voice during the feeding.		
36. Caregiver laughs or smiles during the feeding.		
37. Caregiver uses gentle forms of touching during the feeding.		
38. Caregiver smiles, verbalizes or touches child within five seconds of child smiling or vocalizing at caregiver.		
39. Caregiver avoids compressing lips, grimacing, or frowning when making eye contact with child.		
40. Caregiver avoids slapping, hitting, shaking, or grabbing the child or child's extremities during the feeding.		
41. Caregiver avoids making negative comments or uncomplimentary remarks to the child or home visitor about the child or child's behavior.		
TOTAL YES ANSWERS		

IV. COGNITIVE GROWTH FOSTERING

42. Caregiver provides child with objects, finger foods, toys, and/or utensils.		
43. Caregiver encourages and/or allows the child to explore the breast, bottle, food, cup, bowl, utensils, or the caregiver during feeding.		
44. Caregiver talks to the child using two words at least three times during the feeding.		
45. Caregiver verbally describes food or feeding situation to child during feeding.		
46. Caregiver talks to child about things other than food, eating, or things related to feeding.		
47. Caregiver uses statements that describe, ask questions or explains consequences of behavior, more than commands, in talking to child.		
48. Caregiver verbally responds to child's sound within five seconds after child has vocalized.		
49. Caregiver verbally responds to child's movement within five seconds of child's movement of arms, legs, hands, head, trunk.		
50. Caregiver avoids using baby talk.		
TOTAL YES ANSWERS		

V. CLARITY OF CUES

	YES	NO
51. Child signals readiness to eat.		
52. Child displays a build-up of tension at the beginning of feeding.		
53. Child demonstrates a decrease in tension within a few minutes after feeding has begun.		
54. Child has periods of alertness during the feeding.		
55. Child displays at least two different emotions during the feeding.		
56. Child has periods of activity and inactivity during the feeding.		
57. Child's movements are smooth and coordinated during the feeding.		
58. Child's arm and leg movements are generally directed toward caregiver during feeding (not diffuse).		
59. Child initiates contact with caregiver's face or eyes at least once during feeding.		
60. Child vocalizes during feeding.		
61. Child smiles or laughs during feeding.		
62. Child averts gaze, looks down or turns away during feeding.		
63. Child actively resists food offered.		
64. Child demonstrates satiation at end of feeding.		
65. Child has less than three rapid state changes during feeding.		
TOTAL YES ANSWERS		

VI. RESPONSIVENESS TO CAREGIVER

66. Child responds to feeding attempts by caregiver most of the time.		
67. Child responds to games, social play or social cues of caregiver during feeding.		
68. Child looks in the direction of the caregiver's face after caregiver has attempted to alert the child verbally or non-verbally during feeding.		
69. Child vocalizes to caregiver during feeding.		
70. Child vocalizes or smiles within five seconds of caregiver's vocalization.		
71. Child smiles at caregiver during feeding.		
72. Child explores caregiver or reaches out to touch caregiver during feeding.		
73. Child shows a change in level of motor activity within five seconds of being handled or repositioned by caregiver.		
74. Child shows potent disengagement cues during last half of feeding.		
75. Child shows potent disengagement cues within five seconds after caregiver moves closer than 7 to 8 inches from child's face.		
76. Child avoids turning away from caregiver, or averting gaze during first half of feeding.		
TOTAL YES ANSWERS		

To use this scale for research or clinical practice requires training. For more information write or call:

NCAST Programs
University of Washington
Box 357920
Seattle, WA 98195-7920
Phone (206) 543-8528 FAX (206) 685-3284

Enter the total yes answers from each subscale and compare it with the possible score:

	SUBSCALE Items Possible	SUBSCALE Items Actual	CONTINGENCY Items Possible	CONTINGENCY Items Actual
SENSITIVITY TO CUES	16		6	
RESPONSE TO DISTRESS	11		6	
SOCIAL-EMOTIONAL GROWTH FOSTERING	14		1	
COGNITIVE GROWTH FOSTERING	9		2	
CAREGIVER TOTAL	50		15	
CLARITY OF CUES	15		3	
RESPONSIVENESS TO CAREGIVER	11		3	
INFANT TOTAL	26		6	
CAREGIVER/INFANT TOTAL	76		18	

Check the potent disengagement cues observed during the feeding interaction.

- ___ Back arching
- ___ Choking
- ___ Coughing
- ___ Crawling away
- ___ Cry face
- ___ Crying
- ___ Fussing
- ___ Halt hand
- ___ Lateral head shake
- ___ Maximal lateral gaze aversion
- ___ Overhand beating movements
- ___ Pale/red skin
- ___ Pulling away
- ___ Pushing away
- ___ Saying "no"
- ___ Spitting
- ___ Spitting up
- ___ Tray pound
- ___ Vomiting
- ___ Walking Away
- ___ Whining
- ___ Withdraw from alert to sleep state

Ethnic Heritage. Place a checkmark next to the mother's ethnic heritage and write in her specific group identity.

- ___ African-American
- ___ Asian Indian or A.I.-American
- ___ Chinese or Chinese-American
- ___ Filipino or Filipino-American
- ___ Japanese or Japanese-American
- ___ Korean or Korean-American
- ___ Pacific Islander or P.I.-American
- ___ Vietnamese or Vietnamese-American
- ___ Other Asian
- ___ Cuban or Cuban-American
- ___ Mexican, Chicano, or Mex. American
- ___ Puerto Rican
- ___ Other Hispanic/Latin
- ___ Native American or Alaskan Native
- ___ White/Caucasian (non-Hispanic)
- ___ Other

Specific group identity: _____

Clinical Notes:

Date of Observation _____

Recorder's Signature _____

3/95

Appendix D

Parental Sense of Competence Scale

Listed below are a number of statements. Please respond to each item, indicating your agreement or disagreement with each statement in the following manner:

If you strongly agree, circle the letters **SA**
If you agree, circle the letter A
If you mildly agree, circle the letters MA
If you mildly disagree, circle the letters MD
If you disagree, circle the letter D
If you strongly disagree, circle the letters SD

---

1. **The problems of taking care of a baby are easy to solve once you know how your actions affect your baby, an understanding I have acquired.** **SK**

   SA A MA MD D SD

2. **Even though being a parent could be rewarding, I am frustrated now while my child is only an infant.** **VC-R**

   SA A MA MD D SD

3. **I go to bed the same way I wake up in the morning - I feel I have not accomplished a whole lot.** **VC-R**

   SA A MA MD D SD

4. **I do not know why it is, but sometimes when I'm supposed to be in control, I feel more like the one being manipulated.** **VC-R**

   SA A MA MD D SD

5. **My mother was better prepared to be a good mother than I am.** **VC-R**

   SA A MA MD D SD

6. I would make a fine model for a new mother to follow in order to learn what she would need to know in order to be a good parent.

SK

SA A MA MD D SD

7. Being a parent is manageable, and any problems are easily solved.

SK

SA A MA MD D SD

8. A difficult problem in being a parent is not knowing whether you're doing a good job or a bad one.

SK-R

SA A MA MD D SD

9. Sometimes I feel like I'm not getting anything done.

VC-R

SA A MA MD D SD

10. I meet my own personal expectations for expertise in caring for my baby.

SK

SA A MA MD D SD

11. If anyone can find the answer to what is troubling my baby, I am the one.

SK

SA A MA MD D SD

12. My talents and interests are in other areas, not in being a parent.

SA A MA MD D SD vc-r

13. Considering how long I've been a mother, I feel thoroughly familiar with this role.

SK

SA A MA MD D SD

14. If being a mother of an infant were only more interesting, I would be motivated to do a better job as a parent. **VC-R**

SA A MA MD D SD

15. I honestly believe I have all the skills necessary to be a good mother to my baby. **SK**

SA A MA MD D SD

16. Being a parent makes me tense and anxious. **VC-R**

SA A MA MD D SD

17. Being a good mother is a reward in itself. **VC**

SA A MA MD D SD

18. The questions you have just answered deal with feelings about being a parent. Overall, on a scale from 1 to 10, where 1 is low and 10 is high, how would you rate your <u>feelings of confidence as a parent</u> at this point in time? Please circle your answer.

1 2 3 4 5 6 7 8 9 10
low high

19. Any other comments you would like to make in Part 1 of this questionnaire? If so, please list any comments here.

_____

_____

_____

_____

For T_1 questionnaire, items were worded in future tense.

"SK" indicates Skill/Knowledge subscale; "VC" indicates Valuing/Comfort subscale.

"R" indicates that the item is scored in reverse direction.

Appendix E

Table 2: Summary of Tools and their Psychometric Properties

Tools	Purpose	Reliability		Validity	
		Test-Retest	Internal Consistency	Concurrent	Construct
Parental Diary of Infant/Parent Behavior	Parent's Record of Infant Behavior	N/A	N/A	with tape recorder: r=.6 to .8 (Carey) r=.5 to .6 (St. James-Roberts)	babies reported as excessive cryers were recorded as crying more
NCAFS	Parental-Newborn Interaction	alph[illegible] .8[illegible]	.56 - .59 (1-12 mos.)	r=.19 - .54 with [HOME and MPI (Bayley)] HOME .49 (total parent score) .28 (total child score)	NCAFS and NCATS have differentiated between abusing parents and non-abusive parents (Barnard et al., in press)
NCATS	Parental-Newborn Interaction (cognitive)	.45 - [illegible] (parent [illegible]) [Rescored on [illegible] sample.. [illegible] r=.85 (parent); r=.5[illegible] (infant)]	Total Parent .83 Total Child .60		
Early Infant Temperament Scale (EITQ)	Modification of Carey Infant Temperament Questionnaire to assess temperament in 1-4 mos. olds (based on NYLS temperament categories)	r=.68 (1-2 mos.) r=.79 (3-4 mos.)	r = .51 to .73	As yet, no tools available for comparison	Correlated acceptably amount of infant crying and parents' perceptions of the infant's temperament
Stait Trait Anxiety Inventory .. T Anxiety Scale (STAI-Form Y-2)	Assess how respondents generally feel. Used for assessing clinical anxiety and/or anxiety problems	r = .73 to .86	r = .93	Acceptable correlations with TMAS and IPAI	Demonstrated using contrasted groups
Parenting Sense of Competence Scale (PSOC)	Assess parents' skill/knowledge and valuing or comfort with parenting role	r = .57 to .82	Total Scale r = .80 Valuing/Comforting: r = .69 Skill/Knowledge: r = .80	Total score significantly related to parents' ratings of their confidence (Gojmerac, 1988)	No tools available for comparison
Difficult Life Circumstances Scale (DLC)	to assess the existence of chronic family problems	r = .40 (prenatal to 2 yrs)	N/A	Acceptable negative correlations with HOME, NCATS	With social support, the Beck, physical symptom list

Appendix F

University of Alberta
Edmonton
Canada T6G 2G3

Faculty of Nursing
3rd Floor Clinical Sciences Building

Certification of Ethical Acceptability for Research Involving

Human Subjects

NAME OF APPLICANT(S):	**Dr. M. Ruth Elliott, Dr. Jane Drummond & Dr. Sandra Reilly**
TITLE OF PROJECT:	**"Effectiveness of Different Soothing Interventions on Parent-Infant Interaction and on Infant Crying in Lone and Partnered Parent Situations"**

The members of the review committee, having examined the application for the above-named project, consider the procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

September 30, 1993
Date

S. Lynn Skillen
D. Lynn Skillen, RN, PhD
Chair
Ethics Review Committee

The Ethics Review Committee is a Joint Committee of
The Faculty of Nursing, University of Alberta
and
The Nursing Division, University of Alberta Hospitals

Appendix G

EBH EDMONTON BOARD OF HEALTH

Edmonton, Alberta T5N 4A3

Phone:(403) 482-1965
Fax: (403) 482-4194

RESEARCH AND ETHICS REVIEW COMMITTEE

ETHICS APPROVAL FORM FOR RESEARCH INVOLVING HUMAN SUBJECTS

Date: 1993 11 25

Name(s) of Principal Investigator(s): Dr. M. Ruth Elliott, Dr. Jane Drummond & Dr. Sandra Reilly

Project Title: Effectiveness of Different Soothing Interventions on Parent-Infant Interaction and on Infant Crying in Lone and Partnered Parent Situations

The Research and Ethics Review Committee has reviewed the protocols involved in this project and has found them to be acceptable on methodological and ethical grounds for research involving human subjects.

Specific Comments:

Signed - Chairman of Research and Ethics Review Committee

for the Edmonton Board of Health

Appendix H

University of Alberta
Edmonton
Canada T6G 2G3

Faculty of Nursing
3rd Floor Clinical Sciences Building

Certification of Ethical Acceptability for Research Involving Human Subjects

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NAME OF APPLICANT(S): Sheridan St. Arnaud, MN Candidate

TITLE OF PROJECT: "A Comparison of Life Circumstances and Maternal-Infant Interaction: A Secondary Analysis"

The members of the review committee, having examined the application for the above named project, consider the procedures, as outlined by the applicants, to be acceptable on ethical grounds for research involving human subjects.

July 10, 1996
Date

Janice Lander, PhD
Chair, Ethics Review Committee

ERC 96-097
5005-02-097

Appendix I

University of Alberta
Faculty of Nursing

Letter of Agreement Between Thesis Committee Members
and Sheridan L. St. Arnaud, M.N. Student

As Principal Investigator of the original research project, and as members of her thesis committee, we have agreed that Sheridan (Sheri) will complete secondary analysis of selected data collected for the research project entitled "Effect of Different Soothing Interventions on Parent-Infant Interaction and on Infant Crying." She will describe and analyze the selected data relevant to the 115 mother-infant dyads who participated in the original project. From this correlational, survey study it will be possible to determine the relationship between identified difficult life circumstances and maternal-infant interactions. In order to do this, we will provide Sheri with access to the coded Difficult Life Circumstances surveys, completed by the participants, and the 1-week and 16-week Nursing Child Assessment Feeding Scale surveys completed by the reseach assistants associated with the project. Sheri discussed her intention of using this data for her thesis work with the entire Research Team on January 12, 1996.

Two copies generated by the secondary analysis done by Sheri will be made. One copy will be kept by Sheri and one copy will remain with us. Presentations made by Sheri on her research will acknowledge the source of the data (name of the original research project and the name and location of the investigators). The funding for the collection of the data from the publications and presentations made by Sheri related to this data will be limited to the research questions dealing with the secondary analysis. We will be able to use the data from this secondary analysis in future publications and projects with acknowledgements of Sheri's work.

A manuscript will be [illegible] by Sheri for publication to a mutually, agreed upon journal within 18 months [illegible] nse with Sheri as first author, Dr. Elliott, the Principal Investigator of the original project as [illegible]d author and Dr. Day, her thesis supervisor as third author. If she is unable to do this, Dr. Elliott will submit the article with Dr. Day as second author and Sheri as third author.

Signatures:

M. Ruth Elliott
Dr. M. Ruth Elliott

Ron G. Day
Dr. R. Day

Diane K Kieren
Dr. Diane Kieren

Sheridan L. St Arnaud
Sheridan St. Arnaud

Appendix J

Consent Form

Title of Project: Infant Care Research Project.

Researchers:

Dr. M.R. Elliott, PhD, RN	Dr. J. Drummond, PhD, RN	Dr. Sandra Reilly, PhD, RN
Faculty of Nursing	Faculty of Nursing	Faculty of Nursing
University of Alberta	University of Alberta	University of Calgary
Edmonton, AB	Edmonton, AB	Calgary, AB
Phone: 492-6241	Phone: 492-6410	Phone: (403) 220-6265

Purpose of the Study: The purpose of this study is to determine if certain activities will change babies' behaviour.

Procedure: Mothers who are in their 6 to 8th month of pregnancy will be asked to take part in this study on baby behaviours. Mothers who agree to take part will be placed in groups, using a system that resembles a lottery.

You will be asked to care for your baby in your own style. You will receive phone calls every week from the nurse researcher. She will answer any baby care questions you may have.

Mothers in all groups will be asked to fill out a sheet which has questions about their pregnancy. They will be asked other family information, such as what their life is like. They will also be asked to fill out questionnaires: 1) before their baby is born; 2) at one week; 3) at six weeks; 4) at three months; and 5) at four months after birth. At each time, these questionnaires will take no more than one-half hour to complete.

During the home visits all mothers will receive a chart from the researcher on which to mark their babies' sleep, awake, feeding, fussy and crying periods, toiletting and any spitting up. This chart is called a baby diary.

A nurse researcher will phone you every week during the study to see how you are doing. Your questions can be answered at those times. Each phone call will take about 5-10 minutes of your time. This is when you can ask about the baby diary. In addition to this, you will be asked to chart when they carry out baby care measures. Mothers will be asked to keep a 24 hour diary of these activities for 14 days when the baby is one week, then for 7 days when the baby is 1 month, 6 weeks, 3 months and 4 months old. When the baby is one week old and again at four months old the researcher will visit to watch mothers feeding and playing with their baby. This will take about 1/2 hour each time.

Risks: There are no known risks in this study. All the baby care information the nurse researcher gives are safe things to do. Taking part in this study may help you directly or it may not. What you learn in this study may help you to get to know your baby better. Every parent in the study will receive the same information from the hospital that is normally given. You will not be asked to do anything that may harm you or your baby. If you are bothered by any of the questions on the forms we will refer you to an appropriate health care agency for help. Findings from this study may help parents, nurses and doctors find better ways of caring for babies.

Voluntary Participation: You do not have to be in this study if you do not want to. If you agree to take part in this study and then decide you do not want to be in it, you may drop out at any time. If you want to drop out of the study, let Dr. Elliott or Dr. Drummond know. You do not have to answer any questions that you do not want to. Taking part in the study or dropping out of the study will not make any difference in the care you or your baby will receive.

you may drop out at any time. If you want to drop out of the study, let Dr. Elliott or Dr. Drummond know. You do not have to answer any questions that you do not want to. Taking part in the study or dropping out of the study will not make any difference in the care you or your baby will receive.

Your real name will not appear in this study. The information sheet will have a code number. The real names and information will not be put in any reports nor in any articles written about the study. Data will be stored for seven years after the end of the study and will be kept in a locked cabinet and separate from the consent forms. This is so your answers are private and not in the same place as your name and address. If more analyses of the data are to be done, further ethical approval will be sought. If you have any questions at any time, please call Dr. Elliott (492-6241), Dr. Drummond (492-6410), or Dr. Reilly (403) 220-6256 or Dr. M.J. Wood, Dean, Faculty of Nursing, University of Alberta (492-6761).

Consent:

I, _____, have read this information and agree to be in the study called "The Effects of Selected Soothing Techniques on Parent and Infant Behaviour". I have had the chance to ask questions about the study and my part in it. All my questions have been answered at this time. I understand that the information and results of this study may be used in future studies on parents' and babies' behaviour. If this is to be done, the research project will have to be approved by an ethics committee.

I am aware that during this study, should the researcher become aware of information that may be harmful to my health or that of my baby, she will discuss this with me. Under the law, this information may not be able to be kept confidential. I have been given a copy of this consent form.

_____ _____

Signature of Participant Date

_____ _____

Signature of Researcher Date

. . . . . .

If you wish to receive a summary of the study when it is finished, please fill in the next section.

Name: _____

Address: _____

_____

Appendix K

Explanation of Abbreviations Used in Analysis

Variable Abbreviation	Variable Description
AGE	Mother's age at time of delivery
DLC 1-28	Corresponds to item on DLC Scale
DLC CAT3	Aggregate of scores (no risk=0, low risk=1-2, mod-hi risk=3-7).
DLC CAT6	Aggregate of scores (1to 4=own category, 5-7=one category).
DLC TOT	Summative DLC Scale "yes" responses
FSCGTOT 1	Parental sub-score of "yes" responses on Week 1 NCAF Scale
FSCGTO16	Parental sub-score of "yes" responses on Week 16 NCAF Scale
FSTOTAL 1	Parent-child or total score of "yes" responses on Week 1 NCAF
FSTOT 16	Parent-child or total score of "yes" responses on Week 16 NCAF
GROUP #	Intervention group subject was assigned
PRE-SK	Skill/Knowledge items - PSOC Scale (prenatal responses)
PRE-VC	Valuing/Comfort items - PSOC Scale (prenatal responses)
PSC16-SK	Skill/Knowlege items- PSOC Scale (week 16 responses)
PSC16-VC	Valuing/Comfort items- PSOC Scale (week 16 responses)