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Comparison of Adaptation Processes of Parents with High-Risk versus Low-Risk Neonates over a One Year Interval

By
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Thesis submitted to the School of Graduate Studies of the University of Ottawa as partial fulfillment of the requirements for the degree of Doctor of Philosophy

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ABSTRACT

The present study intended to compare the adaptation process of families of high-risk neonates with that of families of full-term healthy babies. Comparisons between two groups were made at specific times over a one year period: birth, 3 months, 6 months and 12 months. Parents of infants who required the specialized medical care of a neonatal intensive care unit constituted the experimental group; and parents of infants who required usual hospital post-delivery care, the control group. Independent variables were the infant's medical condition at birth, the time of assessments, and parent gender. Dependent variables were measures of parental depression, anxiety, and coping strategies, and infant developmental status at twelve months of age. Measures of family functioning, family resources available, life changes within the family, socio-economic status, and parity and age of mother were used as control variables. Results indicated that parents of at-risk neonates are significantly more depressed and anxious than parents of healthy infants at the time of their infants' birth. Mothers are more anxious and depressed than fathers. One year later there were no differences between the two groups of parents, however mothers of at-risk infants continued to be significantly more depressed than

fathers of at-risk infants. Differences over time were also observed between the groups and between mothers and fathers within groups in terms of the specific coping behaviours felt to be more useful in adapting to the birth of a child.

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Chapter One

The first North American hospital for premature infant care was established in 1923. Consistent with the beliefs of the time, mothers were not involved in the active care of their infant. It was recommended that infants be handled to a minimum and very strict visiting restrictions were imposed, even on parents (Kennell and Klaus, 1982). The first observations of parents of premature infants were conducted in the 1950s-1960s at which time parents continued to be excluded from the premature nursery. This latter factor may explain the extreme maternal reactions that were described by the first investigators (Kennell and Klaus, 1982).

The first study examining the feasibility of allowing parents in the intensive care nursery unit was implemented in 1964 (Barnett, et.al., 1970). Results of a feasibility study indicated that the major concern of health professionals, that parents would bring pathogenic agents into the nursery, proved false. Significant differences were observed between mothers allowed in the nurseries and those restricted from visiting. Mothers who were allowed contact with their infants showed increased commitment, more confidence in their mothering abilities, and greater stimulating and caretaking skills (Barnett, et.al., 1970).

In the past decade advances in neonatal intensive care medicine have significantly increased the survival rate and the quality of life for the premature infant at-risk (Sarason,1977; Kennell and Klaus,1982). A study comparing survivors of respiratory distress syndrome in 1975 to survivors of 1970 indicated significantly better performance on developmental scales at four years of age among the more recent survivors (Kennell and Klaus,1982). When interpreting such results it is important to consider that in addition to the technological advances of that time period there were also changes in nursing practices such as encouraging frequent visits, breastfeeding and interactions between staff and parents. Due to these recent innovations, outcome studies of premature infants published before 1980 are virtually clinically outdated (Nurcombe, et.al., 1984).

Drillen, Thomson and Burgoyne (1980) surveyed, at six years eight months of age, 261 low-birthweight infants (<2000g) and 111 controls, born between 1966-1970. The control sample was not matched on social variables and no perinatal status information was available. Sixty-one subjects received an impairment score of three or over which indicated they were having considerable difficulties progressing in school. Within the control group 17 children also scored within this range. Their observations indicated that problems in primary school were related to the family's social class, evidence of early intra-uterine insult,

gender, postnatal complications and neurological and developmental status in the first year of life. They also compared the low-birthweight group to low-birthweight infants born between 1953-1955. They found that there was no change in the rate of major handicap. Infants with no evidence of early intra-uterine insult and who were neurologically normal in the first year of life, were largely undistinguishable from control children reared in similar environments.

Stewart, Reynolds, and Lipscomb (1981) comprehensively reviewed 22 reports, dating back to the 1940s, on outcome measures for very low-birthweight infants from developed countries. Although very low-birthweight infants may appear normal at birth, they are at-risk for developmental difficulties which may become evident as the child develops and begins school. They noted that it is difficult to interpret data concerning mortality rates and incidence of handicap as the reports come from different specialist centers, populations vary widely and environmental variables intervene. The authors only considered studies describing the outcome of very low-birthweight infants where all live births in the studied population were accounted for (deaths, losses at follow-up), and infants were followed to a minimum of 12 months corrected age. For the purpose of their review, handicaps were defined as abnormalities which over time were likely to

affect, in an important way, the infant's ability to lead a normal life and obtain satisfactory employment. Operationally a handicap included cerebral palsies, hydrocephalus, mental retardation (intellectual quotient two standard deviations below the standardised mean), a developmental quotient below 70, hearing or visual deficits severe enough to require special schooling (Stewart, et.al., 1981). Children not falling within these categories were classified as healthy. Thus only children with the most serious problems were included and children with behaviour problems or learning disabilities were classified as healthy. Although there was wide variability in the characteristics of the infants, results were consistent. Stewart, et.al. (1981) reported that in studies covering the period from 1940-1950 little attention was given to the treatment of infants. Very few survived and the ones that did suffered from a minimum of complications and many survived intact. In the 1950s and early 1960s treatments were introduced and the mortality rate began to fall however sometimes at the expense of an increase in the prevalence of handicaps among the survivors. This increase has been attributed to inadequate applications of new medical and neonatal knowledge. From the mid 1960s the chances of healthy survival for very low-birthweight infants (<1500g) have increased steadily, however the prevalence of handicaps has remained relatively stable at 6-8 % of the total very

low-birthweight births. This progess has been attributed to the more rational use of modern knowledge and the increasing sophistication of obstetrics and neonatal care (Stewart, et.al. 1981).

Saigal, et.al., (1982) did a five year follow-up of 294 infants weighing between 501- 1500 g who were born within a geographically defined area between 1973-1978. Of the 166 infants for whom complete assessments were available at two years of age, 100 were functioning normally. Twenty eight were found to be performing appropriately in ordinary activities and skills of daily living despite developmental or structural abnormality and they required a minimal amount of adult help. Twenty seven required some additional adult caretaking in ordinary activities and skills of daily living beyond what is expected for their corrected age. Eleven infants required significant additional adult care or help in ordinary activities and skills of daily living due to structural or developmental abnormality. They found neurological handicaps in 16.8% of the survivors.

Kitchen, et.al. (1982) did a two year follow-up of 297 infants born in Australia between 1977-1981. They found that 11.8% of the population had cerebral palsy, 1.3% severe sensorineural deafness and 1.7% were blind. Eighteen percent of the population suffered from one or more handicaps. These percentages may be low compared to the general population as many studies were conducted at

technically advanced medical centers where the number of handicaps may be lower. It must be taken into account that many infants are treated in intensive care units that have large service loads and do not have the most recent technology (Kitchen, et.al., 1982). Thus outcome measures of these latter infants as well as those from the most sophisticated centers are required to provide a balanced view of the long term prognosis.

The studies mentioned so far have focused on serious handicaps (e.g.cerebral palsy). However as Astbury et.al.(1983) stated more subtle forms of problems, including behaviour problems or developmental lags, may have serious consequences over time. The authors assessed the developmental status of 65 very low-birthweight infants (<1500g) at one and two years of age corrected for prematurity. These 65 infants represented 86% of the surviving very low-birthweight infants treated at the Neonatal Intensive Care Unit in 1979. Eleven of the children had major disabilities (cerebral palsy, blindness, deafness) and 15 had minor disabilities (e.g. hypertonia, hypotonia, visual deficit requiring corrective lens, multiple minor congenital anomalies). They found that psychomotor development lagged behind mental development at both assessments. A significant decrease was found in mental development scores between one year and two years which is explained by an increase in the number of

low-scoring "hyperactive" children at age two. Another observation was that disability, minor or major, and "hyperactive" behaviour were associated with poorer mental development and psychomotor scores for both assessments.

The authors concluded that it is impossible at this point to determine if behavioural and physical disabilities were causal to the very low-birthweight status alone or in combination with perinatal variables or other unexamined variables. More detailed analysis are required to predict developmental outcome. However this study has indicated the importance of considering cognitive and motor developmental measures in addition to physical disibilities when evaluating the outcome of at-risk children.

When studying factors associated with developmental outcome, parental adaptation and parent-infant interactions have been consistently neglected. The possibility of developmental delays, which may not appear for a number of years following birth, is an additional source of stress or at least concern for parents of low-birthweight or premature infants.

Infant Stimulation Programs

A series of infant stimulation studies have indicated that if a premature infant is either touched, rocked, fondled or cuddled daily while in the nursery, increased weight gain, and progress in certain areas of higher central

nervous system functioning may be observed (Kennell and Klaus,1982). However long-term as well as short-term benefits of stimulation programs and the quality of previous studies are being questionned. The concept of infant stimulation is not limited to the unique act of providing the infant with additional stimulation. Rather it involves determining which type of stimulation and at what time is most appropriate for the child. The infant is already stimulated at a high intensity level (bright lights, noise of the equipment) in the nursery before any additional stimulation has been introduced (Lawson, et.al.,1977).

Intervention programs for premature infants may be grouped according to five theoretical models. Certain programs are aimed at compensating neonatal sensory deprivation, others aim to prevent faulty mother-infant bonding, some provide compensatory experiences during childhood, others aim to help mothers resolve the emotional crisis of the premature birth and others help parents increase their sensitivity and responsiveness to their baby (Nurcombe, et.al. 1984).

Programs designed to provide the infant with increased stimulation by means of lights, shapes, audiotapes, or rocking cribs, usually have as outcome measure the short-term reduction of crying or apnea, increase in weight, activity, visual alertness and mental or motor development. However as we shall discuss these programs have had

inconsistent results, possibly related to their lack of control of the stimulus intensity and the individual differences of each nursery as well as biological and genetic differences between infants.

The majority of intervention studies conducted with premature infants have provided only supplementary stimulation to the infant and have been of brief duration. In a short term intervention study Katz (1971) evaluated 62 low-birthweight premature infants born at 28-32 weeks gestation. Thirty-one experimental infants received a patterned presentation of their own mother's voice through the incubator. When assessed at 252 days gestation age the experimental group achieved greater maturation (motor and tactile-adaptive) and greater auditory and visual function. A follow-up was not done to determine if these differences remained or how they affected future development.

Leib, Benfield, et.al. (1980) designed an early intervention multimodal sensory enrichment program to be implemented by nurses. The first 14 infants weighing between 1200 and 1800 g were placed in the control group. Following the discharge of the last infant in the control group the next 14 infants satisfying the selection criteria were included in the experimental group. The treatment group had a significantly higher developmental status than the control group, as measured by the Bayley Scale of Infant Development at six months corrected age, for mental and

motor scales. The generalization of these results is limited due to the small sample size. There is a need to look at the long term implications of such programs on future development.

Brown, LaRossa, et.al. (1980) studied the effects of nursery based interventions with healthy preterm infants and their socially disadvantaged mothers. They formed three treatment groups and a comparison group. The first treatment group was comprised of babies who received stimulation designed to make them more active contributors to their interactions with their mothers. In the second group the mothers received training to help them become more responsive to the cues ellicited by their baby. The third group was a combination of the training given to the first and the second groups. The comparison group received the normal hospital care. Outcome measures, at discharge and one year follow-up, failed to indicate any effects from the interventions on the mother-infant interactions or infant development. They concluded that these mothers experienced such a high frequency of crises in their social environment that a more comprehensive intervention is required. This study underlined the need to consider maternal factors, such as emotional reaction and coping, when assessing the impact of an intervention program.

Based on literature documenting increased risks for premature low-income family babies and findings that mother-

infant interactions have an impact on the infant's development, a non-randomized home based intervention for premature infants of low-income families was designed (Ross,1984). The parents of 45 infants treated at a regional neonatal intensive care unit were approached to participate . All parents were English speaking, of low social economic status and resided within 40 minutes of the hospital. One family declined to participate and four did not complete the program. The intervention program continued for one year post-term and outcome measures were compared with those of a control group of 40 premature infants treated in the same neonatal intensive care unit later in the year. The intervention program aimed to maximize the infant's mental and motor development by instructing mothers in caretaking skills and activities to promote their child's cognitive, motor and social development. Results from several measures indicated that the home intervention program had a positive influence on the infant's mental ability and on their child-rearing environment during the first year, however the two groups did not differ on measures of motor development. As the home intervention procedures were complex it is not possible to determine the specific components of the program that contributed to differences between study and control groups. A long-term follow-up of subjects is required to evaluate the sustained impact of interventions.

Nurcombe,et.al. (1984) designed an intervention program to promote mother-infant interactions by instructing mothers of low-birthweight infants to be more sensitive and responsive to their infant's physiological and social cues. Seventy eight low-birthweight infants were randomly assigned either to an experimental or control group. However four infants were lost at follow-up due to family move or death. A comparison group consisting of full term normal-birthweight infants was selected. Three groups were thus established: an experimental group (n=34), control group (n=40) and a normal birhtweight comparison group (n=41). The three groups were comparable medically and demographically except for neonatal characteristics (e.g. low or normal birthweight) and maternal educational level which was significantly higher in the comparison group. The intervention consisted of 11 sessions, seven of which took place in hospital during the week preceeding the infant's discharge and four in the home over the three months following discharge. At six months corrected age, outcome measures of infant development (temperament and cognitive) indicated that the two low-birthweight groups did not differ significantly from each other on either measures of mental development or psychomotor development as measured by the Bayley Scales of Infant Development and the Carey Infant Development Questionnaire. However the two groups scored significantly more poorly than the normal weight

comparison group on both measures. Mothers receiving the intervention perceived their infants as more adaptable, happy and approachable. In summary, although the intervention program did reduce the level of temperamental difficulty reported by mothers it did not have a noticeable influence on the infant's cognitive development.

In summary, intervention programs for parents of at-risk infants have produced inconsistent results in terms of their sustained impact on the infant's psychomotor and cognitive development as well as on parent-infant interacions. It is difficult to compare many of these programs as they vary greatly in terms of the types of stimulation or instruction offered, the types of infants included and outcome measures used. Many studies are limited due to small sample sizes, inadequate control groups and their lack of a long term follow-up to determine the sustained impact of their interventions. Although many of these studies examine mother-child interactions they have neglected the emotional reactions of these parents.

The developmental studies have indicated that many of these infants who require intensive medical interventions at birth, are at-risk for physical disabilities as well as developmental and/or psychological difficulties. Parents are aware of these risks which is an added source of stress. Results of intervention or stimulation studies are often inconsistent due to methodological limitations and

different areas of focus. Although a number of intervention programs have examined mother-child interactions, they have neglected the emotional reactions of parents. Parents who are experiencing difficulty in coping with their infant, who are seriously depressed or anxious or who are overwhelmed by additional stressors (e.g. financial or marital difficulties) may not be able to benefit from interventions designed to improve their infant's developmental status or their relationship with their child.

THEORETICAL MODELS OF COPING

In order to determine how parents cope with the specific stressor of the birth of a premature or at-risk infant it is important to examine the literature and theoretical models of stress and coping in general. The models to be considered include the Biological perspective based upon Hans Selye, the Psychoanalytic and Ego Psychology perspective, the Interactive-Cognitive perspective of Richard Lazarus, and the Family Coping Model of H.I. McCubbin.

Biological Perspective

Selye, a physiologist, believed that the basic principles of cellular defense are also applicable to people and their adaptation to the stress of life. The biochemical

reactions used by our cells and organs in their adaptive processes are independent of the type of stressor.

Selye (1974) defined stress as the nonspecific response of the body to any demand made upon it. Each stressor requires a specific action, e.g. if we are cold we shiver, and an increased demand for readjustment. Stressors, which are the demands that produce the stress reaction, are not necessarily physical in nature since emotions or thoughts may also produce a stress reaction. A stressor may be seen as positive (e.g. a promotion, the birth of a healthy baby) or as negative (e.g. loss of a family member, illness). The important characteristic of the stressor is the intensity of the demand for adaptation. Even an excess of a pleasant stimulation is stressful. We must continuously experience at least a minimal level of stress in order to maintain optimal functioning.

Selye proposed the General Adaptation Syndrome (G.A.S.) to explain how different stimuli can produce the same stress reactions. The syndrome is characterised by three stages: Alarm Reaction, Resistance, Exhaustion. In general terms, during the alarm reaction stage the body demonstrates changes characteristic of initial exposure to stress. The body's level of resistance is lowered. If continued exposure to the stressor is compatible with adaptation the organism will enter the resistance stage. The characteristic signs of alarm will disappear and the level

of resistance will rise above the normal level. After long-term exposure to the stressor, the organism's adaptation energy is exhausted and the exhaustion stage begins. The alarm signals reappear and the individual is no longer able to adapt. This model indicates that our adaptation energy is finite. The length of our resistance period is a function of our innate adaptability and the intensity of the stressor.

To explain how the stressor may produce different effects in different individuals Selye introduced the concept of "conditioning factors". The organism's response is determined by internal or external conditioning factors. Internal factors include hereditary factors and past personal experiences. Outer factors may include the climate, drugs used or diet. Consequently, similar stimuli may produce different reactions in different individuals at different times.

In summary, according to this biological perspective, individuals cope with physical as well as mental stress according to a similar mechanism. The laws that control our involuntary physiological responses ressemble the laws that control our voluntary interpersonal behaviour. This homeostatic perspective views stress as a stimulus condition resulting in a disequilibrium in the system and producing a dynamic strain or changes in the system against which mechanisms of equilibrium are activated.

Although the biological model of stress and coping is useful in understanding the physiological process of adaptation it does not offer a basis for psychological interpretation and intervention.

Psychoanalytic and Ego Psychology Perspectives

According to the classical inner perspective elaborated by Freud, the ego grows from the inevitable conflicts originating in infancy between the biological drives (ID) and the constraints of reality. The drives demand immediate satisfaction, otherwise tension results. At this stage of development, our behaviour is controlled by the pleasure-pain principle and little tension is tolerated. The beginnings of ego development may be observed in the barriers blocking painful stimulus overload. As the infant's perception, memory and cognitive functioning develop, delayed gratification, avoidance of previously painful situations and reality-testing are possible (Korchin,1976). Behaviour is no longer controled by the pleasure principle but rather by the reality principle.

The concept of ego defense mechanisms was first introduced by Sigmund Freud in 1926 and elaborated upon by Anna Freud (1936). Sigmund Freud specified that the term "defense" was to be used in conflict situations. Ego defense mechanisms include: repression, isolation, denial, reaction formation, sublimation, projection, acting out,

introjection, doing and undoing, rationalization, and regression. Generally, defense mechanisms may be defined as any technique used by an individual to avoid anxiety brought on by conflict, stress, frustration or danger (Korchin, 1976).

Defense mechanisms protect the individual's self-concept and provide partial satisfaction of needs. Due to the defense mechanisms the individual can continue functioning, however the level of functioning will be limited and inflexible. These mechanisms are adaptive in that greater damage is avoided, they allow the ego to continue functioning. However when used excessively, they become adaptive devices gone wrong since they fail to maintain a balance in aspects of adaptation (White,1974).

Defenses can be stimulated by internal or external events and serve to protect the individual from such events. As well they protect the individual in one or more of the following ways: by denying, distorting or restricting the individual's experience; by reducing emotional or self involvement; or by counteracting threat or damage (Coleman, et.al. 1980). They are usually used in combination rather than alone and frequently accompany task-oriented behaviour.

Ego-psychologists found that a conflict based concept of ego development is very limited. Hartmann (1939) stated that the ego results from more than the drive-reality conflict. It also results from the evolution of innate or

autonomous functions such as memory, perception and cognitive processes. They introduced the concept of a "conflict-free ego sphere". They were interested in the adaptive as well as defensive roles of the ego. They believed that humans are motivated to explore and master their world in addition to attainning their instinctual goals and reducing painful affects (Korchin,1976). In summary, the ego-psychologists are more concerned with conflict-free functions, coping, cognitive processes and self-constructive acts.

The functioning of the ego may be considered as a homeostatic regulator. The ego is responsible for modifying the person's drives in relation to the superego system and the reality system, in order to maintain an optimal level of tension that permits productivity and growth (Menninger, 1977). The human being is continually exposed to stressful situations which require an action from the ego in order to maintain the individual's integrity. When the stress is minor the ego will develop normal adaptation techniques. However in situations where the stress is intensive or chronic the ego must use more energy and activity in order to maintain stability.

When considered from an adaptational point of view, defenses simultaneously protect and limit the individual. A well defended person may be someone who is functioning well in a stressing situation. At the same time it could be

someone who is governed by his defensive behaviour and unable to deal with reality. A person without defenses may be an inadequate individual, or a mature, competent individual (Korchin,1976). Defenses are necessary if we are to grow as individuals. Defenses are adaptable providing they allow the individual to be comfortable, relatively free of anxiety and they do not impede or prevent any of the individual's other activities.

Although the psychoanalytic perspective offers us a theoretical explanation for the emotional experience and reactions of individuals coping with stressful situations, it does not facilitate the experimental investigation and validation as psychoanalytic concepts have not easily lent themselves to empirical validation.

Interactive-Cognitive Perspective

Lazarus (1966) has proposed a systematic interactional model for the stress-coping process that acknowledges the individual as being active in shaping his personal stress experience. Earlier models of stress which assumed a linear cause-effect relationship between stressor and stress response, did not allow for the consideration of individual differences.

According to Lazarus' model stress cannot be defined solely on the basis of the situation or the environment. The capacity of a particular situation to produce a stress

reaction in an individual is dependent on the individual's characteristics. Lazarus developed his interactional model that emphasizes cognitive appraisal and coping as processes. He states that stress must be defined in terms of transactions between individuals and situations and not either one alone due to the important role of personality factors in the production of stress reactions (Lazarus, 1966).

Lazarus and Launier offer the following process-oriented definition of coping: "efforts both action oriented and intrapsychic to manage (that is to master, tolerate, reduce, minimize) environmental and internal demands and conflicts among them which tax or exceed a person's resources" (1978, p.311).

Lazarus identifies two elements of coping: problem-solving and the regulation of emotions. The cognitive appraisal of the stress situation occurs as a primary condition. The emotional response follows the appraisal. Eventhough the cognition controls the initial direction of the coping process, the total response is composed of the cognitive activity, emotions and physiological responses in interaction (Lazarus, Folkman, 1984).

The concept of threat is the major intervening variable in psychological stress (Lazarus,1966). The individual relies on his cognitive processes to appraise the situation. Appraisal of threat is a judgement and influence in which

information is integrated with ideas and expectations. The individual continually appraises the personal experience, and the resulting understanding of the situation will shape future actions.

The individual's evaluation will produce one of three possible appraisals of the stressor: irrelevant, benign or stressful (Lazarus,1966). When a stimulus is perceived as stressful, coping processes are used to reduce or eliminate the anticipated harm. Lazarus refers to these coping processes as "secondary appraisals". The secondary appraisal determines the coping strategy which in turn is reflected in behavioural observations. The coping response emmitted will be based on the evaluation of the best available way to achieve what is believed to be the most desirable or as causing the least amount of discomfort (Roskies and Lazarus,1980). Three classes of factors that influence the secondary appraisal have been determined: the degree of threat, factors in the stimulus configuration, and the individual's psychological structure.

Lazarus (1966) states that a relationship exists between the degree of appraised threat and the type of defense chosen. When the threat is relatively mild the individual tends to use more adaptive coping styles whereas when the threat is severe pathological styles are more likely.

Three factors in the stimulus configuration that have been identified as influencing the coping process include: the location of the harmful stimulus, the effectiveness of other available actions and situational constraints. Among the coping strategies available to him, the individual will choose one that is perceived as having the best chance of eliminating or diminishing the threat. Situational constraints may render certain coping styles unacceptable because their expression exposes the individual to additional threatening stimulus.

Personality traits may influence the coping process since they may affect the appraisal of the situation and the behaviour chosen without the mediating process of appraisal (Lazarus,1966). Four classes of personality factors may influence the coping process: pattern of motivation, ego resources, defensive dispositions and the individual's perception concerning the environment and personal resources. The individual's goals and values are important in determining coping processes since they determine the types of actions that may create additional threats. For example if social desirability is a strong value, overt aggression will not be an acceptable reaction to threat. Ego resources, such as impulse control, influence coping styles directly rather than through the process of secondary appraisal since they are concerned with the selection of actions for behavioural responses. Personality traits or

dispositions are reflected in the choice of a coping activity and dispose the individual to react against threat in particular fashions. Examples of such dispositions are the tendency to cope versus to avoid, the tendency to become defensive, the tendency to conform. Based on previous experiences cognitive structures concerning what is right or wrong, effective or ineffective, the consequences of certain actions are created. These structures or belief systems will influence the coping process and its behavioural expression.

Coping strategies consist of neurocognitive, affective and physiological responses to a stress situation. Following the cognitive evaluation of the stressor, the individual determines the degree of threat and his resources available. This evaluation produces a fluctuation in the general anxiety level, followed by a refinement of his energy into one or more specific conditions. The emotion is then translated into an observable behavioural response.

This model of the stress-coping process implies that when studying life events and their impact on an individual, their meaning to the person must be considered. As mentioned previously, a person's cognitive appraisal of particular life events strongly influence his response to these events (Lazarus and Launier,1978). Whether the individual has control or not over the event, how he perceives this control and individual characteristics such

as temperament, social network and interpersonal relationships may influence a person's coping abilities.

In summary, the coping style or strategy used by an individual in a particular situation is the result of the interaction between his cognitive activity (appraisal), his subsequent emotions and physiological responses. Although the cognitive model of stress and coping does lend itself to experimental verification, the emphasis is on individual coping rather than family coping and adjustment.

Family Coping Model

The literature indicates that family outcomes following a crisis are the result of multiple factors in interaction (McCubbin and Patterson,1981). The earliest conceptual foundation attempting to answer the longstanding question of why some families appear to adjust to stressful life events with little difficulty whereas others are unable to handle even minor events was Hill's ABCX family crisis model(1949).

Hill (1949) studied the stressors of war separation and reunion and their impact on the family. He focused on the precrisis variables which account for the differences in family vulnerability to a stressor event and whether and to what degree the outcome is a crisis for the family. The ABCX model states that A (the stressor event) interacting with B (the family's crisis meeting resources) interacting

with C (the definition the family makes of the event) produce X (the crisis) (Hill, 1949).

According to this particular model a stressor is defined as a life event impacting upon the family system which produces change in the family social system either in terms of boundaries, goals, patterns of interactions, roles or values. A stressor will not always produce a crisis. If the family is able to use existing resources and to define the event in such a way as to restore the balance quickly, the stressor will not reach crisis proportions (McCubbin and Patterson,1983).

McCubbin and Patterson (1981) felt that a more dynamic model was required to explain the efforts a family makes over time to adapt to a crisis. As mentioned previously, Hill (1949) focused primarily on the pre-crisis variables that determine a family's reaction without considering the process of adaptation.

McCubbin and Patterson (1983) indicated four additional factors which appear to influence the course of family adaptation and proposed the Double ABCX Model of Family Behaviour (see figure 1). The four factors include: pile-up of additional stressors, family's efforts to activate or acquire new resources, modifications of the family's perception of the crisis event, and the role of family coping strategies in immediate or eventual adaptation.

Their model is an elaboration of Hill's ABCX model designed to incorporate post-crisis variables.

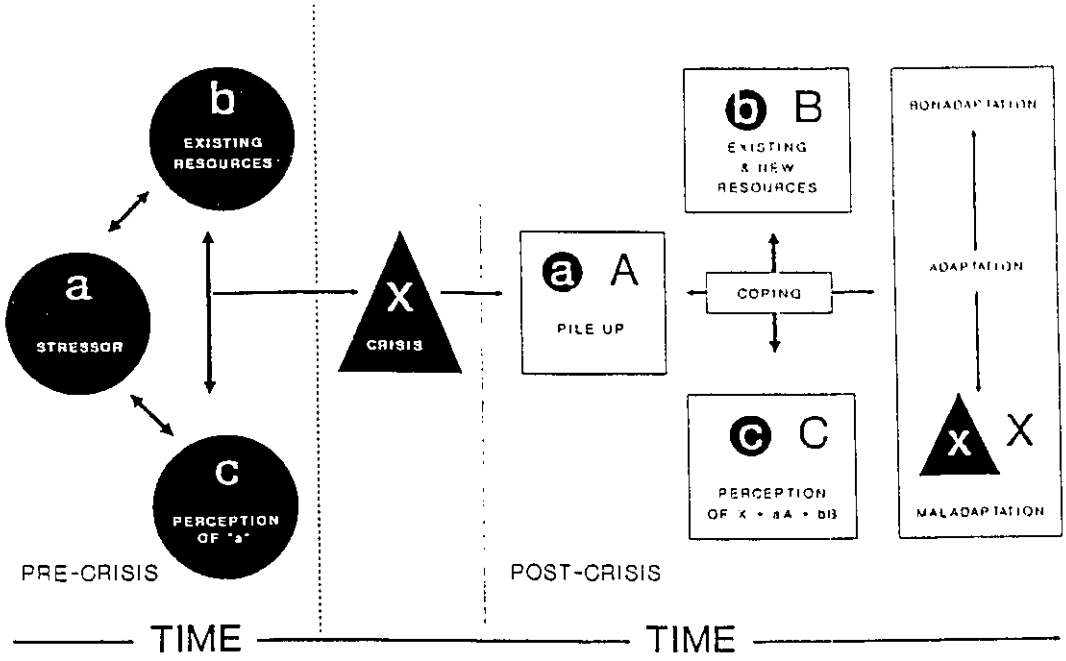

Figure 1: Double ABCX Model (McCubbin, Patterson, 1981)

Factor aA, Pile-Up, was considered essential to the model as families rarely face a singular stressor. Rather an accumulation of strains may result from continued difficulties with the initial stressor, normative family changes occuring simultaneously, the coping behaviours selected may produce new stressors or the changes brought about by the initial crisis may be ambiguous and difficult for the family (McCubbin and Patterson, 1981). A crisis

situation implies that the family system is experiencing an imbalance due to it's inability to meet multiple demands. Consequently, the course of adaptation will be influenced by the number and type of stresssors. Based on a model of family adaptation to chronic illness, Koch (1985) stated that ineffective adaptation is characterized by an accumulation of stressors related to the coping process and increases the probability of a negative mental health outcome for the family system or the individual members.

Family resources include psychological, social, interpersonal and material characteristics of individual family members, the family unit and the community. When considering the process of adaptation, it is essential to consider the new resources that the family develops or strengthens in response to the demands of the crisis situation. Adaptation to stress is not only an intrafamily process, rather the family must react to and use coping behaviours within the family system and in relationship to the community (McCubbin,1979).

When considering the family's coping behaviour as a process, necessarily their perception of the crisis situation will be modified over time. Factor cC, Family Perception, is the family's perception of the total crisis event (McCubbin and Patterson, 1983). This perception includes the new stressors, old and new resources and evaluations of what is required to reestablish family

stability. The family's new perceptions are oriented towards a redefining of the crisis.

In accordance with the Double ABCX model, coping is defined as a multifaceted process where resources, perceptions and behavioural responses interact as the family attempts to achieve a balanced level of functioning (McCubbin and Patterson, 1983). The concept includes cognitive and behavioural components interacting with each other.

Family adjustment comprises three elements: the individual member, the family system and the community. Adaptation is possible only when the demands of one element can be met by another in order to achieve a balance at the two primary levels of interaction (between individual family members and the family system and between the family system and the community) (McCubbin and Patterson, 1983). Positive adaptation results in the maintenance or strengthening of family integration, continued development and a sense of control over the environment. Koch (1985) identified eight indices of family adaptation: emotional expression, marital and family stability, adaptability, cohesion, unexpressed negative emotions, illness, anxiety and depression. A negative adaptation is characterized by a continued imbalance in family functioning, or a deterioration in the family integrity or development, or a loss or decline in family autonomy.

In summary, the Double ABCX model of family adaptation proposed by McCubbin and Patterson attempts to identify family factors that account for the variability in family post-crisis outcomes. They propose that the accumulation of stressors, family resources, perceptions and coping are the initial variables that influence family adjustment.

The Double ABCX model of family adaptation provides the theoretical framework for the present study. The model includes consideration of the actual coping behaviours used, the family's resources as well as consideration of any additional stresses that may be occuring within the family system. Measures of resources perceived by the family as being available to them and of stressors present within the family system will be incorporated in the study.

FAMILY STRESS AND COPING

Research has clearly established that a relationship exists between family functioning and a crisis or stressor within the family and that a particular stressor will affect and be affected by the family context (Shapiro,1983). In order to understand the relationship between family functioning and the stressor it is necessary to consider how families function as dynamic systems. The family system has been defined as a network of interpersonal relationships involving continuous interactions between its members and reciprocal causal effects (Miller and Miller,1980). The

family is a dynamic entity with its own organization and structure. As they develop, families create their own homeostatic maintenance mechanisms that provide stability as well as satisfaction of members' emotional and physical needs (Olsen,1970). Due to interrelationships existing between members and their roles, an action by one member affects all other members and the family as a unit.

In a review of the literature on family stress and coping during the 1970's, McCubbin and Patterson (1981) concluded that studies could be classified according to the type of stressors studied: non-normative events (e.g. impact of disasters on family, occupational stress, changing role of women in the family) or normative transitions (e.g. parenthood, child-launching, post-parental transition, retirement, widowhood).

Four factors commonly identified as influencing a family's adjustment to stressors included the family members' personal resources, the family system's internal resources, social support and coping (McCubbin and Patterson, 1981).

Personal resources include all assistance available to the individual family members when required. When individuals judge that they have adequate resources available for the demands of the situation, they are less likely to feel overpowered. George (1980) identified four basic components of personal resources that contribute to

coping efficacy: education level, health, financial and psychological resources.

McCubbin and Patterson (1981) found that psychological resources were the component most frequently studied in the literature. These include all personality characteristics that people use to adapt to the hardships imposed by the environment. Psychological resources represent what people are, as opposed to coping responses that represent what people do in order to deal concretely with stressful situations (Pearlin and Schooler, 1978).

The family system resources that have received attention in the literature include family adaptability, cohesiveness and problem-solving abilities. Olson and McCubbin (1982) hypothesized that families who are able to function at a moderate level along the dimensions of cohesion and adaptability are more apt to successfully adjust to stress. Pratt (1976) found that families whose organization is characterized by flexible role relationships and shared power structure are better able to actively cope with life stress.

In recent years, the role of the social network and the potential support that it offers have received considerable attention in the area of family stress (McCubbin and Patterson, 1981). The major social structures that have been studied include: neighborhoods, extended family and social support groups. Research has concentrated on two

mediating influences of social support: the protection against the effects of stressors and the encouragement of recovery from the stress experiences by the family.

Based on their review of the literature, McCubbin and Patterson (1981) concluded that compared to the amount of research done in the area of individual coping or in the general area of stress and coping styles, research on family stress and coping has been extremely limited. However this appears to be changing as more and more researchers and clinicians are becoming aware of the importance of understanding how families cope with stress.

Four areas of research have led to this interest in family stress. The first area of research was the indication of the association between life stress and mental illness (Holmes and Rahe, 1967). Family life events figure in all measures of life changes and are thus seen as contributing to the onset of illness (Rahe, 1979). A second area of research has indicated that the family system has the potential for teaching and reinforcing potentially dysfunctional coping behaviours (McCubbin, Cauble, Patterson, 1982). A third area of research that has contributed to the interest in family stress is the observation that not all families are unable to cope with stress. Certain family systems are able to cope with and even grow through the use of appropriate coping strategies. Research has concluded that family coping integrates

psychological as well as sociological perspectives. The psychological perspective considers the direct actions that alter the environment or the thoughts or goals intended to relieve the emotional impact of the stressor (Lazarus, 1966). The sociological perspective (Hill, 1949) emphasizes family resources (e.g. cohesion and adaptability) that help maintain family functioning when dealing with stressful situaions (McCubbin, Cauble, Patterson, 1982). The fourth area of study that has only recently begun to receive empirical support is the value to families and individuals of social support. Cobb (1982) identified three types of social support. Emotional support leads the individual to feel loved and cared for. Esteem support leads to beliefs of being esteemed and valued. Network support leads to beliefs that the person has a position within the system. Research has indicated a strong relationship between social support and the ability to cope with stress (McCubbin, Cauble and Patterson, 1982; McCubbin, et.al., 1980). Socially supported individuals appear to adjust more positively to change and increased social support tends to increase coping ability (McCubbin, Cauble, and Patterson, 1982).

In a large survey study, Pearlin and Schooler (1978) examined coping strategies used by family members when faced with difficulties from four life events: marriage, parenthood, household economics and occupational goals and

activities. Interviews were conducted with 2300 people representative of the Chicago area population. They concluded that the protective function of coping behaviour may be demonstrated in three ways: by eliminating or modifying the situation producing the stress; by reappraising the meaning of the experience so as to neutralize its effects; or by managing the tension. Coping cannot be considered as a unidimensional behaviour since it functions at various levels simultaneously and involves a large number of behaviours, perceptions and cognitions. They found that in interpersonal contexts (e.g. marriage, parenting) it is the specific things that people do, that is their coping responses, that determine wether or not they will experience emotional stress. However, when dealing with impersonal stressors (e.g. economic or employment difficulties) psychological resources are the determining factors.

In three studies examining family adaptation to separation, McCubbin et.al. (1976) found that the family's reaction evolved with time. They shifted towards more complex strategies as the stress experience increased. The specific stressor of separation presented the family with additional difficulties such as the challenge to member's self-esteem and to the family's organization and structure. Coping behaviours involved the management of various dimensions of family functioning at one time: maintaining a

family environment conducive to open communication, promoting member independence and self-esteem, maintaining family unity and attachment, development of social supports in the community for the family and maintaining efforts to diminish the impact of the stressor and the amount of change required by the family.

McCubbin et.al. (1983b) examined the coping patterns of parents having a child with cystic fibrosis. They found that even though mother and father used similar coping behaviours their influence was different. Mother's behaviours were related to the maintenance of family cohesiveness and expressiveness; whereas the father's behaviours were related to the interpersonal relations and the organization of the family. Benfield et.al. (1976) found significant differences between the feelings and grief responses of mothers and fathers of neonates transferred to a regional intensive care unit. More mothers than fathers admitted feelings of sadness, guilt, anger, disbelief, loss of appetite, praying for the baby, depression and crying.

Pearlin and Schooler (1978) stated that the effectiveness of coping strategies is determined by their ability to reduce the level of stress experienced or the negative psychosocial outcomes. However the reduction of stress is not the only outcome. Various studies have focused on the impact of the stressor on the quality of social relations with significant others such as spouses

(Cairns, Lansky, 1980; McCubbin and Patterson, 1981), siblings (Spinetta, Maloney, 1978), and medical staff (Chesler, Barbarin, 1984).

In an exploratory study Barbarin and Chesler (1984) examined the relationships between parental coping strategies and stress, marital quality, relations with medical staff, and relationships with friends and neighbors in families of children with cancer. Seventy subjects were randomly selected from a pool of 265 childhood cancer families of which 55 consented to participate. The authors do not state if the decliners differed from the subjects on any significant variables. Data, obtained through separate interviews with family members and a structured questionnaire completed by the parents, indicated that coping behaviours appear to have a greater influence on social relations than on the reduction of stress experienced. Regardless of the coping behaviours used, parents reported high levels of stress. Thus coping behaviours cannot be expected to relate to the amount of stress reported. Effective coping is more appropriately viewed as the way in which individuals attempt to continue in spite of stressful conditions. They concluded that an evaluation of coping effectiveness must consider the negative or positive effects of the coping behaviours on the individual's or family's social relationships (Barbarin, Chesler, 1984).

In a comprehensive review of family reactions and coping strategies in response to a physically ill or handicapped child, Shapiro (1983) found that families may be affected even by a minor illness in their child. The literature indicated that it is the mother's reaction to the illness that may be the most important etiological factor in any future behavioural disturbances in the child (Shapiro, 1983). When a chronic or life threatening illness affects a family member the entire family is profoundly affected. The family, as a social system, has as one of its roles the remediation of stress for its members (Kaplan,et.al., 1980). Research indicates that mothers of handicapped children report higher levels of depression and anxiety than mothers of normal infants, parents of handicapped infants often have a poorer sense of competence and fathers in particular derive less satisfaction from the parenting role (Cummings, 1970). Parents frequently report psychosomatic illness and they may overprotect their child. Mothers in particular become overinvolved with their ill child to the point of excluding father and siblings (Shapiro, 1983). The family functioning becomes centered around the ill child and their main goal becomes survival. Additional studies have found families who report becoming closer to each other, acquiring personal growth and who manage to develop friendships with other families and health personnel (Shapiro, 1983). Family reactions, both maladaptive and

adaptive, became evident from one to four weeks after the diagnosis was confirmed (Shapiro, 1983).

Shapiro (1983) concludes that a clear interaction exists between family functioning and illness and that a serious illness in a member has a potentially negative effect on the family system. The family has the power, in the choice of coping patterns, to positively or negatively influence the outcome of the illness on family organization and functioning. Family coping patterns have as general goals to respond to the challenge of family adaptation, to maintain a feeling of family togetherness, to reorganize the family structure and functioning and to reestablish an emotional baseline.

These studies emphasize the importance of considering the coping behaviour and emotional reactions of both parents due to the interrelationships between family members and gender differences. The adaptation to an at-risk neonate requires adjustment at various levels of family functioning over time (e.g. change in family unit, need to continue open communication, developing a new social network - neonatal intensive care unit, adjusting to having the infant at home after discharge). Thus it is desirable to examine the coping process over time.

BIRTH OF A CHILD AS A STRESSOR

Families experience a variety of crises during the course of their development. Certain crises are of an extra-family origin (e.g. unemployment) whereas others have an intra-family origin. The latter may be subdivided into crises due to a loss, gain or change in the status of the family (Dyer, 1976). Goldson(1979) states that the birth of any infant is a developmental crisis for the family. A new set of relationships are established, consequently changing the pre-existing family equilibrium. This is a time of change for the entire family whose members are experiencing a temporary disorganization of their usual patterns of functioning.

Dyer(1976) states that the intensity of the crisis is related to a) the state of marital and familial organization at the time of the birth, b) the couple's preparation for marriage and parenthood, c) marital adjustment, d) certain social background and situational variables (e.g. number of years married, whether or not parenthood was planned, father's education).

The roles and tasks of parenthood appear suddenly. From the moment of birth the parents are faced with social expectations. Necessarily the birth of a new infant involves important changes for the parents. However, research indicates that most parents do not have strong negative reactions or opposition to these changes (Miller

and Myers-Walls, 1983). Myers-Walls (1979) found that the amount of change was negatively related to the parent's ability to accept changes.

In a longitudinal study assessing personal well-being, personal stress and marital stress, during the pregnancy, one month after birth and eight months after birth, Miller and Sollie (1980) found that parents reported higher levels of personal stress after the birth. Thus it appears that the first experience of being a parent affects parents, however the majority are only mildly or moderately negatively influenced by these changes (Miller and Myers-Walls, 1983).

Birth of a Premature Infant as a Crisis

Thus the birth of a new baby can be described as a normal developmental stressor during which the parents experience anxiety concerning the baby's well-being, the risks to the new mother and to their relationship, particularly for the first born. Parents of an at-risk neonate experience these same anxieties. In addition, based on results of outcome studies for these infants which indicate developmental lags, longterm handicaps and neurological problems, the birth of an at-risk infant is an additional stressor for the family. The impact of this stressor on parents is of concern to health professionals.

The first studies on parental reactions were conducted before parents were permitted to enter the intensive care nursery (Prugh, 1953; Kaplan and Mason, 1960; Caplan, 1960; Solnit and Stark, 1961; Mason, 1963). These early reports were of a psychoanalytic orientation and focused predominantly on the mother-child relationship with little or no mention of the father, his adjustment, or relationship to the infant. These analyses were either theoretical discussions or descriptive studies based on clinical observations with no empirical control (see Table 1). Although limited by their theoretical orientation and lack of a control group or control variables, they did offer insight into the process of maternal adaptation and provided a direction for future research.

Based on information obtained from clinical interviews with sixty parents of premature infants, Caplan (1960) states that the typical psychological experience of the mother differs following a preterm delivery as opposed to a full-term delivery.

As a pregnancy approaches term, the expecting parents complete their material and psychological preparations and the mother becomes anxious to see her baby. When a healthy full-term infant is born, the mother is proud of her achievement, she is encouraged and congratulated by health professionals and her family. Within a short period of time the mother is able to hold and feed her infant. Her

feelings of success and closeness encourage the beginning of their new relationship. Even though the new mother may be anxious in her role, she is able to complete her maternal tasks based on reinforcement from her previous successes (Caplan, 1960).

For the mother of a premature infant, the experience is quite different. Even though parents are intellectually aware of the possibilities of prematurity, they are not emotionally prepared when it happens to them. Consequently preterm labor comes as a shock to the mother as well as the father. The hospital atmosphere is tense, with additional care being paid to the newborn's condition. After the delivery there is increased concern for whether or not the baby is alive and whether there are any abnormalities. Unlike the mother of a full-term infant, the premature mother is only allowed to see her baby for a brief instant before it is hurried away to an incubator. What the mother is likely to remember is the infant's small size, it's unusual color and it's unattractive appearance (Kaplan and Mason, 1960). Instead of being congratulated by the staff, they may talk to her in guarded tones. As well, the other mothers on the ward may avoid her (Kaplan and Mason, 1960). Such infants may be at risk for delayed attachment with mother and father in addition to developmental lags.

After giving birth to a high-risk infant, the mother must assume a supporting rather than dominant role. She is

forced to take an outside position and let the health care staff take over. The mother is grateful that the medical staff are there to help, however she may resent the necessity of their intervention (Prugh, 1953).

The premature delivery may occur before the parents are economically as well as psychologically prepared for parenthood. The premature delivery challenges all the goals and expectations of the parents, it interrupts their natural process of adaptation and postpones the establishment of the relationship due to a prolonged separation (Goldson, 1979). The natural emotions of affection and pride following the birth of an infant may be replaced by feelings of anxiety and guilt.

Simultaneously the parents have lost one child (the healthy, perfect baby anticipated) and are required to adapt to and accept their infant at risk (Solnit and Stark, 1961). This places a great demand on the parents as they do not have time to work through the loss before they must accept and become attached to their baby. The parents experience feelings of failure and of grief for the full-term child they did not produce.

Table 1: Tabular presentation of studies reviewed

Authors	Type of Study	Sample	Control Group	Focus	Type of Measurement	Time Schedule of assessments	Measure
Prugh 1953	theoretical psychoanalytic	none	none	emotional reactions	semi-structured interview and questionnaire	none	none
Solnit Stark 1961	theoretical psychoanalytic	none	none	mourning process	none	none	none
Kaplan Mason 1960	descriptive psychoanalytic	60 families of prematures	none	psychological tasks	clinical interview	birth to 2 months after discharge	clinical material
Caplan 1960	descriptive psychoanalytic	10 families of prematures	none	parental responses	unstructured interview observations	4 periods between birth and 6 weeks after discharge	qualitative analysis of interview
Mason 1963	anecdotal recall psychoanalytic	26 mothers of prematures from lower SES	none	predict outcome	unstructured clinical interview	during hospitalization	clinical analysis interview
Drotar et. al. 1975	retrospective anecdotal	parents of 20 children with congenital malformations	none	stages of adjustment and process of attachment	structured interview	aged 1 week to 13 years	analyses interview data
Choi 1973	quasi-experimental	20 mothers of infants <2500g	matched for race,sex,parity hospital, mother's age	depression anxiety in mothers	questionnaire	3-5 days after birth	depression questionnaire
Benfield 1976	convenience sample descriptive retrospective	101 couples with infants in NICU	none	grief response of parents	questionnaire	at discharge	questionnaire re: attitudes
Grant 1978	theoretical psychoanalytic	none	none	developmental tasks and responses	none	none	none

Authors	Type of Study	Sample	Control Group	Focus	Type of Measurement	Time Schedule of assessments	Measure
Jeffcoate 1979a 1979b	retrospective	17 parents of preterms	matched for parity and social variables	parent-child relationship parent responses	semi-structured interview and questionnaire	6 to 20 months after birth	Neonatal Perception Inventory clinical analyses
Goldson 1979	theoretical psychoanalytic	none	none	tasks & stages of parental adaptation	none	none	none
Newman 1980	descriptive	parents of 10 LBW infants	none	parent coping styles	interview and observation	not specified	analyses of parental communications
Trause Kramer 1983	convenience sample descriptive	38 parents of low-risk prematures	yes-matched	parent relationship	questionnaires	1 week after birth and 1 & 7 months after discharge	Parental Perception Inventory clinical analyses
Montgomery 1983	theoretical psychoanalytic	none	none	developmental tasks	none	none	none
Philip 1983	retrospective descriptive	parents of 45 in a f-up program	none	recollected anxiety and parental perception	questionnaires clinical interview	6 months to 14 years	F-Up Questionnaire Child Beh. Checklist clinical analyses
Silcock 1984	experimental longitudinal	parents of 24 survivors <1500g	none	verification of psychological tasks	observation interview records	4 & 16 weeks corrected age	wide variety
Blackburn Lowen 1985	retrospective exploratory survey	83 grand-parents and 50 parents	none	emotional reactions	questionnaire	after discharge	responses to neonate NICU, source of support
Steele 1987	theoretical psychoanalytic	none	none	developmental tasks	empirical observation	not specified	not specified

In an analysis of interview data obtained fron ten cases of premature births, Caplan (1960) focused on global patterns of parental responses in coping with this crisis. Observations were made of the behaviours of family members, in their home, over a period of one year following birth. Consensus was obtained, regarding the classification symptoms and the differentiation between the healthy and unhealthy coping patterns, by two psychiatrists. The patterns associated with a positive outcome were reality-based cognitions, free expression and conscious control of feelings and active seeking of help from family, friends and community agents. Patterns associated with an unhealthy outcome were the utilization of defense mechanisms with little or no conscious acknowledgement of the significance of the situation, little or no verbal admission of negative feelings and the reluctance to enlist or accept help from others.

Mason (1963) conducted a study in which he predicted the quality of the early mother-child relationship from information gathered during interviews with the mothers of premature infants during the lying-in period. Variables such as mother's age, parity, social economic status and complications resulting from prematurity were not controlled for. An independent judge used a global clinical judgement, based on an interview between six and ten weeks after the baby was discharged, to place the mothers in two categories:

good or poor outcome. Mason found that certain aspects of the mother's coping mechanisms were extremely valuable in predicting the nature of her subsequent relationship with her child. The following were associated with a positive outcome: mother's anxiety level was moderate to high and was openly evident and acknowledged; she actively sought information concerning the infant's condition, its source and prognosis; strong maternal feelings were present; her husband was supportive; and she had previous experience with a premature infant. Low anxiety level, denied and displaced anxiety, low activity level, maternal feelings not as evident and less support from relatives were associated with a poor outcome.

More recent studies have been conducted since the 1960s when parental visiting in the intensive care nursery was re-introduced. Kaplan and Mason's (1960) exploratory study identified four tasks essential to a healthy mastery of the situation: 1) preparation for a possible loss of the infant 2) acceptance of the fact of the birth of a sick infant 3) resumption of relationship with child 4) understanding the infant's special needs. Many researchers have since attempted to explain parental reactions in terms of stages or tasks (Drotar, et.al., 1975; Grant, 1978; Goldson, 1979; Montgomery, 1983; Steele, 1987; Silcok, 1984), see Table 1.

Many of these reports were theoretical discussions based on observations of parents of premature or at-risk

infants (Grant (1978); Goldson, (1979); Montgomery (1983); Steele, (1987)). These authors discuss the developmental tasks facing these parents and how health care teams may be of assistance to parents. However the application of their observations is limited as there is no indication of the type of sample observed (parent and infant characteristics) nor how data were collected (interview, observation).

Previous research has indicated that the birth of a premature or an ill child precipitates major family stress. However, there are few descriptions, based on empirical study, of the process of family adaptation during the infant's first year of life (Drotar, et.al., 1975). During the crisis brought on by the birth and subsequent hospitalization of the infant, the family has additional psycho-social needs that must be met as the parents progress through various stages of adaptation or developmental tasks (Kaplan and Mason, 1960; Drotar, et.al., 1975; Grant, 1978).

In an attempt to determine the process of parental reactions to the birth of a child with a congenital malformation (e.g. mongolism, congenital heart disease, cleft palate), Drotar, et.al. (1975) interviewed the parents of 20 such children aged one week to 13 years and asked them to recall their reactions to the birth. Based on information obtained from these retrospective structured interviews they concluded that five stages of parental reactions could be identified: shock; denial for which the intensity varied

depending on the visibility of the malformation; sadness, anger, and anxiety which accompanied or followed the denial; adaptation, which is a gradual process involving coping with a number of complex issues such as the anxieties and sadness related to the infant; reorganization which involves a positive acceptance of the chid, the inclusion of the infant in the family and an understanding of the child's special needs. These stages correspond to the tasks, proposed by Kaplan and Mason (1960), that parents must accomplish in order to develop a satisfying relationship with their infant: anticipatory grief and depression, acceptance of the fact of the birth of a sick infant, resuming a relationship with the child, and come to see the infant's special needs and to act accordingly (Goldson, 1979). The authors did not provide descriptions of their sample, nor did they appear to control for other relevant factors such as social economic status, family constellation and medical history. Due to the difficulties with the study's retrospective anecdotal design the authors were unable to identify the length of each particular stage nor separate retrospective from concurrent data.

The general conclusions of the studies previously cited have been that parents frequently express feelings of fear, anxiety, guilt, helplessness, inadequacy, failure and anger following the birth of an at-risk neonate. The parents must be able to come to terms with these feelings in order to

successfully complete the parental tasks that are present during the crisis period and which influence the family's functioning and stability (Grant, 1978). Drotar, et.al. (1975) found that the parents' adaptation was characterized by an increase in their ability to care for the baby and in their satisfaction with the infant. The amount of time that each parent dealt with the issues of each stage varied. However asynchronous parental reactions frequently resulted in a temporary emotional separation of the parents, thus adding further stress. Research has not yet delineated aspects of the family system which impinge on parental adjustment to infants at-risk (Ross, 1984). However it has emphasized the need to further investigate the adaptation process.

Silcock (1984) designed an empirical study to investigate the occurence and intensity of the four psychological tasks (Anticipatory grief; Feelings of failure; Resumption of process of relating to infant; Understanding the needs of their infant) proposed by Caplan et.al. (1965) and the relationship between successful maternal accomplishment of these tasks and the mother-infant relationship and infant development at 4 and 16 weeks adjusted age. She followed parents of 24 surviving infants with birthweight below 1500g. The data were obtained from a variety of sources over time: medical records of pregnancy, parturition, perinatal and postnatal complications; hospital

records of parental concerns, questions, comments and visits; records of the weekly "psychosocial rounds" where the infants' progress and the families' ability to cope are discussed; and inventories completed during admission and at follow-up. The information collected was used to assess the intensity of each mother's experience of the four psychological tasks. The items were selected for each task based on face validity and there was overlapping items between the scales. Each item on the four scales was rated on a four-point scale for intensity frequency. The sample is well described in terms of infant characteristics and family demographics as is the neonatal intensive care environment. However there was no attempt to control for any social demographic or maternal (e.g. parity, age) variables. This is one of the few studies to follow parents and their infants after discharge, which is an important factor, particularly when dealing with a long term process. The clinical assessments which were conducted at 4 and 16 weeks corrected age were done blindly. However the length of follow-up may not have been sufficient given that the length of hospitalization varied from 31 to 115 days (mean of 59 days).

Silcock's results indicated that to a greater or lesser extent, all mothers in her sample experienced anticipatory grief. Parents for who the reaction was most intense included parents who had a greater understanding of the risk

factors due to their professional training (e.g. nurses, physicians), whose infants were at greater risk and for whom the mean age of mothers was higher. Not all mothers experienced a sense of failure. Mothers who had had very difficult pregnancies did not see the birth of a very low-birthweight infant as a failure. The task of resuming a relationship with the child was experienced by all the mothers, however the degree of involvement varied. Fourteen of the twenty four mothers recognized and accepted the special needs of their infants. The main characteristic which distinguished the two group of mothers was social class. Those who would not and could not accept the special needs of their babies were from lower social backgrounds.

Although the results did concur with the stages proposed by Caplan, et. al., (1965), it is clear that a wide range of variables interact to determine maternal reactions and not all variables have the same importance for all mothers. Silcock agrees with Caplan et. al., (1965) that unless mothers are able to successfully resolve these psychological tasks their future mother-child relationship is at risk. However she also cautions that the difficulties facing these parents are considerably more formidable than represented by the tasks.

Of the studies reviewed which focused on the developmental tasks of parents of ill infants, Silcock's (1984) study is certainly the most complete and

informative. She was able to expand on and empirically verify Caplan's et.al. (1965) tasks, which up to this point had only been theoretically identified.

These studies have indicated that there is a parental adaptation process that fosters a positive outcome in terms of parent-child relations and parental emotional well-being. In all of these studies the parental reactions are noted, however it is unclear whether clinical intervention is warranted.

A second area of focus for researchers has been parental reactions and emotional responses following the birth of a premature and/or sick infant, rather than the developmental tasks or stages (see Table 1). These studies have attempted to identify the impact on the parents and their relationships and the psychological variables that may be associated with the adjustment process.

Choi (1973) used a two group quasi-experimental design to verify the hypothesis that mothers of premature infants are more depressed and anxious in the early postpartum period than mothers of full-term infants. The first group comprised 20 mothers of infants weighing 2500g or less at birth. A matched comparison group of 20 mothers of full size infants was selected based on race, sex of infant, hospital of birth, partity and age of mother. Results indicated that mothers of preterm infants are more depressed and anxious during the early postpartum period. Data were

collected by the investigator using a questionnaire administered verbally three to five days following delivery. Although the questionnaire provided an objective method of assessing maternal anxiety and depression the verbal administration raises concerns regarding bias responding from the subjects. The sampling criteria (birthweight <2500g.) creates confusion between premature infants and low-birthweight infants. Of greater interest and applicability is the maternal reaction later during the postpartum period and after discharge which was not investigated.

Benfield et.al. (1976) designed a survey study to systematically examine the attitudes, feelings and behaviours of parents whose critically ill newborn infant had been transferred to a regional neonatal intensive care unit. The sample consisted of the parents of all 101 infants discharged from the neonatal intensive care unit over a five month period. Families with only one parent available at discharge were excluded. The authors do not state how many families were thus elliminated and whether those families differed from the families studied on any significant variables. A satisfactory description of the families and infants studied was included. The authors do not specify if "discharge from the unit" includes being transferred to a local hospital. Results indicated that the majority of parents reacted in a pattern similar to parents

who experienced the loss of their baby during the neonatal period. The authors concluded that the behaviour, attitudes and feelings expressed by the parents in the study reflected an ambivalence as the parents fluctuated between a stage of anticipatory love for the infant during the pregnancy to a stage of anticipatory loss after the birth and subsequent transfer of the infant to the intensive care unit, back to a stage of anticipatory love as the infant's discharge approaches. The authors found that the parents' level of anticipatory grief did not appear to be related to the severity of the baby's illness. The transfer of their ill infant to an intensive care unit immerses the parents in a strange and stressful environment. They may not comprehend the functioning of all the equipment attached to their child and the severity of their child's condition (e.g. seeing their child receive phototherapy is stressful independently of the level of hyperbilirubinemia). These findings may be an underestimation of the parents' grief reaction as measures were taken at discharge when the threat of infant death had passed and memories of past events and emotions may have diminished. The timing of the assessment may have introduced a bias since the length of hospitalization for the infants varied from 3 to 85 days. The authors noted that the extent of parent grief experiences still remains to be determined as does the relationship that exists between the severity of the baby's illness and the parents'

anticipatory grief. A long term observation of the parents is necessary in order to determine the impact of the grief on the family's organization and functioning.

Jeffcoate et.al. (1979a, b) and Trause and Kramer (1983) have focused on the impact of a preterm infant on the family relationships, with the former focusing on the parent-child relationships and the latter on the parents' relationship. Results indicated that families with preterm infants experienced greater disturbance in early parent-child relationships as evidenced by delays in maternal attachment, high incidence of negative maternal rating of their own baby and persistant anxiety about leaving the baby. Trause and Kramer (1983), who limited their sample to a group of relatively low-risk premature infants, found that the premature birth did cause a crisis situation during the immediate postpartum period. However once the infants were home and at a seven months after discharge follow-up there were no significant differences between the parents on measures of adjustment. The applicability and generalizability of these findings are limited due to various methodological concerns: retrospective design, sampling procedures, and sample characteristics.

By way of anthropological techniques, Newman (1980) examined individual differences that reflected individual coping strategies of parents in reaction to the stress of a premature birth. Interviews were held with ten parents

involved in the Sensory Environment Study which aimed to describe the life experience and behaviour of infants living in isolettes for extended periods. Informal interviews were held with other parents with infants in the nursery and at home. Two coping styles were identified: coping through commitment and coping through distance. The former was characterized by an intense, yet sometimes variable, involvement in the care of the infant. Coping through distance involved a longer acquaintance process, parents relied more heavily on the professional staff, they expressed fear, anxiety and possibly even denial before being able to accept their infant (Newman,1980). The author does not specify when the interviews were held, infant and family characteristics, nor whether all available families were interviewed.

Philipp (1983) examined the relationship between parents' recollected anxiety concerning the birth of their preterm/ low-birthweight infant and their perceptions of their child several years later. The sample consisted of the parents (37 mothers, 26 fathers) of 45 children enrolled in a developmental follow-up program. The average age of the children at the time of study was seven years with a range of 6 months to 14 years. During a visit to the clinic parents were given two questionnaires to take home and return in a stamped self-addressed envelope. Three months after the data from the questionnaires were completed a

sub-sample (20 families) was selected for a clinical interview to obtain further information about the parents' experiences regarding the hospitalization and homecoming and their current perceptions of their child. It is unclear why these particular families were selected and if they differed from the remaining sample. Following the interview, the interviewer made a summary rating of the parents' overall level of adjustment to their child. The author does not specify how this rating correlated with the questionnaire data nor wether the interviewers were unaware of the data previously collected. Also given the wide age range of the children (6 months to 14 years) one must question the presence of a bias in the parents' recollection of anxiety. Consequently, the results which indicated that the parents' recollection of anxiety during their infant's hospitalization is not related to their current perception of the child, require further investigation.

Blackburn and Lowen (1985) used a retrospective exploratory survey to study the reactions of grand-parents and parents following the birth of a premature child. A convenience sample of 83 grandparents and 50 parents was recruited, following the infant's discharge, from the members of an organization for parents of premature infants. The questionnaire, based on the literature and the authors' clinical experience, was evaluated for content validity. Other aspects of validity and reliability were

not assessed. Results indicated that the grand-parents, as well as the parents, felt the impact of the preterm birth, however their emotional reactions and concerns varied. Although this study raises important concerns regarding the adaptation for grand-parents, who are often a major source of support for the parents, the findings are limited due to a small sample size, particularly for the fathers and grand-fathers; the retrospective design; sampling procedures; and lack of a control group.

Even after being discharged, the premature infant is a source of stress for the parents. From the moment of initial contact, the full-term infant and parents begin to develop a full repertoire of behaviours that are well adapted for social interactions. However the premature birth disrupts the normal development of such interactions and of the required skills for the infant and parent (Goldberg, 1978). The preterm infant is a less interesting and more difficult social partner since he tends to be less alert and responsive and requires less attention or interactions than the full-term infant. If the parents do not find their interactions with their child reinforcing, they may gradually diminish the frequency of their interactions.

In summary, the most common parental responses to the crises of a premature high-risk birth that have been identified include:: shock, denial, grief, guilt, feelings

of inadequacy, anger and depression. Denial follows the initial shock and functions as a protective mechanism. Denial itself is not maladaptive, so long as it does not persist beyond the initial adjustment phase (Shokier, 1979).

As mentioned previously, most of the studies are descriptive and empirical investigations that have been done have focused mainly on the process of mourning and attachment. Little research has been conducted to look at the longer term process of parental coping with the birth of a premature and possibly seriously ill infant. In addition the literature lacks of specification concerning the degree of prematurity and/or severity of the infant's condition.

Although limited by their methodological drawbacks and heavy reliance on theory, these studies serve to illustrate the perspective of the birth of an at-risk infant as a stressing event to which the parents must adapt. This perspective is congruent with the one adopted in the present study. However previous studies have been limited to assessments in the early neonatal period, at discharge and a small number of short-term follow-ups. The need for more long term follow-up and assessment of the actual coping behaviours used by parents is indicated.

Summary of the Literature

The birth of an at-risk infant is described as being a psychologically traumatic event for the parents,

particularly for the mother who has carried and given birth to the child. She may feel she has failed to produce the healthy infant expected of her. Both parents may experience a loss in terms of their wishes and expectations for the child which must be resolved through a process of grief and readjustment.

The process of the parents' adjustment varies according to their individual personalities, the resources available, their previous attitudes towards the expected child and the particular difficulties that may be associated with the child's illness. Certain parents cope effectively. Others may cope, but at a high psychological price. These parents may become less efficient, depressed, experience chronic feelings of anger, frustration or anxiety. Some may blame themselves and feel guilty leading to the overprotection of the infant. Others may withdraw emotionally or deny any feelings about the situation.

Various professionals from diverse frames of reference have reported on parental reactions to the birth of a premature or defective child. A substantial amount of these studies are descriptive based on clinical observations and interviews with small samples and no control groups. Most are retrospective. Remarkably few have been concerned with parents, most consider solely the child's development (Choi, 1973). The empirical investigations that have been done,

have focused mainly on the process of mourning or of attachment during the period shortly following the birth of the infant. According to the death and dying literature, a normal period of time for the resolution of mourning is six months to one year. However, in the case of chronic disease or of a permanent impairment there is not the finality as in death. The chronic sorrow experienced by the parents may continue with the expression of emotions analogous to mourning, throughout infancy and possibly even longer (Gruppo, 1978).

In summary, studies have shown that survivors of neonatal intensive care units are at-risk for developmental delays, serious handicaps and also more subtle difficulties such as behaviour problems and learning difficulties. With an increasing number of infants surviving, the focus of interest is changing to the quality of life for survivors rather than solely survivorship. The quality of life of a neonate or young child cannot be assessed without some consideration of the parents' adjustment and level of functioning.

Research has also clearly indicated that the birth of a critically ill neonate is a stressful period for parents, requiring reorganization and a change in family functioning. Certain patterns of adaptation and common parental responses have been identified. However the results of many of the previous studies have been limited

due to design and methodological limitations, lack of long-term follow-up and of an evaluation of the coping behaviour actually used by the parents. Thus studies with long term follow-ups, appropriate control groups and assessments of emotional reactions and coping behaviours are required.

RATIONALE

Birth is a normal developmental crisis for parents during which they are anxious about the baby's well being, the risks to the new mother and any changes that will occur in their relationship and social relations particularly if this is their first child. Most parents adjust to this new situation with a minimal amount of disorganization or stress (Miller, Myers-Walls, 1983). However the literature indicates that the birth of a premature or high-risk infant is a very stressful situation for the parents (Caplan, 1960; Solnit and Stark, 1961; Goldson, 1979). The parents experience a normal reaction to the loss of the "ideal" baby anticipated and planned for (Solnit and Stark, 1961), and will progress through an adaptation process. In addition, the literature indicates that premature infants do not do as well developmentally as full-term healthy infants (Astbury, Orgill, Bajuj, Yu, 1983) which may be an additional stressor for these parents.

As previously stated in our review of the literature, four areas of research have led to the current interest in family stress and coping: the association between life stress and mental illness, the ability of the family system to teach and reinforce potentially dysfunctional coping behaviours to its members, the inability of certain families to deal appropriately with stress, and the value of social support to families and their members. These areas of research have indicated the necessity of including changes in family life events and the social support available to the family when examining how a family adjusts to a specific stressor. Research has also increased our awareness of differences in family abilities for coping. When a family faces a stressful situation psychological as well as sociological factors contribute to their adjustment. The family must relieve the emotional impact of the stressor either through direct actions or modifications of their cognitive evaluation of the situation and by the mobilization of the family resources. The family's responses or behaviours may be adaptive in that they succeed in diminishing the emotional impact so that the family is able to grow as a system without sacrificing the family's social relationships and the individual members' development. For other families responses may be maladaptive in that they block family communication, inhibit development of individual members, limit the family's social

interactions without diminishing the emotional impact of the stressor or the amount of change required of the family.

As mentioned previously a family member's reaction to a stressor influences all family members. McCubbin, et. al., (1982) discussed how stressors may accumulate in a family thus modifying their overall coping behaviour. Thus it can be expected that a specific stressor (e.g. birth of a premature infant) may influence the parents' coping behaviour in other aspects of family life.

The literature however does not answer the following questions which will be addressed in the present study. Are the coping behaviours used by parents of infants transferred to a neonatal intensive care unit different than those of parents of full-term healthy infants? Is the stress experience greater for parents of at-risk infants? What behaviours do the parents use to cope with their at-risk infant? Do these parents need extra support or care in order to try and alter the outcome for the child? Is the stress experience and adaptation process different for mothers compared to fathers?

As indicated in the literature, parents whose infant is transferred to a Regional Neonatal Intensive Care Unit find themselves in an unfamiliar and stressing environment. The future of their newborn is uncertain and consequently their daily lives are disrupted. They may be in need of additional support from both family and hospital personnel.

If mothers feel that they have failed to produce a healthy infant they may seek reassurance from the staff that they did not do anything wrong and that they are accepted. Given that they are spending long hours at the hospital they may rely on family and friends to assist with daily routines such as care of additional children.

Overnignt these parents find themselves in an unfamiliar environment, in which they have no knowledge. Consequently they may feel helpless, unable to contribute and assume a passive attitude. This may be encouraged by the medical staff who inform the parents that they can only wait and see what will happen next.

Previous studies have indicated that many of these parents initially find it difficult to accept their child and his/her condition. They may tend to be cautious in developing a relationship with their offspring. In fact resuming a relationship with the child has been identified as one of the later tasks in the process of adaptation (Kaplan and Mason, 1960).

The coping behaviour labelled Maintaining Family Integrity which includes behaviours such as "Doing things with the baby.", "Investing myself in my child.", may not initially be useful behaviours for these parents. Later in their adaptation process they would find these behaviours equally as useful as parents with healthy infants.

Certain family coping styles may not be influenced by specific stressors. For example, in the present study we do not anticipate differences between parents for the coping behaviours labelled Seeking Spiritual Support and Reframing. These are seen as more stable coping patterns and if parents did not previously rely on spiritual guidance (e.g. "Seeking advice from a minister.", "Attending church services.") to assist them in coping with family difficulties, it is not anticipated that they will rely more on this behaviour following the birth of a premature child. Neither is it anticipated that they will rely on the coping behaviour labelled Reframing (e.g. "Accepting stressful events as a fact of life.", "Believing we can handle our own problems.") any more or less than the average young family.

Within the at-risk group differences are anticipated between the experiences of mothers and fathers. Mothers may feel a need to seek social support more than their spouses. Particularly if they are feeling guilty, depressed or anxious, they may find the social and emotional support of family, friends and medical staff useful in coping with their ill infant. The coping behaviour labelled Being Religious, Thankful, and Content (e.g. "Reliving the past, reflecting on memorable moments.", "Believing that things will work out.", "Telling myself that I have many things to be thankful for.") may also be more useful to mothers as they come to terms with their feelings of anger and guilt

and what the psychoanalysts refer to as their "narcissistic wound". In addition since many of these particular behaviours appear to be more passive and stereotypic "feminine behaviours", fathers may not report them as being useful. Behaviours labelled Assuming Responsibility ("Developing occupational skills.", "Setting standards for childrearing.") appear to be more active behaviours that may appeal more to fathers and consequently be reported as more useful by them.

Furthermore it is anticipated that the coping behaviours labelled Maintaining Family Integrity will be reported as equally useful to mothers and fathers as these behaviours appear related to the tasks of assuming a relationship with their infant as part of the adaptation process.

By identifying the differential patterns of responses during the crisis of a premature birth that are either adaptive or unadaptive we may be able to plan for effective interventions. A knowledge of the positive coping strategies will enable health professionals to assist parents who are experiencing difficulties in adapting, and to identify, early on, which parents will be in need of the most attention and counselling. Good family functioning is important for the emotional, physical and psychological development of it's members, including the new baby.

It is felt that such a long term study may have important benefits for the families of at-risk infants. If

an intervention program is required to assist these families, it should be based on empirical data, rather than clinical impressions.

The transfer of the infant while the mother is still in hospital or living at considerable distance from the regional center imposes a prolonged period of parent-infant separation. The father may be spending alot of time traveling between the infant's hospital, visiting his wife and home and work responsibilities. When parents are told that their infant must be transferred to a regional intensive care unit they face the possibility that their child may die, they are confronted with an unfamiliar environment. They may not understand the reason for all the medical apparatus hooked up to their child.

Benfield et.al. (1976) studied all parents of infants admitted to a regional neonatal intensive care unit. Results indicated that having their new infant transfered to a regional intensive care unit is stressful for the parents independently of the severity of the infant's illness.

In the present study, all newborn infants admitted to the Neonatal Intensive Care Unit of the Children's Hospital of Eastern Ontario within three days of birth requiring intensive care interventions and who remained in the Neonatal Intensive Care Unit for a minimum of five days before being discharged either home or to another hospital were included in the study if they satisfied the inclusion

criteria. The admission of the neonate, regardless of the reason for admission, was considered to be a significant stressor.

HYPOTHESES

H1: It is expected that parents of at-risk infants will report a higher level of state anxiety and depression than control parents. This initial difference will decrease over the one year assessment period. No difference is expected on the measure of trait anxiety.

H2: It is expected that mothers of at-risk infants will report greater distress than fathers of at-risk infants. Thus higher scores are expected on measures of depression and state anxiety. This difference will decrease over the one year assessment period.

H3: It is expected that fathers of infants at-risk and fathers of healthy infants will report coping behaviours which involve Assuming Responsibility more useful than will mothers. Mothers will find behaviours labelled Seeking Social Support and Self-Development and Being Religious, Thankful and Content more useful. These differences are expected to still be present after one year. No significant differences are expected between mothers and fathers for the coping behaviour: Maintaining Family Integrity.

H4: It is expected that parents of at-risk infants will rely more heavily on the following coping behaviours: Seeking Social Support, Passive Appraisal and Mobilizing the Family to Accept Help. They will find the coping behaviour Maintaining Family Integrity less helpful initially. These differences will disappear over time. No significant differences are expected between the groups on the following coping behaviours: Reframing, Seeking Spiritual Support.

H5: It is expected that parents whose infant's performance is significantly below average (1 s.d.) on either the mental or motor subscales of the Bayley Scales of Infant Development will report higher levels of depression at the one year assessment.

CHAPTER TWO: METHODOLOGY

This study was a prospective longitudinal investigation of parental coping behaviours in the families of thirty neonates transferred to the Neonatal Intensive Care Unit at the Children's Hospital of Eastern Ontario, between April 1986 and September 1986. The families of thirty healthy infants born at the Ottawa General Hospital served as a control group. Comparisons were made on measures of parental coping behaviours, depression and anxiety at four assessment periods (birth, three months, six months and twelve months).

Subjects

The cohort of at-risk infants comprised 18 girls and 12 boys. Their gestational ages ranged from 25 weeks to 39 weeks. Birthweight ranged from 780 g to 4539 g. Length of hospitalization varied from 9 to 126 days, with a mean of 17 days.

Control infants comprised 15 girls and 15 boys. They were all full-term babies and their birthweight ranged from 2640 g to 4600g. Length of hospitalization ranged from 2 to 8 days, with a mean of 3.9 days.

Control and at-risk groups were matched for mothers' parity and age within three years and family socio-economic status as determined by mothers' and fathers' occupation level.

Neonate Selection Criteria

Subject selection was based on the following inclusion and exclusion criteria.

At-risk group: All newborn infants admitted to the Neonatal Intensive Care Unit at the Children's Hospital of Eastern Ontario within three days of birth and who remained in the intensive care unit for a minimum of five days before being discharged either home or to the referring hospital were included in the study if they satisfied the inclusion criteria. Conditions for admission to the Neonatal Intensive Care Unit included severe prematurity, asphyxia, respiratory distress requiring ventilation, hydronephrosis, sepsis, enterocolitis, hydrocephalus. Families with infants diagnosed as having chronic conditions (e.g. Down Syndrome, Spina Bifida) were not included as it was felt that their adaptation process may be different due to the chronic nature of their infant's condition.

Control group: Thirty infants and their families, matched with families in the at-risk group on the following variables: socio-economic status, mother's age and parity, were included in this group. These mothers had given birth following a full term pregnancy free of complications. Infants were healthy at birth, required no medical interventions (e.g. phototherapy, oxygen). Infant Apgar

scores at one and five minutes were seven or higher. The infant was discharged at the same time as the mother.

All families, from both groups, participating in the study were two parent families who lived within a 75 km. radius of the Children's Hospital of Eastern Ontario. Both parents understood written English or French. Mothers of multiple births or with parity greater than three were not included. In addition parents with life threatening chronic illnesses or those receiving psychological or psychiatric services were not included. All information concerning the inclusion/exclusion criteria was obtained from the infants' medical charts and from parents.

Selection of Parents

This was a comparison study of two groups who were sampled at different times over a one year period. Subjects were recruited between April 8th 1986 and September 9th, 1986. Data collection was completed by September 14th, 1987.

Subjects participating in the study were assessed at the time of their infant's birth, three months after birth, six months after birth, and one year after birth. Parents had previously consented (see Appendix A) to participate in a study examining how mothers and fathers adapt to the birth of a baby. Participation in the study was voluntary and

independent of the medical services offered. Parents were informed that they were free to withdraw at any time, and that all results will be kept confidential.

Approaching parents of at-risk infants

Upon admission of a neonate which satisfied the inclusion and exclusion criteria and whose parents met the inclusion/exclusion criteria, a letter of introduction (Appendix B) concerning the study was addressed to the parents and left next to the baby's incubator. The nursing staff were aware of the study, and with the unit social worker, were helpful in explaining the purpose of the letter to the parents. Approximately three days after the letter had been left the examiner contacted the parents by telephone to answer any questions concerning the study and to determine if they would like to participate. If the parents agreed to participate an appointment was arranged to meet with them at the hospital for approximately one and a half hours. During the interview, any additional questions were answered by the investigator, demographic data (Appendix C) were collected and the parents completed the following questionnaires: Family Inventory of Life Events and Changes, Family Inventory of Resources for Management, Family Crisis Oriented Personal Evaluation Scales, Family Coping Inventory, Family Assessment Measure, Spielberger Anxiety Scale and Beck Depression Inventory. At the time of

the three and six month assessments the parents were contacted by telephone and an appointment was made to meet with them in their home to have them complete the following questionnaires: Family Crisis Oriented Personal Evaluation Scales, Family Coping Inventory, Family Assessment Measure, Spielberger Anxiety Scale and Beck Depression Inventory. For the 12 month evaluation, the questionnaires were mailed to the parents approximately two weeks before the child's birthday. No attempt was made to correct for gestational age as we were interested in the parents' reaction in the first year following birth. The examiner then contacted the parents by telephone to schedule an appointment in order to review the questionnaires with them and administer the Bayley Scales of Infant Development.

Approaching parents of control infants

Following the inclusion of a family in the at-risk group they were matched, based on the family's socio-economic status and the mother's parity and age, with parents having a healthy infant. Birth records in the nursery at the Ottawa General Hospital were examined in order to identify families satisfying selection and matching criteria. To be included, the control parents must have given birth within one month of the index parents.

Parents with infants satisfying the inclusion criteria were approached within two days of the birth, and the

purpose and implications of the study were explained. If the parents wished to participate a time was scheduled for the examiner to meet with them, in their home, and have them complete the questionnaires and gather demographic data.

The subsequent interviews (e.g. three, six, twelve months after birth) were conducted in the family's home at their convenience, following the same procedure as for the at-risk group.

MEASURES

Control Measures

FAMILY INVENTORY OF LIFE EVENTS AND CHANGES (Appendix D)

Family Inventory of Life Events and Changes (McCubbin, Patterson, Wilson, 1979) is a 71-item self-report instrument designed to record the normative and non-normative life events and stressors experienced by a family during the last twelve months. A subtest of 34 items records life events experienced prior to the past year which frequently take longer to adapt to or by nature are chronic. Life events and changes experienced by all family members are recorded. There are nine subscales, namely, intra-family strains, marital strains, pregnancy and child bearing strains, finance and business strains, work-family transitions and strains, illness and family "care" strains, losses, transitions "in and out", and legal violations by family members, and weighted scores based on the difficulty of each

item. For the purpose of the present study only the Total Recent Life Changes Scale score was used.

The initial selection of items was made from life changes appearing on other individual life change inventories (e.g. Social Readjustment Rating Scale (Holmes and Rahe, 1967)) and situational and developmental changes experienced by families at different stages of the life cycle. Each item is worded to reflect a change of sufficient magnitude to require some adjustment in the regular pattern of family member interactions. The Family Inventory of Life Events and Changes provides an index of a family's vulnerability as a result of the accumulation from the presence of several stressors simultaneously.

The overall internal reliability for the Family Inventory of Life Events and Changes using Chronbach's Alpha is 0.72. It is not recommended that the scales be used alone as reliable indices of experienced stress given the wide variance in frequency of occurence of family life events. Construct validity was assessed by correlating the ten scales with a measure of family functioning (Family Environment Scale (Moos, 1976)). An accumulation of life change (Total Recent Life Changes Scale) correlated negatively with the Family Environment Scale dimensions of cohesion (-.24), independence (-.16), and organization (-.14), and positively with conflict (+.23). Predictive validity was assessed by correlating the eight categories of

events and the total score with the health status of 100 children with cystic fibrosis. Results indicated that an increase in life changes in the areas of development and relationships management and decisions, health, finances and total score was negatively correlated with the child's functioning.

FAMILY INVENTORY OF RESOURCES FOR MANAGEMENT(Appendix E)

The Family Inventory of Resources for Management (McCubbin, Comeau, Harkins, 1980) is a 69-item Likert scored, self-report scale designed to assess what personal, intra-family, social and financial resources a family believes they have. It is hypothesized that families possessing a larger repertoire of resources will manage more effectively and will be better able to adapt to the stressful situation. There are four scales focused on esteem and communication, mastery and health, extended family social support and financial well-being. There are two additional indexes: Sources of Financial Support which reflects the sense of stability and esteem associated with income and a Social Desirability Scale. The selection of items was influenced by literature and the theory in three major areas: personal resources, family system internal resources and social support. In the present study only the Total Score, corresponding to the sum of the following four subscales: Esteem and Communication, Mastery and Health,

Extended Family Social Support, Financial Well-Being, will be used.

The internal reliability of the four scales is .89 as determined by Chronbach's Alpha. The internal reliabilities (Chronbach's Alpha) for the four subscales are: .85 for Family Strengths I:Esteem and Communication, .85 for Family Strengths II:Mastery and Health, .62 for Extended Family Social Support, .85 for Financial Well-Being. Intercorrelations between subscales indicate moderate correlations (ranging from .19 to .37) as would be expected from measures assessing related dimensions of family functioning. Significant positive correlations were found between the Family Inventory of Resources for Management scales and family environment dimensions of cohesion, expressiveness, organization and negative correlations between measures of family conflict and four of the Family Inventory of Resources for Management subscales, thus supporting the validity of the scale. High and low level conflict families (as determined by the conflict scale of the Family Environment Scale) differed in their level of social psychological resources (Nevin, McCubbin, Comeau, Cauble, Patterson, Schoonmaker, 1981).

FAMILY ASSESSMENT MEASURE (FAM) (Appendix H)

The Family Assessment Measure (Skinner, Steinhauer, Santa-Barbara, 1985) is a self-report instrument providing

quantitative indications of family strengths and weaknesses. The basic concepts assessed include: Task Accomplishment, Role Performance, Communication, Affective Expression, Involvement, Control, Values and Norms. The Family Assessment Measure, which is based on a process model of family functioning, consists of three scales: General Scale, Dyadic Relationships Scale, and a Self-Rating Scale. For the present study the Dyadic Scale which measures relationships between specific pairs in the family will be used. The dyadic scale is comprised of 42 items and produces a overall rating of family functioning and seven subscales for the specific dyad.

Psychometric properties for the Family Assessment Measure were established based on 475 families tested at various health and social services settings in the Toronto area (Skinner, et.al., 1983). These families included 933 adults (mean age= 38 years) and 502 children (mean age= 14.9 years). The sample comprised a broad range of educational levels with 45% of the men and 38% of the women having some post-secondary education. For the Dyadic Relationships Scale internal consistency reliability estimates (coefficient alpha) for the overall rating was .95. The median reliability for the subcales was 0.72. In a sample of 277 clinical families intercorrelations among the subscales ranged from 0.63 to 0.82. Median correlations were -0.35

and -0.28 between the subscales and social desirability and defensiveness respectively.

Dependent Variable Measures

FAMILY CRISIS ORIENTED PERSONAL EVALUATION SCALES (F-COPES) (Appendix F)

The Family Crisis Oriented Personal Evaluation Scales (McCubbin, Larsen, Olson, 1982) is a 29-item self-report instrument created to identify effective problem-solving and behavioural strategies used by families in response to difficulties. Items focus on two levels of interaction: how a family deals internally with difficulties among members and how the family deals externally with problems that emerge outside its boundaries but that also affect the family unit (McCubbin, Joy, et.al. 1980). It is hypothesized that families utilisizing behaviours on both levels of interaction will adapt more effectively.

This scale was designed to integrate family resources and meaning/perception factors into coping behaviours. There are five subscales which focus on attitudes and behaviours within the family and according to the family's relationship with the community (e.g. Acquiring Social Support, Reframing, Seeking Spiritual Support, Passive Appraisal, Mobilizing Family to Acquire and Accept Help).The subscale Acquiring Social Support was designed to measure the family's ability to actively engage in acquiring support

from relatives and friends. Reframing was designed to assess the family's capacity to redefine their difficulties in order to make them more manageable and responsive to problem solving. The subscale Mobilizing the Family to Acquire and Accept help assesses the family's ability to seek community resources and to accept assistance. Passive Appraisal assesses the family's tendency to respond to difficulties in a passive rather than active manner. The subscale Seeking Spiritual Support assesses the family's ability to acquire spiritual support. National norms are available for male and female adults for each subscale.

A large sample (n=2740) was randomly split in half in order to permit the replication of the reliability and validity checks (McCubbin, Patterson, 1981). Factor analyses using the Varimax rotation were calculated and five factors were established plus the total scale. The five factors had eigen values greater than one and each of the 29 items had a factor loading greater than .35. These findings were replicated with the second half of the sample population. Chronbach's Alpha was calculated for each factor separately and for the total scale for each sample group. The overall reliability coefficient was established as .86, and 0.87 for the two groups. The individual factors' alpha reliabilities were as follows: Acquiring Social Support (.84; .83); Reframing (.82; .81); Seeking Spiritual Support (.79; .81); Mobilizing Family to Acquire and Accept Help

(.71; .70); Passive Appraisal (.64; .62). Test-retest reliability correlations were obtained over a 4-5 week period from 116 subjects. Pearson correlations varied from .61 to .95 for the various subscales and was .81 for the Total Scale. The factors "Reframing" and "Passive Appraisal" obtained slightly lower test-retest correlations than the other factors. The authors attribute this to the fact that behaviourally concrete items may provide more consistent response patterns over time than those factors related to more cognitive adjustments. The purpose of including this general coping scale in the study is to verify wether the impact of an ill neonate influences the parental functionning in other areas and not only those relating to the infant.

FAMILY COPING INVENTORY (AS APPLIED TO PARENTS WITH NEW BABIES)(FCI) (Appendix G)

A revised version of the 70-item Family Coping Inventory (Ventura, Boss, 1983) was used in the present study. The Family Coping Inventory was originally developed for families experiencing membership loss or separation (McCubbin, Patterson, 1981). The present version, a 28-item self-report instrument, is designed to assess how helpful various family-oriented coping behaviours are to parents experiencing the birth of a new baby, using a four point scale: Not Helpful, A Little Helpful, Fairly Helpful, Very

Helpful. The scale focuses on four coping patterns: Seeking Social Support and Self-Development, Maintaining Family Integrity, Being Religious, Thankful and Content, and Assuming Responsibility.

Validity and reliability studies have been done with the original version of the Family Coping Inventory in three different separation situations: with intact families where the husband is frequently absent for short periods on business (Boss, et.al., 1979); with intact families where husband is separated from family for an extended period due to military assignment (McCubbin, et.al., 1980); and with divorced persons (Moore, 1980). The study of military families indicated five factors with Chronbach's Alpha reliabilities ranging from .71 to .86. The study of divorced families also produced five factors with Alpha reliabilities ranging from .71 to .86. One validity study found that coping patterns and balanced coping were significantly associated with less distress (Patterson and McCubbin, 1980).

Factor analysis of the 28 coping behaviours that constitute the short version of the Family Coping Inventory as applied specifically to the birth of a child resulted in three coping patterns: Seeking Social Support and Self-Development, Maintaining Family Integrity, and Being Religious, Thankful and Content. Alpha reliabilty for the total scale was .85. Internal consistency coefficients

obtained from a study of 200 mothers and fathers were: .85 for social support; .68 for family integrity and .50 for family lifestyle. Analysis indicated that the 28-item version needed revision in order to accommodate both fathers' and mothers' response styles. A 34-item scale was constructed containing a fourth factor: Responsibility. Alpha reliabilities for a replication study with 94 parents using the 34-item Family Coping Inventory were: .62 for Social Support; .66 for Family Integrity; .62 for Family Lifestyle and .68 for Responsibility. In a recent study with 60 mothers and 60 fathers alpha reliabilities were calculated separately and were as follows (Ventura,1985):

	mother	father
Social Support	0.64	0.66
Family Integrity	0.60	0.80
Lifestyle	0.18	0.57
Responsibility	0.43	0.65.

BECK DEPRESSION INVENTORY (Appendix I)

The Beck Depression Inventory (Beck, 1961) is designed to provide a quantitative assessment of the presence and depth of depression. It is widely used in research and clinical work as a simple, quick and reliable tool in gathering information about a person's depressive state. It

has been used with a variety of populations (e.g. psychiatric in-patients, psychiatric out-patients, adolescents and male and female adults in a general population). Internal consistency was determined based on the split-half reliability. The Pearson correlation between the odd and even numbered items was determined to be .86 based on 97 cases. With a Spearman Brown correction the coefficient increased to .93. The stability of the instrument was assessed by having patients complete the inventory at different times over two to six week intervals. A clinical estimate of the patient's depth of depression was made by a psychiatrist at the same time as each administration of the test. The correlation coefficient between the Depression Inventory scores and the clinical ratings of depth of depression was 0.67. Studies indicate a high degree of reliability and of validity. The inventory was able to distinguish between subjects with varying degrees of depression and also to reflect changes in the intensity of depression over time (Beck,1961).

STATE-TRAIT SELF-REPORT ANXIETY INVENTORY (Appendix J)

This self-perception inventory (Spielberger, Gorsuch, Lushene, 1968) consists of 40 items that distinguish between state anxiety, a transitory condition of perceived tension; and trait anxiety, a relatively stable condition of susceptibility to anxiety. Twenty items assess how the

subject "feels now, that is, at this moment"; and twenty items assess "how you generally feel". The items are scored such that elevated scores suggest high state or trait anxiety. Test-retest reliability coefficients for the trait scale are reported separately for male and female undergraduates and over a 104 day period are .73 and .77 respectively. Thus the trait measure is quite stable. For the State scale, test-retest reliabilities are low, as would be expected, since the state scale conceptually does not measure a persistent characteristic. The reliability coefficients were .33 and .31 for the state scale for male and female undergraduates respectively. Alpha reliabilities, which are more appropriate reliability measures for the state scale, as measured by the Kuder-Richardson-20, ranged from 0.83 to 0.92. The validity for the trait scores was estimated by correlating the scores with the Institue for Personality and Ability Testing Anxiety Scale Questionnaire, Manifest Anxiety Scale and Affect Adjective Checklist. Coefficients were 0.75, 0.80, 0.52 respectively.

Normative data are available for various reference groups including: college freshmen, undergraduate college students, high school students, male psychiatric patients, general medical and surgical students and young prisoners. This normative information allows comparisons of an individual's scores with various reference groups. Norms

provide normalized T-scores with a mean of 50 and standard deviation of 10.

In summary the State-Trait Anxiety Inventory is a very popular scale which is easy to administer and score and provides a reliable and valid indication of the subject's transitory experience of anxiety and/or the individual's inclination to tension or anxiety.

BAYLEY SCALES OF INFANT DEVELOPMENT (BSID)

The Bayley Scales of Infant Development (Bayley, 1969) are a well standardized and comprehensive measure of infant development from age two months to two and a half years. The test requires approximately 45-90 minutes to administer and the scales provide a number of scores. The most relevant for this study are the mental development and motor development scores. The Mental Scale is comprised of 163 items which assess responses to visual and auditory stimuli, manipulation and play with objects and responses involving social interaction such as socialization and imitation. The Motor Scale, 81 items, measures the progression of gross motor abilities such as sitting, standing, walking and stair climbing in addition to abilities involving finer motor coordination. Standardization of the Bayley Scales of Infant Development was conducted on 1262 infants and children which comprised a representative sample of infants

in the United States. The standardization sample was controlled for sex and race of infants, family residence (urban-rural) and for education level of the head of the household. Only "normal" children living at home were included in the sample thus eliminating premature infants and infants living in institutions. Split-half reliabilities on the Mental Scale subtests varied from 0.81 to 0.93 and from 0.68 to 0.92 on the Motor Scale subtests. The validity of the scales was assessed by correlating the scores of the two year olds with their scores on the Stanford-Binet. The correlation coefficient obtained was 0.57. The score obtained is a normalized standard score that allows each infant to be compared to other infants in the same age group inclued in the standardization sample.

The Bayley Scales of Infant Development are a carefully standardized, highly reliable and comprehensive assessment of a child's current developmental status which provides an indication of the extent of any deviation from normal development.

It is important to note that all the scales selected for inclusion in this study are not ideal. A number of the correlations reported in the psychometric properties are not as high as would be desirable and at times a significant proportion of the variance remains unexplained. Questionnaires assessing behavioural coping patterns do not

sample all possible behaviours and at times subjects find it difficult to rate their behaviour along a four or five-point scale. However the questionnaires selected were judged to be among the best available for the purposes of the study, and more beneficial than attempting to design and validate new questionnaires.

Summary of Variables

In order to control for the potentially confounding effects of various other factors the following control variables were incorporated into the study.

Resources: Resources perceived as being available by the family as measured by the Family Inventory of Resources for Management.

Life changes: Social and economic changes experienced by the family during the preceeding 12 months, as measured by the Family Inventory of Life Changes.

Dyadic Adjustment: The couple's level of dyadic functionning as determined by the Family Assessment Measure.

Demographic: Family socio-economic status, mother's age and parity.

Three independent variables were included.

1.Parent Factor: this variable has two levels, mother and father, and refers to the gender of the parent being considered.

2.Group Factor: this variable has two levels, at-risk and control, and refers to the medical condition at birth of the infant of each parent studied.

3.Time Factor: this variable has four levels, birth, three months, six months, one year, and refers to the four assessment periods.

Fourteen dependent variables were included.

1.Dependent variables 1 to 4: the four scale scores on the Family Coping Inventory. These scores represent the reported helpfulness of certain coping behaviours by the parents in adapting to the presence of the new baby in the family.

2.Dependent variables 5 to 9: the 5 scale scores on the Family Crisis Oriented Personal Evaluation Scales. These 5 scores represent the degree of utilization of certain coping behaviours by the parents to adapt to daily difficulties, not directly relating to the new baby.

3.Dependent variable 10: score on the Beck Depression Inventory. This score serves as a measure of

the level of depression experienced by the parent.

4. Dependent variable 11: score on the Spielberg State Anxiety Scale. This score serves as a measure of the level of anxiety currently being experienced by the parent.

5. Dependent variable 12: score an the Spielberg State Anxiety Scale. This score serves as a measure of the level of anxiety usually experienced by the parent.

6. Dependent variable 13 and 14: score on the Bayley Scales of Infant Development (mental and motor development). This score serves as a measure of infant development at the one year assessment.

Chapter Three: RESULTS

In the present study coping behaviours and emotional reactions of parents of seriously ill neonates were examined and compared to those of parents of healthy full-term infants. Comparisons were made between the developmental status of at-risk versus control infants. Measures of coping consisted of scores obtained by parents over four assessment periods (e.g. birth, three months, six months, twelve months) on the following dependent measures: nine measures of coping behaviours, a measure of depression, a measure of state anxiety and a measure of trait anxiety. Three control measures were included in the study: family resources available, family life changes and a measure of dyadic adjustment. At the one year assessment the Bayley Scales of Infant Development were administered to all the infants.

Drop-Outs

The appropriate sample size for this study was determined based on the statistical approach of Cohen(1977) using data from the Beck Depression Inventory. This method takes into consideration the means and their distribution, the expected population variance and the effect size statistic. With k=2 groups, a standard deviation between the mean for Group A and Group B was considered to be a difference worth detecting. The significance level for all

analyses was set at .05 in order to reduce the Type 1 Error risk and yet still detect differences of a practical importance. Thus with set at .05 and power=.80 the number of subjects required per group would be 17. Thus 30 subjects per group were recruited to allow for drop-outs.

Initially thirty couples were recruited for each group for a total of one hundred and twenty participants. By the twelve month follow-up, five couples in each group had withdrawn from the study. Consequently the analyses were performed with one hundred parent participants, e.g. twenty-five mothers and twenty five fathers in each of the two groups. As indicated in Table 2 there were no significant differences between the drop-outs and the remaining participants on any of the control or matching variables. The principal reason for the loss of participants was that the families had moved between the six month and twelve month follow-up and we were unable to reestablish contact. One couple in the control group separated after the six month assessment and no longer wished to participate.

Subject Characteristics

There were no significant differences between the two groups on the following variables: mother's and father's age, education level and employment status, and mother's parity (Table 3). See Appendix K for the mean scores.

Table 2: T-tests Between Mean Scores for Drop-Outs and Remaining Subjects on the Control and Matching Variables

Variable	t Value	df	p
child's sex	.57	58	ns
mother's education	.56	58	ns
father's education	1.64	58	ns
mother's age	1.46	58	ns
father's age	.23	58	ns
parity	.9	58	ns
mother's employment	.78	58	ns
father's employment	.89	58	ns
mother returning to work	1.41	58	ns
length of hospitalization	.91	58	ns
resources	1.86	118	ns
life changes	.56	118	ns
dyadic adjustment	1.14	118	ns

Table 3: Mean scores for at-risk and control groups on the matching variables

	t value	df	p
mother's education	1.54	58	ns
father's education	1.73	58	ns
mother's age	.43	58	ns
father's age	.23	58	ns
mother's employment	.62	58	ns
father's employment	1.11	58	ns
parity	.18	58	ns

The participation rates were 81% for the at-risk group and 64% for the control group. There were no significant differences between participants and non-participants on any of the social demographic variables. The reasons for not wanting to participate included: too much time involved (n=3), would be moving out of town within the next year (n=5), or were not interested (n=9).

To determine if the parents of each group (e.g. parents of at-risk infants versus parents of control infants) differed significantly on any of the three control variables, (e.g. dyadic adjustment, family resources and life changes), the following analyses were done. A 2(Group factor) X 4(Time factor) repeated measures ANOVA was performed on the dyadic adjustment scores, as measured by the Family Assessment Measure. Table 4 indicates that there were no differences between parents of at-risk infants and parents of control infants on measures of dyadic adjustment. The ANOVA (Appendix L) also indicated that parental scores on the measures of dyadic adjustment did not significantly change over the one year assessment period as the Time Factor was not significant.

Table 4: Analysis of Variance of Mean Scores for Parents of At-Risk and Control Infants on Control Variable: Dyadic Adjustment (Family Assessment Measure)

	X	SD	MS	F	p
At-Risk Group	45.0	9.6	235.62	.87	ns
Control Group	46.6	10.0			

T-tests were performed between groups on the measures of resources, as measured by the Family Inventory of Resources for Management, and life changes, as measured by the Family Inventory of Life Events, at the time of birth

and at the twelve month follow-up. As indicated in Table 5, differences between mean scores on the variables family resources and life changes for parents of at-risk and of control infants were not significant at the first assessment nor one year later.

T-tests were also performed to determine if there were any significant differences on measures of resources and life changes between the birth and twelve month follow-up. As shown in Table 6 there were no significant differences between parental scores at the initial assessment and twelve month follow-up on measures of family resources and life changes.

Table 5: T-Tests between mean scores for Parents of At-Risk and Control Infants on Control Variables: Resources (Family Inventory of Resources for Management) and Life Changes (Family Inventory of Life Events)

Variable	X	SD	t Value	p
Resources:Birth				
At-Risk	126.3	17.9	1.42	ns
Control	121.7	17.1		
Resources:1 year				
At-Risk	126.9	34.4	.43	ns
Control	124.7	13.2		
Life Changes:Birth				
At-Risk	9.9	3.4	.05	ns
Control	9.9	4.2		
Life Changes:1 year				
At-Risk	10.9	3.9	.89	ns
Control	10.1	4.9		

Table 6: T-tests Between Mean Scores at Birth assessment and Twelve Month Follow-Up on Control Variables: Resources (Family Inventory of Resources for Management) and Life Changes (Family Inventory of Life Events)

Variable	X	SD	t Value	df	p
Resources					
Birth	125.3	16.3	.19	99	ns
12 months	125.8	25.9			
Life Changes					
Birth	9.8	3.8	1.66	99	ns
12 months	10.5	4.4			

Analyses of the Dependent Variables

A 2[Group(child illness) factor] X 2(Gender factor) X 4(Time factor) mixed design with 25 subjects per cell was used to test the hypotheses regarding differences between parents of at-risk children and parents of control neonates for the nine coping behaviours and levels of depression and anxiety. The Group factor included at-risk and control parents; the Gender factor included mothers and fathers; and the Time factor included the four assessment periods: birth, three months, six months and twelve months. Given the repeated measures design the Greenhouse-Geisser correction for probabilities was used to determine probability levels for all main effects and interactions which included the repeated factor, Time.

Hypothesis 1

The first hypothesis stated that parents of at-risk infants would report higher levels of depression and state anxiety at the initial assessment. It was expected that this difference would no longer be present by the twelve month follow-up assessment. No differences were expected between groups on the measure of trait anxiety.

A 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA for the state anxiety data, as measured by the Spielberger State-Trait Anxiety Inventory, indicates significant main effects for the three factors: Group, Parent Gender, and Time (Appendix M).

Parents with infants at-risk (X=50.4) reported being significantly more anxious than control parents (X=45.3), $F(1,96)=11.32$, $p<.001$. However the difference, between at-risk parents' (X=48.7) and control parents' (X=44.0) scores, was no longer significant at the one year assessment (t(DS) (2,96)=7.7).

When the means of both groups are combined, the levels of state anxiety decreased significantly over time. Post-hoc comparisons between the means at the four assessment periods, using Tukey's Honest Significant Difference procedure, indicate a significant decrease between the birth (X=50.5) and twelve month (X=46.3) scores (t(hsd) (6,288)= 3.34) (Table 7). Parents were significantly less anxious at the twelve month assessment than they were at the birth

assessment (mean difference=4.2). Differences between mean scores at the remaining assessment periods were not significant.

Table 7: Differences between mean scores at the four assessment periods on the dependent variable: State Anxiety (Spielberger Anxiety Inventory) (Tukey's Honest Significant Difference).

	time1	time2	time3	time4	
time1	-	2.5	3.1	4.21*	
time2	-	-	.57	1.71	*p<.05
time3	-	-	-	1.14	
time4	-	-	-	-	

A 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA for the trait anxiety variable, measured by the Spielberger State-Trait Anxiety Inventory, (Appendix N) indicates a significant main effect for the Group factor, $F(1,96)=3.9$, $p<.051$. This difference was not hypothesized. Parents of infants at-risk (X=48.4) reported significantly higher levels of trait anxiety than did parents of control infants (X=45.0).

For the depression variable, as measured by the Beck Depression Inventory, results from a 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA indicate significant main effects for the Group factor, $F(1,96)=4.75$, $p<.03$ and the Parent Gender factor, $F(1,96)= 24.48$, $p<.001$. In addition the following interactions were significant:

Group X Parent Gender $F(1,96)= 5.54$, $p<.02$; Time X Group, $F(3,288)= 89.75$, $p<.001$; and Time X Parent Gender, $F(3,288)= 22.43$, $p<.03$ (Appendix O).

Upon examining the graphic plotting of the means of the four groups (e.g. at-risk mothers, at-risk fathers, control mothers, control fathers) across the four assessment periods it was decided to further examine the data separately for the mothers and fathers as they did not appear to be reporting similar experiences (see Figure 2). Consequently 2(Group) X 4(Time) repeated measures ANOVAs were completed for mothers and fathers separately.

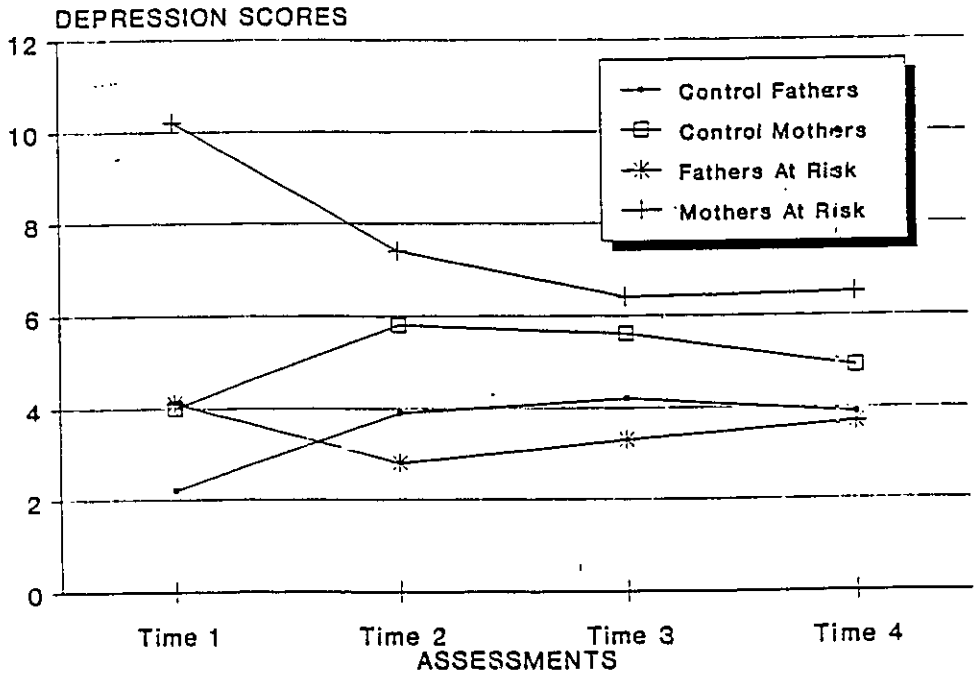

Figure 2: Graphic plotting of mean scores for the dependent variable: Depression (Beck Depression Inventory)

Results of the repeated measures ANOVA for the fathers' scores (Appendix P) indicate a significant Group X Time interaction, $F(3, 144)=3.7$, $p<.01$. Post-hoc analyses were completed using Tukey's Honest Significant Difference procedure ($t(hsd)(3,144)=1.7$) between the mean scores at the birth assessment and three months for the at-risk and control groups. Results indicate a significant difference between at-risk fathers' (X=3.2) and control fathers' (X=2.1) scores at the birth assessment with fathers of high-risk infants reporting higher levels of depression (mean difference=1.9). The difference between the scores of fathers with at-risk infants (X=2.8) and fathers of control infants (X=3.9) was not significant at the three month assessment (mean difference=1.1).

Scores obtained by control fathers were significantly lower at the first assessment (X=2.2) than at the three month assessment (X=3.9), with a difference of 1.72 between the scores. Thus between the birth and three month assessment the depression scores of fathers of control infants rose significantly, however their scores remained consistent afterwards across the six and twelve month assessments.

Results of the repeated measures ANOVA for the maternal scores on the depression variable indicate a significant main effect for the Group factor ($F(1,48)=9.6, p<.003$), and a significant interaction Time X Group ($F(3,144)=8.96$,

$p<.001$), (Appendix Q). Post-hoc analyses (Table 8) using Tukey's Honest Significant Difference procedure (t(hsd) (8,144)=2.4) indicate significant differences between scores obtained by the mothers of at-risk infants (X=10.2) and mothers of control infants (X=4.0) at birth (mean difference= 6.2). At-risk mothers reported significantly higher levels of depression at the first assessment than did mothers of control infants. No significant differences were obtained between the groups at the three, six and twelve month assessments (Table 8).

Within each group comparisons were made between the means at birth and three months and between the means at three and twelve months. For at-risk mothers significant differences were noted between means at birth (X=10.2) and three months (X=7.4) (mean difference=2.76), with mothers reporting a lower score at three months. The difference between the means at three (X=7.4) and twelve months (X=6.5) was not significant (mean difference=0.92). For control mothers no significant differences were obtained between the means at the first assessment and three months (mean difference=1.8) nor between the means at three and twelve months (mean difference=0.88).

Table 8: Post-hoc comparisons (HSD) of mean scores for mothers for the significant interaction Group X Time for the dependent variable: Depression (Beck Depression Inventory)

	time1	time2	time3	time4
At-Risk (x)	10.2	7.4	6.4	6.5
Controls (x)	4.0	5.8	5.5	4.9
Differences	6.2*	1.6	.9	1.6

*$p<.05$

Hypothesis 2

The second hypothesis stated that within the at-risk group mothers would initially report higher levels of depression and state anxiety than fathers but that by the twelve month assessment this difference would have phased out.

Analyses verifying this second hypothesis were completed with data solely from the parents with infants at-risk. Results from a 2 (Parent Gender) X 4(Time) repeated measures ANOVA for the state anxiety variable, measured by the Spielberger State-Trait Anxiety Inventory, indicate a significant main effect for the Parent Gender factor, $F(1,48)=6.43$, $p<.015$, and the Time factor, $F(3,144)=5.19$, $p<.003$ (Appendix R). Analyses using the Dunn-Sidak procedure, (t(DS)$(2,48)=6.87$), indicate that for the initial assessment mothers (X=59.0) were significantly more anxious than fathers (X= 49.1) (mean difference=-9.98). At the twelve month follow-up there was no difference

between the scores obtained by mothers (X=50.4) and fathers (X= 47.0) (mean difference=-3.4). For the depression variable results from a 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix S) indicate a significant main effect for the Parent Gender factor, $F(1,48)=29.14$, $p<.001$, and the Time factor, $F(3,144)= 8.28$, $p<.001$. The Parent Gender X Time interaction was also significant $F(3,144)=4.08$, $p<.01$. Analyses using the Dunn-Sidak procedure, (t(DS) (4,48)=2.61), indicated that within the at-risk group mothers were significantly more depressed than fathers at all assessments (Table 9). The largest difference between their mean scores was observed at the initial assessment (mean difference=6.04). The mean difference between mother and father scores decreased at each assessment period yet the difference was still significant at the final assessment.

Table 9: Paired comparisons (Dunn-Sidak procedure) of mean scores for at-risk parents for the significant interaction Time X Parent Gender for the dependent variable: Depression (Beck Depression Inventory)

	time1	time2	time3	time4
Mother(X)	10.16	7.4	6.4	6.48
Father(X)	4.12	2.76	3.28	3.72
Difference	6.04*	4.64*	3.12*	2.76*

*$p<.05$

Hypothesis 3

The third hypothesis predicted that fathers would report the coping behaviour Assuming Responsibility to be more useful than would mothers. Mothers would find behaviours labelled: Seeking Social Support, Being Religious, Thankful and Content more useful than would fathers. No differences were expected for the coping behaviour Maintaining Family Integrity. Theses coping behaviours were assessed with the Family Coping Inventory.

No significant differences were obtained on a 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA for the factor, Assuming Responsibility (Appendix T). Thus the hypothesized difference, that fathers would find the coping behaviour labelled Assuming Responsibility more useful, was not supported. The statistical power for the contrast is approximately .20 .

Results of a 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix U), for the coping behaviour labelled Seeking Social Support, indicate a significant main effect for the factor, Parent Gender, $F(1,96)=16.48$, $p<.0001$. Consistent with the hypothesis, mothers (X=27.0) reported the coping behaviour identified as Seeking Social Support significantly more helpful than

fathers (X=22.2) when coping with adding a new member to their family system.

For the coping behaviour labelled Being Religious, Thankful, and Content, a 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix V) indicates a significant main effect for the factor Parent Gender, $F(1,96)=14.88$, $p<.0002$. Mothers (X=15.9) consistently reported the coping behaviour Being Religious, Thankful and Content, as being significantly more helpful to them in adjusting to adding a new member to the family system than did fathers (X=12.9).

For the coping behaviour entitled Maintaining Family Integrity, a 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix W) indicated that the main effect for the Parent Gender factor, was not significant. Thus no differences were found between mothers' (X=25.7) and fathers' (X=24.5) ratings of the usefulness of the coping behaviour Maintaining Family Integrity. Although the statistical power is weak (power=.32) this is consistent with the literature (Ventura, Boss, 1983) and the hypothesis.

Hypothesis 4

The fourth hypothesis stated that parents of at-risk infants would report using the following behaviours,

measured by the Family Crisis Oriented Personal Evaluation Scales, more: Acquiring Social Support, Passive Appraisal, and Mobilizing the Family to Accept Help, than parents of control infants. Parents of at-risk infants would find the behaviour Seeking Social Support, measured by the Family Coping Inventory, more helpful than control parents.Parents of at-risk infants would find the behaviour Maintaing Family Integrity less helpful initially. No differences were expected between groups on the following behaviours: Reframing, and Seeking Spiritual Support. This hypothesis focuses on differences between the parents of at-risk neonates and parents of healthy control neonates.

Results of a 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix U), for the coping behaviour Seeking Social Support (Family Coping Inventory), indicate that the main effect for the group factor was not significant, with the statistical power of the contrast equal to .35. Thus there was no difference between the parents of at-risk neonates (X=24.5) and parents of control infants (X=24.8) in terms of their rating the usefulness of the coping behaviour labelled Seeking Social Support when adapting to the birth of a baby.

No significant results were obtained on a 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix X) for the coping behaviour, Acquiring Social Support (Family Crisis Oriented Personal Evaluation Scales)

(statistical power =.30). Thus there was no difference between at-risk parents (X=28.3) and control parents (X=27.0) in terms of the reported use of the coping behaviour Acquiring Social Support when dealing with family problems.

A 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix Y) for the coping behaviour labelled Passive Appraisal, indicates a significant main effect for the Group factor, $F(1,96)=10.27$, $p<.002$. Parents with neonates requiring medical interventions (X=8.3) reported using the coping behaviour labelled Passive Appraisal significantly more than parents of healthy neonates (X=6.9). There were no significant differences between the groups for the Time factor, statistical power equals .32.

No significant differences were observed on 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVAs for the coping behaviours labelled Seeking Spiritual Support (Appendix Z) and Accepting Help (Appendix AA).

There was no difference between the parents of at-risk neonates (X=12.3) and control parents (X=11.4) in terms of the reported utilization of the coping behaviour Mobilizing the Family to Seek and Accept Help (statistical power =.38). These results do not support the hypothesis. Consistent with the hypothesis there was no difference in

the scores obtained by parents of at-risk neonates (X=10.9) and control parents (X=10.9) for the coping behaviour Seeking Spiritual Support (statistical power =.40). Thus there was no difference between the two groups in terms of the reported use of these two coping behaviours when dealing with family problems.

A 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix BB) for the coping behaviour labelled Reframing indicates a significant Group factor X Time factor interaction, $F(3,288)=2.96$, $p<.04$.

Post-hoc analyses using Tukey's Honest Significant Difference procedure indicate a significant difference (mean difference= 1.7) between at-risk parents (X=31.1) and control parents (X=32.8) at the first assessment in terms of using the coping behaviour labelled Reframing (t(hsd) (2,288)= 1.5). Parents in the control group reported using the behaviour more frequently when coping with family problems than parents at-risk. This difference was not anticipated. There was a tendency in the at-risk group to increase their use of the coping behaviour Reframing over time, however the differences were not large enough to be clinically significant and were not investigated (mean difference of 1.7 between the first assessment and the twelve month follow-up).

A 2(Group) X 2(Parent Gender) X 4(Time) repeated measures ANOVA (Appendix W) indicates that for the coping behaviour Maintaining Family Integrity there is a significant main effect for the Time factor, $F(3,288)=4.55$, $p<.005$, and a significant interaction, Group X Time, $F(3,288)=5.10$, $p<.0008$.

Paired comparisons, using the Dunn-Sidak a priori procedure, between the group means at the four assessment periods indicate a significant difference between at-risk (X=21.9) and control (X=25.7) groups at the first assessment, with the control group reporting the coping behaviour Maintaing Family Integrity as being more helpful, t(D.S.) (4,96)=3.18, see Table 10. The differences between group means at three months (mean difference=0.3), six months (mean difference=0.9) and twelve months (mean difference =0.9) were not significant.

For the at-risk group, post-hoc paired comparisons between the mean at the initial assessment and the means of the three other assessment times (Table 11) were made using Tukey's Honest Significant Difference procedure, (t(hsd) (4,96)=3.74). The difference between the means from the initial (X=21.9) and three (X=24.9) month assessments was not significant. Significant differences were found between means at birth (X=21.9) and six (X=26.1) month

assessments and between the birth (X=21.9) and twelve (X=26.4) month assessments with parents reporting the coping behaviour Maintaining Family Integrity significantly more helpful at the later assessments. Thus for parents with infants at-risk, the coping behaviour Maintaining Family Integrity became significantly more useful for them in coping with adding the baby to the family system over the year assessment period.

Table 10: Post-hoc comparisons (Dunn-Sidak procedure) of mean scores for the significant interaction Group X Time for the dependent variable: Maintaining Family Integrity (Family Coping Inventory)

	time1	time2	time3	time4
At-Risk (x)	21.9	24.9	26.1	26.4
Controls (x)	25.7	25.2	25.2	25.5
Differences	3.8*	.3	-.9	-.9

*p<.05

Table 11: Differences between mean scores at the initial and follow-up assessment periods for the at-risk group on dependent variable: Maintaining Family Integrity (Family Coping Inventory) (Tukey's Honest Significant Difference)

	time1	time2	time3	time4
time1	-	3.0	4.2*	4.5*

*p<.05

Hypothesis 5

The fifth hypothesis predicted that parents of infants with mental and/ormotor Bayley scores one standard deviation

or lower below the standardised mean would report higher levels of depression at the twelve month assessment.

The two groups (at-risk versus control) differed significantly on the mental and motor measures of the infants' development at the one year assessment (Table 12).

There were only three infants with mental scores below 85 and seven with the motor scores below 85 on the Bayley Scales of Infant Development. Thus although the t-test was non-significant the sample size was too small to arrive at any firm conclusion.

Table 12:T-Tests between at-risk and control infants' scores on the Bayley Scales of Infant Development

Mental Development Index

	X	S.D.	t Value	df	p
Control Group	117.4	9.5	6.06	48	.001
At-Risk Group	98.0	12.9			

Motor Development Index

	X	S.D.	t Value	df	p
Control Group	104.0	12.1	3.98	48	.001
At-Risk Group	89.6	13.4			

We decided to do a correlational analysis between the parental depression scores at the twelve month assessment and the infants' scores on the cognitive and motor subscales. The correlation between the depression scores and the infants' mental scores on the Bayley Scales of Infant Development was -0.074. The correlation between depression scores and the infants' motor scores was -0.069. These results do not support the stated hypothesis as there does not appear to be a relationship between the infant's level of development at age twelve months and the parents' reported level of depression.

CHAPTER FOUR: DISCUSSION

Analyses indicated that although the two groups of parents (at-risk versus control) did report differences in levels of usefulness of certain coping behaviours, these differences were not always consistent with those hypothesized. Differences hypothesized between the groups were confirmed for the following coping behaviours: Maintaining Family Integrity, Seeking Spiritual Support, and Passive Appraisal. Parents of control infants initially reported the coping behaviour Maintaining Family Integrity more useful than parents of at-risk infants, however this difference was no longer present at the twelve month assessment. Parents of at-risk infants reported the coping behaviour Passive Appraisal more helpful than did parents of control infants. No differences were observed between the groups for the coping behaviour Seeking Spiritual Support. The hypothesized differences between the two groups based on parent gender were verified for the following coping behaviours: Seeking Social Support, and Being Religious, Thankful and Content. Mothers reported the coping behaviours Seeking Social Support, and Being Religious, Thankful and Content more useful than did fathers. No differences were observed between mothers and fathers for the coping behaviour Assuming Responsibility.

These results and their implications for understanding the adaptation process for parents of at-risk infants will be discussed presently. Discussion will follow the hypotheses put forth earlier.

Hypothesis 1

"It is expected that parents of at-risk infants will report a higher level of state anxiety and depression than control parents. This initial difference will decrease over the one year assessment period. No difference is expected on the measure of trait anxiety."

This was confirmed for the depression and state anxiety scores but not for the trait anxiety scores. Results indicated that at the first assessment at-risk fathers experienced a higher level of depression than control fathers and that at-risk mothers reported a significantly greater level of depression than control mothers. For both fathers and mothers this initial difference had phased out by the three month assessment. The reported level of depression did not change significantly over the year period for at-risk fathers. Results for control fathers indicated a significant statistical difference between birth and three months assessments. Their level of depression increased at the three month assessment. Questionnaires at birth were collected within two weeks of the baby's birth. The lower

scores at the initial assessment may be a reflection of their happiness and satisfaction of having a healthy baby and may reflect a heightened positive emotional state. At this time daily concerns and hassles may seem insignificant compared to the joy and satisfaction felt towards the birth of their healthy infant. Their scores at three months may reflect a more accurate assessment of their usual emotional state, combined with the difficulties encountered with a three month old infant.

For at-risk mothers, their level of depression decreased significantly between birth and three months, after which time changes were not significant. Control mothers showed no significant changes in their level of depression. It was noted that their level of depression also increased at three month assessment compared to the first assessment, however as stated the difference was not significant.

It is interesting to consider the maternal scores within the frame of reference of postpartum depression. Thirkettle and Knight (1985) distinguish between postpartum blues which refer to a brief episode of depression which occurs within the first five days after birth and postpartum depression which tends to be more severe, of longer duration and may occur at any time within six months after delivery. In a study examining the occurence of postpartum blues, Knight and Thirkettle (1986) found that questionnaires

assessing depressive symptomatology were not sensitive enough to identify women suffering from postpartum blues. When asked to rate how depressed or anxious they are feeling on a simple analogue rating scale, a significant difference was observed between the scores obtained by mothers within ten days following the birth of their first child and a control group of women who had not given birth within the previous twelve months (Knight, Thirkettle, 1986). Thus the Beck Depression Inventory used in the present study may not be an appropriate measure for assessing postpartum blues. To particularly evaluate the occurence of postpartum blues daily assessments during the ten days following delivery, using an analogue rating scale would be more appropriate. However the focus of the present study was long-term adjustment, consequently the Beck Depression Inventory was a more appropriate measure.

Higher depression scores at the first assessment for mothers of at-risk infants may reflect a reaction to the seriousness of their infant's medical condition. For mothers of healthy infants, elevation in their scores occurs at the three month assessment. This elevation may reflect postpartum depression which occurs within the first six months after delivery in approximately 10% to 40% of the population (Thirkettle, Knight, 1985). In reviewing the literature on postpartum depression and blues, Thirkettle

and Knight (1985) found a trend for women who experienced postpartum depression to have reported fewer symptoms during their pregnancy. Thus for women who have experienced a trouble-free pregnancy the failure of childbirth to live up to their high expectations may be related to an increase in depressive feelings. In addition by three months a family routine is established, the social support may be lessening, the buoying excitement of a new baby is reduced and a number of mothers may be worrying about household matters, e.g. daycare arrangements as they begin plans to return to work.

In the present sample of 25 mothers of healthy infants, at the three month assessment, one mother was reporting a moderate level of depression while four mothers reported a mild level of depression. This represents an increase from the initial assessment when only one mother reported a mild level of depression. Thus in our sample it would appear that five mothers in the control group were possibly experiencing postpartum depression at the three month assessment.

The state anxiety data analyses indicated that mothers obtained higher scores than fathers and that parents of at-risk infants reported higher levels of anxiety than parents of healthy infants. Over time the levels of anxiety decreased for all groups, with a significant difference noted between scores at birth and twelve months. At the twelve month assessment the difference between the at-risk

and control parents was no longer significant. Although significant differences were obtained between group scores, all group means were within one standard deviation of the general population mean, thus the average group levels of anxiety being reported were not within the clinically significant range. However when considering individual scores it is evident that a number of parents were reporting significant levels of anxiety. At the initial assessment, six at-risk mothers, one at-risk father and one control mother reported levels of anxiety one standard deviation above the standardized mean. At the three month assessment, six at-risk mothers continued to report high levels of state anxiety. By the six month assessment, three at-risk mothers, two control mothers and one control father reported significant levels of anxiety. By the one year assessment, two at-risk mothers and one control mother reported high levels of state anxiety. Thus although the group means were within the clinically non-significant range, a number of individual parents were experiencing significant levels of anxiety.

The initial elevations may reflect the control parents' insecurities regarding the care of an infant. For the majority of parents this was their first child and they may have been uncertain regarding child care. Within the at-risk group the level of parental anxiety diminished as the infants' medical conditions improved and they were able

to leave the hospital. Developmental progress of their infant could also be more clearly observed and may have contributed to a decrease in their anxiety level.

A significant difference was found between at-risk and control parents on the measure of trait anxiety. At-risk parents identified themselves as being more anxious than the control parents. This difference was not anticipated. Again the group mean scores were within the average range.

State anxiety is conceptualized as a transitory emotional state which may vary over time. Trait anxiety refers to relatively stable individual differences in anxiety proneness. Although subjects in both groups were instructed that for the "state" questionnaire they were to report how they felt at this moment and for the "trait" questionnaire they were to indicate how they generally feel, parents in the at-risk group may have found it more difficult to make the distinction. Also a number of parents within the at-risk group were aware during the pregnancy that there would be complications at the time of delivery and the mothers were closely followed throughout their pregnancy. Consequently their level of anxiety may have been elevated during the preceeding months as well, thus influencing trait anxiety.

Hypothesis 2

"Differences are expected between the experiences of mothers and fathers within the at-risk group. It is expected that mothers of at-risk infants will report greater distress than fathers of at-risk infants. Thus higher scores are expected on the measures of depression and state anxiety. This difference will decrease over the one year assessment period."

Mothers of at-risk infants reported higher scores on the Beck Depression Inventory at all assessment periods than did fathers of at-risk infants. The difference between their scores did not phase out over the year assessment period as mothers continued to report higher scores at the one year assessment than did fathers. Depression scores decreased significantly for mothers and fathers between the first and final assesssment at which time the mean scores for both groups of parents were within the normal range. However in terms of individual scores, at the final assessment, one mother reported a moderate level of depression, and five mothers and one father reported mild levels of depression. At the initial assessment the maternal mean score on the Beck Depression Inventory was within the mildly depressed range with two mothers reporting a moderate level of depression and fourteen mothers reported mild levels.

The hypothesis was confirmed for the state anxiety data. Mothers of at-risk neonates reported higher levels of

anxiety than fathers of at-risk neonates at the first assessment. The difference between their scores was not significant by the twelve month assessment.

Based upon results pertaining to the first two hypotheses we can conclude that the emotional experiences differ for the two groups of parents and even within the group of at-risk parents between mothers and fathers. However the intensity of the emotional reactions may not have been as high as expected. It is important to note that although significant statistical differences were obtained, most parental scores and all the group means, except for the at-risk mothers' depression scores at birth, were within the normal range (score of 0-9) on the Beck Depression Inventory and within one standard deviation of the mean on the anxiety measures. At the initial assessment fourteen out of twenty-five at-risk mothers scored within the mildly depressed range and two within the mild to moderate range of depression. It is possible that the parents, particularly the fathers of the at-risk neonates, felt that it was socially desirable to deny depressive symptoms. The parents were aware that we were assessing their coping behaviours and they may have felt that acknowledging these symptoms would reflect negatively on their ability to cope with their infant.

Sackett, et al., (1985) used the concept of relative risk to describe the strength of association between a treatment or condition and an outcome measure. In the present study we are interested in determining the relative risk of developing a mild and/or moderate level of depression following the birth of an at-risk infant. It was decided to separate mothers and fathers since, as mentionned previously, there were significant differences between their scores.

For paternal scores, based on the present sample, the relative risk of developing a mild level of depression immediately following the birth of a critically ill child is 2:0. Two fathers in the at-risk group reported mild levels of depression compared to none in the control group. At the three, six and twelve month assessments the relative risks were calculated as being: 1:3, 1:4, 1:2 respectively. Thus control fathers were at a greater risk for reporting mild levels of depression following the birth of a child, for example at the six month assessment, four control fathers reported a mild level of depression as opposed to only one at-risk father. The relative risk of reporting a moderate level of depression was 1:1 at the initial assessment and 0:1 at all subsequent assessment. Thus the relative risk for a moderate level of depression was not significantly different between the groups.

For maternal scores, the relative risk of developing a mild level of depression immediately following the birth of a critically ill child is 16:1. Sixteen mothers in the at-risk group presented with mild levels of depression compared to one control mother. At the three and twelve month assessments, the relative risks were calculated as being: 7:5, and 3:2 respectively. At the twelve month assessment six at-risk mothers versus four control mothers reported mild levels of depression. At the six month assessment the relative risk was 4:5. Since five control mothers reported mild levels of depression as opposed to four at-risk mothers, the relative risk is virtually equal at this assessment period for the present sample. In terms of a moderate level of depression the relative risks for the birth, three, six and twelve month assessments were: 2:0, 0:1, 1:0, 1:0, respectively. At the initial assessment two at-risk mothers reported a moderate level of depression as opposed to no control mothers. For the subsequent assessment periods the level of relative risk are not significant. Parents of at-risk infants do not appear to be at any greater risk for developing moderate levels of depression, however they are at greater risk for mild levels of depression particularly immediately after the birth and at three months following birth.

When considering state anxiety, we selected a score of one standard deviation above the standardized mean as a

cutoff score indicating a significant level of anxiety. For fathers' scores the relative risk for the birth, three, six and twelve month assessment were calculated as: 3:1, 3:2, 7:4, 1:1 respectively. At the initial assessment six fathers in the at-risk group as opposed to two in the control group reported a signficant level of state anxiety. It was at the six month assessment that the greatest number of fathers (seven at-risk and four control fathers) in both groups reported high levels of anxiety, however the at-risk fathers were only 1.75 times more likely to report a high level than the control fathers. By the twelve month assessment, there was no difference between the groups in terms of relative risk. For maternal scores the relative risks were calculated as being: 17:4, 8:3, 7:4, 7:4 respectively. At the initial assessment, at-risk mothers were 4.25 times more likely to report a significant level of state anxiety. By the six and twelve month assessments the relative risk had decreased, yet at-risk mothers were still 1.75 times more likely to report a high level of anxiety. Thus even one year after the birth of their children at-risk mothers were still at a greater risk for state anxiety. Parents of critically ill infants appear to be at a greater risk for reporting anxiety than depression even one year following the birth of their child.

Hypothesis 3

"It is expected that fathers of infants at-risk and healthy infants will find coping behaviours which involve Assuming Responsibility more useful. Mothers will find behaviours labelled Seeking Social Support and Self-Development, and Being Religious, Thankful and Content more useful. These differences are expected to still be present after one year. No significant differences are expected between mothers and fathers for the coping behaviour: Maintaining Family Integrity."

This hypothesis was formulated based on the Ventura and Boss (1983) study which indicated that mothers and fathers agreed upon the helpfulness of the coping behaviour Maintaining Family Integrity; that mothers found Seeking Social Support and Self Development and Being Religious, Thankful and Content to be more helpful than fathers; and that fathers identified additional coping behaviours that they found useful and which Ventura labelled Assuming Responsibility.

Results indicated no differences between groups or between mothers and fathers on the behaviour labelled Assuming Responsibility. Items comprising this scale include: "Accepting financial responsibilities" and "Developing work-related skills". In the present study the majority of mothers were employed outside of the home and planned to return after maternity leave. These mothers may

see themselves as being equally responsible and active in the planning and caring for the financial well-being of their child. The differences between the costs of health care in Canada and the United States may also explain the difference between our results and those obtained by Ventura, Boss (1983). Canada has a universal access system without economic barriers. Thus Canadian parents of infants requiring specialized medical care may not have the same financial concerns as American parents whose insurance policies may not cover all the necessary medical interventions.

The results for the coping behaviours: Seeking Social Support and Self-Development and Being Religious, Thankful and Content were consistent with the differences hypothesized. Mothers consistently reported the two coping behaviours as being more helpful in adjusting to the baby than did the fathers.

According to Ventura (1983) these results are consistent with previous studies of family coping with an increase or loss in family constellation. The coping behaviour Maintaining Family Integrity is consistently reported as useful whether the family transition involves the loss or addition of a family member. The other two coping

behaviours: Being Religious, Thankful and Content and Seeking Social Support and Self-Development involve more

individual psychological and social aspects. The reported usefulness of these behaviours is not as consistent over time (Ventura, Boss, 1983).

Fathers may not need to seek social support and information regarding child care. They may rely on their spouses to know child care issues and to teach them, whereas mothers may be more actively seeking this information and support either from their families, friends or health professionals and thus find it more helpful. Fathers may fear that if they actively seek social support they may appear unable to be self-supporting and supporting of their family. It is possible that fathers were engaging in these behaviours, however they did not report them as being useful.

Two separate measures of the coping behaviour Seeking Social Support were obtained: 1)on the Family Coping Inventory which dealt with the usefulness of coping behaviours when adapting to the new baby, and 2)on the Family Crisis Oriented Personal Evaluation Scales which assessed the parents' use of coping behaviours when facing general family difficulties. It is only when coping with the new baby that mothers reported the behaviour to be more useful than did fathers. When facing more general family difficulties mothers did not rely on social support any more than fathers.

Socially and culturally having a new infant is not seen as a "problem" or "difficulty". When an infant is brought home offers of help abound from families and friends. Thus it is not seen as a weakness or as being inappropriate to seek and find helpful support from family and friends. Also since many of these parents were first time parents seeking advice from health professionals is also an appropriate behaviour. When dealing with family difficulties, individuals may be more hesitant in seeking or admitting they seek support.

The difference between mothers and fathers for the coping behaviour Being Religious, Thankful and Content may also reflect differences in individual coping styles. While mothers may be thankful for their new infant, and reflect on the past and feel content with their lifestyle, fathers on the other hand may be looking more towards the future and planning for the family's future.

Hypothesis 4

" It is expected that parents of at-risk infants will rely more heavily on the following coping behaviours: Seeking Social Support, Passive Appraisal and Mobilizing the Family to Accept Help. They will find the coping behaviour Maintaining Family Integrity less helpful initially. These differences will disappear over time. No significant

differences are expected between the groups on the following coping behaviours: Reframing, Seeking Spiritual Support."

The results confirmed the hypothesis for the coping behaviour Maintaining Family Integrity. Control parents found this coping behaviour significantly more useful than at-risk parents at the first assessment and by the three month assessment the difference had phased out. The coping behaviour entitled Maintaing Family Integrity included such behaviours as "Trying to be a parent for the baby", and "Doing things with the child". At the birth assessment many of the at-risk children were in incubators, the parents were not allowed to hold their baby and the care, including feeding, was provided by the nursing staff. Thus for these parents many of these particular coping behaviours were not possible and consequently not useful. By three months of age all the infants were home and at that time there was no significant difference between at-risk and control parents.

In addition, as stated in the theoretical literature, these parents are working through their grief over the loss of their anticipated child. Consequently, they themselves are unavailable to their actual infant and find it difficult to begin developing a sense of family integrity.

The hypothesis was also confirmed for the coping behaviour Seeking Spiritual Support, as no significant

differences were observed between the at-risk and control parents in terms of the reported use of this coping behaviour. However the hypothesis was not supported for the coping behaviour Reframing. No differences between the two groups were hypothesized, however it was noted that the parents in the control group used this behaviour, at the first assessment, more than the at-risk parents. This difference did not persist as the at-risk parents tended to increase their use of the coping behaviour over time.

Since the difference between the two groups was observed only at the initial assessment it would appear that the crisis of the birth of an at-risk infant may have influenced parental coping behaviours that extend beyond coping with the new baby. The coping behaviour Reframing included such behaviours as "Knowing we have the power to solve major problems", "Showing that we are strong", "Defining the family problem in a more positive way so that we do not become too discouraged". It would appear that for the parents of at-risk neonates the crisis is so disrupting that they are unable to reframe their present family difficulties in more positive terms or to appear strong. However when the crisis has passed, by the three month assessment, they report using the coping behaviour as often as do control parents.

The hypothesis was not confirmed for the coping pattern

Passive Appraisal. The results indicated that parents of at-risk infants tended to use this behaviour significantly more than control parents. This also appears to be a general coping behaviour which was influenced by the birth of an at-risk infant. While the baby's condition is critical physicians and nursing staff frequently tell the parents that there is nothing they can do but wait and see, time will tell, hope for luck, etc.. When completing the forms at the later assessment periods it is possible that the parents continued to have this frame of reference in mind. Particularly if the possibility of future complications or developmental delays continued to be present the parents may have adopted a passive attitude of wait and see, only time will tell.

The hypothesis was not confirmed for the coping behaviours Seeking Social Support and Self-Development (measured by the Family Coping Inventory), Acquiring Social Support (measured by the Family Crisis Oriented Personal Evaluation Scales) and Mobilizing the Family to Seek and Accept Help as no significant differences were observed between the groups. The coping behaviour Mobilizing the Family to Seek and Accept Help involved more actively seeking advice and support: "Seeking information and advice from family doctor". This type of support may be sought by

all parents with a neonate whether the infant is critically ill or not.

It was hypothesized that parents of at-risk infants would find more useful the coping behaviour Seeking Social Support in adapting to the new infant. Based on anecdotal information obtained from parents during the assessments, particularly at the birth of the baby and in retrospect afterwards, many parents of at-risk infants reported that they felt support was not available. As mentionned previously in the literature review one important source of support for new parents is their own parents. However for parents in the at-risk group this source of support may not be available as grand-parents are also dealing with their own emotional grief reactions. Also friends and extended family may not be available. Parents may hesitate before contacting friends until the news is more definite or positive. People may be uncertain how to respond to the parents, thus preferring to avoid contact until the baby's condition is more stable. Thus these parents may be feeling a need or desire for social support yet the support may not be readily available and thus not rated as useful. Further investigation in this area should distinguish between needing or wanting social support and the availability of support. If the support is in fact unavailable or is even interpreted as being unavailable by the parents this may be a possible area of intervention.

As there was no difference between the groups on their reported use of the coping behaviour Acquiring Social Support when dealing with family problems, it would appear that the difficulties experienced by parents of critically ill neonates do not extend to an increased need for social support when dealing with family problems.

In summary the emotional reactions differ between the groups and between mothers and fathers within the at-risk group. Initially at-risk parents report higher levels of anxiety and depression at the time of the baby's birth and these differences gradually phase out over the year period. Within the at-risk group mothers consistently reported higher levels of depression than did their husbands. Mothers were also significantly more anxious initially yet this difference phased out over the year. Initial differences between the scores of mothers and fathers within the at-risk group may be related to what Solnit and Stark (1961) have identified as the narcissistic wound experienced by mothers following the birth of an ill infant. According to Solnit and Stark (1961) mothers feel disappointment, helplessness and a sense of failure, which may be contributing to their higher levels of depression and anxiety.

There were no differences between the two groups of parents on the following coping behaviours: Seeking Social Support, Being Thankful, Religious and Content, Assuming

Responsibility, Seeking Spiritual Support, and Mobilizing the Family to Seek and Accept Help. At the initial assessment control parents reported the coping behaviour Maintaining Family Integrity to be more helpful, and relied on the behaviour Reframing more. Parents of at-risk infants reported using the coping behaviour Passive Appraisal more. When coping with adding a new member to their family mothers found the coping behaviours Seeking Social Support and Self-Development and Being Religious, Thankful and Content more helpful than did fathers.

The differences between at-risk and control parents on the coping behaviours Reframing and Passive Appraisal appear to indicate that the birth of a critically ill child influences parental coping with family problems and not only with the birth of the child. These two coping patterns were assessed using the Family Crisis Oriented Personal Evaluation Scales which evaluated the utilization of coping behaviours when dealing with family problems.

However it is important to note that the statistical power for all non-significant contrasts were weak. Consequently we are unable to state that in fact there are no differences between groups in terms of the usefulness of these coping behaviours. Further investigations in this area are warranted. An important point to be considered would be the internal validity of the subscales. Although the questionnaires have been moderately well researched the

question of their appropriateness for this particular population merits further investigation. More detailed item analysis and subscale internal validity are required. The appropriateness of different measures or increased sample sizes should also be considered. An additional point to consider in future investigations would be the need to control further for external factors (e.g. severity of child's illness, family structure).

Hypothesis 5

"It is expected that parents whose infant's performance is significantly below average (<1 s.d.) on the mental and/or motor subscales of the Bayley Scales of Infant Development will report higher levels of depression at the one year assessment."

As mentionned previously the fifth hypothesis was not investigated due to insufficient numbers of infants with scores at least one standard deviation below the mean on the Bayley Scales of Infant Development. Due to the small sample size (e.g. 25 infants from the Neonatal Intensive Care Unit) not too many atypical scores were obtained. With both groups combined only six infants obtained mental scores

below 85 and only 16 obtained motor scores below 85 on the

Bayley Scales of Infant Development at twelve months of age.

Due to our inclusion/exclusion criteria the infants with chronic diseases were excluded and many infants with relatively less threatening conditions were included (e.g. infants with hyperbilirubemia who were discharged within six days). Thus this sample is possibly atypical in terms of developmental delays in high-risk neonatal populations. It is interesting to note that there were significant differences between the scores obtained by at-risk and control infants on both the mental and motor scales. Control infants scored significantly higher than at-risk infants. Thus although not many scored significantly below the standardized mean, there was a significant group delay compared to healthy controls.

Correlational analysis completed to investigate if a relationship exists between parental depression scores and infant developmental status indicated an absence of relationship. It is possible that a number of parents were not aware of delays in their infant's development and thus were not overly concerned. It would have been interesting to ask parents to rate their infant's development and to correlate these ratings with their depression scores and also with the actual developmental status scores. This question merits further investigation with a larger sample size.

In general the results indicate that parents of at-risk neonates are experiencing a higher level of distress than parents of healthy neonates and that coping behaviours selected by the two groups of parents also differed throughout the adaptation process. It also became evident that mothers and fathers of high-risk infants differ in the intensity of their emotional reactions.

As the mothers of the critically ill infants reported higher levels of depression and anxiety coupled with a need for social support, it would appear that they are feeling vulnerable and are in need of emotional support. Fathers however do not appear to feel these emotions as intensely, whether due to stereotypes or actual gender differences.

The present findings lend empirical support to the concepts of tasks and a process of adaptation following the birth of a premature child. Initially they are reporting higher levels of depression and anxiety than the parents of healthy infants. Also they are not able to consider themselves as a family unit as yet. However as the process continues, by the time their infant is three months of age and relatively physically well, the majority of the families were reporting that Maintaining Family Integrity was a useful coping behaviour. This increase in the family unit corresponds to a decrease in parental depression and

anxiety, thus is a possible indication of positive adaptation.

It is important to consider the fact that when using questionnaires it is possible for two individuals to arrive at the same subscale score but for different reasons. Thus it becomes difficult, without any additional qualitative information, to elaborate on the reasons for different or similar coping patterns. Thus a more complete theoretical understanding of coping patterns is still to be refined.

Limitations

An important issue to address in the present study is the use of self-report questionnaires as opposed to actual sampling of parental behaviours. Throughout the assessment process many parents stated that they found it difficult to rate their behaviour on a four or five point scale. Many felt the reasons they found a particular behaviour helpful would be different than another parent, even their spouse. This is a valid point and certainly the use of questionnaires limits the data available to us. Since this was an exploratory study it was considered important to obtain empirical measures from previously validated scales in order to form a basis for further investigations. Certainly a next step in understanding these parents' reactions would be to formulate a structured interview based on the results obtained in the present study and the

literature. The interview would provide us with a greater understanding of why parents find certain behaviours more useful than other behaviours, may help explain individual and gender differences and may identify additional coping behaviours that were not included in the present scales.

Also, as mentionned previously, the actual questionnaires selected were not always ideal. Not all possible coping behaviours and emotional reactions were sampled. Parents certainly experienced other emotions in addition to depression and anxiety. However given the present state of knowledge in the coping literature and more particularly in coping with a premature infant, the present questionnaires were considered to be acceptable.

A second point of debate is the number of analyses completed in the present study. In total 104 statistical comparisons were made. Thus with set at .05 we would expect five positive differences attributable to chance alone. When designing the study we were aware of the number of variables and the difficulties this would present in controling for statistical errors. However it was decided that the risk was warranted given the nature of the study and the desire to generate hypotheses for future research. In an attempt to diminish the probability of error, specific directional hypotheses were proposed, all post-hoc and multiple comparisons were done using conservative

statistical techniques (Tukey's Honest Significant Difference, Dunn-Sidak) which controlled for error experimentwise.

Applications And Future Research

The finding that parents of critically ill neonates do not report reliance on social support from family and friends even during the crisis period, any more than do parents of healthy neonates, is relevant to the interventions conducted in the Neonatal Intensive Care Unit. Possibly more attention towards the involvement of the extended family is warranted. Parents of high risk neonates may need to be told that family and friends may not know how to respond to them and consequently may appear unavailable or uninterested. Thus the responsibility will fall on the parents to actively seek the support they need. Another approach would be to include grand-parents, or if they are not availble another significant family member, more intensely in the activities of the neonatal unit e.g. support groups. Parents should be encouraged and supported to be more active in coping.

Since parents of at-risk neonates reported that the coping behaviour Maintaining Family Integrity was not as useful to them as it was to the parents of healthy neonates, possibly explaining to them ways that they can act as parents to their infants may be of benefit. For example

telling them that talking to the infant, participating in what ever child care activities are permitted, simply visiting in order to create a bond with their child may help them to feel that they actually are a family and that they have a role to play in the care of their child.

Also since the depression and anxiety scores were lower than would be expected for parents of at-risk neonates, particularly during the actual crisis period, it may be important to reassure parents that these are in fact normal and healthy reactions and that they should not attempt to deny these feelings for fear that the staff will perceive them as unable to cope. This fear may be more intense for the fathers given social stereotypes.

Future research in this area should focus on more detailed data collection by use of interviews and/or observations, particularly between the birth and six month assessments as this is the period where most significant changes occured in the parental responses thus warranting further investigation. Specifically asking parents to identify areas that they experienced difficulty in coping with and what coping behaviours were most useful in dealing with these specific difficulties would yield further information on the actual difficulties and coping patterns. The inclusion of more subjects and the infants with chronic disorders and more serious medical conditions would permit the consideration of the impact of additional

factors: nature and severity of the child's illness, length of hospitalization, family variables (e.g. single parent versus two parent families) and birth order. One issue not addressed in the present study but which warrants attention is the impact on the neonate's siblings.

In addition further investigation of the psychometric properties of the questionnaires used in the present study, specifically for the population considered, would be important in order to assess their applicability.

In considering McCubbin's Double ABCX Model of Family Adaptation, it would be of interest to compare the coping patterns of families with higher levels of family resources and few family life changes versus families with low resources and a high number of changes. Also of importance to consider would be the family system structure of each family

As the survival rate continues to increase for infants that are severely premature or chronically ill, consideration for the family unit will also increase in importance.

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APPENDIX A

CONSENT FORM

Family Functioning Study

I, consent to take part in a study which will examine the family functioning of parents of infants transferred to a regional intensive care unit and parents of healthy newborns. The purpose of the study is to learn how parents successfully adapt to this situation and how health care professionals can identify the need for assistance for parents experiencing difficulties in this adaptational process.

It has been explained to me that I will be asked to complete certain questionnaires at specified time intervals over a one year period (at the birth of my child, three months, six months and twelve months of age). The questionnaires concern the resources that I believe are available, my family's problem-solving attitudes, the behaviours I use to adapt to the new baby and my family's functioning. I understand that I may refuse to answer any question or questions. I also understand that I may withdraw from the study at any time, even after signing this form, and this will in no way affect the regular care given to my child. These are standardized tests and people have reported no difficulty in using them.

Any information that is collected about me during this study will be kept confidential. The responsibilty for this study rests with Elizabeth Paquette and Dr. John Goodman from the department of Psychology, Children's Hospital of Eastern Ontario. Any questions may be directed to Dr. Goodman at 737-2692.

name	signature	date
witness	signature	date

I have explained the nature of the study to the parent and feel he/she has understood it.

E. Paquette	signature	date

APPENDIX B

Letter of Introduction

Dear Parents:

We would like your cooperation in studying how parents adjust to the birth of an infant. The purpose of this study is to understand how the parents adjust successfully to this situation and how health professionals can identify a need for assistance in parents who are experiencing adjustment difficulties.

Your participation in this study will require four meetings over a period of one year (at birth, at three months, six months and twelve months following the birth). During these meetings we will ask you to complete questionnaires concerning the resources you believe are available, your family's attitudes and the behaviours you use to adjust to the new baby. Each meeting will require approximately one hour of your time.

The responsibility for this study rests with Elizabeth Paquette and Dr. John Goodman from the department of Psychology of the Children's Hospital of Eastern Ontario.

You will be contacted by Elizabeth Paquette and if you wish to participate a meeting will be scheduled at your convenience. If you should have any questions in the mean time, you may contact Dr. Goodman at 737-2692.

Elizabeth Paquette

Dr. John Goodman
Director,
Dept. of Psychology
CHEO

APPENDIX C

DEMOGRAPHIC DATA

Subject no.:

1. City of Birth: (indicate 1 only)
   - Ottawa
   - Hull
   - Other Ottawa-Hull area
   - Other Ontario
   - Other Quebec

2. Parent's Education:
   (circle highest grade completed)

mo.	1	2	3	4	5	6	7	8	9	10	11	12	13
fa.	1	2	3	4	5	6	7	8	9	10	11	12	13

univ. college mo. 1 2 3 4 + fa. 1 2 3 4 +

3. Family Constellation

Age: mother: father:	Siblings: male/female	age	status
	1.		
	2.		
	3.		

Status code: 1-Natural
2-Adopted
3-Half

4. Occupation of Parents

occupation	Mo.	Fa.
exec.,major prof.		
mid.-mingt.,less prof.		
admin.,supev.,sm.bus.		
clerical, technical		
skilled, craftsman		
semiskilled		
unskilled		
homemaker		
student		
never worked		
current emp. yes no		

5. Will mother be returning to work after maternity leave?
   Yes No Uncertain

6. length of hospitalization: _____ days

7. Rating at discharge: 1=healthy control
   2=good prognosis
   3=chronic prognosis

Pages 160 - 183, Appendices D through J, contain copyrighted material, being copies of the tests administered to the subjects participating in the research. Copies of these tests may be obtained from the publishers. Consult the bibliography.

APPENDIX K
Mean scores for parents of at-risk and control infants on demographic variables

At-risk Group

Variable	Mean	Standard Deviation
Mother's education	14.2	1.7
Father's education	14.3	2.4
Mother's age	28.2	3.9
Father's age	30.1	4.6
Mother's employment	4.8	2.3
Father's employment	4.0	1.7
Parity	1.7	.7

Control Group

Variable	Mean	Standard Deviation
Mother's education	14.9	2.0
Father's education	15.4	2.4
Mother's age	28.6	3.8
Father's age	30.4	4.3
Mother's employment	5.2	2.3
Father's employment	3.5	1.8
Parity	1.7	.7

APPENDIX L
Analysis of Variance of Mean Scores for Parents of At-Risk and Control Infants on Control Variable: Dyadic Adjustment (Family Assessment Measure)

Source	MS	df	F	p
Group(G)	235.62	1	.87	ns
Between S error	270.68	98		
Time(T)	10.66	3	.46	ns
G X T	47.01	3	2.05	ns
Within S error	22.92	294		

APPENDIX M
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: State Anxiety (Spielberger State-Trait Anxiety Inventory)

SOURCE	MS	df	F	p
Group(G)	3203.56	1	11.32	.001
Parent Gender(P)	1274.49	1	4.50	.03
G X P	345.96	1	1.22	ns
Btwn Ss error	282.96	96		
Time	316.23	3	4.58	.005
T X G	125.22	3	1.81	ns
T X P	115.63	3	1.67	ns
T X G X P	93.02	3	1.35	ns
Win Ss error	69.05	288		

APPENDIX N
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Trait Anxiety (Spielberger State-Trait Anxiety Inventory)

SOURCE	MS	df	F	p
Group(G)	1159.40	1	3.90	.051
Parent Gender(P)	1046.52	1	3.52	ns
G X P	.90	1	0.00	ns
Btwn Ss error	297.33	96		
Time	86.05	3	2.36	ns
T X G	73.12	3	2.01	ns
T X P	72.81	3	2.00	ns
T X G X P	43.74	3	1.20	ns
Win Ss error	36.39	288		

APPENDIX O
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Depression (Beck Depression Inventory)

SOURCE	MS	df	F	p
Group(G)	152.52	1	4.75	.03
Parent Gender(P)	786.80	1	24.48	.001
G X P	178.22	1	5.54	.02
Btwn Ss error	32.14	96		
Time	2.46	3	.33	ns
T X G	89.75	3	12.07	.001
T X P	22.43	3	3.02	.03
T X G X P	8.18	3	1.10	ns
Win Ss error	7.43	288		

APPENDIX P
Analysis of variance of mean scores obtained by fathers of at-risk and control infants on the dependent variable: Depression (Beck Depression Inventory)

SOURCE	MS	df	F	p
Group(G)	0000.50	1	00.02	ns
Btwn Ss error	29.90	48		
Time	5.16	3	.88	ns
T X G	24.80	3	3.70	.01
Win Ss error	6.70	144		

APPENDIX Q
Analysis of variance of mean scores obtained by mothers of at-risk and control infants on the dependent variable: Depression (Beck Depression Inventory)

SOURCE	MS	df	F	p
Group(G)	330.24	1	9.60	.003
Btwn Ss error	34.38	48		
Time	19.74	3	2.42	ns
T X G	73.12	3	8.96	.001
Win Ss error	8.16	144		

APPENDIX R
Analysis of variance of mean scores obtained by mothers and fathers of at-risk infants on the dependent variable: State Anxiety (Spielberger State-Trait Anxiety Inventory)

SOURCE	MS	df	F	p
Parent Gender(P)	1474.25	1	6.43	.015
Btwn Ss error	229.26	48		
Time	360.29	3	5.19	.002
T X P	144.42	3	2.08	ns
Win Ss error	69.37	144		

APPENDIX S
Analysis of variance of mean scores obtained by mothers and fathers of at-risk infants on the dependent variable: Depression (Beck Depression Inventory)

SOURCE	MS	df	F	p
Parent Gender(P)	856.98	1	29.14	.001
Btwn Ss error	29.41	48		
Time	57.59	3	8.28	.0001
T X P	28.35	3	4.08	.01
Win Ss error	6.95	144		

APPENDIX T
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Assuming Responsibility (Family Coping Inventory)

SOURCE	MS	df	F	p
Group(G)	109.20	1	1.76	ns
Parent Gender(P)	8.7	1	.14	ns
G X P	44.22	1	.71	ns
Btwn Ss error	62.13	96		
Time	1.27	3	.11	ns
T X G	9.85	3	.85	ns
T X P	3.57	3	.31	ns
T X G X P	3.63	3	.31	ns
Win Ss error	11.64	288		

APPENDIX U
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Seeking Social Support (Family Coping Inventory)

SOURCE	MS	df	F	p
Group(G)	9.3	1	.07	ns
Parent Gender(P)	2270.52	1	16.48	.001
G X P	19.8	1	.14	ns
Btwn Ss error	137.79	96		
Time	5.11	3	.2	ns
T X G	19.49	3	.78	ns
T X P	1.15	3	.05	ns
T X G X P	24.92	3	1.0	ns
Win Ss error	25.02	288		

APPENDIX V
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Being Religious, Thankful and Content (Family Coping Inventory)

SOURCE	MS	df	F	p
Group(G)	17.22	1	.28	ns
Parent Gender(P)	909.02	1	14.88	.001
G X P	1.10	1	.02	ns
Btwn Ss error	61.08	96		
Time	6.74	3	.63	ns
T X G	3.81	3	.36	ns
T X P	2.49	3	.23	ns
T X G X P	10.42	3	.97	ns
Win Ss error	10.72	288		

APPENDIX W
Analysis of Variance of mean scores obtained by parents of at-risk and control neonates on the dependent variable: Maintaining Family Integrity (Family Coping Inventory)

SOURCE	MS	df	F	p
Group(G)	34.22	1	.38	ns
Parent Gender(P)	138.06	1	1.52	ns
G X P	49.7	1	.55	ns
Btwn Ss error	90.92	96		
Time	95.7	3	4.55	.005
T X G	124.15	3	5.9	.001
T X P	21.79	3	1.04	ns
T X G X P	34.03	3	1.62	ns
Within Ss error	21.04	288		

APPENDIX X
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Seeking Social Support (Family Crisis Oriented Personal Evaluation Scales)

SOURCE	MS	df	F	p
Group(G)	163.84	1	1.49	ns
Parent Gender(P)	73.96	1	.67	ns
G X P	146.41	1	1.33	ns
Btwn Ss error	109.79	96		
Time	9.01	3	.57	ns
T X G	22.76	3	1.45	ns
T X P	19.36	3	1.23	ns
T X G X P	13.97	3	.89	ns
Win Ss error	15.69	288		

APPENDIX Y
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Passive Appraisal (Family Crisis Oriented Personal Evaluation Scales)

SOURCE	MS	df	F	p
Group(G)	183.60	1	10.27	.001
Parent Gender(P)	46.92	1	2.63	ns
G X P	3.06	1	.17	ns
Btwn Ss error	17.87	96		
Time	2.22	3	.64	ns
T X G	1.75	3	.50	ns
T X P	8.08	3	2.30	ns
T X G X P	3.32	3	.93	ns
Win Ss error	3.50	288		

APPENDIX Z
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Seeking Spiritual Support (Family Crisis Oriented Personal Evaluation Scales)

SOURCE	MS	df	F	p
Group(G)	.56	1	.01	ns
Parent Gender(P)	45.56	1	.78	ns
G X P	5.52	1	.09	ns
Btwn Ss error	58.40	96		
Time	6.32	3	1.32	ns
T X G	10.59	3	2.20	ns
T X P	4.27	3	.89	ns
T X G X P	3.66	3	.76	ns

APPENDIX AA
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Accepting Help (Family Crisis Oriented Personal Evaluation Scales)

SOURCE	MS	df	F	p
Group(G)	76.56	1	2.45	ns
Parent Gender(P)	52.56	1	1.68	ns
G X P	3.06	1	.10	ns
Btwn Ss error	31.28	96		
Time	9.24	3	1.70	ns
T X G	7.92	3	1.46	ns
T X P	2.08	3	.38	ns
T X G X P	7.02	3	1.29	ns
Win Ss error	5.42	288		

APPENDIX BB
Analysis of variance of mean scores obtained by parents of at-risk and control infants on the dependent variable: Reframing (Family Crisis Oriented Personal Evaluation Scales)

SOURCE	MS	df	F	p
Group(G)	37.21	1	.99	ns
Parent Gender(P)	10.89	1	.29	ns
G X P	23.04	1	.61	ns
Btwn Ss error	37.75	96		
Time	14.46	3	1.97	ns
T X G	21.69	3	2.96	.04
T X P	10.56	3	1.44	ns
T X G X P	1.31	3	.18	ns
Win Ss error	7.33	288		

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