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Predictors of Father-Child Interaction Measured by the Nursing Child Assessment Teaching Scale

by

Vickie Lynne Boechler 

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Nursing

Faculty of Nursing

Edmonton, Alberta

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Abstract

This study examined the relationships between father and child characteristics and father-child teaching interactions. Fathers of 153 healthy children (2-24 months of age) were observed at home interacting with their child as measured by the Nursing Child Assessment Teaching Scale (NCATS). Fathers reported the number of times in the past week they had sole responsibility for their child (father involvement). Father age and education and child gender and birth order were not predictors of the NCATS scores. Father involvement was a significant predictor of the Child Total and Father Contingency NCATS Scores explaining 7% of the variance. A proposed NCATS subscale to measure parental scaffolding had an alpha reliability of .74. Child age was a significant predictor of the Father Scaffolding NCATS Score. Researchers and practitioners need to consider the degree of father involvement with the child and the importance of child age when assessing father-child interactions.

University of Alberta

Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled *Predictors of Father-Child Interaction Measured by the Nursing Child Assessment Teaching Scale* submitted by Vickie Lynne Boechler in partial fulfillment of the requirements for the degree of Master of Nursing.

Dr. Margaret Harrison

Dr. Joyce Magill-Evans

Dr. Christine Newburn-Cook

Date: Sept 26, 2000

Dedication

This thesis is dedicated to my husband Daryl who is incredibly profound and analytical and helps me to stay grounded. He has always been supportive and caring while urging me to push the boundaries of life-long learning.

To my two sons, Justin Craig Potter who supported my ambition to do graduate studies and Daryl Jay Boechler who kept mom's car running.

Our children have grown up with a mother who was always reading a book or 'going to school' and a father who was traditional but very involved.

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I especially thank my mother and father Gilbert and Camie Potter who held secondary education in high esteem and told me, "you cannot leave home until you have your grade twelve". I also thank my brother Jimmy Potter for believing in me and giving me financial support so I could get out of the gate!

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Chapter I

INTRODUCTION

Nurses have traditionally provided care to mothers and children in a variety of settings but more recently have broadened their focus to include fathers. Nurses have involved fathers in the care of infants, beginning with prenatal classes, participation in labor and delivery and then the postpartum period, by caring for the family in contrast to caring only for the individual mother and child. Involvement of both parents in interactions with the infant is of paramount importance if children are to grow and develop optimally within their families (Gable, Crnic, & Belsky, 1994; Graham, 1993).

Since the 1970s, there has been an increased focus on the contribution of fathers in families with young children (Lamb, 1997a). Lamb reviewed the role of the father in child development over the last 30 years and argues that the role of the father is just as important for child developmental outcomes as the role of the mother. As society changed over time so did the characterization, by researchers, of the father in contacts with his children (e.g. Darling-Fisher & Tiedje, 1990; LaRossa 1997; LaRossa, Gordon, Wilson, Bairan, & Jaret, 1991; Riley, 1985; Rotundo 1985; Russell, 1983).

Originally, research on fathers and their children focused on father involvement. Pleck (1997), in his twenty year review of father involvement, argued that the measurement of involvement has shifted over the years from time spent with the child to measuring positive paternal involvement with positive engagement behaviors and stylistic behaviors. He explicitly outlines evidence describing the amount of time that fathers spend with their child in terms of accessibility, responsibility and interaction or engagement where interaction is a component of involvement. As other researchers (Lamb, 1995; Rustia &

Abbott, 1993; Tiedje & Darling-Fisher, 1996) have noted, there are different definitions across studies for father involvement making it difficult to compare studies. Often the words involvement, participation, and interaction, are used interchangeably which leads to further confusion in interpreting research studies.

There is an extensive body of knowledge which shows that supportive, sensitive maternal interaction with a child is related to child development. Substantial research since the 1970s has confirmed important links between qualities of mother-child interaction and child development outcomes (Bee et al., 1982; Belsky, Rovine & Taylor, 1984; Bornstein, Haynes, O'Reilly, & Painter, 1996; Bornstein & Tamis-LeMonda, 1989; Damast, Tamis-LeMonda, & Bornstein, 1996; Greenberg & Crnic, 1988; Kelly, Morisset, Barnard, Hammond, & Booth, 1996; Magill-Evans & Harrison, 1999; Olson, Bates & Bayles, 1984). Specifically, there is evidence that different modes of interaction yield different types of child outcomes (Bornstein, 1989; Bornstein, Vibbert, Tal & O'Donnell, 1992; Bruner & Bornstein, 1989; Tamis-LeMonda & Bornstein 1987; Vibbert & Bornstein, 1989).

Recently, research in the nursing and psychology literature has begun to examine the interaction between fathers and young children or the quality of interaction in the father-child dyad using a variety of frameworks. Bornstein (1988, 1989, 1995) describes different modes of parent-child interaction such as nurturant, material, social and didactic caregiving. Barnard et al. (1989) describe the process of parent-child interaction and how to measure it. However, there is limited research on father-child interaction and the relationship to child development.

There is evidence which shows that interventions by nurses can influence the pattern of mother-child interaction (Barnard, 1997a). Promotion of child development and prevention of later mental health issues are goals for early intervention in the mother-child relationship (Barnard, Osofsky, Beckwith, Hammond, & Appelbaum, 1996). Two seminal intervention projects, the Clinical Nursing Models Project and the Nursing Systems Toward Effective Parenting-premature (NSTEP-P), have shown that public health nursing home visits can positively influence the mother-child interaction (Barnard et al., 1987; Barnard, Booth, Mitchell & Telzrow, 1988; Kang et al., 1995). Mothers who participated in the preventive intervention program called Keys to CAREgiving had more responsive parent-child interactions (Barnard, Morisset & Spieker, 1993; Letourneau, 1998) than mothers who did not receive the early intervention. Similarly, other intervention studies demonstrated a positive effect of support and guidance at home by public health nurses on mother-child interactions (Barrera, Rosenbaum, & Cunningham, 1986; Beckwith, 1988; Spiker, Ferguson, & Brooks-Gunn, 1993).

Parenting programs for fathers (McBride & Darragh, 1995), and research on how fathers interact with their children is limited. In order to plan intervention programs for fathers, we need to increase our knowledge about the quality of father-child interactions and how fathers interact with children at different ages. Nursing has the potential to further influence the development of the young child by implementing parenting intervention programs that focus on the father-child relationship. There is some evidence that such parent education and support programs increase father participation in interaction and accessibility (Mahoney, Wiggers & Lash, 1996; McBride, 1991). As it stands now, the availability of intervention programs for fathers needs to be expanded,

fathers need information on alternative roles for fatherhood, and health care professionals need to know the impact of intervention programs on the quality and type of father-child interactions (McBride & Darragh, 1995). Evidence-based nursing on the contribution of father interactions to child development can provide direction for intervention programs for fathers of young families (Magill-Evans & Harrison, 1999).

In the near future, Lamb (1997b) believes that the most important advances in father-infant relationships will involve determining how interaction patterns within the family system affect infant development. Lamb contends that we know selected father and infant characteristics influence the father-infant interaction but we do not know how these influences complement and supplement one another. Some of the characteristics that may influence father-child interaction are the child's age and gender. Father-child interactions may also differ by context. For example, the pattern of interaction may vary in play as compared to more structured interaction.

In order to increase our understanding of father-child dyads, information is needed about the characteristics of fathers, infants, and toddlers related to interactions in father-child dyads before further research is done on interventions with fathers and their young children.

Statement of the Problem

The information about fathers in families is limited (Tamis-LeMonda & Cabrera, 1999). Most of the research on fathers has measured father involvement in terms of quantity of time spent with children rather than quality of interaction. It is important to emphasize that there is no evidence linking the amount of contact with desirable child outcomes (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000).

There is a paucity of research that examines the associations between father characteristics, child characteristics, father involvement and father-child interaction. The majority of the studies on parent-child interaction used samples of mothers and their children but mother-child interaction cannot be used as a proxy for father-child interaction (Tamis-LeMonda & Cabrera, 1999). There may be similarities between parents in their interactions (Biernat & Wortman, 1991), but there may also be differences (Harrison & Magill-Evans, 1996). In summary, more information is needed on father-child interaction.

This study will examine the relationships among father characteristics, child characteristics, and father-child interactions specifically in a teaching situation. Father and child behavior will be measured using the Nursing Child Assessment Teaching Scale (NCATS). Scaffolding is a teaching strategy that can be used to promote development of a child (Pratt, Kerig, Cowan & Cowan, 1988). The study will also examine whether a scaffolding subscale can be identified among items in the NCATS.

The findings from this study will add to our knowledge of father-child interactions as a basis for designing more effective intervention programs for fathers and their children. The results of the study may provide the practitioner with an additional subscale in the NCATS to measure parental scaffolding during a teaching interaction.

Purpose of the Study

The purpose of this descriptive study was to explore the relationship of selected characteristics of the father (age and education) and selected characteristics of the child (age, gender and birth order) to the father-child interaction in a teaching situation.

Research Questions

1. Which characteristics, father's age, father's education, child's gender, child's age, child's birth order, predict the father's behavior and the child's behavior in the teaching interaction after controlling for the father's involvement with the child?
2. Can a subscale score for parent scaffolding be identified in the Nursing Child Assessment Teaching Scale?

Definition of Terms

Interaction (Dependent Variable): "a reciprocal process in which each member of the dyad sensitively observes and adjusts personal behavior to the other member" (Brazelton, 1988).

Involvement (Independent Variable): the father's participation in caring for and being with his child. In this study, this variable is operationalized as the number of times the father had sole responsibility for the care of the child while the mother was at work, busy, or away from the home in the past week.

Scaffolding (Dependent Variable): adult guidance during interaction that leads the child to solve problems collaboratively that could not be solved alone, within the learner's moving zone of proximal development (Greenfield, 1984).

Chapter II

A REVIEW OF THE LITERATURE

A literature review was done in order to identify and examine significant father and infant characteristics associated with interaction between fathers and children under 24 months of age. The following literature is presented in five sections: first, the history of fathering, limited to the 20th century, is discussed. Second, the importance of fathers in child development is considered. Third, conceptual frameworks for father-child interaction and father involvement are discussed. Fourth, the impact of father characteristics and child characteristics on father-child interactions are reviewed. Finally, scaffolding in didactic and social interaction is presented. The focus of this study is on father-child interaction for children under preschool age. The quality and actual process of interaction in a teaching situation is emphasized and the literature review concentrated on research in these areas.

History of Fatherhood

The available evidence on the history of fatherhood (society's norms, values and beliefs about parenting) suggests that the "culture of fatherhood has changed more rapidly than the [actual] conduct" of fatherhood, what fathers do and their paternal behaviors (LaRossa, 1988, p. 451). Rustia and Abbott (1993) have supported LaRossa's thesis in their longitudinal study on father involvement in infant care. Many fathers do not fulfill society's increased expectations for equitable co-parenting and active father involvement (McBride & Rane, 1997).

The recent literature has emphasized the fact that the role of the father has been changing (Horn, 2000; LaRossa, 1997; Pruett, 1998; Tiedje & Darling-Fisher, 1996).

Rotundo (1985) suggests that it became easier for fathers to enjoy warmth, play and intimacy with their children as early as the late nineteenth century but it was not until after World War II that the trend toward more emotional involvement of fathers and more active male participation in child rearing became evident.

Pleck reported some of the first evidence of father involvement in the literature in 1979. Fathers, whose wives were working, unlike men in earlier studies, were beginning to get involved in childcare. Rotundo (1985) found that father involvement around 1970 was helping to form the basis of a new style of fatherhood, androgynous fatherhood, which has persisted to the present. Stimulated by a rise of the women's movement and women entering the workforce, androgynous fatherhood led to a new set of ideals that minimized the difference between the sexes. In this view, men and women are seen as fundamentally alike with similar qualities distributed randomly across the boundaries of gender. Because of the changing emphasis on fatherhood, researchers recognized fathers as "forgotten contributors to child development" (Lamb, 1975).

Although there has been considerable research on the development of father-infant relationships since the 1970s, most of it was completed on traditional families where the mother stays home, and the father is the sole breadwinner (Lamb, 1997a) which restricted the generalizability of the results. Pruett (1998) reminds us that fathering in various types of families continues to be underrepresented in the child development literature.

Early research sought to determine whether (and when) infants formed relationships with their fathers (Lamb, 1975). Once it was determined that infants do become attached to their fathers (e.g. Ferketich & Mercer, 1995a; Fox, Kimmerly & Schafer, 1991; Jones, 1981; Lamb, 1977; Mercer, Ferketich, May, DeJoseph, & Sollid, 1988), the research

community then turned their efforts towards defining the similarities and differences between mother and father relationships with their children (e.g. Belsky, Gilstrap, & Rovine, 1984; Dickie & Gerber, 1980; Kotelchuk, 1976; Lamb, 1975, 1997b; Lamb, Frodi, Hwang, Frodi & Steinberg, 1982; Landerholm & Scriven, 1981; McLaughlin, White, McDevitt, & Raskin, 1983; Pruett, 1995). We know that fathers and mothers are sensitive and responsive in their interactions with their infants (Lamb, 1997b) and that social conventions underlie the traditional division of parental responsibilities for some, but not all, fathers (Lamb, 1997b; LaRossa, 1997; Rotundo, 1985). With the exception of lactation, there is no evidence to support the belief that women are predisposed to be better parents than men (Lamb, 1997b) and in fact it can be argued that motherhood and fatherhood are more alike than not (Kotelchuk, 1976; LaRossa, 1997; Rotundo, 1985).

The Importance of Fathers in Child Development

The role of fathers in the development of their child is reviewed in two areas. First information is presented on the importance of parenting during the period of infancy and preschool. Second, research on the father's impact on child development is outlined.

Why is Parent-Child Interaction so Important?

Mother-child interaction and its impact on child development has been well researched (e.g., Barnard, Bee, & Hammond, 1984; Barnard et al., 1996; Beckwith, 1971; Bee et al., 1982; Belsky, Taylor & Rovine, 1984; Bornstein, 1988; Kelly et al., 1996; Morisset, Barnard, Greenberg, Booth & Spieker, 1990; Stevens, Blake, Vitale, & MacDonald, 1998; Streissguth & Bee, 1972). Measures of mother-infant interaction taken in the first year of life are among the best predictors of later IQ and language performance in the child (Bee et al., 1982). The influence of environmental risk on young

children's cognitive and linguistic competence is meditated by the quality of early mother-child interaction (Morisset et al., 1990). Because interactive quality has been shown to have an independent effect on a child's cognitive development, it must be a focus of early intervention (Kelly et al., 1996).

Some researchers suggest that father-infant and mother-infant interaction may differ substantially in character (Harrison & Magill-Evans, 1996; Lamb, 1975; Pruett, 1995; Tenenbaum & Leaper, 1998). In contrast, Bornstein et al. (1992) postulate that there is little difference in father-child and mother-child interaction. Still others posit that there are both similarities and differences (Belsky, 1979; Lamb, 1997b; Worden, Kee & Ingle, 1987). We need to examine the experience of fathers directly, rather than relying on data from mothers as proxies for fathers (Tamis-LeMonda & Cabrera, 1999). The mother-child and father-child relationships require separate analysis (Parke, 1995) before we can begin to analyze the triad of mother, father and child.

Given the fact that the preschool years of life are important in terms of child development (Bornstein, 1995), it is surprising that there is little definitive literature on the quality of interaction between fathers and their preschool children. Most studies of father involvement find quality and quantity of interactions to be unrelated (Grossman, Pollack, & Golding, 1988; Radin, 1994) but direct father-child interaction is an important indicator of the quality of father involvement. Just as earlier research showed evidence that quality rather than quantity of mother-child interaction was an important predictor of cognitive and social development, a similar relationship appears to hold for fathers as well (Marsiglio, 1991; Parke, 1995).

The Impact of the Father on Developmental Outcomes

There is evidence that fathers have positive effects on their child's development. The first evidence that fathers were important to their child's development came out of the child psychology literature and was given the term 'father involvement'. Preschool children with highly involved fathers are characterized by increased empathy, increased intellectual development, increased social competence, less-stereotyped beliefs, and a more internal locus of control (Pleck, 1997; Pruett, 1983; Radin, 1986). Nugent (1991) found that paternal involvement in caretaking such as talking and playing with the child had an independent effect on infant cognitive development in addition to infant state behavior. Amato's (1998) review of relevant father-child studies looked at men's contributions to their children's lives apart from that of being the breadwinner. He found that the quality of the father-child relationship was positively associated with children's well-being and development. Many researchers however have indicated that the lack of a clear and consistent definition of father involvement has been a major obstacle to research on the paternal role (Lamb, 1995, Pleck, 1997; Pruett, 1998; Tamis-LeMonda & Cabrera, 1999).

In summary, there is some evidence that fathers make a unique contribution to their child's development (Parke, 1995; Pruett, 1988). The amount of time that fathers and their children spend together appears to be less important than what they do with that time and how fathers, mothers and important people in the lives of children value and facilitate the father-child relationship (Lamb, 1995).

Conceptual Frameworks for Father-Child Interaction and Involvement

There are three major conceptual frameworks that have been developed and used to describe father-child relationships: Lamb's model of father involvement (Lamb, Pleck, Charnov & Levine, 1985), Bornstein's (1995) typology of human interaction and Barnard's model of parent-child interaction (Barnard et al., 1989). All three models and related research are reviewed. The Barnard model is the conceptual framework used in this study.

Lamb's Model of Father Involvement

Lamb and his associates (1985) proposed a model of paternal involvement consisting of three dimensions: (1) father's accessibility or availability to his children regardless of the actual interactions between father and child, (2) father's responsibility for his children and participation in such tasks as selecting a pediatrician and making appointments, selecting daycare centres or babysitters, arranging care of sick children, and monitoring the children's whereabouts and activities, and (3) father's actual interaction or engagement with his children in play or caregiving. These three dimensions facilitate analysis of the various forms of father and child relationships.

Responsibility has been the least investigated construct (Horn, 2000; Lamb et al., 1985) because it has been hard to operationalize (Doherty, Kouneski, & Erickson, 1998) but it has been proposed as the most important component of father involvement (Tamis-LeMonda & Cabrera, 1999). Pleck's (1997) review of father involvement found that we

have yet to identify any task in caring for a child for which fathers have primary responsibility.

It is clear that fathers are spending more time interacting with their children than did fathers one or two generations ago (Pleck, 1997). Fathers' interaction time in the 1980s and 1990s were two-fifths that of mothers (43.5%), an overall increase of about a third in interaction time for fathers since the 1970s. Pleck reported evidence that fathers' caregiving and play with their children, although still less than mothers, had increased by 33% over the past generation in the United States as a whole.

Several researchers found that fathers spend less time than mothers in all three dimensions of father involvement. For example, when Jump and Haas (1987) looked at father participation (interaction in caregiving, in social development, in cognitive development such as teaching and play interaction, and for affective needs) they found that the fathers were participants in all domains but spent significantly less time than the mothers in all categories of involvement.

Levant, Slattery, and Loiselle (1987) found that mothers spend more time in child care and household chores than fathers do. The employment of wives had no effect on time spent in child care or household chores by either parent. However, their results differ from Barnett and Baruch (1987) and Jones and Heermann (1992) who found that maternal employment moderates father involvement. The more hours the mother works the more time fathers spend in caregiving and interacting with the child. The Levant et al. findings are consistent with McBride and Mills (1993) who found that mothers spend significantly more time in interaction with and are more accessible to their preschool children than fathers. Pleck (1983) contends that the husband's proportional share of the

family work increased over time not because they were doing more but because their wives were doing less.

In general, studies that looked at father involvement with the child usually focused on the amount of time spent with the child. Research on father-child relationships needs to differentiate more clearly between involvement and interaction.

Bornstein's Modes of Human Interaction

Bornstein (1995) described parent–child interaction as 4 modes of caretaking/caregiving. In order of importance to the child, these were: a) nurturant interaction or caregiving which meets the physical requirements of the infant in providing sustenance, protection, supervision, and grooming, b) social caretaking or interaction which is comprised of the physical and verbal strategies parents use to express their feelings and to engage their young in interpersonal exchanges such as rocking, kissing, physical comforting, smiling, non verbal vocalizing, playful face-to-face contact as well as game play, c) didactic interaction which includes the transmission of knowledge from parent to child by stimulating and arousing the child to the environment outside the pair, and finally, d) material interaction or ways in which parents provide and organize the child's physical world. Bornstein argues that these four domains constitute coherent but mutually distinctive constructs.

Bornstein (1989) contends that caretaker interactions may exert an influence in child development because of their cumulative nature and that different modes of interaction yield specific child developmental outcomes and therefore influence specific aspects of growth and development. For example, Bornstein and associates (1992) studied 34 toddlers from 13 to 20 months of age. They hypothesized that didactic interactions would

relate to the toddler's language abilities (not competencies in play) whereas parent's social interactions would relate to toddler's play competencies (not language development). Their hypothesis was partially supported. Father didactic interactions at 13 months did predict toddler language development at 20 months but not play skills at 20 months. However, father's social interactions at 13 months did not predict either toddler language or play competencies at 20 months. The failure to demonstrate that social interaction relates to play skills may be because types of play were not stable across the second year.

Although this area of research has not been well developed, further research on parent-child interactions needs to differentiate the type of interaction as specific modes of interaction may relate to different outcomes in child development (Bornstein et al., 1992; Tenenbaum & Leaper, 1998). The focus of this study is on social and didactic interaction (not nurturant or material interaction) between fathers and their children.

Barnard's Process of Parent-Child Interaction

While Bornstein (1995) describes the types of parent-child interaction, Barnard et al. (1989) describes the process of parent-child interaction without actually defining the term interaction. Barnard believes that the parent-child dyad is influenced by the individual characteristics of each member and that these individual characteristics are modified to meet the needs of the parent-child relationship.

Barnard's Child Health Assessment Interaction Theory, which supports the Barnard Model, is made up of three major constructs that are said to influence an infant's developmental process, Child, Caregiver and Environment. These three constructs overlap each other in three concentric circles depicting interaction at the centre. The Child is described in terms of its characteristics such as age, gender, and birth order and

how these variables affect the child's ability to adapt and interact with the caregiver. Caregiver refers to either mother, father, or other caregiver and includes the individual's characteristics (e.g. age, education) which affect the caregiver's ability to adapt and interact with the child. Environment represents the environment which surrounds the child and the caregiver and includes all experiences encountered by the child, i.e. people, objects, places, sounds, visual and tactile sensations. Characteristics of the environment include aspects of the physical environment of the family, the caregiver's presence and influence, and opportunities and materials provided by the caregiver for the interaction. The interaction among the three components constitutes the ecological foundation of the developing child and provides a basis for assessment and intervention programs (Barnard, Eyres, Lobo, & Synder, 1983; Koniak-Griffin & Verzemnieks, 1995).

Barnard et al. (1989) proposed that there are four attributes of parent-child interaction. First, the partners in the relationship must each possess a sufficient repertoire of behaviors so that sequences are possible and a smooth-flowing interactive system develops in order for the child to receive the quality and quantity of stimulation needed for optimum development. Barnard and associates, call it a "mutually adaptive dance between partners". Thoman and Browder (1987) believe that babies are born dancing and already have the repertoire of behaviors when they are born. A second critical feature of parent-child interaction is that the responses of the dyad must be contingent on one another and both halves of the partnership are important. As the child matures, consistency in contingent responsivity on the part of the parent is crucial to the child's cognitive competence (Beckwith & Rodning, 1996). The third element is the richness of the interactive content. The amount of time the parent spends with the child, the amount

of verbal stimulation, the degree of positive affect she/he brings to the child, and the range of materials or toys she/he provides to the child are all related to later social or cognitive skills in the child (Bornstein, 1989; Lamb, 1997b). The fourth element is that the adaptive patterns between the dyad must change over time relative to the developmental stage of the child (Barnard et al., 1989; Tamis-LeMonda & Bornstein, 1987). The interaction that a 12 month-old-infant requires is different from what a 24-month-old toddler requires. As the child gets older there is a shift in the burden of responsibility for the interactive pattern and the parent's undivided attention decreases (Belsky, Taylor et al., 1984).

Parents and children have certain responsibilities to maintain the interaction (Barnard, 1997a). The socially competent parent is responsible for contingently responding to the child's communication cues, alleviating the child's distress and providing opportunities for social, emotional and cognitive growth and learning. The socially competent child is responsible for producing readable, predictable cues and being contingently responsive to the parent (Barnard et al., 1988; Dickie & Gerber, 1980). Barnard (1997a) suggests that the ability of the parent or caregiver to interpret infant behavior and respond contingently known as sensitivity to cues, as well as the child's ability to give clear behavioral cues known as clarity of cues, influence the quality of the parent-child interaction. Parent behavior in interactions is a major determinant in the intellectual growth of the child (Bornstein, 1989; Broom, 1998; Dickie & Gerber, 1980; Lamb et al., 1987; Parke, 1990; Wood, 1980).

Impact of Father Characteristics and Child Characteristics On Father-Child Interactions

Barnard et al. (1989) proposed that characteristics of the child and characteristics of the father influence father-child interaction. Although Russell and Radjoveic (1992) argue that there are many antecedents to father-child interaction, this study will focus on selected personal characteristics of the father and child (paternal age, education and child age, gender and birth order).

Multiple domains of influence can determine the extent and quality of father involvement and father-infant interactions and the characteristics of the father are probably the most influential in determining a father's parenting style (Belsky, 1984). Lamb (1997a) argues that the important characteristics of the father as a parent such as warmth, closeness, and involvement rather than the characteristics of the father as a man appear to influence child development. Because of the difficulty in defining the concepts and the inconsistent use of measurement tools to measure father involvement and father-child interaction, it is difficult to generalize findings across studies. However, the following studies are meaningful because they represent initial attempts to understand the relationship between father and child characteristics, father involvement and father-child interaction in a teaching situation.

Father's Age and Interactions

Studies on father age and father interactions with infants and toddlers have used a variety of methods; however most studies used self-report (e.g. De Luccie, 1996;

MacDonald & Parke, 1986; Marsiglio, 1991; Tiedje & Darling-Fisher, 1993). Other researchers used observation in the home (Broom, 1994) or observation and self-report combined (Volling & Belsky, 1991) to measure father involvement and interaction. Each study used a different tool to measure involvement or interaction in their samples of fathers with infants and/or toddlers. The samples were predominantly Caucasian and there is little research on young adolescent fathers (Lerman, 1993).

Father age is a significant predictor in some studies but the findings conflict. Volling and Belsky (1991) found that father age was one of the best predictors of father interaction with firstborn children at 3 and 9 months of age. Older fathers engaged in more responsive, stimulating, and affectionate interaction with their three and 9 month old infants and provided care more often to their older infants. Using self-report to measure father participation in child care, Tiedje and Darling-Fisher (1993) found that father age predicted the father's participation in playing for fun with the child, but older fathers were less active participants in such play. Tiedje and Darling-Fisher also reported that father age was not a predictor of participation in physical care of the child nor in teaching activities with the child. De Luccie (1996) in a study of 144 fathers ranging in age from 26 to 60 years, found that older fathers were less frequently involved in child rearing and the fathers felt parenting was less satisfying and not as important. MacDonald and Parke (1986) also found that older fathers were less active in parenting, playing less with their children. Other studies found that father's age was not a significant predictor of parental sensitivity for 3 month old infants (Broom, 1994) or father involvement with newborn and children to age 4 years (Marsiglio, 1991).

A limitation seen in some of the previous research is the confounding of paternal age and the timing of first fatherhood (Daniels & Weingarten, 1982). In a study using rigorous methods, Cooney, Pederson, Indelicato, and Palkovitz (1993) found that late fathers (30 years and older) with their first child reported significantly more involvement with their children than fathers 23 years of age and under or 24-29 years. One possible explanation for this finding is that late-time fathers (median age of mothers was 30.5 years) with more established careers may have more time for active parenting (Daniels & Weingarten). Cooney and colleagues argue that fathers 30 years and older are more able than younger fathers to be active parents and to feel positive about the experience because of reduced demands in other social areas.

Men who delay fatherhood are significantly different from men who father their first child during their 20s in the quantity and quality of time they spend with their children (Heath, 1994). Heath reported that men who fathered their first child after 35 years spent more time in their fatherhood role than men who became fathers at a younger age and were more nurturant using greater amounts of praise and physical affection (e.g., hugs) in their interactions with their children. Perhaps late parenting more often reflects planned behavior and opportunities for anticipatory rehearsals for the father role, whereas early parenting is more commonly unplanned.

The age at which parents have their first born child is changing and couples are having children at later ages (Ross, Scott & Kelly, 1996). Therefore, the most intensive period of parenting is now likely to occur when Canadian parents are in their thirties possibly providing children with a different set of experiences than in the past when more couples had their first child in their twenties. With the trend for couples to delay parenthood until

they are well established, it is important to further explore the effects of paternal age on father-child interactions.

Father's Education and Interactions

Maternal lack of educational, interpersonal and financial resources constitute risk factors for children's developmental outcomes (Barnard et al., 1993; Morisset et al., 1990). There is some evidence that higher levels of paternal education are positively associated with children's developmental outcomes (Amato, 1998). However, there is a paucity of studies on the association between paternal education and father-child interaction for infants and toddlers and the findings are inconsistent.

Tiedje and Darling-Fisher (1993) found that father education was an important predictor for participation in some child care activities but that the relationship between the variables differed between studies. Higher paternal education was associated with increased participation in childcare in the Tiedje et al. (1990) study. In contrast, in the Darling-Fisher (1987) study, which used the same method of data collection, less educated fathers had higher participation in child care. The different findings may be due to differences in samples. Fathers in the Darling-Fisher study were on average 7 years younger than fathers in the Tiedje et al. study and had lower annual family incomes.

Other studies found that father education was a significant predictor of father-child interaction and father involvement. For example, Ninio and Rinott (1988) using the Lamb et al. (1985) model of father involvement and father self report found that more educated fathers were more involved in social interactions with their 9 month old infants. In a separate study that used a combination of home observation and self-report, Volling and Belsky (1991) found that more educated fathers stimulated, responded to, and provided

care more often to their 9-month-olds. Shields and Sparling (1993) confirmed previous findings that the better educated fathers who were also older showed higher scores for quality of physical involvement with the 3 month old child than less educated fathers. In this latter study, it is not possible to determine whether the involvement was related to age or education.

A few studies found that father education was not a significant predictor of father-child interaction for infants and toddlers. For example, Marsiglio (1991) and De Luccie (1996) found that the father's educational level was a poor predictor of the father's self reported level of involvement with the child. The De Luccie sample may have lacked adequate variation as 73% of the fathers were college graduates.

Biernat and Wortman (1991) posit that it is likely that higher education among fathers has a liberalizing effect, making these men seem less traditional and more likely to participate in child care such as teaching skills and interactive play. Possibly older, more educated fathers have more knowledge about the importance of parenting activities for child development and therefore may spend more time interacting with their child in an appropriate manner (see Cooney et al., 1993). Further research is needed with infants and toddlers in order to confirm this hypothesis.

It has been suggested that the father may decide how much he participates in the care of the child based on the child's characteristics (Cummings, 1976). Recent research has shown that the child's characteristics influence the father. This relationship however, has been studied much less extensively than the influence of the father on child development.

Some researchers have found that child characteristics are stronger predictors of fathers' interaction activities than paternal or maternal characteristics (Ambert; 1992;

Marsiglio, 1991; Shields & Sparling, 1993) while other researchers argue that child characteristics have the least influence on father-child interaction (Belsky, 1984; Woodworth, Belsky, & Crnic, 1996). How does the infant influence the development of the father's relationship with the child? Child characteristics such as gestational age, general health, failure to thrive, neurological development, temperament, age, sex, birth order, and social competence may all influence the fathering role (Graham, 1993; Rustia & Abbott, 1993; Tiedje & Darling-Fisher, 1993; Volling & Belsky, 1991). This study will look at three of these child characteristics: gender, age and birth order. The following literature review is primarily limited to parents of infants and toddlers.

Child's Gender and Interactions

The child's gender has been an inconsistent predictor of parental behavior in previous studies (Belsky & Volling 1987; Braungart-Reiker, Garwood, Powers, & Notaro, 1998; Ninio & Rinott, 1988) with infants and toddlers. One of the possible reasons is limited statistical power arising from small sample sizes (e.g. Graham, 1993).

When Broom (1994) looked at mothers' and fathers' interactions with their infants as measured by the NCATS, she found that the gender of the child was not a significant predictor of the teaching interaction. These findings lend support for Belsky's (1984) claim that infant characteristics are the least important variable in determining competent parenting.

On the other hand, many studies showed the effects of child gender on father-infant interactions. Easterbrooks and Goldberg (1984) found that both qualitative and quantitative aspects of fathering were more strongly related to the development of sons than they were to the development of daughters. There was a tendency for fathers to

spend less time with their toddler daughters than sons. The data supports Lamb's (1997b) review emphasizing the significance of the father-son relationship.

Fathers vocalize more to their infant girls than to their boys during father-infant interaction (Jones, 1981; Palkovitz, 1984). Jones discovered that the sex of the infant strongly influenced fathers' perceptions of their infants in verbal and nonverbal father-infant interactions and in play and caretaking. Fathers had more positive perceptions of their less irritable girls than they did of their less irritable boys. In a later study (Jones & Heermann, 1992), child gender was a better predictor of parental caregiving for fathers than for mothers. It was suggested that fathers have more options as to when and how they will participate in infant care, whereas mothers are the primary caregivers regardless of infant characteristics. Jones and Heermann also found that other factors such as maternal employment and father age were better predictors of paternal caregiving than infant characteristics.

There is evidence to suggest that fathers treat boys and girls differently. In a longitudinal study, Cowan, Cowan and Kerig (1993) looked at fathers of first-born sons and daughters and found that fathers exhibited more increasing authoritarian interaction with daughters than with sons as marital conflict increased. In other words, they treat their sons well regardless of marital satisfaction and treat their daughters the way they treat their wives. Kelley, Smith, Green, Berndt, and Rogers (1998) found that African-American fathers were more sensitive in their freeplay interactions with their daughters than their sons but they did not include marital quality as a variable. On the other hand, Belsky, Gilstrap et al. (1984) failed to find evidence that fathers prefer to interact with sons at least through the first nine months of life.

Fagot and Hagan (1991) studied three age groups of children: 12 month olds (n = 92), 18 month olds (n = 82) and five year olds (n = 192) and found several differences in mothers' and fathers' reactions to boys and girls during the three age periods. Overall, there were more significant differences in parent reactions to toddler boys and girls than infant boys and girls and no differences in parent reactions were seen at 5 years of age. In a later study, Fagot and Kavanagh (1993) found that fathers of infants and toddlers gave more positive reactions to boys and more directions and instructions to girls.

Most of the evidence indicates that fathers are more involved with sons than with daughters (De Luccie, 1996; Dickie, 1987; Marsiglio, 1991) and fathers of sons report greater satisfaction with their fathering role than fathers of daughters (De Luccie, 1996). Fathers lifted and held their 3 month old sons more than their daughters in the Shields and Sparling (1993) study implying that parents may interact more with infants of their own gender. The child may also be more inclined to approach their same-gender parent when they wish to discuss important issues or do certain things (Marsiglio, 1991) and sons may be more effective in drawing their fathers into active engagement (De Luccie, 1996). Radin (1994) noted that there is greater stability over time in the father's degree of involvement with his sons and she assumes that perhaps it is an indication that father involvement is related to the father's paternal identity. "If boys do establish closer relationships with their fathers than do girls, they may be more likely to be positively affected than girls by their fathers" (Marsiglio & Cohen, 1997, p. 237). In a 20-year longitudinal study by Furstenberg and Harris (1993), boys consistently reported being closer to their fathers than did girls. Fathers with sons provide more infant care than fathers with daughters (Dickie, 1987; Jones & Heermann, 1992; Rustia & Abbott, 1993)

and the lowest level of paternal involvement is for daughters with no brothers (Harris & Morgan, 1991). Harris and Morgan contend that living with a brother may increase a girl's chances of experiencing greater father-daughter interaction although they still receive unequal attention. Levy-Shiff and Israelashvili (1988) found that fathers of infant boys were more involved in play and affiliative behaviors such as teaching, but not caregiving, than were fathers of infant girls. However, there is some conflicting evidence. Tiedje and Darling-Fisher (1993) found their study contradicted previous assumptions that fathers participate more if there are boys in the family; in fact the data indicated that fathers participated more in physical care and play activities if there were girls in the family.

Despite the prominence in some of the literature, the impact of child gender on interactions with fathers and mothers appears to have received limited attention. Leaper, Anderson, and Sanders (1998) in a recent meta-analysis looked at the evidence on gender effects and how parents talk to their children and found that there were not enough available studies to perform a meta-analysis of child gender effects on fathers. They hypothesize that, as more studies of father-child interaction become available, this type of analysis will become possible. Ambert (1992) posits that one of the reasons that researchers pay only lip service to the possibility of a child effect is that they are not comfortable with the idea that children are co-producers in their own development and can affect parents in ways not usually recognized. Consequently, the concept is minimized in child development, family, sociology, and nursing research programs. For these reasons, the effect of child gender needs to be studied more closely.

Child's Age and Interactions

The age of the child is the strongest predictor of father involvement and satisfaction (De Luccie, 1996; MacDonald & Parke, 1986) with infants and toddlers. MacDonald and Parke in a seminal study found that there is an increasing disparity between boys and girls as they get older and their frequency of play with the father, suggesting that boys receive more prolonged intensive exposure to physical play than girls. Fathers play more with older children; as children develop, fathers take on a larger role in physical play. Physical play is most common in early infancy and into the preschool years. Fathers are frequently responsible for the older children while mothers are caring for the infant (Belsky, Gilstrap et al., 1984; Jones & Heermann, 1992).

Harrison and Magill-Evans (1996) compared 54 fathers interacting with their term infants at 3 months and again at 12 months of age. The infants interacted with their fathers better at 12 months of age than at 3 months of age while the opposite was true for the fathers. The fathers had less response to the child's distress and social-emotional growth fostering at 12 months of age than at 3 months of age. There is no obvious explanation for these findings.

Marsiglio (1991) examined two subsamples of children birth-4 years of age (n = 394) and 5-18 years of age (n= 1071) focusing exclusively on engagement (interaction) activities. The father's most frequent interaction with the children in both age groups was playing with them at home. Fathers were also more likely to read to older children and play with younger children in the preschool group.

There is a shift in parenting strategies between the ages of 1 to 5 years, from positive support, caregiving and play to that of direction and teaching the child. Fagot and Hagan (1991) discovered that fathers start later than mothers in using verbal instructions and directions with their toddler children. That is, mothers start to use more instruction and direction with 18-month-olds, but by 5 years, both parents use equal amounts of instruction. Eighteen-month-old toddlers received more negative reactions, from fathers and mothers, than 12-month-old infants or 5-year-old preschoolers. This data suggests that 18 months is a critical age because it is at this age that the child is being exposed to instructions and directions, probably as a function of their increased language skills and they are more engaged with their parents than at any other age (Fagot & Hagan, 1991).

In a longitudinal study, Jones and Heermann (1992) looked at children at 1 month (n=342), 6 months (n=323) and 12 months of age (n= 310). Fathers did more caregiving as the child got increasingly older. This may be because the father was more comfortable caring for the older child as the needs of the infant changed and as the child became more predictable over the first year in terms of established routines.

Fagot and Kavanagh (1993) included seventy 12-month-olds (infant sample) and sixty-seven 18-month-old children (toddler sample) in their study. Observers rated fathers of infants as liking their children more than fathers of toddlers ($p<.001$) and a trend for fathers to take more pleasure in child rearing their 12-month-old in comparison to an 18 month-old. Fathers also gave more positive reactions to infants and more instructions and directions to toddlers, a finding similar to Fagot and Hagan (1991). Infants showed more passive behavior while the toddlers showed more communication attempts, not a surprising finding given the physical and language differences between an infant and a

toddler. Parents of 18-month-old children face more challenges as their children require more management skills than parents of 12-month-old children.

In comparing children across five developmental periods from toddlers to school-age children, De Luccie (1996) found that fathers were more frequently involved with younger children and sons than with older children and daughters. She also found that fathers of younger children had more maternal support for father involvement and believed that father involvement was important.

In summary, it appears that the amount and type of interaction changes with the age of the child. It has been established that child age is a predictor of father involvement and satisfaction however, some researchers found that fathers were less involved (De Luccie, 1996; Fagot & Kavanagh, 1993) with their children as the child got older while others found that fathers were more involved (Jones & Heermann, 1992; MacDonald & Parke, 1986) as the child got older. As discussed earlier these findings are also influenced by the gender of the child.

Child's Birth Order and Interactions

Birth order of the child has been studied extensively in the child development literature on mother-child interaction (Ambert, 1992) but not on father-child interaction. There is inconsistent evidence to suggest that birth order predicts father interactions with infants and toddlers. Some studies showed that birth order is a predictor of father-child interaction (Belsky, Gilstrap et al., 1984; Jones & Heermann, 1992; Rustia & Abbott, 1993) while other studies found no evidence for this (Ferketich & Mercer, 1995a, 1995b; Marsiglio, 1991). Some studies have found that fathers spend more time interacting with first born than later born children (Donate-Bartfield & Passman, 1985; Ninio & Rinott,

1988; Shields & Sparling, 1993) after 3 months of age. Although later born children receive less attention than first-born children, their arrival still signals a decrease in parental attention to the older sibling (Petersen & Rollins, 1987). Harris and Morgan (1991) maintain that, "the most advantaged son is [still] the only son" (p. 540).

Belsky, Gilstrap et al. (1984) looked at stability and change in father-infant and mother-infant interaction between 1, 3 and 9 months of age in a seminal study, the Pennsylvania Infant and Family Development Project. They found evidence that parents are susceptible to birth order effects even when there were no differences in the behavior of first-borns (n=41) and later born (n=31) children. They also found that the father's interaction with the child was more affected by the birth order than that of the mother possibly due to the father's experience or inexperience rather than responses to behavioral differences between first-and later-born babies. Belsky, Gilstrap and associates suggest that as the infant develops and fathers become more experienced, the father becomes more comfortable in the parenting role.

Jones and Heermann (1992) found that the number of children was a good predictor of direct care and therefore involvement. Fathers did less direct caregiving of the new infant at one month and presumably more caregiving of the older children in families with more than one child. They suggest that younger fathers with fewer children or one child give more care to the newborn infant. However, Marsiglio (1991) found evidence to suggest that the number of minor children in the family, in the birth-4 age group, was not a significant predictor of self-reported levels of father interaction.

Rustia and Abbott (1993) predicted that multiple–time fathers would perform more infant care tasks than first-time fathers because of prior learning. However, first-time

fathers reported doing more infant care than multiple-time fathers with significant differences between the two groups for three tasks: comforting a fussy infant, encouraging vocalization, and getting up at night with the infant. Multiple-time fathers reported doing more infant care for their sons than their daughters, a finding inconsistent with Belsky, Gilstrap et al. (1984). However, Rustia and Abbott found that first-time fathers of male infants and first-time fathers of female infants cared for their infants equally, a finding replicated by Belsky, Gilstrap and others. They posit that more wives of first-time fathers were working, multiple-time fathers may have been more involved in the care of older children, or that this cohort of first-time fathers were more exposed to society's current expectations that fathers participate in child care.

In contrast, Ferketich and Mercer (1995a) claim that "the love relationship developed with a subsequent child is as unique as with the first child" (p. 35). Paternal infant attachment in 93 inexperienced (first-time) fathers was compared with 79 experienced fathers (with one or more previous children) at postpartum, 1, 4, and 8 months following birth and no differences were found between father-infant attachment in experienced or inexperienced fathers. Ferketich and Mercer (1995b) used the same sample again and looked at paternal competence of experienced and inexperienced fathers. Their findings suggest that after fathers adjust to parenthood with the first child, the birth of the second or later child leads to no change in the father's perception of his ability to meet the demands of parenting. These results may be due to the fact that fathers of subsequent children know that there will be changes in family routines and relationships the first year following childbirth. Some of the limitations seen in this study may have been the instrument's lack of reliability to measure the change a parent makes in becoming the

parent of the second or later child and the high attrition rate leading to a smaller sample size.

Evidence of parental sensitivity related to experience with children is conflicting. Donate-Bartfield and Passman (1985) found that inexperienced mothers and fathers responded more contingently to their first-born infant's cries than to their later born infant's cries. It is possible that sensitivity to infant cues may be more superior for new parents as they may be compensating for their lack of experience in parenting. Conversely, Broom (1998) found that fathers of two children had greater parental sensitivity on the NCATS and suggests that it may be owing to their increased experience with children.

The child effect of birth order is an important area to study in asking questions about how later-born children affect their fathers in comparison to first born children. Further research will help to clarify birth order effects of children on the interaction between fathers and children.

In conclusion, much of the research on father and child characteristics and interaction came from the father involvement literature and focused on the quantity of time spent with the child rather than the quality of interaction between the father and child. The limited literature that addressed father-child interactions focused mainly on play or caretaking and infrequently on teaching.

Belsky (1984) argues that the characteristics of the father are the most influential in determining the quality of the father's interactions with the child. Findings suggest that father's age influences the father-child interaction but the results are equivocal, particularly as the age of first-time fatherhood increases in society. Fathers' education is a

stronger influence in the father-child interaction but inconsistencies are evident. Some evidence indicates that while there is increased frequency of interaction between children and fathers with higher education (Ninio & Rinott, 1988; Shields & Sparling, 1993; Tiedje et al., 1990) there is also evidence that there is increased frequency of interaction between children and fathers with less education (Darling-Fisher, 1987).

There is less evidence about the influence of the child's characteristics on the father-child interaction. Child gender was an inconsistent predictor of the type or amount of interaction between the father and child (Belsky & Volling, 1987; Ninio & Rinott, 1988) possibly due to insufficient power in most of the studies. Some studies showed that fathers treat boys and girls differently (Cowan et al., 1993; Fagot & Hagan, 1991) and that they are more involved and provide more infant care for their sons (Rustia & Abbott, 1993; De Luccie, 1996). Leaper et al. (1998) report they were unable to do a meta-analysis of child gender effects on fathers in father-child interaction, as "there was not a sufficient number of available studies" (p. 24). Child age was a consistent predictor of father-child interaction. As the child gets older, the father places more emphasis on teaching and less on caregiving (Fagot & Hagan, 1991). There was conflicting evidence however; some researchers found that the father plays more with his older child (Jones & Heermann, 1992; McDonald & Parke, 1986) while others found he plays less with his older child (De Luccie, 1996; Fagot & Kavanagh, 1993). Limited research examined birth order of the child and father involvement with infants and toddlers or whether birth order is a predictor of father-child interaction. There are many unanswered questions on whether paternal age and education and child gender, age, and birth order are associated with father and child behavior in interactions, particularly teaching interactions.

Because most research has focused on the father's role in caretaking, this study will examine father and child behavior during a teaching-through-play interaction using Father Total and Child Total NCATS Scores. Child development theory and recent research have focused on parental scaffolding during a didactic or teaching interaction. The following section includes a definition of the concept of scaffolding and related research on parents of children less than school age.

Scaffolding in Didactic and Social Interaction

Scaffolding is a term proposed by Wood, Bruner and Ross (1976) that relates to the zone of proximal development (ZPD) described by Vygotsky (1986). Vygotsky defined the ZPD as the difference between the actual developmental level the child is capable of reaching independently and the level of potential development or what the child can achieve under the guidance of a more capable tutor. Scaffolding is behavior of a parent or caregiver that leads the child to solve problems collaboratively that could not be solved without adult guidance (Greenfield, 1984; Wertsch, 1991).

Conner, Knight and Cross (1997) believe that the interactional scaffold is made up of two characteristics. First, after an error is made or there is difficulty in completing the instruction by the child, the teacher immediately gives more support in the teaching and learning situation. Second, upon the child's success in following the teacher's instruction, the teacher immediately gives less support in the teaching learning situation.
Parental scaffolding describes functions and facets of the teaching process that are prerequisites to children's learning and illustrates one kind of didactics (Bornstein, 1989). As didactic and social interactions occupy a substantial proportion of parenting

(Bornstein, 1989) scaffolding should be encouraged in parents until these skills are firmly established (Barnard, 1997a).

Several studies look at maternal scaffolding and its effects on teaching the child a new task but there is a dearth of studies on paternal scaffolding. Rome-Flanders, Cronk & Gourde (1995) examined maternal scaffolding in mother-infant games and its relationship to language development in a longitudinal study in infants less than 24 months. The researchers identified the following nine scaffolding behaviors: 1) stage setting, 2) attention getting, 3) direct verbal instruction, 4) indirect verbal instruction, 5) modelling, 5) attention maintaining, 7) reinforcement, 8) shaping, and 9) negative judgement, some of which are found in the cognitive growth fostering subscale of the NCATTS (Sumner & Spietz, 1994). They found that mothers used different scaffolding behaviors depending on the age of the child and the type of game being played. No strong relationship was found between maternal scaffolding and language development. The sample size was inadequate for statistical analysis using ANOVA and future research requires larger samples.

Maternal knowledge of child development and actual play behaviors was investigated by Damast et al. (1996) during a free play session. Mothers modified their play level to that of the child's level by responding to their child with play that was either at the same or higher level of play. Mothers who were more knowledgeable about growth and development of children responded more often to their child by introducing higher level play. These findings along with those of Fiese (1990) and Bornstein et al. (1996) suggest that mothers who support their toddler's play in ways that promote their child's development use the more precise teaching strategy of scaffolding.

Three articles discuss paternal scaffolding in teaching interactions. Two articles are similar in their findings. Conner et al. (1997) examined mothers' and fathers' scaffolding in interactions with their 2-year-olds using two structured tasks while Pratt et al. (1988) looked at three-year-olds and three structured tasks. Conner and others (1997) found that mothers and fathers were equally capable of displaying appropriate levels of shifting in their use of scaffolding as a teaching strategy consistent with the findings of Pratt et al. They also found that younger children need more support in general and that younger children may not improve as quickly as older children in the teaching situation. These findings parallel those of Pratt and others with the exception that parents withdrew their support more dramatically in teaching interactions with the older children in the Pratt et al. study. As learners become more advanced, parents provide less guidance and withdraw the scaffold (Greenfield, 1984). Higher rates of success were associated with scaffolding while lower rates of success were associated with non-scaffolding interaction behaviors, therefore the support of the parents' instruction was a positive predictor of child performance (Pratt et al.). Taken together with the Pratt et al. study, the Conner et al. study provides evidence for promoting effective scaffolding as a teaching strategy for fathers with children in the preschool age group.

Tenenbaum and Leaper (1998) found that mothers and fathers used similar didactic questions and had equal opportunities to use scaffolding with their preschool children during toy play but overall fathers provided fewer scaffolding responses than mothers did. While both parents provided scaffolding responses following correct answers during play, mothers were more likely than fathers to use scaffolding with children after incorrect responses. They noted that parents avoided negative feedback in scaffolding

after their infant's incorrect responses. This finding is consistent with previous findings from Rome-Flanders, et al. (1995). Tenenbaum and Leaper speculate that, since previous research (Mannle & Tomasello, 1987) showed that fathers may be less aware of their child's cognitive level because they spend less time with the child than the mother, fathers may be less able to facilitate and use scaffolding with their children's learning.

Easterbrooks and Goldberg (1984) found that qualitative aspects of parenting were more saliently predictive of toddler development than the quantitative measurement of father involvement. No articles were located that reported studies of father scaffolding with infants and toddlers as a predictor of later developmental outcomes.

In summary, there is little research on father scaffolding during teaching interactions. As the NCATS contains items that measure scaffolding behaviors described by Rome-Flanders et al. (1995), it appears useful to determine whether a scaffolding subscale can be identified in the NCATS when used to measure father and infant/toddler interaction.

Chapter III

METHOD OF INVESTIGATION

This study involved secondary analysis of observational data that was previously collected in four studies (Harrison, 1990; Harrison & Magill-Evans, 1996; Harrison, Magill-Evans & Benzies, 1999; Harrison, Magill-Evans & Sadoway in press). A correlational design was used to determine the association between characteristics of the father (age, education), characteristics of the child (gender, age, birth order) and their behavior during interaction in a teaching situation. The NCATS was used to measure the teaching interaction. A new subscale in the NCATS on parental scaffolding was tested for reliability.

Participants

The total population for this study included 153 healthy children (74 girls and 79 boys) between the ages of 2 and 24 months of age who were born at term and whose fathers were English speaking, over 20 years of age, and living in a stable relationship with the child's mother. They were recruited over a 10-year period.

The mean age of fathers in the sample was over thirty years (Table 3.1). This is consistent with the age of fathers in Canadian families. In 1994-1995, the average age of fathers in two-parent families with children 0-11 years was 36.6 years (Ross et al., 1996). The fathers, on average in this study, had three years of education in addition to their high school diploma. The fathers were well educated compared to Canadian fathers in two parent families with children 0-11 years. In a national survey, the average level of education for fathers of children in this age group was a high school diploma (Ross et al., 1996).

Fathers indicated whether they had primary responsibility to care for their child or shared caregiving. The majority of the fathers were secondary caregivers. Only five were primary caregivers. The average number of times that fathers had sole responsibility for their children was 4 times a week.

The average age of the infants and toddlers in this sample was 9.5 months. The sample was balanced in the number of boys and girls and the numbers of first or later born children (Table 3.1).

Table 3.1
Demographic Characteristics of Fathers and Children (N=153)

Demographic Variable	M	SD	Range
Father			
Age (years)	31.9	5.36	21-58
Education (years)	14.9	2.99	9-24
Caregiver[a]			
- % primary	3		
- % secondary	72		
- % shared	25		
Child			
Age (months)	9.5	6.78	2-24
Gender-			
% male	52	--	--
Birth Order-			
% First-born	52	--	--

a Responsibility in daily care of child

Data Collection

The original convenience samples were recruited from the community through posters placed at the university, selected Public Health Centres, churches, day cares, as well as by word of mouth (snowball technique). Research assistants also recruited fathers and their children from well child clinics in public health centres and from neonatal units in hospitals. The father was invited to participate in the study. The researcher described the study and obtained the father's name, address, telephone number and birth date of the child. Fathers were contacted later by telephone to ascertain if they met all the inclusion criteria and were still interested in being in the study. Inclusion criteria were: father of an infant or toddler between 2-24 months of age; father was English speaking, over 20 years of age, living in a stable relationship with the mother of the child, and the couple was not seeing a professional for marital concerns. The child was born a healthy term infant. If the father and child were eligible for inclusion in the study, an appointment was made to visit the father in his home.

At the beginning of the home visit, the purpose of the study was explained to the father, i.e. to find out how fathers showed their child something new. The investigator answered any questions that the father had about the study and the father then completed the consent form (Appendix A). One copy was given to the father and the investigator kept one copy, which was placed in a locked cabinet in the research office. The father was observed in interaction with his child at a time which was convenient to the family and when the child was awake and rested. The father was asked to show the child how to use a standardized teaching item, for example, grab a ring or take the lid off a small container.

The father was told to take as long as he liked and to let the observers know when he was finished. Two trained observers watched the father teach his child in all cases.

After the tool was administered, the father was given the demographic questionnaire to fill out while each of the research assistants independently scored the interaction between the father and the child on the NCATS. The research assistants were available to answer any questions immediately following the teaching interaction and pointed out the strengths that they saw in the interaction between the father and child. After leaving the home, the research assistants came to a consensus on items they scored differently as individuals. The consensus scores were used for the data analysis in this study.

The research assistants that collected the data were formally trained in the use of the NCATS and completed a four day workshop conducted by a certified trainer according to the protocols used by the University of Washington. In order to administer the tool observers were required to achieve 85% agreement with a partner on at least 5 cases before they could administer the tool (Barnard et al., 1989; Barnard, 1997b). All research assistants maintained an inter-rater reliability greater than 85 % during the entire data collection period.

Measures

The measures used in the study were the NCATS and the demographic questionnaire.

NCATS. The NCATS (Appendix B) has been widely used in research and clinical practice to test the quality of interaction between the caregiver and the child in young families (Barnard, 1997a; Barnard et al., 1989; Barnard & Kelly, 1990; Sumner & Spietz, 1994). All of the items on the NCATS scale as developed by Barnard and others (1989) were based on research studies found in the seminal literature (Beebe & Stern, 1977;

Givens, 1978; Goldberg, 1977; Hess, Shipman, Brophy & Bear, 1968; Wood et al., 1976). The NCATS was developed around six constructs of father-child interaction depicted in the Barnard Model (Barnard, 1997a). The teaching loop, which is part of the NCATS, is an important part of parent-child interaction and the parent's feedback should be contingent on the accomplishments of the child (Sumner & Spietz, 1994). The absence or incomplete use of the teaching loop is an indication that the parent/teacher does not have a 'good fit' with the child who is learning and this is an area that may need intervention by a public/community health nurse. The teaching interaction in the NCATS is novel for the parent and child and therefore "places some stress on the interactive system" (p. 15). It allows the practitioner to look at the adaptive patterns of the parent and child outside of their well-rehearsed routines (Barnard et al., 1989). The NCATS avoids using sexually stereotyped objects for the interaction, a beneficial feature for this study, as fathers are known to differentiate their utilization of toys with respect to the infant's sex (Langlois & Downs, 1980).

The NCATS was chosen because it is easily administered in clinical and research areas in a variety of settings such as well child clinics and the child's home. It is important that a tool is useful in these areas because results from a psychometrically sound tool can be used to develop intervention programs with an evidence-based evaluation component (Barnard, 1997c).

The NCATS consists of 73 items or behaviors that are categorically scored, 'yes' or 'no' by observers who are trained to administer the tool. It provides a child's behavior score from two subscales: clarity of clues and responsiveness to caregiver/parent, and a parent behavior score from four subscales: sensitivity to cues, response to child's

distress, social-emotional growth fostering and cognitive growth fostering (Barnard et al., 1989). The items are summed to give a Parent Total Score, a Parent Contingency Score, a Child Total Score, a Child Contingency Score and an NCATS Total Score. Higher scores indicate more satisfactory teaching interactions for the parent and the child.

The NCATS has high internal consistency on total scores. Cronbach's alpha based on all available cases in the NCATS reference database is .87 for the total Parent Total Score, .81 for the Child Total Score, and .81 for the NCATS Total Score based on mother-child observations (Sumner & Spietz, 1994). Test-retest reliability over 12 months is reported for the Parent Total Score as .85 and for the Child Total Score as .55. This degree of consistency is acceptable for the Child Total Score because it reflects developmental change or maturation effects in the child between time 1 and time 2 for measures obtained at 3- to 4- month intervals (Barnard et al., 1989).

Researchers (Barnard et al., 1989) have tested the NCATS for content validity, criterion validity (concurrent validity, predictive validity), and construct validity (discriminant validity, intervention validity). This tool has also been used with several special populations: twins, preterm infants, failure to thrive infants, children with birth defects and developmental disabilities, children in home and out of home care, adolescent mothers, and child behavior problems (Morisset, 1994). The NCATS discriminates between groups who differ in interactive ability and differentiates between maternal interactions with preterm and term infants (Barnard et al., 1984; Harrison, 1990); mother-infant interactions for at risk mothers, adolescent mothers, and preterm infants (Barnard et al., 1996); and mother and father interactions with term and preterm infants (Harrison & Magill-Evans, 1996). It also differentiates between mother-infant interactions without

intervention and with intervention in high-risk infants and families (Barnard, 1997c; Barnard et al., 1988). The NCATS is a valid predictor of later parent-child interaction and of child cognitive outcomes (Barnard et al., 1989; Morisset, 1996).

Demographic questionnaire. Parental involvement with the infant or toddler was measured by a questionnaire (Appendix C) previously developed by Harrison and Magill-Evans (1996). In this questionnaire, the father identified which parent was the primary caregiver or whether caregiving was shared between the mother and the father. The father had the opportunity to report the number of times he had sole responsibility for the child in the previous week and how much time he spent playing and caring for the infant, when both working and not working. He also provided his age, education, birth order of the child, occupation and yearly family income. The demographic questionnaire has not been tested for reliability and validity.

Statistical Analysis

The analysis was performed using the statistical program, SPSS V 10. The level of significance was .05 except for correlations when $p<.01$ was chosen in order to reduce the possibility that, with the number of correlations involved, significance occurred by chance. Demographic characteristics of fathers and their children and all NCATS scores were analyzed using Pearson r correlation and multiple regression, stepwise. The Pearson product-moment correlation coefficient was considered weak for values $r = .10$ to .30, moderate for $r = .30$ to .50, and strong for $r > .50$ in the analysis (Burns & Grove, 1993).

Research Question 1: Which characteristics (i.e., father's age, father's education, child's age, child's gender, child's birth order) predict the father's behavior and the child's behavior in the teaching interaction after controlling for father's amount of contact with the child?

Multiple regression, stepwise was performed. Only fathers who were secondary caregivers (n = 110) were included in this analysis. First, father involvement was entered into the regression. In step 2, father age, father education, child age, child gender, and child birth order were then entered as a group into the analysis to determine which of the 5 independent variables were the best predictor variables for the Father Total Score and the Child Total Score. This strategy is most appropriate when there is no theoretical basis for considering that any independent variable is more important than another and therefore all independent variables are of equal importance to the research question (Polit 1996). Barnard gives equal emphasis to parent characteristics and child characteristics in measuring parent-child interaction in her model (Sumner & Spietz, 1994).

Munro (1997) states that there should be 10 subjects per independent variable in order to get a stable prediction equation. A power analysis was done using Cohen's (1988) formula N= L $(1-R^2)$+ u+ 1 divided by R^2 where N= total sample size L= moderate effect size, u= number of independent variables and alpha was set at .05. The power for this study was 95%. For six variables, a total sample size of 93 father-child pairs was needed to do multiple regression analysis in this study.

Residual analysis was used to check the assumptions before the data were submitted to the regression procedure (Munro, 1997). The residuals were plotted for each dependent variable against each of the independent variables. The residuals were from a normal distribution and the plotted values fell close to the regression Line in the scatterplot.

Research Question 2: Can a subscale score for parent scaffolding be identified in the Nursing Child Assessment Teaching Scale instrument?

On an exploratory basis, a new subscale was examined, the Father Scaffolding Score, based on the total number of 'yes' responses to selected items in the NCATS. Bornstein et al. (1992) argues that father didactic interactions, where scaffolding behaviors are used extensively, relate significantly to later language development in toddlers.

Content validity on the new subscale was partially completed using a two-stage method described by Lynn (1985). The development stage (Stage 1) of content validity determination was completed. The development stage has three steps: domain identification, item generation and instrument formation. In Step 1 domain identification of scaffolding was accomplished through a thorough literature review on the topic so that all dimensions or subdimensions could be identified. In Step 2 all of the possible scaffolding items contained in the NCATS were identified. Finally, in Step 3 the items were assembled in a usable form, reworded as necessary and assembled in a suitable sequence (Lynn) (Table 3.2).

Rome-Flanders et al. (1995) describe nine scaffolding behaviors of which seven appear to be important: stage setting, attention-getting, direct verbal instruction, indirect verbal instruction, modeling, attention maintaining, and reinforcement. Items on the NCAST which appeared to tap these scaffolding behaviors were selected: sensitivity to cues subscale (items 2, 3, 4, 8, and 10), social-emotional growth fostering subscale (items 28, and 29), and the cognitive growth fostering subscale (items 34, 35, 38 to 42, 44, 45, and 47).

Stage 2 known as the judgement-quantification stage was partially completed. Step four and five require endorsement by experts that the items are content valid and the complete instrument is content valid. Confirmation that the items and the instrument were valid was done by a member of the supervisory committee, an NCATS trained expert. Her expert review confirmed the selection of the items chosen for the Father Scaffolding Scale.

In order to determine that the Scaffolding Scale was distinct from the other NCATS subscales, the correlations to the Father Total Score and Father Contingency Score were examined. The correlation between the Father Scaffolding Score and the Father Total Score was $\underline{r}$ =.68 and the correlation between the Father Scaffolding Score and Father Contingency Score was $\underline{r}$ = .56. Although they do appear to tap some commonalties, the scales also appear to be distinct.

Cronbach's alpha was calculated for the Father Scaffolding Score in order to determine the reliability of the scale. The alpha reliability for the sample of 153 fathers was .74, an acceptable value (Polit, 1996). When the inter-item correlations were examined they ranged from $\underline{r}$ = -.19 to $\underline{r}$ =. 87 and none of the items were of zero variance.

In order to further determine that the Father Scaffolding score was different from the subscales currently used in the NCATS, the Father Scaffolding Score and Father Contingency Score using 110 fathers (secondary caregivers) were then used as dependent variables in the regression analysis. By comparing the findings from the regression analyses, it would be possible to determine whether the Father Scaffolding Score was a distinct scale.

Table 3.2

Items Selected from the NCATS for the Proposed Scaffolding Subscale

Original NCATS Item	Behavior
2	The child is positioned in order to reach for and handle the teaching materials.
3	Caregiver gets the child's attention before beginning teaching interaction.
4	When the child is attentive caregiver gives instruction (90% of the time).
8	Caregiver praises child's successes or partial successes.
10	The task materials or child's position is changed by the caregiver after unsuccessful attempts by the child to do the task.
28	Caregiver praises child's efforts in general at least once during the teaching interaction.
29	Caregiver makes cheerleading type statements to the child.
34	Caregiver provides an environment that is free from distractions (sibs, pets, other people, T.V., other toys).
35	The caregiver focuses attention and child's attention on the teaching task at least 60% of the interaction time.
38	Caregiver describes perceptual qualities of the teaching materials to the child.
39	Caregiver uses at least two different phrases or sentences to describe the teaching task to the child.
40	Caregiver uses explanatory verbal style teaching more than imperative style teaching.
41	The caregiver uses clear, unambiguous language when instructing the child (e.g. ambiguous = "turn"; unambiguous = "turn the page in the book").
42	Both verbal description and modeling are used simultaneously in teaching any part of the task to the child.
44	After the child has performed better or more successfully than the last attempt the caregiver (verbally) praises the child.
45	After the child performs better or more successfully than the last attempt the caregiver smiles and/or nods (nonverbal) at the child
47	Both verbal and non-verbal instructions are used in teaching the child.

Protection of Human Subjects

This researcher received approval from the Health Research Ethics Board of the Capital Health Region and the University of Alberta in order to conduct a secondary analysis of the data from previous studies. Prior approval was given to the principal investigators of the original studies to conduct the research. Signed consent was obtained from participants in the original studies (Appendix A). The consent form outlined the risks and benefits of the study and informed the participants they could withdraw from the study at any time.

A letter of agreement between the original investigators and the author outlined the conditions under which the data was provided. The original investigators were part of the researcher's thesis committee and provided access to the data as coded computer files. The researcher did not have access to identifying information of the father or his child. Only code numbers were used to link the data for analysis from the four studies.

Chapter IV

FINDINGS

The purpose of this study was to explore the relationship of selected characteristics of the father (age and education) and selected characteristics of the child (age, gender and birth order) to the father-child interaction in a teaching situation. First, NCATS scores on the teaching interaction are presented. Relationships between the characteristics of the sample and NCATS scores are then explored. Next, the relationships between father and child characteristics and their NCATS scores, after controlling for the father's involvement with the child, are described. Finally, a new subscale, called Father Scaffolding, based on selected items in the NCATS is examined. The reliability of the Father Scaffolding subscale and its relationships with the sociodemographics of the sample and Father Involvement scores are presented last.

NCATS Scores for Father and Child Interaction

The scores for the six subscales on the NCATS, the Father Total Score, the Child Total Score, the Father Contingency Score, and the Child Contingency Score are given in Table 4.1 (N=153). There was a wide range of scores for all the NCATS subscores. Nevertheless, no father or child scored zero on any subscale. In general, the subscales had lower reliability measured by the α coefficient than the Father Total, Child Total, Father Contingency and Child Contingency scores. The subscale, Sensitivity to Cues had the lowest reliability.

Table 4.1

NCATS Scores for Father-Child Interaction (N= 153)

NCATS Subscale	M	SD	Range	α Coefficient
Father				
Sensitivity to Cues	9.35	1.13	4-11	.11
Response to Distress	9.58	1.38	5-11	.58
Social-Emotional Growth Fostering	8.14	1.57	3-11	.37
Cognitive Growth Fostering	11.14	2.65	1-17	.55
Father Total Score	38.20	4.52	22-49	.66
Father Contingency Score	14.93	2.82	8-20	.65
Child				
Clarity of Cues	8.71	1.36	2-10	.50
Responsiveness to Parent	9.62	2.40	2-13	.72
Child Total Score	18.33	3.43	4-23	.78
Child Contingency Score	8.88	2.15	2-12	.67

For the subsample of fathers who were secondary caregivers (n=110), the scores for the six subscales on the NCATS, the Father Total Score, the Child Total Score, the Father Contingency Score, and the Child Contingency Score are given in Table 4.2. The subscale scores and alpha reliabilities are similar to those in the full sample of 153 fathers, with the exception of the Sensitivity to Cues subscale, which has a lower reliability of -.03.

Table 4.2

NCATS Scores for Father-Child Interaction (n=110)

NCATS Subscale	M	SD	Range	α Coefficient
Father				
Sensitivity to Cues	9.44	1.05	6-11	-.03
Response to Distress	9.73	1.29	5-11	.55
Social-Emotional Growth Fostering	8.14	1.63	3-11	.41
Cognitive Growth Fostering	11.06	2.64	5-17	.56
Father Total Score	38.36	4.49	26-49	.67
Father Contingency Score	15.09	2.84	8-20	.68
Child				
Clarity of Cues	8.70	1.41	2-10	.53
Responsiveness to Parent	9.57	2.50	2-13	.75
Child Total Score	18.27	3.61	4-23	.80
Child Contingency Score	8.80	2.25	2-12	.71

Research Questions and Findings

Research Question 1: Which characteristics (i.e., father's age, father's education, child's age, child's gender, child's birth order) predict the father's behavior and the child's behavior in the teaching interaction after controlling for father's amount of contact with the child?

When the characteristics of the father and the child were examined in relation to the dependent variables none of the characteristics were significantly correlated with the NCATS scores (see Table 4.3). There was a weak positive correlation between Father Involvement and the Child Total Score and the Father Contingency Score.

Table 4.3

Pearson Correlations of Sociodemographic Variables and Father Involvement with NCATS Scores (n=110)

Predictor Variable	NCATS Score		
	Father Total Score	Child Total Score	Father Contingency Score
Father Age	.00	-.05	-.04
Father Education	.11	.10	.03
Child Age	.01	.08	.03
Child Gender	-.10	.00	-.09
Child Birth Order	.05	-.17	-.03
Father Involvement	.17	.23*	.19*

*p <.05 level (2-tailed).

When the correlations were examined among the predictor variables even Father Education and Father Age were not highly correlated in this sample (Table 4.4). Correlations between predictors were low, therefore the inclusion of all of them in a regression equation was appropriate as there was a low incidence of multicollinearity.

Table 4.4

Correlations Between Predictors (n=110)

Predictor	1	2	3	4	5	6
1. Father Involvement		.19*	.08	.18	.06	-.04
2. Father Age			.38**	.35**	-.00	.08
3. Father Education				.16	.04	.01
4. Child Age					-.05	-.07
5. Child Gender						-.13
6. Child Birth Order						

**p .01 (2-tailed)
* p .05 (2 tailed)

To determine whether characteristics of the father and child predict NCATS scores in the teaching interaction, the Father Total Score was regressed onto the six predictor variables controlling for Father Involvement at Step 1 (Table 4.5). Father Involvement or the number of times in a week that the father was solely responsible for the child, is not a significant predictor of the Father Total Score. However, when father age and education and child age, gender and birth order were entered into the regression analysis, father involvement was the factor that was most strongly associated with the Father Total Score. Only one percent of the variance was explained by the six predictor variables.

Table 4.5

Effect of Independent Variables on Father Total NCATS Score

	Father Total Score						
Predictor Variable	R	Adj. R^2	F of Equation	R^2 Change	Betas Step 1	Betas Step 2	p of β
Step 1							
Father Involvement	.17	.02	3.3	.03	.17	--	.07
Step 2							
Father Involvement	.25	.01	1.2	.03	--	.19	.06
Father Age						-.08	.45
Father Education						.14	.18
Child Age						-.02	.82
Child Gender						-.12	.22
Child Birth Order						-.05	.64

The Child Total Score was regressed onto the six independent variables in the same order as previously outlined (Table 4.6). Amount of contact or Father Involvement was controlled for in the multiple regression, stepwise model by entering it in Step One (Table 4.6). The amount of time the father is involved with the child is a significant predictor of the Child Total Score explaining four percent of the variance. The characteristics of the father and child did not add significantly to the prediction of the Child Total Score.

Table 4.6

Effect of Independent Variables on Child Total NCATS Score

	Child Total Score						
Predictor Variable	R	Adj. R^2	F of Equation	R^2 Change	Betas Step 1	Betas Step 2	p of β
Step 1							
Father Involvement	.23	.04	5.739*	.05	.23	--	.02
Step 2							
Father Involvement	.32	.05	1.921	.05	--	.23	.02
Father Age						-.15	.16
Father Education						.13	.21
Child Age						.06	.58
Child Gender						-.03	.72
Child Birth Order						-.15	.13

Research Question 2: Can a subscale score for parent scaffolding be identified in the Nursing Child Assessment Teaching Scale?

The Father Scaffolding Score was regressed onto the six independent variables, father involvement, father age, father education, child age, child gender, and child birth order in the same order as previous analyses (Table 4.7). Father involvement or the number of times in a week the father had sole responsibility for the child was a significant predictor of the Father Scaffolding Score in the first step of the regression analysis. However, Father involvement was not a significant predictor in the second step; child age became a significant predictor of the Father Scaffolding Score. Together, the predictor variables explained 12% of the variance.

Table 4.7

Effect of Independent Variables on Father Scaffolding NCATS Score

	Father Scaffolding Score						
Predictor Variable	R	Adj. R^2	F of Equation	R^2 Change	Betas Step 1	Betas Step 2	p of β
Step 1							
Father Involvement	.23	.04	5.767*	.05	.23	--	.02
Step 2							
Father Involvement	.41	.12	3.413**	.12	--	.17	.07
Father Age						-.05	.64
Father Education						.14	.17
Child Age						.31	.00
Child Gender						-.02	.85
Child Birth Order						.07	.46

For the comparison to an established NCATS subscale, the Father Contingency Score was regressed onto the six-predictor variables, controlling for Father Involvement in Step One (Table 4.8). Father Involvement or the amount of time the father has sole responsibility for the child in a week is a significant predictor of the fathers' contingent response to the child explaining 3% of the variance. The father and child characteristics did not add to the prediction of the Fathers' Contingency Score unlike the Father Scaffolding Score.

Table 4.8

Effect of Independent Variables on Father Contingency NCATS Score

	Father Contingency Score						
Predictor Variable	R	Adj. R^2	F of Equation	R^2 Change	Betas Step 1	Betas Step 2	p of β
Step 1							
Father Involvement	.19	.03	4.187*	.04	.19	--	.04
Step 2							
Father Involvement	.24	.00	1.068	.02	--	.21	.03
Father Age						-.10	.35
Father Education						.06	.57
Child Age						.01	.92
Child Gender						-.11	.25
Child Birth Order						-.03	.77

As the regression analyses were done with the subsample of 110 fathers who were secondary caregivers, the Father Scaffolding Subscale reliability was examined for these fathers. Cronbach's alpha reliability of the Father Scaffolding Score in the subsample was .74. When the inter-item correlations were examined, item number 3 was discarded as

having no variance (caregiver gets the child's attention before beginning the task at the start of the teaching interaction). The Father Scaffolding Score had a higher reliability than the Father Total Score (α=.67), Father Contingency Score (α= .68) and Child Contingency Score (α= .71) but not the Child Total Score (α=.80) in the subsample. When the characteristics of the father and child were examined in relation to the Father NCATS Scaffolding Score, there was a weak correlation between the Father Scaffolding Score and child age ($r = .34$, $p < .01$), and father involvement ($\underline{r} = .23$, $p < .05$). However, there was no significant correlation between the Father Scaffolding Score and father education, father age, child gender and child birth order.

In conclusion, father involvement or the number of times the father has sole responsibility for the care of the child in the past week, is a stronger predictor in the teaching interaction than any of the sociodemographic variables for Father Total, Child Total, Father Contingency but not the Father Scaffolding Score in the NCAST. The child age is the best predictor for the new Father Scaffolding Score. The Father Scaffolding Score appears to be distinct.

CHAPTER V

DISCUSSION

This chapter provides a discussion of the major findings of this study. First, the similarities and differences of the NCATS Scores for fathers will be compared to other studies (Broom, 1994: Brophy-Herb, Gibbons, Omar, & Schiffman, 1999; Nakamura, Stewart, & Tatarka, 2000) that used the NCATS to measure father-child interaction. Second, the findings for Research Question One will be discussed, "Which father and child characteristics predict father and child behavior in the teaching interaction?" Next, results for Research Question Two will be discussed, "Can a new subscale for scaffolding be identified in the Nursing Child Assessment Teaching Scale?" Finally, limitations and implications for nursing practice with suggestions for future research are presented.

Comparisons of NCATS Scores for Fathers

In general, the average scores for each subscale of the NCATS in the current study were similar to those reported in other studies on fathers and children (Broom, 1994: Brophy-Herb et al., 1999; Nakamura et al., 2000) although some differences were found (Table 5.1). Mean scores for the fathers in the Broom (1994) study may have been slightly higher on two subscales because the fathers in that study had also demonstrated high levels of marital quality, psychological well being and parental sensitivity on measurement. The current study was comparable to the Nakamura et al. sample of predominantly White fathers and infants 3 to 6 months of age although all infants in Nakamura et al. were first born. Brophy-Herb et al. (1999) report NCATS scores for low-income fathers whose infant children had a mean age of 6.9 months. The current study is somewhat comparable to the Brophy-Herb et al. sample in the number of boys (52% vs.

47%) and girls (48% vs. 63%). Fathers in the Brophy-Herb et al. study were recruited from an early intervention study. It is unclear in the published article whether the NCATS observations were made after the intervention or if the fathers were even part of the intervention. Lack of information about the time of data collection in relation to the intervention is a limitation in the Brophy-Herb et al. study. The mean scores were slightly higher in the current study than Brophy-Herb et al. on Sensitivity to Cues, Response to Distress, Cognitive Growth Fostering and Father Total Score but lower on Social-Emotional Growth Fostering. Generally, the results of this study are similar to those reported in the literature. Therefore, this Canadian sample does not have unusual scores.

Table 5.1

Mean NCATS Scores for Father-Child Interaction and Father Characteristics

Scores	Present Sample of Father-Child Pairs (N=153)	Broom (1994) (N= 71)	Nakamura et al. (2000) (N=15)	Brophy-Herb et al. (1999) (N=44)
NCATS Scales				
Father				
Sensitivity to Cues	9.4	9.5	9.3	8.6
Response to Distress	9.6	10.6	10.2	8.1
Social-Emotional Growth Fostering	8.1	10.0	9.0	8.8
Cognitive Growth Fostering	11.1	--	10.5	10.9
Father Total Score	38.2	--	39.1	36.4
Father Contingency Score	14.9	--	14.3	--
Child				
Clarity of Cues	8.7	--	8.9	8.1
Responsiveness to Parent	9.6	--	9.7	8.0
Child Total Score	18.3	--	18.5	16.1
Child Contingency Score	8.9	--	8.7	--
Father Characteristics				
Father Age (Yrs.)	31.9	30.9	32.6	26
Father Education (Yrs.)	14.9	--	16.7	--

Research Question 1: Which characteristics (i.e., father's age, father's education, child's gender, child's age, child's birth order) predict the father's behavior and the child's behavior in the teaching interaction after controlling for father's amount of contact with the child.?

For comparison purposes in the discussion, research studies were chosen that were similar to this study i.e., where fathers were observed in the home with children less than 2 years old. In the present study, father's age and education did not predict the Father Total Score or the Child Total Score. This finding is consistent with Brophy-Herb and colleagues (1999) who reported that father age and father education were not significantly related to any NCATS scores for low-income fathers in interactions with their children age 1 to 16 months. Broom (1994) also found that father age did not predict father interaction with 3-month-old infants as measured by the NCATS.

However, two studies (Shields & Sparling, 1993; Volling & Belsky, 1991), which did not use the NCATS and observed fathers in their homes, reported father age and education as significant predictors. Volling and Belsky used a similar sample ($n = 119$) of predominantly White, well-educated fathers with 3 and 9-month-old infants. The fathers were observed in stimulating responsive and playful interaction with their infants during a one hour naturalistic home observation. Measurement included a coding system developed by the researchers to record the fathers' interactive behavior with his child. They recorded five behaviors, 1) Respond - the father responded contingently to the child either by showing the baby a toy or talking in response to infant vocalization; 2) Stimulate/arouse - the father focused the infant's attention on some aspect of the setting

and/or stimulated the child such as getting its attention or lifting the baby up; 3) Caregiving - the father provided physical care for the child; 4) Positive affection - the father expressed any emotion such as smile, hug or kiss; and 5) Read/watch TV - the father watched TV or read. Multiple regression, stepwise was used to analyze the data. Father age was identified as one of the five best predictors that explained father-child interaction at 3 and 9 months while father education was only a "best predictor" when the infant was 9 months of age.

Shields and Sparling (1993) used home observation during father-child play with 21 ill and healthy three month olds. Their method of measurement was the Parent-Child Interaction Scale (PCIS) which scores parents on 12 behaviors in terms of amount, quality and appropriateness of interaction. The 12 subscales include: Physical Involvement, Verbal Involvement, Responsiveness of Caregiver to Child, Play Interaction, Teaching Behavior, Control Over Child's Activities, Directives, Relationship Among Activities, Positive Statements, Negative Statements/Discipline, Goal Setting and General Impression. Each father was instructed to play normally with his child for 10 minutes using a standardized set of toys, similar to the NCATS. Shields and Sparling reported that more educated fathers were more involved in social interactions. Father education was positively related to the fathers' physical involvement (fathers' quality of handling of child and the appropriateness of caregiver positioning of child for the purpose of interaction or play). Fathers with less education showed a different quality of Physical Involvement than fathers with some college education. Similar items in the NCATS that involve physical involvement (e.g., 1. 2, 6, 10, 15, 24) might have shown a relationship between father education and physical involvement in this study.

Inconsistencies in the significance of father age and education in interaction in the Shields and Sparling (1993) study may be due to a small and dissimilar sample. In addition, different methods were used to measure observation in the home in these studies (Volling & Belsky, 1991; Shields & Sparling, 1993). These differences make it impossible to generalize across findings. However, there is consistency between the current study and the two studies that also use the NCATS (Broom, 1994; Brophy-Herb et al., 1999). In summary, studies that used naturalistic observation and longer observations detected effects for father education and age. Perhaps the NCATS does not tap variables which are sensitive to the effects of age and education although the trend to lower scores in the Brophy-Herb et al., study may suggest that the NCATS is somewhat sensitive to these effects.

In this study, child gender did not predict the Father Total Score or Child Total Score on the NCATS. This is consistent with findings reported by Broom (1994) who used the NCATS to measure father-child interaction. Similar studies that used home observation also found no paternal differences in how daughters and sons are treated (Belsky, Gilstrap et al., 1984; Belsky & Volling, 1987; Dickie, 1987) although they used different measurement tools than the NCATS. Other home observation studies report that fathers spent more time in instructional interaction with girls (Fagot & Kavanagh, 1993) and were more positive toward daughters in their communication attempts (Fagot & Hagan, 1991).

Belsky, Gilstrap et al. (1984) used a detailed behavioral checklist to measure father-child interaction in the home with 1, 3, and 9-month-olds. The instrument consisted of five parent behaviors: Respond, Stimulate-arouse, Caregiving, Positive affection,

Read/watch TV and four child behaviors: Fuss/cry, Smile/excite, Explore and Sleep. Belsky and Volling (1987) later used the same measurement tool to capture father behaviors in interactive involvement. Concepts measured such as Respond, Stimulate-arouse, and Positive affection are similar to the NCATS, which may explain why the findings of Belsky and Volling and Belsky, Gilstrap and colleagues were consistent with this study.

Dickie (1987) measured specific aspects of parent-infant interaction in 46, four to eight month olds during 2 hour observations using: a) verbal and non-verbal contingent responding, b) emotional consistency, c) appropriate stimulation, d) reasonableness of expectations and routines, e) expression of warmth and pleasure, and f) anticipation of infant needs. His findings that fathers played equally with sons and daughters were consistent with this study.

Fagot and Hagan (1991) and Fagot and Kavanagh (1993) used the Fagot Interactive Behavior Code. The researchers described father and child behavior using: Context Codes included male and female toy play and art activities; Interactive Codes included attempts to communicate through gestures and language as well as aggressive behaviors such as demanding attention and taking or trying to take an object; Reaction Codes included instructional reaction with positive comments and play activities; and finally Negative Codes with criticism, cries, whines, physical restraint or aggression. It is unclear why Fagot and Hagan and Fagot and Kavanagh obtained different results than the current study as the behaviors coded are similar to the items on the NCATS.

Leaper et al. (1998) suggest that the magnitude of gender effects on parents' behavior was underestimated in an earlier meta-analysis (Lytton & Romney, 1991) when self-

report, laboratory observations and home observations were combined. Lytton and Romney also did not consider aspects of the interaction such as the physical setting or the activity structure. Leaper and others contend that observing gender-typed behaviors depends on the observational setting and there may be larger effects seen in home observation. However, gender effects were not observed in the current study conducted in the home with an adequate sample size. The likelihood of detecting gender effects on parents' behavior may depend on the age of the child (Leaper et al., 1998). It is possible that gender effects are observed in father interactions with older children. Fathers may begin to respond differently to their sons and daughters when the children reach the preschool years. However, Fagot and colleagues (1991; 1993) did find gender differences in father interactions with younger children.

In this study, child age did not predict the Father Total Score or Child Total Score on the NCATS. Brophy-Herb et al. (1999) found that the Father Total Score and the four father subscale scores on the NCATS did not differ for children $\geq$ 7 months (n=21) or < 7 months of age (n=23). However, Brophy-Herb and associates found that older infants scored significantly higher on the Child Subscales and Total Score than younger infants. Their sample was similar to the present study in the age of the children (1-16 months) and the use of the NCATS in the home.

Other studies that used home observations with infants or toddlers to measure the effects of child age on father-infant interactions consistently found a relationship. Belsky, Gilstrap et al. (1984), Fagot and Hagen (1991), and Fagot and Kavanagh (1993) found that child age predicted the father-child interaction in infants and toddlers. Fathers moved from positive support, caregiving and play with the younger child to teaching and

instruction with the older child. Harrison and Magill-Evans (1996) measured interaction in father-child dyads at 3 and 12 months and found a negative relationship between the infant's behavior and the father's behavior. At 12 months of age compared to 3 months of age the infants' behavior in the teaching situation had improved while the fathers had lower Father Total Scores on the NCATS due to lower scores on the Response to Distress and Social Emotional Growth Fostering subscales. Measuring the same cohort at 3 and 12 months controls for individual variability however the current study did not use the same cohort to measure the effects of child age on the teaching interaction. Although it has been previously shown that child age is a consistent predictor of father interactions, more research is needed with infants and toddlers to measure father-child interaction in the home.

Birth order of the child and its effect on the father-child relationship has not been well studied (Ambert, 1992). Birth order (first born, later born) did not predict the Father Total Score or Child Total Score on the NCATS in this study. This is consistent with one other study (Brophy-Herb et al., 1999) which used the NCATS to measure father interactions with similar age children during a home observation.

Two studies were located that used home observation of father interaction with infants and toddlers and examined child birth order as a predictor of father-child interaction measured by observation scales other than the NCATS. Belsky, Gilstrap et al. (1984) and Shields and Sparling (1993) reported findings inconsistent with this study. Belsky, Gilstrap et al. reported that the behavior of the father was more affected by birth order than that of mothers. At 1, 3, and 9 months fathers expressed positive affection, engaged, responded to, and stimulated their first-born children more than their later-born children.

In addition, the treatment of first- and later-borns was significantly different but only after 3 months of age. Shields and Sparling found that fathers of later-born, healthy children showed more affectionate and instrumental (i.e., simultaneous) touch (lifting, holding, positioning) than fathers of first-born children. Although the rating scale used by Belsky, Gilstrap et al. was similar to the NCATS in content, their findings were inconsistent with this study and cannot be explained. The small sample size in the Shields and Sparling study was a limitation of that study. The limited number of studies using child birth order as a predictor of father-infant interaction suggests that more research is warranted using adequate sample sizes, consistent valid measurement tools during a home observation and repeated measures using multivariate analysis.

Father Involvement as a Predictor of Father-Child Interaction

Father involvement in this study was measured as the number of times the father had sole responsibility for the child in the past week. Father involvement was the best predictor of the NCATS scores. There are a number of possible explanations. The involved father may be more interested in parenting, have a more vested interest in teaching the child and respond more appropriately towards the child. The more time the father spends alone with the child, the more familiar he becomes with the child's behavior. This experience gives him an opportunity to respond more contingently to the child during teaching interactions thus increasing the child's ability to give clearer cues and respond more appropriately to him (higher child scores on the NCATS). Alternatively, when children are more responsive, fathers feel that they are successful in their interactions with the child and therefore they may be more willing to be involved with the child and care for the child irregardless of whether the mother is available.

Father involvement predicted only 4% of the Child Total Score. Father involvement can have multiple dimensions. The measure used in the current study reflects some degree of availability of the father, his willingness to take responsibility to provide care and indirectly his skill in child care. A useful measure would have been direct observation of father involvement in the home with repeated measures. However, this may not be a feasible alternative as it may be too disruptive to normal family functioning and add to the respondent's burden. More detailed self-report measures of father involvement or additional information from the mother of the child could be used to provide a wider picture on father involvement and might explain a greater percent of variance in the NCATS scores.

Fagot and Hagan (1991) argue that home observations produce the largest effect size as home observations allow the parents and child to react more naturally than in the laboratory. Although father-child interactions were observed in the home in the current study, the fathers' self-report on the number of times they had sole responsibility for the child in the past week was a limitation of the study. The use of more than one instrument to measure the variables would strengthen the results of the study.

Future research needs to consider other variables that might be more predictive of the NCATS Scores. Maternal support, marital quality, the fathers' motivation or interest in parenting and the father's perception of the cognitive maturity of the child may be better predictors. Previous researchers have found that the more support the mother offered the father, the more the fathers were involved (De Luccie, 1996). Higher father involvement was also found when fathers reported good marital adjustment (Levy-Shiff & Israelashvili, 1988; Volling & Belsky, 1991). Father's motivation or interest in parenting

is influenced by the father's developmental history (that is his own father's involvement) (Barnett & Baruch, 1987), personality characteristics such as self-esteem (Volling & Belsky, 1991) and egalitarian beliefs about women or gender roles (Baruch & Barnett, 1981). Fathers who attribute a greater measure of cognitive maturity to their child may be more motivated to be involved with the child (Ninio & Rinott, 1988). These variables may explain more of the variation in NCATS scores.

In summary, no single predictor (i.e., father involvement) exerts a dominant influence on father-child interaction. Future research should investigate how variables associated with father involvement act as cumulative predisposing factors. How they interact with one another and how their influence may vary in different settings (Pleck, 1997) and with different types of father-child interaction needs to be studied.

Research Question 2: Can a subscale score for parent scaffolding be identified in the Nursing Child Assessment Teaching Scale?

Scaffolding is known as "aided performance" (Vygotsky, 1986) or specific behaviors that the father does in providing support to the child so the child can attempt to learn a new task beyond the child's current level of development. The proposed Scaffolding Subscore was based on 17 items in the NCATS. Scaffolding is different from contingency, as it is more multidimensional. However, it may contain some elements of contingency. Of the seventeen items in the Scaffolding NCATS Score, ten are exclusive of the items on the Father Contingency NCATS Score (2, 29, 34, 35, 38, 39, 40, 41, 42, and 47) while seven items overlap (3, 4, 8, 10, 28, 44 and 45). The majority of the scaffolding behaviors are in the NCATS Cognitive Growth Fostering Subscale. The proposed Scaffolding Subscale did have adequate internal reliability ($\alpha = .74$) (N= 153

and n=110). Based on the intercorrelations between the Father Scaffolding Score and Father Total Score and Father Contingency Score and the results of the regression analysis it appears that the Father Scaffolding Score is distinct from the other two scores.

Father involvement and the child age predicted the Father Scaffolding Score. Father involvement, or the number of times the father was solely responsible for the child during the week, was significant in Step One of the multiple regression analysis and predicted 4% of the variance. However, child age became the significant predictor of the Father Scaffolding Score in Step Two of the analysis. In combination with the other variables, it predicted 12% of the variance. These findings need to be interpreted with caution until more research is done using the proposed Scaffolding Scale.

There were no reports in the literature on paternal scaffolding that compared children of different age groups in the same study. Conner and associates (1997) compared their findings on mothers' and fathers' scaffolding of 2-year-old children with those of Pratt and associates (1988) on 3-year-old children. They support the supposition that younger 2-year-old children need more support and may not improve as quickly as older 3-year-old children in the teaching situation.

It is possible that child's age is related to the scaffolding behavior of the father in the teaching interaction in this study because as the child gets older, the father may be both more involved in caregiving and more likely to structure the interaction for learning. The more times the father has sole responsibility for his child or has opportunities to be involved with the child alone, the more he learns about the child and this may provide him with a better idea of how to use scaffolding or guide the child in new learning situations. Also, it is possible that father involvement as measured in this study was an

indirect way of measuring the age of the child as the correlation between involvement and child age was $r = .18$ ($n = 110$).

Limitations

There were limitations to the study. Limitations included the use of a convenience sample, use of fathers who were secondary caregivers (n=110), observation-experimenter presence, gender of the data collectors, short interaction time, and use of a single measure rather than multiple measures to measure father-child interaction.

The early research on fathers was largely based on samples of traditional, married, two-parent families in which the couple had a stable relationship (Grant, Duggan, Andrews, & Serwint, 1997; Lamb, 1997b). A limitation of this study was that the data was collected using the same traditional, married, two-parent family in which the couple had a stable relationship. The sample does not include the variety of different types of families that are common today. The convenience sample also did not include a variety of ethnic backgrounds or large numbers of less educated or adolescent fathers. The fathers were predominantly White and were well educated. The majority of the families were in the middle class and on average, the fathers had a secondary education. The participants cannot be said to represent all fathers and their children.

Forty-three fathers who identified themselves as primary or shared caregivers were excluded from the regression analysis. The literature on fathers who are primary caregivers (i.e., Radin, 1994) indicates that they are a unique group. In general, fathers who are primary caregivers are less traditional in their sex roles. Future research should address these fathers as a specific group. Since the 1970s, there has been an increased emphasis on the role of fathers in parenting (Lamb, 1997a), however in most families the

majority of family work is done by women (Levant et al., 1987). As LaRossa (1988) states "the culture of fatherhood has changed more rapidly than the [actual] conduct of fatherhood' (p. 451). In the secondary data set, those fathers who indicated they were shared parental caregivers did not describe the amount of involvement they had with their child. For this reason, they were excluded from the analysis. If their self-report is accurate, fathers who were most involved were excluded from the study. Fathers who indicated they were shared caregivers may have done so because of societal expectations not because of their actual involvement. In addition, the item used to measure father involvement may not have been sensitive enough to measure the construct in the fathers who were secondary caregivers. The item has not been widely used and future research needs to address differences between fathers using a variety of methods to measure father involvement.

Another limitation of this study was a possible methodological problem with observation-experimenter presence during a home observation. Several review articles on parent-child interaction suggested observer influences as a limitation (Mahoney, Spiker, & Boyce, 1996; Russell & Radojevic 1992; Streissguth & Bee, 1972). There is a tendency for behavior to change when it is under study (Russell, Russell, & Midwinter, 1992). Specifically, Russell et al. stated that 80% of the parents in their study reported observer influence to some degree. There is evidence to suggest that fathers are more influenced than mothers (Russell & Radojevic; Russell et al.,) by the observer's presence when observed at home. It has been speculated that influence of observer presence might operate differently in father-son versus father-daughter dyads (Russell et al.,) and future research could explore this possibility.

Some researchers (Russell et al., 1992; Shields & Sparling, 1993) suggest that further research efforts in the area of father-infant interaction may benefit from using male raters. A possible limitation in this study is that the research assistants who observed the father-child interaction were female. However, Nakamura et al. (2000) report similar mean NCATS scores for father-child interaction and the observations in that study were made by a male. Brophy-Herb et al. (1999) contend that there is no evidence that male data collectors would be more appropriate for studies of fathers.

The short interaction time between the father and child when using the NCATS as a measure is a limitation in research, although it is a positive feature in the clinical area. The length of teaching interaction did not exceed 10 minutes in this study. Repeated observations at different times using the NCATS may provide a more reliable measure.

To focus on single measures of parenting is misleading (Fagot & Kavanagh, 1993). There are different relationships between child age, gender, birth order and father characteristics such as father age and education and fathers' parenting. For example, Fagot and Kavanagh suggest that complex relationships between father behavior and child behavior are a function of the child's age. Future research should take into account that any observed differences in father involvement by father and child sociodemographics may vary because of the relationship with the fathers' motivation to parent, beliefs about parenting, marital quality and maternal support and therefore multiple measures are essential to measure all these constructs.

Implications for Nursing Practice

There are implications for nursing practice following the findings that father involvement predicts the Child Total Score and the Father Contingency Score, while

father involvement and child age predict the Father Scaffolding Score. This data will be useful in planning meaningful nursing strategies to educate and support fathers in their caregiving activities (Rustia & Abbott, 1993). The following factors can impact nursing practice: 1) use of the NCATS tool in the practice setting, 2) the importance of characteristics of the father and child that the nurse should be aware of before she/he intervenes, 3) the importance of knowing how involved the father is with the child, and 4) the potential for promoting parental scaffolding as an intervention strategy to enhance the cognitive development of the infant and toddler.

The NCATS is a valid tool based on research however, there has been limited use of this measure with fathers and their children in the practice area. This study of 153 father-child interactions provides a beginning basis for intervention with fathers. The NCATS is used by the Public/Community Health Nurse to assess, plan interventions and evaluate parent-child interaction (Barnard, 1997c) in a variety of settings including well-child clinics, the home and parenting classes. It serves as a diagnostic tool for parent-child interaction. Parenting strategies can be implemented by using the individual items in the NCAST as intervention strategies. Subsequent evaluation of parent-child interaction can be estimated by doing a pre-test before the intervention and a post-test measurement following the intervention. Since the NCATS is still being used in the research and clinical area, nurses should regularly review the literature in judging the NCATS utility in clinical prediction (Li, 2000).

Nurses need to be aware of the sociodemographics of the populations that they serve. Public/Community Health Nurses working with young families must consider the effects of father and child characteristics on parenting when planning interventions to strengthen

father-infant interaction. Four variables in this study (father age, father education, child gender and child birth order) did not predict father-child interaction but child age and father involvement did account for some of the variance in father-child interaction in a teaching situation. If fathers are aware that the age of the child will impact their involvement and interaction with the child, then they may be better prepared to interact with the child based on the child's developmental capacities.

Nurses need to know how involved fathers are with their children. This area has not been well researched by nurses. In order to give family-centered care, the nurse needs to be able to assess how involved the father is with his children in relation to the rest of the family members. For example, if a father is uninvolved he needs help to recognize the positive impact that he may have on his child's development by playing during caretaking (Shields & Sparling, 1993).

Parental scaffolding during a teaching interaction is a strategy that can be used to enhance the cognitive development of the child and information on this behaviour could be incorporated into parenting classes for fathers. The preliminary work done in this study suggests that a Scaffolding Subscale may be identified in the NCATS. Before use in practice, more research is needed.

Recommendations for Future Research

This study included fathers in two-parent families with a stable marital relationship. Future studies need to include fathers in nontraditional families, more diversity in father ethnicity and adolescent fathers. In addition, a wider range of paternal education should be considered in future studies of father-child interaction as measured by the NCATS.

There is a need for further research to explain the low alpha reliability (α= .11) (N=153) found on the Sensitivity to Cues Subscale in this study. Barnard et al. (1989) has suggested that this subscale is not as conceptually consistent as the other NCATS subscales.

Brophy-Herb et al. (1999) contend that fathers should have different cutoff scores on the NCATS for clinical intervention than mothers. At present, the developers of the NCATS suggest clinical cutoff scores for mothers but not for fathers. Further research is needed to identify the appropriate scores for clinical use with fathers.

Father involvement is a multidimensional concept (Ninio & Rinott, 1988) and requires a measurement tool that is comprehensive using agreed upon dimensions of father involvement. Ninio and Rinott used a comprehensive definition to measure father involvement based on the work of Lamb and associates (1985). The dimensions were accessibility, responsibility and interaction or engagement. It is suggested that measurement of these dimensions will facilitate future research in father involvement as a predictor of scores on the NCATS.

Scaffolding of learning for infants and toddlers is a poorly researched construct in the child development literature and non-existent in the nursing literature. Research is needed comparing parental scaffolding of infants and toddlers using the NCATS tool. Also there is a need to investigate the relationship of father scaffolding behavior to the child's later development. In addition, a study comparing father scaffolding measured by the NCATS and another observation measure is needed for evidence on concurrent validity.

Conclusion

The origins of individual variation in father-child interaction are complex. These include, but are not limited to, parent and child characteristics, personality characteristics, biological determinants, social situational factors, socioeconomic status, culture, and experiences of parents (Belsky, 1984, Bornstein, 2000). There are many unanswered questions in the area of father-child interaction and much of the variance is unexplained. Little is known about the quality of father-child interaction and how fathers teach their infants and toddlers in new learning situations despite the advances in research in the area of father involvement. Father involvement was the best predictor of the Child Total Score and Father Contingency Score while the child's age was the best predictor of the proposed Father Scaffolding Score on the NCATS. This information will add to the knowledge base that needs to be established prior to the design of interventions for the nursing practice area regarding fathers and their children. Our conceptual paradigms still continue to outstrip our scientific and humanistic understanding in this area (Parke, 1995).

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Appendix A

Consent Forms from Previous Research Studies

Appendix A

CONSENT FORM

Title of Research Project:
Father Interactions with Term and Preterm Infants

Investigator contact at

Mrs. Margaret Harrison, R.N., MScN
University of Alberta
Faculty of Nursing 432-6249
or Department of Family Studies 432-5141

The purpose of this research project is to learn more about how fathers relate to their premature baby when they show him/her a toy.

I know that three months after my baby comes home from hospital two observers will watch me while I show my baby how to play with a toy. This observation will take place in my home at my convenience and last approximately 1/2 hour. If my baby was not born pre-maturely, I know that I am part of a comparison group.

I have been assured that there will be no risk to me or to my child resulting from participation in the research. Code numbers will be assigned to the observations of each father and the identities will be known only to the researcher. The results of the study will be published but neither I nor my child will be named. I am free to withdraw from the study at any time.

I consent to participate in this study and to allow my child to participate.

_____ _____

Date Signature

Readability: Flesch-Kincaid Grade Level-8.3

Project: **Mother and Father Interactions with Term and Preterm Infants**

Researchers: Margaret Harrison, RN, PhD
Faculty of Nursing
492-5931

Joyce Magill-Evans, PhD
Faculty of Rehabilitation Medicine
492-0402

The first purpose of this study is to find out if mothers and fathers use the same way to show their infants something new. The second purpose is to find out the kind of stress that mothers and fathers have. Some of the parents will have a baby who was born early and some will have a baby -who was born at the expected time.

The researchers will make four visits to your home over 18 months. At three, eight and twelve months after your baby goes home from hospital, you will be watched while you show your baby how to use a toy. You will be asked to answer written questions about the stress you have and the activities you do with your baby. These home visits will last about 1 1/2 hours each. The visits will be at a time of day that suits you. At 18 months, your baby will be examined in your home by a research assistant to see how he/she is developing. This home visit will take about 1 to 1 1/2 hours. The baby's hospital record will be looked at by the researchers to get information about the baby's birth and health.

There are no risks to you or your baby if you are in the study. There are no direct benefits to you from being in the study. The results of the study will help us plan care for other parents and infants. You may refuse to answer any questions. The researchers will not share your answers with your partner. You may withdraw from the study at any time by telling the researchers you do not want to continue. Your information will not have your name on it, just a number. The list of parents' names and their numbers will be kept separately in a locked file. Only the research team will know who was in the study. When the findings of the study are presented at meetings or in articles, your name will not be given. If the information from the study is looked at in future years, the researchers will ask permission from a university ethical review committee.

You will be asked if you would like to be part of other studies of families with young children. At that time you can decide if you want to be in the new study or not. A copy of this form will be given to you. If you have any questions later, you may phone one of the researchers whose names are above. A summary of the results will be made available upon request.
We agree to participate in this study.

_____ _____
Mother Date

_____ _____
Father Researcher

Code Number _____

Project: Father-Child Interactions and Fathers' Perceptions of Parenting Stress

Researchers:
Margaret J. Harrison, RN, PhD
Faculty of Nursing
University of Alberta, Edmonton
403-492-5931

Joyce Magill-Evans, OT(C), PhD
Faculty of Rehabilitation Medicine
University of Alberta, Edmonton
403-492-0402

The first purpose of this study is to find out how fathers show their infants something new. The second purpose is to find out the kind of stress that fathers have with a young child.

The researchers will make one visit to your home when your child is under 3 years old. During the visit you will be watched while you show your child how to use a toy. You will also be asked to fill out a questionnaire about what kind of stress you have. The home visit will last about one hour. The visit will be at a time of day that suits you and when your child is expected to be alert and not hungry.

There are no risks to you or your baby if you are in the study. There are no direct benefits to you or your child from being in the study. The results of the study will help us plan care for other parents and children. You may refuse to answer any questions. You may withdraw from the study at any time by telling the researchers you do not want to continue. Your information will not have your name on it, just a number. The list of fathers' names and their numbers will be kept separately in a locked cabinet. Only the research team will know who was in the study. When the findings of the study are presented at meetings or in articles, your name will not be given. If the information from the study is looked at in future years, the researchers will ask permission from a university ethical review committee.

A copy of this form will be given to you. If you have any questions later, you may phone one of the researchers whose names are above. A summary of the results will be made available to you upon request.

I have read the information provided, had my questions answered, and agree to participate in this study.

_____ _____

Signature of Father

_____

Address to send results of study

_____ _____

Signature of Researcher Date

Project: Fathers' and Toddlers' Scores on a Measure of Parent-Child Interaction Information Sheet

Researchers:
Margaret J. Harrison, RN, PhD
Faculty of Nursing
University of Alberta, Edmonton
403-492-5931 403-492-0402

Joyce Magill-Evans, OT(C), PhD
Faculty of Rehabilitation Medicine
University of Alberta, Edmonton

Delmarie Sadoway, RN, MHSA
Manager, Community Health Services
Capital Health Authority
403-413-7960

The purpose of this study is to find out how fathers show their infants something new.

The researchers will make one visit to your home when your child is between 1 and 2 years old. During the visit you will be watched while you show your child how to use a toy. You will be asked to fill out a questionnaire about yourself and your child. The home visit will last about one hour.

There are no risks to you or your baby if you are in the study. There are no direct benefits to you or your child from being in the study. The results of the study will help us plan care for other parents and children. You may refuse to answer any questions. You may withdraw from the study at any time by telling the researchers you do not want to continue. Your information will not have your name on it, just a number. The list of fathers' names and their numbers will be kept separately in a locked cabinet. Only the research team will know who was in the study. When the findings of the study are presented at meetings or in articles, your name will not be given. If the information from the study is looked at in future years, the researchers will ask permission from a university ethical review committee.

A copy of this form will be given to you. If you have any questions later, you may phone one of the researchers whose names are above. A summary of the results will be made available to you upon request.

If you have read the information provided and have had your questions answered, and you agree to participate in the study, please complete the following consent form.

CONSENT

Part 1:

Title of Project: Fathers' and Toddlers' Scores on a Measure of Parent-Child Interaction

Principal Investigator(s):

Margaret J. Harrison, RN, PhD
Faculty of Nursing
University of Alberta, Edmonton
403-492-5931

Joyce Magill-Evans, OT(C), PhD
Faculty of Rehabilitation Medicine
University of Alberta, Edmonton
403-492-0402

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Community Health Services
Capital Health Authority
403-413-7960

Part 2 (to be completed by the research subject):

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you are free to refuse to participate or withdraw from the study at any time?	Yes	No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your records?	Yes	No

This study was explained to me by: _____

I agree to take part in this study.

_____ _____ _____
Signature of Research Participant Date Witness

_____ _____
Printed Name Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____
Signature of Investigator or Designee Date

Address to Send Results _____

Fax: (403) 492-2551 http://www.ua-nursing.ualberta.ca

Appendix B

Nursing Child Assessment Teaching Scale

Appendix B
Nursing Child Assessment Teaching Scale

Permission to use the Nursing Child Assessment Teaching Scale was granted to Dr. Margaret Harrison by Georgina Sumner, Director of NCAST.

All information regarding this instrument may be obtained from:
Director of NCAST
University of Washington
Box 357920
Seattle, WA, USA
98195-7920
E-Mail: ncast@u.washington.edu

Appendix C
Demographic Questionnaire

Appendix C

Code Number_____

Date_____

Fathers' Study
Demographic Data Form

1. Your age at last birthday?_____ Your age at the birth of your 1-2 year old child?_____

2. What grade did you complete in school? Grade_____

3. Indicate how many years you attended each of the following:

   University/college _____
   Technical school such as NAIT_____
   Other (specify)_____

4. Are you employed? No____ Yes ____ If yes, please describe your current job.

Title: _____ Things you do: _____

_____

5. Yearly Family Income:

a) less than 20,000 ____ e) $50,000-59,999 ____

b) $20,000-29,999 ____ f) $60,000-69,999 ____

c) $30,000-39,999 ____ g) $70,000-79,999 ____

d) $40,000-49,999 ____ h) $80,000 and over____

6. What is your ethnic background? _____

7. List the birth date for each of your children:

   a) _____ b) _____ c) _____ d) _____ e) _____

8. Who is the primary caregiver for your child between the ages of 1-2 years old?

   ____ mother ____ father ____ shared equally

9. While you are working, who cares for your child between the ages of 1-2 years old?

   Your partner/spouse _____
   Other family members _____
   Babysitter/nanny _____
   Daycare _____
   Other (please specify) _____

For Office Use Only

Code Number _____

10. In the last seven days, how many times have you had sole responsibility for the care of your child between the ages of 1-2 years of age, while the mother is at work, busy, or away from the house?

_____ times

This is:
____ the same number off times as usual
____ less than usual
____ more than usual

11. On a typical day <u>when you work</u>, how much time do you spend:

a) giving care to your 1-2 year old child?

____ less than 15 minutes
____ 15 to 30 minutes
____ more than half an hour

b) playing with your 1-2 year old child?

____ less than 15 minutes
____ 15 to 30 minutes
____ more than half an hour

12. On a typical day <u>when you are not working</u>, how much time do you spend:

a) giving care to your 1-2 year old child

____ less than 15 minutes
____ 15 to 30 minutes
____ more than half an hour

b) playing with your 1-2 year old child?

____ less than 15 minutes
____ 15 to 30 minutes
____ More than half an hour

13. Since your 1-2 year old child was born, have you been away from your child for more than a week at a time?

No _____ Yes _____
If yes, how long? _____ weeks _____ months

Thank you for taking the time to complete this questionnaire.