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The effects of handling training on parent-infant interaction and infant development

Maietta, Lenny Sue, Ph.D.

The Fielding Institute, 1987

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The Effects of Handling Training on Parent-Infant Interaction and Infant Development

A dissertation submitted

by

Lenny Maietta

to

The Fielding Institute

in partial fulfillment of
the requirements for the
degree of

Doctor of Philosophy In Psychology

with an emphasis in
Clinical Psychology

This dissertation has been
accepted for the faculty of
the Fielding Institute by:

Nancy Downing, Ph.D.
Chair

Hallock Hoffman
Program Director

Pat Hodges, Ph.D.
Second Faculty Member

Martha Novak
Second Student

November, 27,1985

Abstract

The Effects of Handling Training on Parent-Infant Interaction and Infant Development

by

Lenny Maietta

This study examined parent-infant interaction within a cybernetic context of learning where development is considered to be a family venture. It evaluated a handling training program for new parents intended to enhance family interaction and infant development.

Handling refers to the touch-linked movement exchanges occurring between parents and infants during shared activities. A group of 22 low-risk, first-time parents of primarily white North American origin, received handling training just before the birth and during the first 2 weeks postpartum. Assessments carried out at 1 month, 6 weeks, and 2 months postpartum found that handling training positively affected: (1) parent expectations of infant behavior using the Parent Expectation Survey, (Barnard & Eyres, 1979); (2) the degree of mutuality in parent-infant interaction using the Mutual Interaction Scales, (Maietta, 1985); (3) the apparent development of the infant according to the Infant Behavior Observation Schedual, (Munzik-Bruno, 1986); and (4) parenting confidence using parenting confidence questionnaires, (Davidson, 1979).

Previous research had demonstrated the general importance of touching and close bodily contact for attachment and infant development. This study demonstrated the impact of a specific method of touching newborns. The central concepts of the method, mutuality and social tracking (following between individuals by active linking of sensory-motor systems) may fill an essential missing link in understanding the processes through which patterns of parent-infant communication evolve, before the child has even a passive understanding of words.

Acknowledgements

I am indebted to a long list of individuals for their support of this study. I am deeply indebted to the families and staff of the Maternal and Infant Care Project, University of New Mexico Medical Center for their excited involvement in the Touch-In-Parenting Project.

This study is founded upon cybernetic systems theory. I am grateful to Dr. K.U. Smith, and the late Drs. Gregory Bateson and Moshe Feldenkrais for their personal and professional assistance in establishing the project's theoretical background in cybernetics. Dr. Smith has continuously given invaluable personal support and guidance throughout this study.

The project would never have been completed without the patient assistance of the staff of the Fielding Institute. Gary Schulman provided ongoing assistance on all research "technicalities". Hallock Hoffman and Nancy Downing provided ongoing critical analysis of the manuscript, humorous insights and support that made it possible to finish this seemingly never-ending project.

Last of all I must thank my family: My partner Dr. Frank Hatch with whom I developed the ideas upon which this study was based; and our young children who made it possible to personally experience the benefits of learning-to-learn mutually with children.

TABLE OF CONTENTS

Chapter I Introduction ----------1

Chapter II Review of the Literature ----------14

Cybernetic Research----------14
Newborn Competencies: Handling: Development----34
Parenting Programs----------42
Summary----------47

Chapter III Statement of the Problem ----------49

Research Problem----------49
Hypotheses----------52

Chapter IV Methods ----------58

Referral Source----------58
Selection Criteria----------61
Demographic Data----------62
Subjects Obtained----------64
Treatment----------64
Home Teaching----------72
Instruments----------73
Logistical Procedures----------84
Video Tape Recording Procedures----------88
Rater Training Procedures----------89
Video Analysis A: Mutual Interaction----------91
Video Analysis B: Apparent Infant Development--93
Data Analysis----------94

Chapter V Results ----------95

Comparability Data----------95
Hypotheses----------100
Exploratory Questions----------118

Chapter VI Discussion ----------145

Hypotheses----------127
Exploratory Questions----------135
Ancedotal Information----------138
Sample----------139
Measurements----------139
Shortcomings of the Design----------142
Future Research----------143
Conclusions----------144

References----------146

Appendices----------156

Appendix A Birthing Class Description ------156
Appendix B Treatment Process Narrative -----158
Appendix C Home Teaching Narrative ---------182
Appendix D Parent Expectation Survey -------193
Appendix E Mutual Interaction Scales -------194
Appendix F Questionnaires ------------------208
Appendix G Infant Behavior Observation Schedule----------219
Appendix H Consent Forms -------------------221
Appendix I Video Taping Procedures ---------229
Appendix J Rater Training Narrative --------231

List of Tables

Table 1: Comparison of Treatment and Control Groups on Selected Variables --------96
Table 2: Influence of Treatment, Parent's Gender and Baby's Gender on Pretest Comparability Questionnaire----------98
Table 3: Effects of Treatment, Participant's Gender and Baby Gender on Posttest Parent Expectation Scores----------102
Table 4: Interrater Agreement for MIS Scales---------- 104
Table 5: Intercorrelations Among Mutual Interaction Scales----------106
Table 6: Correlations Between Mutual Interaction Scores and Post Test Expectation Scores----------108
Table 7: Effect of Group and Baby Gender on MIS Scores----------110
Table 8: T-Tests for Intervention vs. Comparison Groups on Mutual Interaction Scores----------112
Table 9: Intercorrelations Among Apparent Development Scores----------114
Table 10: Effects of Treatment and Baby Gender on Apparent Development Scores------117
table 11: Influence of Treatment, Parent's Gender and Baby Gender On Posttest One Confidence Items----------120

Table 12: Means and Standarad Deviations on Significant Posttest One Confidence Items----------121
Table 13: Influence of Treatment, Parent's Gender and Baby Gender on Posttest Two Confidence Items----------123
Table 14: Means and Standard Deviations on Significant Posttest Two Confidence Items----------124
Table 15: Influence of Treatment, Participant's Gender and Baby Gender on Unmatched Posttest Confidence Items----------126

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CHAPTER ONE

INTRODUCTION

Over the years the field of clinical psychology has broadened its concerns beyond remediation to encompass developmental and preventive issues. This expansion has created the need for developing methods that prevent illness and enhance human development (Levy, 1984; Sanford, 1972).

This study evaluated a method of improving parent-infant interaction skills as a means of enhancing development. Behavioral cybernetic theory provided the conceptual background for the method that was evaluated. Within a framework of cybernetic system's, parents' handling practices are seen as the primary tool for developing positive parent-infant interaction patterns that support the infant's development. The purpose of the study was to see how parents and infants could profit from parents learning systematic handling skills intended to support their baby's participation and competence during caretaking and play activities.

Expectant parents received training just before the birth of their baby and during the first 2 weeks postpartum. The initial effects of that training were documented on three dependent measures: (1) the parents' expectations of their infants' abilities, behavior and

development; (2) the mutual interaction skill of the parent-infant team; (3) the infants' apparent development during the first 6 weeks.

Handling practices are an important and relatively unexplored component of healthy development in young children. Only two areas of research have indirectly addressed the effects of handling on development and the parent-infant relationship. These include investigations regarding the role of touch in parent-infant attachment and the effects of sensory stimulation on premature babies.

Attachment researchers, (e.g., Ainsworth, 1969, 1973; Bowlby, 1969; Klaus & Kennell, 1976) were concerned with timing, amount of tactile contact, and the effect of particular kinds of touching activities on attachment. What they discovered was that timely touching and close bodily contact supported the development of a nurturing attachment relationship between a parent and infant. Investigations concerned with the effects of sensory stimulation on premature babies (Gottfried 1984a, 1984b; Gottfried, Wallace-Lande, Sherman-Brown, King, Coen, & Hodgman 1981), indicated that touching (and other sensory stimulation) supported infant development. Touch as described in that literature must be considered in a very broad context as a superficial, yet intimate sensory mode confined to skin and body surface experience.

I have a more specific view of touch and its role in the parent-infant relationship. When I speak of touch in this document I refer to its function of interfacing an individual with the surface of the external world, animate and inanimate. Touch and movement go hand-in-hand. Only when the two are linked is it possible to experience and give meaning to differential qualities of touching and/or being touched.

This study was concerned with handling, of which touch is a component. By handling I refer to the touch-linked exchanges between parent and infant during specific activities. An exchange involves the spatial positioning of body parts, timing, and the muscular effort parents and infants make relative to each other. Touch is the sensory medium for making and maintaining contact during the handling exchange.

Laban (1950) incorporated the three categories of space, time and effort, into a notation system for observing and classifying persistent patterns of body movement. They are the central and most observable components of nonverbal communication. I assume that the spatial, temporal, and effort aspects of each predominantly nonverbal parent-infant exchange determine the movements of the participants, and the effect and meaning of each interaction.

Recently attention has been brought to the possible integrative function touch plays for the other senses. In a round table discussion dedicated exclusively to touch, Brazelton (1984, p. XVII) expressed his opinion that "touch may be one of the main intersensory integrators, and one of the main consolidators or cementers of development." Research in behavioral cybernetics has provided insights as to why this role may be attributed to touch. Touch is the only sensory mode that allows for immediate feedback and adjustment of response for all participants in an interaction (Smith & Sturgeon, 1971; Stein & Meyer, 1971). As a result, people (babies included), can accurately follow tactile exchanges and coordinated tactile-visual or tactile-auditory exchanges for long periods of time. A parent skilled in tactile communication can use touching as the stable reference for organizing the rest of the infant's sensory and motor events into meaningful patterns.

It seems trite to point out that, especially in infancy, all aspects of function and development are closely interrelated. Yet, developmental researchers have tended to focus on cognitive, emotional, and social aspects of development. They have basically ignored the area of motor development except to point out the usual time of appearance of the major milestones of head control, sitting, creeping, standing, walking, etc., necessary for accomplishment of age-

specific tasks (M. Ainsworth, personal communication, March 1986). Motor skills seem to simply appear with time, either from innate maturational processes (Gesell, 1925), through the infant's interaction with the physical environment (Piaget, 1952), or through a combination of both. Motor skills, which imply the ability to follow movement patterns, were linked to cognitive, emotional and social aspects of development as a result of research at the Behavioral Cybernetics Laboratory, University of Wisconsin at Madison (Ansell & Smith, 1973; Smith, 1968, 1971, 1972; K.U. Smith, S. Ansell & M. F. Smith, 1963; Smith & Schiamberg, 1973; K.U. Smith & W.M. Smith, 1962; K.U. Smith, C. Zwerg & N. Smith, 1963).

Clinical practice with children and developmental research has provided a body of evidence indicating:

(1) Newborns have full sensory capabilities at birth or shortly thereafter (Brazelton, 1984);

(2) Newborns can use their sensory capabilities to synchronize their behavior with the behavior of others (Condon, 1974, 1975; Kaye, 1977; Schaffer, 1974; Stern, 1971, 1974);

(3) Newborns/infants must be touched for healthy development to occur (Montague, 1978);

(4) Newborns need close bodily contact (Ainsworth, Blehar, Water & Wall, 1978) to establish nurturing attachments essential for development;

(5) Nurturing attachments enable the infant to develop a sense of trust (Erikson, 1950), or self (Bettleheim, 1967) necessary for normal personality and social development;

(6) Early childhood is concerned with differentiation at social, emotional, cognitive and motor levels of functioning (Brazelton, 1984; S. Greenspan & N. Greenspan, 1985; Greenspan & Lourie, 1981);

(7) Cognitive, social, and emotional development proceed positively when parents make their actions contingent on the behavior of their infant (Barnard & Bee, 1984; S. Greenspan & N. Greenspan, 1985);

These investigations of development within the context of the parent-infant relationship, have led to an emerging consensus that interaction patterns of parents and infants are predictive of the quality of child development and parent-child relationships (Barnard & Bee, 1984). Insights of these investigations have provided practitioners with the means to recognize when the parent-infant relationship and the infant's development will most likely proceed well, and when it will not. They have supplied a body of evidence supporting the proposition that early parenting programs aimed at improving the nature of mother-infant interaction

are highly desirable as a means of reducing the incidence of later pathology (M. Ainsworth, personal communication, January 1986). Yet, parenting programs that give parents tangible skills are rare.

The following limitations of earlier research have made it difficult to translate the above-listed insights into parenting programs:

(1) Much of the research has been concerned with identifying kinds and sequences of behavior that lead to pathological patterns of interaction. The effect has been to establish a framework for conceptualizing parenting intervention programs intended to prevent pathological behavior rather than enhance all aspects of development and human function.

(2) Suggestions for positive and supportive parent-infant interaction are based on observations of things that the newborn/infant is able to do, at particular ages, rather than on an understanding of the motor-sensory processes that underlay parent-infant interaction and knowledge of human function;

(3) The terms of mutuality and contingency are often used interchangeably in regard to parent-infant interaction. Both terms describe an interaction where the parent engages the child in such a manner that they accomplish something together. However, at the level of sensory-motor

functioning a mutual exchange and a contingent exchange are distinctly different (Maietta & Hatch, 1985).

Mutuality describes the degree of synchrony in a bidirectional simultaneous interaction. A response is mutual if it goes in both directions between two people in the same time frame. The only sensory mode that allows for mutual exchange is touch. Mutuality implies compliance (synchrony) between participants. In a simultaneous interaction between a parent and infant, meaning is mutually determined by the participants.

Contingency is descriptive of the degree of synchrony in a bidirectional sequential interaction. Contingent patterns of interaction rely predominantly on visual and auditory stimuli. They are the normal conversation mode of communication as they refer to sequentially timed exchanges. Contingency implies synchrony between participants in the same way that mutuality does. In a sequential bidirectional (contingent) exchange, meaning must be either predetermined, or assigned in steps by each of the participants over time.

In my professional practice I have observed that babies are able to participate actively in mutual tactile exchanges long before they can participate actively in sequential exchanges. I assume that through touch-guided mutual exchanges parent and newborn establish patterns of

meaning. It seems appropriate that that unique meaning should later be used to analyze their contingent, sequential response patterns.

(4) Prior research has tended to confuse the kinesthetic or movement sense with touch. Brazelton (1984, p. XVII) broached the possibility that touch may serve to integrate the other senses. In fact, it is the kinesthetic or movement sense that integrates all of the senses. Movement allows us to perceive differences (Poincare, 1905). Without movement we cannot see, hear, taste, smell, or experience touch. Because touch causes immediate kinesthetic feedback and adjustment it is the fastest and most accurate exteroceptor mode of transferring and interpreting information. For this reason, I assumed touch would be an effective sensory system for parents to utilize to improve all motor-sensory functioning.

The handling training was founded upon theory and research in the field of behavioral cybernetics regarding motor-sensory integration in human function and learning (Ansell & Smith, 1973; Kao & Smith, 1971; Smith, 1962, 1965, 1968, 1972; K.U. Smith, S. Ansell & M.F. Smith, 1963; Smith & Schiamberg, 1973; K.U. Smith & M.F. Smith 1962; K.U. Smith & W.M. Smith, 1962). When the theory and findings of cybernetic research are applied to parent-infant interaction they suggest that:

(1) Patterns of parent-infant communication are established through the exchange of specific tactile messages, during caretaking and play activities (Smith, 1968).
(2) Infants learn perceptual and communication skills by synchronizing their behavior with the behavior of others (especially parents or primary caretakers) through processes of social tracking or following (Smith,1972).
(3) An optimal learning environment for infants is one in which the parent continuously adjusts behavior to accommodate the behavior of the infant while organizing the infant's efforts so that they mutually accomplish a particular activity (Ting, M. Smith & K.U. Smith, 1972).

The above three ideas were central to this investigation. When designing the study I was concerned with questions regarding: 1) What information, and which skills do parents need to develop patterns of interaction that enhance family relationships and the infant's development? 2) What kind of teaching format enables parents to transfer presented information into behavior with their infant?

A review of existing parenting programs was of little assistance in answering those questions. Evaluations of programs have been almost impossible. They have either been too broad to evaluate, or they have existed as adjuncts to other prenatal or postnatal services (Joy,

1980). As a result it has been difficult to determine optimal parenting program content or effective teaching formats.

Evaluations of parent-infant interaction and parenting programs have determined that parent expectations affect: (1) what parents actually do with their child (Barnard & Eyres, 1979; Brazelton, 1973; Novers, Shore, Timberlake & Greenspan 1984); (2) the design of the child's learning environment (Barnard & Eyres, 1979; Davidson, 1979; (3) and the child's development (Barnard, & Eyres, 1979). These findings indicate that the content of parenting programs should include information about newborn abilities and development.

In regard to teaching format, Joy's (1980) review of parenting programs found that parents had difficulty transferring information presented through lectures, written materials, or film into behavior with their child. Davidson (1979), on the other hand, was successful in helping parents to utilize information about newborn behavior and development when it was discussed and demonstrated in a conversational format.

In 1983 I developed a simple, experiential parenting intervention program that teaches parents systematic handling skills. The program incorporated: (1) insights of developmental research described earlier regarding newborn

abilities, the role of touch in attachment and development, and differentiation during infancy; (2) findings of evaluations of parenting programs; (3) the behavioral cybernetic insights related to the role of motor activity in learning and human function; and, (4) my expertise in using movement methods to improve human function.

The intent of this study was to train a low-risk population of parents in handling skills and document the initial effects of that training on the infant, parent, and parent-infant team. Usually, it has only been in cases of pathological behavior, physical deformity, a debilitating disease, or an unfortunate accident, that parents and professionals have become conscientiously engaged in the whole developmental process, attempting to maximize the infant's limited potential. This study is based on the assumption that low-risk parents and infants can benefit equally from such attention.

The results of cybernetic research on learning indicated that an effective parenting program (for any parent-infant population) would be one which provided parents with: (1) an experiential understanding of the processes involved in development; and (2) handling skills with which they could facilitate that development during caretaking and play activities. There was an obvious need to

investigate the effects of handling training on infant development and parent-infant interaction.

CHAPTER TWO

REVIEW OF THE LITERATURE

The literature reviewed for this project came from two schools of thought. It included: (1) studies in the field of behavioral cybernetics relevant to development, parent-infant interaction and human function; (2) studies in developmental psychology contributing to understanding the foundations of handling practices and the effects of handling in parent-infant interaction and development.

The research of Dr. Karl U. Smith in applying cybernetic theory to perception, communication and learning provided the foundation of this study. His relevant work and a historical perspective of other applicable research in the field of cybernetics is reviewed first. The purpose is to provide the reader with a cybernetic context for understanding the dissertation.

1.Cybernetic Research

The field of behavioral cybernetics is concerned with control and communication in living systems (Wiener, 1948). Since before World War II, researchers in cybernetics have studied the motor-sensory parameters of behavior. Evidence has accumulated indicating that movement and the motor

systems of the body play a central role in both control of individual and collective behavior and effective communication (Bertalanffy, 1968; Powers, 1973; Smith, 1945, 1965, 1968, 1971, 1972; Weiner, 1948, 1950).

A series of investigations in the cybernetic field beginning in 1930 made significant observations about the feedback-controlled nature of functioning in human beings. The earliest study, carried out by McGinnis (1930), investigated visual following abilities of newborn infants. He found that newborns could visually follow a shiny watch and respond overtly during early postnatal development. Several years later, Smith and Warkentin (1937) used young kittens to study visual following skill and visual acuity. They found that accurate following involves continuous guidance and synchronization of eye and body movement.

These investigations were followed by experimental studies to obtain actual measurements of the interaction between eye and body movements (Smith, 1937; Smith & Bojar, 1938; Smith & Bridgman, 1943; Smith & Kappauf, 1940; Smith, Kappauf, & Bojar, 1940). The investigations found that any eye movement involved immediate adjustment of all other motor system components to accommodate the change. These initial series of studies provided evidence of the intricate functional relationships between motor and sensory systems.

They indicated that skill development in either system necessitated learning in both areas.

Smith (1945) added to the evidence by performing a study investigating how the interaction and integration of motor and sensory processes guided response in a system composed of a person and a machine. The questions being examined were: How does one continuously correct for errors in performance? How does one learn? He found that when an individual moved, the sensory systems immediately registered and ordered the effects of that motion. The effects initiated immediate alterations of the individual's motion in a continuous circular pattern of motor-sensory adjustment.

This description of learning can be applied to all individuals of all ages, in all learning situations. It is the basis of the cybernetic model of human functioning that describes human beings as self-controlling and self-generating feedback systems (Bateson, 1972; Powers, 1979; Smith, 1972; Wiener, 1948). This model indicates that each of us generates our own behavior. Our sensory systems register informational effects of activity and use the information to regulate our next response. Movement plays a central role in the process. The function of each sensory system is dependent upon the ability to create, follow and interpret movement patterns related to specific

visual, auditory, gustatory, olfactory, tactile and kinesthetic stimuli. Even newborns generate their own behavior. I assume that the more parents can assist them in creating, following and bringing meaning to movement and sensory stimuli, the greater will be their skill in controlling and generating their own behavior.

a. Motor Sensory Regulation of Performance

Investigations of motor-sensory regulation of performance utilized experimental optical, electronic, electromechanical, television, and real time computer methods to study the integrated functioning of motor-sensory systems as feedback controlled processes (Smith, 1971). Typically in such studies, subjects performed tasks while receiving displaced and delayed feedback. Learning and control of motions under displaced and delayed feedback conditions were compared to learning with immediate sensory feedback. In this way it was possible to determine precisely many of the motor-sensory relationships of human motion and learning.

Studies on motor-sensory regulation (Gould & Smith, 1963; Putz & Molitor, 1968; K.U. Smith, S. Ansell & M. Smith, 1963; Smith & Henry, 1966), are significant in that they demonstrated the intricate relationship between motor and various sensory aspects of human functioning. They demonstrated that human beings, regardless of age, are able

to follow and adjust to changes in themselves and in other people when sensory feedback is immediate. However, when there is a delay in the feedback that is critical for controlling motion, performance b eaks down, and learning, even with practice, is impossible.

Gould and Smith (1963) examined the relationship between vision and motor activity. They used television methods to control the angular displacement of visual feedback in maze-tracing and freehand circle drawing. In maze tracing the subject received constant visual information about performance as the pencil moved in the free space between two lines. The visual feedback of motor performance, referenced by the tactile feedback of the pencil following the lines of the maze, allowed the subject to correct constantly for errors in motion. In freehand circle drawing, the subject, receiving only visual feedback of performance, could not adjust for movement errors and could therefore not improve performance.

In a similar study K. U. Smith, S. Ansell and M. Smith (1963) compared subjects' skill in tracing motion patterns with delayed and immediate feedback. They found dynamic feedback, where the subjects received continual visual feedback of the effects of motions, to be the most effective means of enhancing performance and learning. They found static operational feedback, where subjects were

shown a still picture of the effects of motions, to be an inferior method of learning.

In another area of motor-sensory functioning, Putz and Molitor (1968) demonstrated the intricate relationship between breathing and motion systems. Two groups of subjects were compared in their skill to coordinate breathing and motion under varying conditions. The subjects of one group used a part of their body to follow their own breathing patterns displayed as sine-wave patterns on an oscillograph screen. They were able to regulate their breathing when following a visual image of their breathing pattern with tactile contact. Subjects of the second group used a part of their body to follow a machine-generated breathing pattern displayed on the oscillograph screen. The breathing pattern was not their own. They were not able to regulate their breathing under these conditions. The results illustrated the intricate relationship between breathing and motion. In addition, they found that learning was superior with body-yoked feedback (where sensory effects lead to adjusted motion in a circular process) in comparison to situations where the subject followed an external environmental stimulus pattern which did not adjust for errors.

Smith and Henry (1966) performed studies on the component interactions of motion systems and expressive movement using posture platforms. A posture platform is a

board placed on top of several strain-gauges which measure any changes in motion or directions of motion of the person standing on it. In these studies the researchers provided comparative measurements of transport and postural movements responsible for bilateral, up and down, and forward and backward coordination. While the subject drew patterns of letters and designs under conditions of variations in the visual, auditory, kinesthetic, or tactual modes of sensory input, the postural adjustments the subject made to draw those patterns were recorded by the apparatus. The results indicated posture and its sensory channels are regulated as feedback controlled mechanisms.

Smith and Sturgeon (1971) and Stein and Meyer (1971) demonstrated the intricate relationship between touch and motion. They found that touching is the most effective means of insuring accurate following and mutual exchanges between individuals because the tactile system transfers and interprets information far faster than any other exteroceptor system. For that reason, sensory systems that have slower processing time such as vision and hearing are less effective in the control of motion.

Smith and Sturgeon (1971) studied the effects of delayed tactile feedback by producing a transmission lag between finger and thumb movement, and vibro-tactile (rubbing) stimulation of the same digits. The results

showed that any delay causes progressively severe impairment in the ability to coordinate movement of the finger and thumb.

Stein and Meyer (1971) studied skill in following the motions of another person with one or two hands touching. They attached hand-arm transducers to the subject's palms which measured their accuracy in following. These measurements were transduced onto a screen where they were compared with measurements of accuracy in following another person's hand motion without touching, using only visual guidance. They found that the accuracy and synchronization of movement between subjects was far superior with either one or two hands touching than when they tried to follow each other's motions by vision alone.

These findings have important implications for interventions in infant development and parent-infant interaction. Investigations of newborn competency have established that newborn babies are able to see (Fantz, 1961, 1965), hear (Hutt, 1973), and smell (MacFarlane, 1975). They are not, however, able to organize their muscular efforts to match and act on incoming stimuli. Yet, they, like all people, are able to follow someone else's motion patterns while maintaining tactile contact for longer periods and with greater accuracy than they can follow visual or auditory patterns (Smith & Sturgeon, 1971; Stein & Meyer, 1971).

These findings suggest that parents can establish interactive contact with their babies through touch and motion long before other modalities of communication are available. I anticipated that they could learn to use touch-guided motion to facilitate the orderly development of all of their infant's other sensory and motor functions.

b. Studies on Social Tracking (Following)

The idea for a method to train parents and infants in handling skills came from social tracking studies conducted by Smith and others at the Behavioral Cybernetic Laboratories, University of Wisconsin, Madison (Smith, 1972; Ting, M. Smith & K. U. Smith, 1972). The concept of social tracking suggests that in an interaction, two or more persons are yoked together in closed motor-sensory circuits in which the individuals reciprocally control the sensory input of each other by the movements they make relative to each other (Smith 1972). In other words, human beings of all ages follow and communicate with each other, to a large degree, by synchronizing their movements during an interaction.

One of the first experiments to test the idea of feedback control of social tracking, (K.U. Smith, S. Ansell and W.M. Smith, 1963) required tracing a visual maze pattern while unknowingly viewing the parallel but delayed

motions of another person on a television monitor. The results indicated that social learning is limited: 1) when feedback delays are involved; and 2) when the interaction does not involve mutual control in which each person contributes to the overall performance.

Ting, M. Smith, and K.U. Smith (1972) examined learning under three conditions: 1) When the teacher or model watched what the imitator did but did nothing about it; 2) when the model received no indication of what the imitator was doing; and 3) when the model watched what the imitator did and tried to aid by adjusting his or her movements to assist the imitator in reducing the errors in following. They found that most learning occurred when the model continuously adjusted his or her motion so that the imitator could more accurately follow. Furthermore, by simple comparisons of following through the various sensory mediums they determined that following through touch was more effective than any other sensory means. Not only was timing of motion while following more accurate, but precision of spatial use and appropriate force exertion were most exact when subjects were linked by touch.

The results of these studies further supported the idea that learning between parent and infant is primarily determined by mutually linked movements and sensory input. Through touch interactions the motor and sensory systems of

parent and infant are yoked together in such a way that they actively follow and adjust to each other. I assume that in this way infants acquire functional knowledge of joint action, levels and directions of movement, and the use of their motion systems as understood and practiced by the parent. They thereby develop learning patterns similar to those of their parents. They come to select, guide and regulate sensory information similarly. I believe that this process of motor-sensory following accounts for the striking similarity in posture, gestures, behavior and even personal histories within families.

These ideas may explain the findings of a number of investigators including Bruner (1977), Halliday (1975), Newson and Shotter (1974), and Trevarthen (1977). They pointed out that long before the infant's even passive understanding of language, mother and infant have established communication patterns through which mutual understanding and meaning is developed.

Cybernetic findings provide a new framework for observing parent-infant interaction in terms of motor-sensory tracking or following. For example, Richards (1974) made film sequences of mothers and babies smiling at each other and analyzed them frame by frame. He found the infant's behavior goes through a distinct timed sequence of development which ends in a smile. The mother must pace

herself to wait for her infant's response if the interaction is to result in mutual smiling. From a cybernetic analysis of the interaction, the infant is following not just the facial expression of smiling, but the whole sequence of small body adjustments that the mother makes, initiated by a particular smile, made in response to a particular ordering of sensory information. By following the parent's motion messages, the parent and infant come to a mutual understanding of what those messages mean. They develop mutual patterns of responding to particular sequences of motion messages.

The same is true in parent-infant interactions mediated through an object. J. Newson and E. Newson (1976) described the way in which a parent can successfully get a 4-week-old infant to follow visually the movement of a dangling ring. They found that the parent's motion needed to be paced in time with the motion of the infant. In addition, the parent needed to remain aware of the infant's state of arousal and direction of focus at all times. They needed to adjust the position of the ring moment-by-moment according to the infant's responses and spontaneous actions. A cybernetic analysis suggests that in such interactions the infant is not simply following the motion of the dangling ring. The ring is the medium through which the infant is having an interaction with the parent. The

parent moves the ring not just with the motion of the hand or arm, but with a coordinated and synchronized sequence of movements thoughout the entire body, guided and initiated by the movement of the hand. The infant, in this way, made the connection between the motion of following the ring and the abstract notion of up and down and side to side according to how the parent's body organized to make those motions.

The above studies of Richards (1974) and J. Newson and E. Newson (1976) are part of a body of research used to illustrate that all human beings, including parents and babies, synchronize their behavior during an interaction. Some of the earliest research in synchrony was done by Bateson and Mead (1942). Using film analysis they found that individuals engaged in an interaction, complemented, mirrored, or paralleled the movements of each other. Their observations indicated there is a logical synchronization of motion patterns in an interpersonal exchange which provides the context for understanding the communication. Birdwhistle (1970), analyzing films of family interaction using the method of kinesics, and Condon (1975), analyzing film studies on synchrony and dissynchrony in interaction came up with similar conclusions.

Video recordings have been the principal means of analyzing synchronization between mothers and infants.

Video footage of synchronized motions (Brazelton, 1962; Stern, 1971), synchronized gazing (Carpenter, 1974; Haaf & Bell, 1967;) and synchronized smiling (Richards, 1974) have highlighted synchronization as an important parent-infant activity.

What is lacking in most research on synchrony is an understanding of the motor-sensory foundations of synchronized behavior. Smith's work (1971) indicated that there are different kinds of compliance or synchrony between interacting individuals. It is possible for one person to do the majority of adjusting and still have the interaction be synchronized. I assume that how the parent adjusts to the infant influences who learns in the interaction, what is learned, and the infant's developing understanding of how one learns. If the infant must do most of the adjusting the learning that occurs will be one-directional and limited to the repertoire of the dominant partner. When the infant must "copy" the parent in order to have an interaction, the infant will most likely take over the parent's perceptual and response patterns as a flat caricature, adding little. If the parent and infant contribute mutually to the interaction--ie., if they continuously attend and adjust to each other's movement messages, both the parent and infant will learn new and previously unexperienced patterns of response and

adaptation. Through mutual learning interactions, new perceptions and response patterns can be created for all members of the family (Maietta & Hatch 1985).

c. Social Tracking Skills in the Child

The idea that an infant's development is optimized through mutually determined, or mutually-guided tactile interactions between parent and infant grew out of a number of studies. Ansell and Smith (1973); Smith (1972, 1973); K.U. Smith, C. Zwerg and N. Smith (1963); found that very young children can follow and represent dynamic motion patterns much better than they can represent the same static patterns. These studies can be understood to support the thesis that mutual or simultaneously determined interactions are more basic and precede a child's ability to engage in sequential exchanges. In these studies, the ability of young children to follow dynamic patterns suggested that dynamic mutual following acts as a precursor to visual and manual recognition of static visual forms. In other words, a child must experience those patterns in the course of mutual interactions with others for years before it is possible to recognize and reproduce them in another time frame. Children begin experiencing these patterns while following the motion patterns of their parents as they are being carried and handled in infancy.

K.U. Smith, C. Zwerg and N. Smith (1963) carried out a study on the maturation of social tracking in infants between 6 months and 3 years. Using a rotating playpen and a static video monitor, they investigated the orientation skills of the infants by displaying images of the mother, a stranger, and a window in static and dynamic situations. The study indicated that tactual, auditory, and visual following of the parents and siblings is crucial to maturation of all critical behavioral components in the child's development.

Smith (1973) investigated the motor-visual control of the infant. In a hospital setting the sides and front of cribs were arranged with sensing metal plates which when touched activated visual or auditory, dynamic or static images of siblings and parents.

Both studies indicated that there are two critical phases of maturation in infants. The first phase is earlier than 20-22 months in which the sensory environment is controlled by general orientation movements of the hands, head, and eyes. During this phase infants must rely on parents to give them access to sensory stimuli and to organize their general efforts into meaningful patterns. A second phase begins around 20-22 months when articulated movements develop, allowing for more self-control made possible by more sophisticated and accurate behavior.

Ansell and Smith (1973) studied the development of following skills in preschool age groups. They studied children aged 3, 4, and 5 on their capabilities of dynamically following the movements of another person by visual guidance. They found that the ability to do dynamic visual-manual following was present in infants. Accuracy developed progressively between the ages of 2 and 10.

Smith (1973) studied 3-year-old children through youths in late adolescence on their ability to follow predictable and non-predictable dynamic moving patterns through a translucent glass screen. In these studies the experimenter moved a target in a figure eight and double triangular path and the child attempted to follow the patterns with a pencil-like instrument on the other side of the glass screen.

The studies found that children can follow a dynamic social pattern at a much younger age than they can represent the same pattern after having it shown to them in static form. These studies indicate that touch-guided mutual following precedes both the ability to follow persons or objects visually and visual recognition of static visual forms. The researchers concluded that a child must experience those patterns in gross and fine articulated motions in parts of, and with the complete body, for years before it is possible to recognize and reproduce them in symbolic or abstract form. I assume that the child begins

experiencing those patterns while following the motion patterns of parents when being carried and handled in the first 2 years of life.

Experimental observations of 1-and 3-year-old infants in finger dancing interactions, Smith (1973), indicated tactual following is involved in the development of continuously controlled movements. In these observations a blindfolded child could accurately follow the movements of another person so long as their fingers were touching. The same was true for two-handed following. But when the blindfold was removed and the child was instructed to follow the other person's hand movements using the eyes for guidance it was very difficult. Following two hands without physical contact, using the eyes for guidance of both hands, was impossible.

The social tracking studies indicated that both smooth motor control and bimanual coordination develops in infants and children as a result of repeated and continuous tactual interactions. I assume that it is through mutual tactile-guided interactions that the child progressively develops self-control in the environment and learns to order and make sense out of sensory experience. The implications of these findings for the design of parent-infant interaction training methods is obvious. Such methods must emphasize the primacy of touch-based interactions, especially in the beginning of the infant's life.

Piaget has contributed important insights into the nature of the infant's interaction with the physical environment during development of sensory-motor skill. Piaget's theories are similar to those of cybernetic theory in three ways: 1) they both suggest that infants/children self-generate and self-regulate their own activity. In Piaget's assimilation-accommodation process and in the cybernetic equivalent, social tracking process, the infant/child adjusts to and makes adjustments upon the external world through continuous active interaction with the physical and social environments; 2) Both schools present the developmental process as a gradual progression. The infant-child first develops relationships with, and learns about the external world through physical actions upon and interaction with it. The infant then internalizes those patterns of relationship in the process of developing the ability to learn about and relate to the world through symbolic and logical processes (Piaget, 1952; Smith,1968; Smith & L. Schiamberg, 1973); 3) Both Piagetian and cybernetic theory suggest that the developmental process entails stepped, interdependent interactions between maturational and learning processes. Critical phases of maturation are enhanced or hindered by the quality of learning experiences involving social-tactual tracking (following) interactions between parents and infants and

interactions with the physical environment (Smith & Schiamberg, 1973).

The difference between Piagetian and cybernetic approaches is that Piaget emphasized the interaction of the child with the non-responsive physical environment. Cybernetic studies, on the other hand, have considered the child as part of a self-controlling system comprised of mutually responsive family members. This new methodology makes it unnecessary to objectify children in order to study their development (Ozer, 1978). Cybernetic theory and methods of investigation have made it possible to examine the complex motor-sensory variables of parent-infant relationships in vivo.

The results of cybernetic investigations suggest that children develop in the context of actively following their parents or primary caregivers. They are able to follow accurately each other primarily through maintaining tactile contact during caretaking and play activities. Touch-based exchanges during those activities play a central role in the development of patterns of family communication. They influence the child's development of perceptual skills, smooth motor control, bi-manual and hand-eye coordination necessary for complex learning.

Those findings were used to design the parenting program evaluated in this investigation. It seemed logical

that a parenting program should provide parents with the handling skills to fulfill their role as the child's primary learning resource.

2. Newborn Competencies: Handling: Development

In this part of the review I did not attempt to present the voluminous and complex body of literature relevant to all aspects of parent-infant interaction. I was only concerned with those studies that contributed to understanding the foundations and effect of handling practices on the parent-infant relationship. Research on handling is scarce. Relevant research included investigations on: 1) The role of touch in attachment and development; and 2) newborn competencies. I inferred from studies about touch that the means by which parents used touch to interact differentially with their children was primarily through what I understand as handling. Findings in that research, I reason, support my thesis of the importance of the quality of handling to development and a thriving parent-infant relationship.

Touch is essential for healthy development (Montague, 1978). Almost all infants develop in a family context, touching and being touched and handled by parents and siblings. Until able to manipulate toys, talk, and move around alone by crawling and walking, infants and their

parents depend on touch as an important medium of exchange.

a. Attachment

Touching has received a lot of attention in the context of parent-infant attachment. Most investigations have been concerned with questioning what attachment is, at what age and through what activities feelings of attachment appear. This study is concerned with questioning the effects of giving parents manual skills with which to follow and organize their newborn's behavior. Descriptions of attachment and descriptions of the activities known to support the development of attachment are included here. They provide a general picture of the positive parent-infant feelings necessary for parents to be able to support their infant's development. They also indicate the kinds of activities thought to support positive attachment. Specific studies are not included as investigations on attachment have not provided insight as to how to make parent-infant relationships specifically beneficial for the development of the child. Such was the goal of the training program being evaluated.

The concept of attachment refers to the human bonds between parent and infant that are essential for growth and learning. Ainsworth (1973) offered a general description of attachment. She described attachment as an affectional

tie that one person forms to another specific person binding them together in space and enduring over time. The purpose of attachment, suggested Bowlby (1969), is to provide a relationship of sufficient predictability, duration, and intensity for the normal sequence of maturation and development to take place unhindered.

A number of researchers have considered the activities through which attachments develop. Montague (1978) suggested lots of touching and skin contact during shared activities are important for attachment to occur. Ainsworth (1973) gave specificity to Montague's description suggesting that close bodily contact and such shared activities as cuddling and fondling, are essential for establishing a nurturing attachment relationship. Her description considered the emotional or feeling attributes of the relationship. Ainsworth (1973), Bowlby (1969), Richards (1979), Klaus and Kennell (1976) suggested that frequency, quality of touching and appropriate pacing are also important nurturing ingredients. Richards (1974), attempted to reach behind the specific activities. He proposed that the development of a nurturing or nonnurturing relationship between parent and infant appears to be based upon how information is synchronized and processed between them. Richards' thesis is in agreement

with the assertions of this project regarding the motor-sensory foundations of communication exchange and learning.

Smith (1968) looked at the communication processes through which patterns of relating are established and through which the infant develops patterns of perceiving and responding. His research showed that the qualities and patterns of parent-infant communication are established through the exchange of specific tactile signals coordinated with visual and auditory cues during caretaking and play activities. His findings suggest that quantity of contact alone could not account for the orderly and timely progression of the development of family interaction patterns. Smith's assertions are borne out by Beckwith (1971a, 1971b, 1972), Clarke-Stewart, Vanderstoep and Killian (1979) and Lewis and Coates (1980) who pointed out that infant development is more affected by the appropriateness, than by the amount, of parent responsiveness.

The attachment research has demonstrated that parents need to love their children. Touching, holding and close bodily contact have been found to support loving feelings between the parent and infant. It would be useful for parents to be able to use their love as the resource for supporting their infants' development. To do so, it would be helpful for them to have both the conceptual foundations and

practical handling skills necessary to adjust to and specifically support their child's development over time.

b. Newborn Behavior and Development

Brazelton (1984, p. XVII) presented touch as possibly one of the main intersensory regulators. Research with premature infants has provided evidence to that effect. Gottfried's research with premature infants (1984a, 1984b), indicated that touch is an organizer for learning and development. He showed that the stimulus associated with touch can have a positive or negative effect. Tactile interactions between parents and infants and between professionals and infants need to be made appropriate to the ability of the infant to incorporate them as experience. He pointed out the need to look more closely at the critical components, correlates, and consequences of touch on the parent-infant relationship.

Smith's research (1968, 1972) showed that communication based on touch is the most immediate of all exteroceptor modes for guiding, supporting and bringing order to infants' experience, thus helping them develop broad foundations of motor and sensory skills. Hence, touch can be a primary medium for developing intersensory organization and establishing effective parent-infant patterns of interacting.

Barnard and Bee (1984) identified four features that contribute to optimum development of infants. They are: (1) interlocking behavior repertoires; (2) contingent responses between parent and infant; (3) adequate stimulation; and (4) appropriate change in adaptation as development progresses. As I have pointed out in other parts of this dissertation, during the infant's first months, these aspects of relationship are accomplished to a great extent through handling practices.

Factors contributing to the development of these features include:

(1) the infant's behavior. It is well documented that newborn behavior is organized from birth and can be synchronized with the behavior of others in the course of development (Brazelton, 1972, Condon, 1974, Dunn, 1975, Kaye, 1977, Klaus & Kennell, 1976, J. Newson & E. Newson, 1976, Stern, 1974).

At birth, infants' sensory systems are more developed than the motor systems. The newborn is able to regulate what information is taken in by selective attention. Most visual, hearing and olfactory capacities are present at birth and mature quickly over the next weeks, affording the infant more and more selective control over sensory input.

That such is the case has been demonstrated by work with newborn sensory preference. In the area of visual preference, Fantz (1965) found infants preferred patterned surfaces over plain ones, things with differentiated parts and moving patterns. Carpenter (1974) found 2-week-old infants preferred to gaze at their mother's face over that of a stranger.

In the area of auditory preference, Hutt (1973) found that even before birth, 9-month-old fetus' preferred patterned over pure sounds. Condon and Sanders (1974) found that newborns between 12 hours and 2-days old synchronized their motion with the timing and rhythm of the mother's voice.

McFarlane (1975) found that newborns also have olfactory preferences. Five-day-old newborns preferred the smell of their mother's milk over the smell of a stranger's milk.

The newborn competency studies illustrated that a newborn is equipped to perceive and respond selectively at birth, or shortly thereafter. However, a newborn does not have the ability to move alone through space. What stimuli the infant is able to pay attention to, and how the infant is able to respond to a particular stimulus, is determined by the parent's sensitivity and handling skills.

(2) The second accepted contributing factor is the parent's behavior which has been found to be influenced significantly by their expectations (Broussard & Hartner, 1970; Broussard, 1976; Barnard & Eyres, 1979; Novers et al., 1984).

Studies on the effect of parents' expectations found that parents' expectations of their newborn's competencies, behavior and development strongly influenced what they actually did with the child. For instance if a parent thinks a child cannot see colors until 3 months of age, colors will not be presented until that time. If a parent thinks a child cannot hold the head vertical until 2 months the child will be handled in such a way that that is what happens. In other words, our assumptions influence our behavior. Parents create an environment for their infants based on their assumptions about the infant and the infant's development. Therefore, the more accurate the parent's assumptions match the realities of newborn competency and development the greater is their potential for actively participating in the developmental process.

(3) A third contributing factor now receiving attention is the infant's behavior over time. The infant's behavior becomes progressively more organized, differentiated and adaptive during the first two years (S. Greenspan & N. Greenspan, 1985; Greenspan & Lourie, 1981,

Stern, 1974). It is understood that the infant's complex organization results from a combination of parent-infant interaction and maturation of the nervous and motor systems (Brazelton, 1984; S. Greenspan & N. Greenspan, 1985).

Cybernetic analysis of infant differeniation over time suggests that maturation of the nervous and motor systems must be considered in the context of parent-child interaction. Behavior patterns, whether differentiated or undifferentiated, are learned. This study evaluated a program designed to help infants and parents develop differentiated behavior patterns beginning from the moment the baby is born.

Parenting Programs

Handling skills based on knowledge of human function are necessary for families to develop skills of differentiation together. Existing parenting programs do not offer that kind of assistance. Joy (1980) found most parenting programs are an adjunct to existing prenatal, Family Centered Maternity Care (FCMC), and pediatric well-baby programs. They provide parents with a minimal amount of information regarding child development, caretaking techniques, and parenting issues, through lectures, written materials, and sometimes a little practical experience. His report of informal evaluations of those programs suggested that even a minimal amount of aid increased parents confidence in being

able to care for their infants.

There have been only a few formal studies done on parenting preparation programs. They represent good first attempts at establishing appropriate parenting program content and effective teaching formats. Their limited success demonstrates the need for more specific research in the area.

Cronin (1979), Hancock (1979), and Stein (1977), offered additional services to well-baby programs. In a group format they gave parents information about infant stimulation, social behavior, and emotional response patterns. Informal evaluation of those programs indicated that parents felt more confident and were observed by professionals in the well-baby programs to behave more confidently when caring for their infants. Evaluations focused on the broad question of "does it work?" rather than "what components affect what outcomes?" Consequently, it was impossible to discern what aspects of the programs contributed to the increase in parent confidence.

Davidson (1979) investigated the effects of home teaching based on the Brazelton Neonatal Behavior Assessment Scale (BNBAS) (Brazelton, 1973) with 86 families. Her program had three components: (1) Information was provided about general behavioral patterns of newborns; (2) discussion and demonstration of individual

infant response patterns were given; and (3) there were discussions with parents about how they could best respond to those response patterns.

At one month, Davidson found that trained mothers were significantly different from control group mothers on 22 variables contributing to the mother-infant relationship. Trained mothers engaged more often in auditory stimulation and social engagement with their infants; encouraged their infants for sensorimotor achievement; provided a more stimulating environment; reported themselves as more confident in caring for their infants; found it easier to quiet their fussy or crying infant; reported feeling more attached to their infants; and perceived their infant had changed more in the first month. The difficulty with this study was that it evaluated a multi-faceted program. Hence, no determination could be made regarding what program aspects contributed to the enhancement of parent-infant relations. The parenting program being evaluated in this study had only one topic, handling. Thus, it was possible to determine if handling enhanced development and the parent-infant relationship.

Barnard and Eyres (1979) carried out a longitudinal study of 193 expectant women in Seattle, Washington. They found that mothers knew very little about the sensory capacities of a newborn. Less than 13% believed their

infant would be aware of their surroundings at birth. They found that a mother's prenatal expectations of her infant's capacities and development were related to the stimulation they later provided and the child's development.

These studies indicate the importance of parents having knowledge of newborn behavior and development. A conversational interaction in which newborn abilities are discussed with, and demonstrated to parents appears to be an effective teaching format.

It seems logical that the prenatal period would be an ideal time for influencing the parents' expectations of their infant, and helping them develop interactional skills useful for beginning a supportive and productive relationship with their newborn. But studies by Williams (1977) and Kruse (1976) found that parents did not assimilate information presented prenatally about child development or theraputic material intended to reduce early parental stress. It was suggested that perhaps their format of presenting information through lectures, written materials, and theraputic groups is not a medium that enables parents to translate successfully information about development into practical skills of interaction with their infants. It was anticipated that the experiential format of the training in this study would better facilitate the translation of information about

development into supportive patterns of interaction in the parent-infant relationship.

When the findings of these studies are combined they indicate that the content, timing and format of an intervention intended to enhance parent-infant relations is important. The findings of Barnard and Eyres (1979) that pre-natal maternal expectations are related to stimulation provided in the postnatal environment and the child's development indicates that the prenatal period would be the most appropriate time for intervention. It was anticipated that an appropriate training format in that period could both effectively influence the parents' expectations of their child's development and assist them in developing skill in tailoring their interactions to support and facilitate that development.

As I have said, most early parent-infant interactions rely on touching and handling. This parenting program has therefore integrated current research data on the importance of the role of touch and skillful handling in the establishment of family patterns of communication and infant/child development.

Summary

The point of view I drew from this literature is that development is a family interactive venture. Beginning at birth, family members synchronize their movement signals

and develop similar patterns of perceiving and communicating with each other and the world. Tracking studies from cybernetic research indicated that the synchronization is accomplished through touch and handling during caretaking and play activities. Touch and handling practices play a major role in establishing the parameters of synchroneity and degree of mutuality in parent-infant behavior, thereby influencing the infant's motor-sensory, emotional, social and cognitive development.

Communicating the touch and feel of mutual interaction is not easily done in writing. I assume that without hands-on instruction and support in specific positive handling behavior it is improbable that many parents would develop skills that support mutuality in their handling practices. This reality is unfortunate since most caregiving, such as dressing, feeding and transporting of infants, is dependent on handling. Those activities requiring touch are both vital to infants' survival, and constitute their primary learning resource. Positive handling skills must be cultivated which provide parents with adaptive parenting behaviors that continuously adjust to fit the changing needs of the evolving and differentiating child and family system.

The reviewed literature indicated the appropriateness

of an investigation of the effects of teaching parents handling skills.

CHAPTER THREE

STATEMENT OF THE PROBLEM

Research Problem

The focusing question of this study was whether a carefully designed parenting program would enhance family interaction and the infant's development. The target population was the newborn-new parent dyad.

The literature reviewed pointed toward an emerging consensus in the field of developmental psychology that a parent's interaction skills play a major role in all aspects of the child's development and the parent-child relationship (Barnard & Bee, 1984). Parenting programs that enhance parents' interaction skills should then be an effective means of preventing family pathology, enhancing child development and family relationships. I expected to find evaluations of many programs. What I discovered was that parenting programs are rare and evaluations of those programs are almost nonexistent (Joy, 1980).

I assume an effective parenting program should provide appropriate newborn-infant information and specific skills that enable parents to interact effectively with their particular newborn. While developmental research has

provided essential parenting information, it has not provided insights regarding communication and human function necessary to incorporate that information into effective parent-newborn interaction trainings. I assume that is one reason for the small number of parenting programs. The research findings of developmental psychology have enabled parents to realize that:

(1) their infant has almost full sensory capacities at birth (Brazelton, 1984);

(2) their infant uses these sensory capabilities to follow or synchronize to the behavior of others (Condon, 1974; Kaye, 1977; Schaffer, 1974, 1977; Stern, 1971);

(3) their infant needs touching (Montague, 1978) and close bodily contact (Ainsworth, 1973) in order to establish nurturing bonds.

(4) their infant needs nurturing bonds to develop a sense of trust (Erikson, 1950), or self (Bettleheim, 1967) necessary for normal personality and social development;

(5) during development their child is learning to differentiate social, emotional, cognitive and motor aspects of behavior (S. Greenspan & N. Greenspan, 1985);

(6) they can support differentiation with habits of contingency (Barnard & Bee, 1984).

These six points give parents a general picture of development and a glimpse of what kinds of interactions

support development. However, there is nothing general about parent-infant interaction. Each interaction has a specific context and usually a specific goal. Parents need instruction in order to use their handling to enhance the nonverbal communication skills of their newborn children. Such instruction can assist them in transferring general information about newborns and development into patterns of relating that specifically supports their infant's participation and competence during each interaction.

Research in the field of behavioral cyberbetics has provided the insights necessary to provide parents with such skills. It has established the motor-sensory foundations of communication and human function (Smith, 1968; 1972). When cybernetic theory and research findings are applied specifically to parent-newborn interaction they indicate that:

(1) Though newborns have full sensory capabilities they are best able to follow and incorporate tactile and kinesthetic information (Smith & Sturgeon, 1971; Stein & Meyer, 1971);

(2) It is not just the newborn that follows the parent. Parents and newborns adjust to each other in varying degrees (Smith 1971). Parents can synchronize their actions with the behavior of the child in ways that follow and develop the child's behavior into meaningful expression, appropriate to a specific situation.

(3) Touch is the most accurate communication medium (Smith & Sturgeon, 1971; Stein & Meyer, 1971). Touch (Montague, 1978) and close bodily contact (Ainsworth, 1973) have been found to establish nurturing bonds. However, what partially distinguishes one infant's development from another are the specific messages conveyed through tactile exchanges.

(4) Human beings (including parents and infants) synchronize their movement in order to communicate (Bateson & Mead, 1942; Condon 1975; Birdwhistle 1970). In each exchange their motion varies spatially, temporally, and dynamically (Laban 1950). The specific effort, timing, and spatial qualities of the interaction establish specific patterns of parent-child communication which can make a difference in the infant's development over time.

(5) Research indicates that parents can be taught how to utilize their handling practices to participate actively in the social, emotional, cognitive and motor aspects of the infant's developmental process. However, there are no studies that examined the effects of systematically applied tactile communication skills upon the parent(s), infant, or parent-infant team.

Hypotheses

In this study, expectant parents were taught handling skills and the initial effect of the training was documented

using three dependent measures: (1) parents' expectations of their newborns' abilities, behavior and development; (2) mutual interaction skill of the parent-infant team; (3) the infants' apparent development over the first 6 weeks of life. Two exploratory questions considered the effects of training on parenting confidence and infant growth. The hypotheses of this study were as follows:

(1) It was anticipated that intervention group parents who were taught handling skills that support mutual exchange during parent-infant interaction would exhibit a higher degree of change toward more accurate expectations of their infant's early abilities, than untrained parents at a 1-month postpartum assessment.

It has been satisfactorily demonstrated that newborns can see, hear and are aware of their surroundings, and, that parental expectations of infant ability influences the environment they provide the child and the child's development (Barnard and Eyres, 1979). Intervention group parents learned to use handling to explore systematically their newborn's abilities. This practical exploration should have enabled them to develop more accurate expectations of infant abilities than the expectations of control group parents who did not have such instruction.

(2) It was anticipated that trained mother-infant teams would exhibit a greater degree of mutual interaction skill while performing caretaking activities than would untrained mother-infant teams at a 1-month postpartum assessment. Tactile exchanges are the most primitive or simplest form of exchange. They can be used to develop a solid foundation for the parent-infant relationships. Skills of mutuality in handling practices must be based on knowledge of tactile communication and human function. They are difficult to learn without experiential touch-guided instruction. Control subjects who did not have that instruction would have to develop those skills through friends and/or extended family relationships, unguided experience or chance.

(3) It was anticipated that the infants of trained parents would appear to be more developed than infants of untrained parents at a 1-month postpartum assessment. Infants develop through a combination of maturational and interactional processes (Brazelton 1984, S. Greenspan & N. Greenspan 1985). They develop while being touched and handled by parents. Systematic handling as a result of training should have positively affected intervention babies in the areas of state, motor integrity and stress which are indicative of development level.

Exploratory questions included:

(A) Will trained mothers and fathers have higher self-report confidence scores than untrained mothers and fathers on the 1-and-2-month posttest confidence measures? This question is based on an interest in the relationship between confidence and behavior. Research in kinesics (Birdwhistle, 1970) has illustrated that what people think they are doing and/or their intentions often do not match their behavior. While I anticipated a difference in parenting behavior between intervention and control group parents, I did not know if their self-reported confidence about their behavior would be different.

(B) What effect, if any, would training have on the infant's physical growth? Touching has been found to effect weight gain in premature babies (Gottfried 1984b). It seemed worthwhile to explore the effects of handling training on height and weight gain in a low risk population of babies.

The primary significance of this study is that it introduced the theories and research findings of behaviorial cybernetics into the study of parent-infant interaction in clinical psychology. The literature on behavioral cybernetics served as the bridge to translate the knowledge base of several fields into a practical parenting approach

that was thought to enhance infant development and family interaction.

Research in developmental psychology has mainly focused on understanding and preventing pathological behavior. In addition to its focus on pathology, research in maternal-child health has attempted to provide an index of infant and mother-infant behaviors. Research findings in those areas have provided insights relevant to designing programs for prevention, early diagnosis and intervention of pathological patterns of behavior.

However, prevention of pathology and enhancement of development toward optimal function are very different topics. Prevention of pathology focuses on minimal conditions for normal development. Programs to enhance development focus on optimal function. They require a much different knowledge base than those intended to prevent dysfunction. If parents want to enhance their infant's development they must have fundamental knowledge of how their child learns. They need to know more than the kinds of activities to provide. They need the theoretical foundations and tactile communications skills necessary to discern how to use themselves relative to their infant in ways that support optimal participation and learning for both parent and child in every interaction.

To my knowledge, this study provided the first documentation of the effect of handling practices on parental expectations, parent-infant interaction and infant development. The long-term significance of handling training is in providing parents the skills with which they can develop habits of mutuality that facilitate the infant's emotional, social, and sensory-motor development and optimize learning conditions for the entire family.

CHAPTER FOUR

METHODS

Subjects

Referral Source

This study was conducted at the Maternity and Infant Care Project in Albuquerque, New Mexico. It is referred to as the Project throughout the rest of the narrative. The Project is federally funded and operates under the direction of the Department of Obstetrics and Gynecology at the University of New Mexico Medical Center and in close cooperation with the University of New Mexico Hospital. It serves a population of 2,000 pregnant women/couples who would not receive necessary health care for any of the following reasons: family income is below national poverty guidelines; they have high-risk social or medical problems beyond their control; they face cultural barriers.

The Project has four satellite clinics in Bernalillo County. The services offered by all clinics are identical. During the last trimester of pregnancy, pregnant clients are offered a non-mandatory 5-week birthing class series. My subjects were solicited from participants of these classes.

Birthing classes were offered at two locations. Three separate series of classes were offered on Tuesday, Thursday and Friday evenings at the University of New Mexico. Clients served by three of the Bernalillo County clinics participated in those classes. Each of those three clinics services a broad area of Albuquerque. Each class had a mixture of clients served by all three clinics. Participants did not know each other. The three clinics are an equal distance from the university site.

Clients of the fourth clinic attended birthing classes at their own medical facility on Monday evenings. That clinic served clients in an outlying community of Albuquerque. The clients lived too far from the university to make the weekly trip for birthing instruction.

The birthing class curriculum was identical at both locations (Appendix A). There were three instructors for the four series of classes. One taught both the Monday evening class at clinic four and the Thursday evening class at the university facility. The other two instructors taught one evening per week at the university. It is important to note that participants did not sign up for an instructor. They signed up for the evening of their choice. The identity of the instructor was not known until the first class.

There was a total of 70 couples in the combined birthing classes: 53 couples attended classes at the university; 17 couples attended class at clinic four. In order to ensure a large enough sample I had to obtain subjects from all four classes. The Thursday evening class, the larger of the two classes taught by the same instructor with 18 couples, and the largest class at the university, taught on Tuesday evening with 19 couples were solicited for the experimental group. Participants in the two smaller classes taught on Monday evening at clinic four with 17 couples and the Friday evening class with 16 couples were solicited for the control group.

I was not able to randomize my sample because of two circumstances at clinic four: (1) I anticipated that since clients from that area would not drive to the university for birthing instruction they would also not make the drive for parenting instruction. (2) I was concerned about the possible confounding effects of both intervention and comparison subjects from that neighborhood clinic speaking with each other and destroying the purity of the design. Though I could not randomize my sample, I made every effort to keep the two groups equal except for the handling training.

Selection Criteria

(1) Subjects must be receiving prenatal care from the Project

(2) Subjects must attend the Project's birthing class series

(3) Subjects must have a university hospital birth

(4) Subjects must have a delivery room birth

(5) Subjects must have rooming-in accommodations

(6) Subjects must have less than $9,000 yearly income

(7) Both parents must agree to participate in the study.

(8) Both parents must be between the ages of 17 and 36.

(9) All mothers must be within 6 weeks of their delivery date when the study begins. Pregnant couples begin the 5-week birthing class series when the woman is in her third trimester of pregnancy. The touch-training program would run for an additional 2 weeks. So the women would be between 2 and 4 weeks of the anticipated delivery date when the touch-training was complete.

(10) This birth must be the couples' first child whom they will keep

(11) There must be no health risks anticipated for the expected baby or mother when the study begins.

(12) If mother or infant must stay in the hospital longer than 4 days after the birth, they will be dropped from the study. A longer hospital stay would indicate health problems.

There was no ethnic selection. The breakdown of the 2000 clients served by the Project is 66.9% Hispanic, 27% Anglo, 3.1% Black, 2.4% Oriental, and .6% Native American. I was assured by two cultural anthropologists familiar with the study design and assessment procedures that the study was concerned with gathering information in areas affecting all of the ethnic groups served by the Project equally. The video taping aspect of the study was concerned with recording specific parent-infant tasks performed by all of the ethnic groups. Ethnic groups have been found to differ in the amount of parent-infant contact (Brazelton, 1972; Brazelton, Robey, & Collier, 1969; Freedman & Freedman 1969). However, this study was concerned with the quality of mutuality in parent-infant contact during caretaking and play activities rather than amount of contact.

Demographic Data

All subject-pairs were clients of the federally funded Maternity and Infant Care Project, Albuquerque, New Mexico. As such, their joint yearly income was below the national poverty level standard of $9,000 per year. All subjects except six women in each group who were housewives, were employed in service-oriented positions. The sample was of predominantly white, North American origin (17 intervention subjects and 20 comparison subjects). There were an additional five Hispanic subjects in the intervention

group and three Hispanic subjects in the comparison group. All subject-pairs except one in each group were married.

The means and standard deviations for general demographic variables were as follows: The mean age of intervention subjects was 26.2 years (S.D. = 3.9) while the mean age of comparison subjects was 27.0 years (S.D = 2.3). Intervention subjects had attended school for a mean number of 13.5 years (S.D = 0.8) while the mean number of years that comparison subjects had attended school was 12.9 (S.D. = 1.0). The mean for the length of time intervention subjects had been partners was 31.4 months (S.D = 23.9) while the comparison group mean on that variable was 32.4 months (S.D.= 21.8). The wide dispersion around the mean was due to the broad range of time partners of both groups had been together (between six months and eight years before their pregnancy).

As stated earlier, all subject-pairs were clients of the Project. They voluntarily attended a 5-week birthing class series offered by the Project. They had their baby in the delivery room of the University of New Mexico Hospital. The mean number of weeks of gestation for intervention group mothers was 40.3 (S.D = 1.7) while the mean gestation time of comparison group mothers was 40.1 weeks (S.D = 1.5). During the birth process, one newborn was delivered with forceps, three had fetal distress, and one had to have the cord removed from around the neck. All complications were handled

immediately. All subjects had rooming-in accomations during their hospital stay. The mean length of time intervention subjects remained in the hospital was 1.7 days (S.D. = 0.6) while the mean for comparison subjects was 1.6 days (S.D. = 0.7).

Subjects Obtained

The study was carried out over a 19-week period. The treatment group began with 16 couples. The comparison group began with 13 couples. Full data were collected on 22 families comprised of a mother, father and baby. No subjects voluntarily withdrew from the study. I was unable to follow appropriate home teaching and video-taping procedures with two subject families in each group due to a death in my family that necessitated my leaving town. I lost three other subject families in the treatment group due to an infant's health, mother's health, and a death in a family. As a result, there were 11 treatment group families and 11 comparison group families.

Treatment/Training

In the touch-training program, outlined in Appendix B, the treatment couples developed skills of mutual-tactile-guided interaction, whereby they became proficient in using touch as a method of communication. It had been my experience that due to the size differences between parent

and infant, and the infant's relatively poorly differentiated movement and response skills, parents develop greatest sensitivity by learning tactile skills with each other and then applying them to their interaction with their infant. Therefore, the intervention process consisted of two distinct phases. Phase one consisted of two, 2 1/2-hour group touch-training classes just before the baby was born. During this phase, couples learned the importance and effectiveness of tactile-guided interactions by applying them in their own relationships. Phase two of the training consisted of two, 1/2-hour home teaching visits. They occurred once a week during the first 2 weeks after the baby's birth. During home visits, parents were assisted in applying skilled tactile contact during caretaking and play activities as a means of participating in the processes through which their infant develops complex motor and communication skills.

Phase One: Touch-Training Classes Prior to the Birth

The classes were presented in an exploratory manner. My intent was to draw parents into an experience where learning resulted through mutual explorations between partners, and all members of the class. It was the quality of interaction that I wanted parents to learn to have with their infants.

The teaching strategy was: To draw out participants' assumptions on each topic in both verbal and experiential situations; provide structured touching activities to expand those assumptions; add information from current research; then summarize all of the presented ideas in the light of possibilities for consideration rather than right or wrong answers.

Phase One: Class One Content:

(1) Newborn Sensory Competency

Human senses were described. They included auditory, visual, gustatory, olfactory, tactile and kinesthetic senses. Newborn sensory capabilities were discussed.

(2) Newborn Motor Competency

The role of motion in communication and human function was discussed. Motion was broken down into the following categories: (1) the coordination of our body parts when moving; (2) posture, or the way we habitually hold our body parts in relation to each other; (3) the gestures of our face and other body parts. We discussed how our way of moving influences what sensory information we can pay attention to, how and what we communicate, and our expertise in athletic, professional and social interactions.

(3) Role of Touch in Developing Sensory-Motor Skills

We discussed how touch coordinated with other sensory stimuli can be used to develop all sensory and motor skills.

(4) Orientation in Space

Participants learned how to orient in space using their own body as their reference. They learned that in order to organize their own body, or to be able to assist their partner or infant to move through space in ways that are graceful and efficient, they need to distinguish between directions relative to the room or environment, their own body, and the body of the person with whom they are interacting.

(5) Mutual Interaction/ Mutual Learning

Learning situations involving leading and following were structured to enable parents to experience the relational and functional effects of mutually determined behavior where partners interact with balanced roles. When concepts of leading and following are understood as synonymous terms, learning is optimized for everyone involved in an interaction.

All concepts/ideas were presented in an experiential format. Partner activities were structured involving touching combined with other sensory modes of perceiving and communicating. The partner activities were similar to

those parents would be participating in with their infants. They included: following another person with hand or other body contact; changing another person's position from stomach to back and return; bringing another person to standing; and holding another person in a carrying position. Individual learning activities involved the participants following objects in the environment, and moving themselves through space from positions of lying, to sitting, to standing.

Expectant parents quickly realized the communicating nature of their touch. They learned to combine tactile, kinesthetic, visual, and auditory information to improve their perceptual skills and develop skill in having mutual interactions. They were presented the idea that babies/children develop broad perceptual and communication skills as a result of interactions where there is mutual effort and control between the parent and infant.

Phase One: Class Two Content:

1) Development

The development and coordination of visual and auditory skill with the development of movement skill was described. Activities were structured to allow participants to experience the patterns of motoric development and the relationship between visual, auditory, and motoric skill development. They were taught how to use touch, directly

and via an object, to facilitate development and coordination of sensory and motor functioning. By applying the ideas and practices of touching to their relationship with their partner, while in an educational setting, they experienced the effect of touching practices on relationships and learning.

(2) Body System Components

In a cybernetic analysis of a self-controlling system there are three functional components. They include a mass, movement, and guidance component. When considering the human body as a system, the mass component is represented by the total weight of the body. The movement component is represented by the muscle system. The guidance component is represented by the central nervous system. The function of bones is to carry the mass (weight). Muscles are best utilized to provide movement, continuously changing the position of bones relative to each other. Guidance is provided by the nervous system which coordinates and integrates incoming (sensory) and outgoing (motor response) information.

Exercises and partner activities involving moving another individual from lying to sitting and standing were presented to assist participants in experientially sorting out these three functions, and discovering the relationships that exist among bones, muscles, and the

nervous system. If muscles and bones are able to perform their functions well, the effect is that the body feels "weightless," even when carrying extra weight. The individual is able to adjust quickly and respond to changing sensory information with grace and ease.

Information about systems components was used to present parents with suggestions of how to use their handling to support their child's competence during carrying or other activities involving moving the infant. Parents learned that it is possible to hold an infant (or an adult) without putting stress on their own body, or restricting their own motion. In addition, they learned how to make contact and adjust their handling during those interactions so as not to put unnecessary restrictions on the body and motion of their infant. Knowledge of the components of body functioning and skill in handling will likely enable the parent to hold or move the infant in positions that are not off-balance. Off-balanced positions give the infant inaccurate non-verbal messages about how to carry weight when moving in the parent's vertical world.

(3) Functional Anatomy

Participants experientially learned how their anatomy functions. This section was broken up into the areas of joint awareness and levels of motion. A) Joint awareness: Expectant parents discovered the relative location of each

joint in their bodies. They experienced the direction of motion made possible by the form of the joint. They also experienced and expanded the range and quality of their motion by moving each other. B) Levels of Motion: Parents discovered that there is an alternating pattern of motor organization throughout the body. The pattern alternates from an area of unidirectional, forward/backward bending motion to an area allowing for multidirectional bending, turning, and rotational motion. The stable areas of limited directional motion are located over the top of the unstable areas of multidirectional motion. The pattern can be found from the toes to the head, and from the middle of the body outward. Parents experienced the difference between bending and rotational motion in their own bodies and in their partners. They learned how to produce and combine bending and rotational motion in order to move themselves, assist a partner, and later their infant to move in organized and sequential patterns. With such knowledge and skill they could support the infant's development during caretaking and play activities.

(4) Touch as a Medium for the Development of Visual and Auditory Skills

Touch was presented as the most effective medium of communication. Activities were presented that would enable parents to experience the accuracy of touch-based

communication. In other activities touch was coordinated with visual and/or auditory information to enable parents to experience touch as a tool for developing visual and auditory skills.

Home Teaching

In the second phase of training, members of the intervention group received individual training in their homes (see Appendix C). They received instruction a half hour, once a week for the first 2 consecutive weeks after the birth of the infant. The babies were between 5-and 6-days-old on the first visit. They were between 11-and 12-days-old on the second visit. Both parents were present for home teaching sessions.

In individual sessions parents were assisted in adjusting the concepts and methods presented in the training to fit the needs and abilities of their individual infant and the specific parent-infant relationship. Discussion during home teaching was confined to ideas related to the touch-training program.

Topics of the two home teaching visits included:

1) having mutual interactions with your baby through your touching practices during caretaking, play, and feeding activities

2) using touch to develop visual and auditory skill

3) bringing order to your baby's general efforts to roll

over, sit up, stand up, and move through space.

Home teaching sessions were carried out in a conversational exchange involving questioning and demonstration by both the parents and trainers. There was no systematic presentation of the above concepts. It was important that parents did not have an idea that they had a pocket-full of techniques to impose on their child. Parents were handled as they handled their infants in order that they could experience the effects of their touching practices.

INSTRUMENTS

Questionnaires

This study assessed the effects of teaching new parents handling skills as a medium for having mutual interactions with their infants. The following assessment instruments were chosen because: (1) They examined questions relevant to mutuality in parent-infant relationships (Parental Expectations Survey and Parenting Confidence Questionnaire Items); (2) they measured the degree of mutuality in parent-infant interaction under nonstressful conditions (Mutual Interaction Scale); (3) they considered the effects of mutuality on infant development (Infant Behavioral Observation Scale).

There are very few assessment instruments which examine early parenting behavior and parent-newborn/infant relationships. Assessments have been developed to measure newborn health status and abilities. Others are exploratory measures used to discover parent characteristics that influence parent behavior.

1. The Parental Expectation Survey, (found in Appendix D), is a five item survey developed at the University of Washington to assess parental expectations of early child development. The measure was first used in a longitudinal study of 193 first-born babies and their families at the University of Washington, Seattle, Washington (Barnard, & Eyers 1979). Assessment of parents' perceptions and children's environments was a major focus throughout the study.

The questionnaire was developed to assess maternal expectations of early child development. The correct answers are based on research of newborn capabilities that has demonstrated that newborns can see, hear and are aware of their surroundings.

The following is an item example: At what age do you think your baby will first be able to see objects and people clearly? Possible answer choices range from birth to 1 month in weekly intervals; 1 month through 1 year in monthly intervals; and a fill in possibility. The answer of Birth is

the most appropriate research-based answer. Scoring entails comparing the age difference of parental expectations, i.e., the age a parent expects that his or her newborn will be able to see clearly, to the fact that most newborn's can see clearly at the time of birth.

The Washington study found significant correlation between parental expectations and the environment they provided the child. Parents with more realistic expectations of newborn/infant capabilities provided environments which encouraged development in their children.

Although the correlation above provides some intuitive validity, there is no reliability and validity material available on the questionnaire. It was the best instrument I found for assessing parent expectations of infant behavior. The questions are straightforward and easily understandable by the limited education sample used in this study. The potentially appropriate answers are backed by a large body of research.

The measure was used in this study to assess the parental expectation dependent variable. A pretest was administered to all subjects 1 week before the intervention began. An identical 1-month posttest was administered during the 1-month postpartum home visit.

2.The Mutual Interaction Scales (MIS), (Appendix E), developed by Maietta in 1985, is an instrument to assess

the mutuality in parent-infant exchanges. The instrument was first used in this study.

The MIS is a movement observation schedule influenced by the movement notation systems of Laban (1950) and Eshkol (1976). The three primary elements of these systems °time, effort and space' are used to assess mutuality of parent-infant teams while performing three common activities: (1) changing clothes, (2) changing positions (3) lifting the baby to a carrying position.

Grading of mutual interaction is done by raters. They are trained to assess the three observation elements of effort, time and space which comprise the observable components of motion in an interaction. Each element is further broken down into four unique aspects of effort, time and space.

EFFORT	TIMING	SPATIAL CHANGES
Direction	Stepped Intervals	Distance
Quantity	Contact	Positioning
Quality	Synchrony	Contact
Contact Location	Motion Continuity	Magnitude

The purpose of including three activities in the scale is so that the predominant pattern of interacting can be seen from a continuously changing perspective. The

particular activities were chosen because the majority of daily interactions between parent and infant either focus upon the specific activities, or involve those specific motion patterns being observed. It is assumed that patterns of interacting are persistent across activities. In each activity raters are able to observe some aspects of the pattern of interaction more clearly and rate them more accurately, than in other activities. The large number of opportunities to rate each motion element of the parent-infant interaction helps to insure that a rater's final score is representative of the degree of parent-infant mutual interaction skill.

Raters score each item on a scale of (+1) to (+5). They check boxes representing answers of Definitely yes (1), Probably yes (2), Cannot say (3), Probably no (4), Definitely no (5), to indicate whether the target behavior is present or absent in the interaction being observed. High scores mean mutuality is not present. Low scores mean mutuality is present. The best possible score of (1), would indicate that the unit of a component being observed, (e.g., the direction of effort), definitely facilitates mutual participation in accomplishing the particular activity. The poorest possible score of (5), on the same observation would indicate that the direction of

effort definitely does not facilitate mutual participation in accomplishing the particular activity.

An example is given here for rating the component "Effort" in a parent-infant clothes-changing interaction. In arriving at an "Effort" score, respondents rate, on a scale of (1) to (5) whether the direction of effort, amount of effort, quality of effort (bound or free) and the location where effort was applied, each facilitate the target behavior of mutual participation between parent and infant in accomplishing the clothes-changing process. The subscores for each of the four aspects is totaled to give the score for effort in that activity. The scores could range from (4) to (20). All three activities are graded in this way using the element of Effort. The score for effort in the three activities is added for a possible range of (12) to (60).

The same process is used to determine the combined activity scores for Timing and for Space. Each category will be applied to each activity to determine whether the parents' handling practices facilitated mutual parent-infant participation during the particular activity being observed. Evidence of the degree of mutual interaction skill is the degree to which the infant participates and appears competent during the interaction. At completion, a subject pair has a total score on each of the scales: Effort, Timing, Space.

This was the first time the instrument was used. The study results provide content and face validity though there are no reliability or other validity data. The MIS measure was used to assess the dependent variable, mutual interaction skills. It was made from videotape recordings of mother-infant interactions made during the 1-month postpartum home visits.

This instrument evolved out of my work with human function over the past 15 years. It is especially applicable to parent-infant interaction, and infant development because of the non-verbal context of the majority of early parent-infant interactions.

3. Prenatal and analogous postnatal caregiving confidence questionnaires (Appendix F): These were adapted questionnaires. The original was the Schaefer/Mannheimer Postnatal Research Inventory which was developed to study the experiences of mothers and their babies the first few weeks after delivery. The inventory was adapted by Sheena Davidson at the University of British Columbia for a longitudinal study of mothers and infants on the development of attachment (1979). Home observations of parent-infant interaction and self-report measures were used to compare subjects who had received group teaching, or, group plus home teaching. The teaching was based on the Brazelton Neonatal Assessment

Scale. The self-report measures included prenatal, postpartum and toddler-age questionnaires.

Stepwise regression analyses were used to assess the degree to which postpartum reports of attachment, confidence in caregiving and emotional feelings could be predicted from items in their own and the other two areas. Attachment, confidence in caregiving, and emotional state were not correlated prenataley, but there was significant correlation at 1-month postpartum. Davidson's study found evidence that teaching parents about their infants improved caregiving confidence and facilitated the development of maternal attachment and behavior.

Reliability and validity information is not available on the questionnaires. I received them from the University of British Columbia with the suggestion that I increase the number of possible responses on each item.

I adapted the vocabulary of the Davidson questionnaires to a sample with limited education, and made the items applicable to both mothers and fathers. There was a total of 42 items on the pretest questionnaire; 44 on the post-one questionnaire; and 11 on the post-two questionnaire. A sample item which appeared on all three measures was: "I think I will be (am, on posttests one and two) able to tell my baby's wants and needs." Possible responses are on a 5-point scale ranging from strongly agree (1), mildly agree

(2), no opinion (3), mildly disagree (4), strongly disagree(5). Identical items on all three questionnaires are compared to determine level and change of confidence.

All items on the pretest confidence questionnaire were used as a measure of comparability between groups. Identical post-one and post-two confidence questionnaire items administered at 1-and 2-months postpartum, were used to assess the exploratory parenting confidence question.

4. Infant Behavioral Observation Schedule was designed by Munzik-Bruno (1986). It incorporates motor and infant state components of the Brazelton Neonatal Behavioral Assessment Scales (BNBAS) (1973) and infant stress indicators from the Assessment of Premature Infant Behavior (APIB) by Heidi Als (1985). It was designed for this study to assess the apparent motor integrity, state, and stress level of 1-month-old infants. (see Appendix G).

The observation assessment considers three aspects of infant behavior during parent-infant interaction including infant state, stress level and motoric integrity. The behaviors are scored on a 5-point scale with 1 indicating the greatest development, 5 indicating the least development and a score of 3 indicating a moderate degree of development. Following, are the descriptions of the assessment categories: 1) Infant State: Infant state is indicated by the level of state maintenance and approach behaviors. On a scale of

1-5, 1 would indicate that the infant maintained an alert, calm state consistently and when losing control was able to regain quickly and easily. A score of 5 would indicate there was little to no attempt to self-quiet. The infant had poor success at regaining lost control.

2) Stress: The level of stress is indicated by the number of avoidance behaviors. On a scale of 1-5, 1 would indicate there were few signs of stress. The infant was able to handle all maneuvers easily. A score of 5 would indicate there were multiple periods of unmodulated stress.

3) Motoric Integrity: The level of motoric integrity is indicated by the baby's movement quality. On a scale of 1-5, 1 would indicate that the baby made smooth excursions, had some control against gravity in the upper extremities, made several hand-to-mouth movements, and made no startled movements. A score of 5 would indicate that the baby was more than twice startled, plus having tremors and jerky movements.

The assessment is made while observing mother-infant interaction on a videotape recording. Observations are made at 15-second intervals. The assessor simply counts the number of behaviors in each category that appear during that time frame.

The assessent combines items from the BNBAS and the APIB. The Brazelton Neonatal Assessment Scale (1973) has

been widely used. It is traditionally used to assess the neurological development of newborns from 1-30 days of age. Data have been collected to establish the reliability of the scale during the first month as well as its usefulness in discriminating populations and establishing individual differences among neonates.

Published reports indicate reliabilities of independent testers trained at the same time as ranging from .85 to 1.00 (Brazelton et al., 1969; Freedman & Freedman, 1969). In addition, testers can be trained to a .90 criterion of reliability and the level of reliability remains at .90 or higher for a prolonged period of practicing assessors (Brazelton & Tryphonopoulou 1972).

There is no reliability or validity data on The Assessment of Premature Infant Behavior by Heidi Als. The stress indicators of the APIB are based on the BNBAS. It is a new tool and there are relatively few clinicians trained to use it.

The designer and administrator of the Infant Behavioral Observation Schedule used in this study was certified in using the BNBAS for research purposes. She was also trained by Als in the use of the APIB. The adaptation of the BNBAS and APIB was made because this study was concerned with assessing infant behavior and development in the context of parent-infant interaction (which persists

over time), rather than professional-infant interaction (which occurs in a moment in time).

PROCEDURES

Logistics

The project extended over an 18-week period. Following, is a week-by-week descriptions of the procedures of the program.

Weeks 1-5: I attended all birthing classes offered by the Project on Monday, Tuesday, Thursday and Friday evenings. My intent in doing so was to allow all potential subjects in both groups to be familiar with me. They all knew that I had a partner, two small children, and that I was interested in parent-infant relationships.

Week 3: I gave a 10-minute presentation to potential subjects in each birthing class. Tuesday and Thursday evening participants were solicited to be in the treatment group. Monday and Friday evening participants were approached to be in the comparison group. All potential subjects were informed that I was carrying out a study to gather information about the experience of pregnancy, parenting and the parent-infant interaction. The procedures of the study were presented specifically for each group. The presentations were made at the end of each class.

Interested individuals signed their names on a list as they were leaving the class.

Week 4: I telephoned potential subjects who had signed the list to see if they met the selection criteria. Individuals who did not meet the criteria were used for rater training tapes. There were two single mothers in each group that I used for this purpose. Subjects were informed that the first stage of the project would involve filling out consent forms and two questionnaires. I requested that they stay after the fifth birthing class for that purpose.

Week 5: Treatment and Control subjects stayed after each of their respective birthing classes. I once again described the steps and purpose of the study. They signed consent forms (Appendix H). They filled out the pretest measures, including the parental expectation survey and the parenting confidence questionaire. Demographic data were collected on the pretest confidence questionnaire. Comparison group subjects from the Monday and Friday night birthing classes were informed I would call them when their baby was due to begin arrangements for the next step of the study. Treatment group subjects from the Tuesday and Thursday night birthing classes were invited to attend the first touch-training class on the following Thursday evening.

Week 6: Phase One of Treatment began. The first 1 1/2 hour touch-training class was on Thursday evening for treatment group couples. Couples in the comparison group had no contact.

Week 7: The second 1 1/2 hour touch-training class was on Thursday evening for treatment group couples. Subject couples in the comparison group had no contact.

Week 8: There was no contact with any of the subjects.

Weeks 9-11: All babies were due. I called all treatment and comparison subjects 2 days after their due date if I had not been notified of a birth by the Project. I called every 3 days thereafter until the baby was born. During the birth conversation I obtained the baby's height and weight data. Arrangements were made with treatment group subects for the first home teaching visits. Comparison group subjects were told I would keep contact with them to arrange for a home visit when the infant was 1 month old.

Post birth week 1: This was the beginning of Phase Two of the Treatment. Treatment group subjects received home teaching visits when the baby was 4-6 days old. Both parents were present.

Post birth week 2: Treatment group couples received a second home teaching visit when the baby was 11-13 days

old. Both parents were present. A note was sent to comparison group subjects. The note said I hoped the baby was fine and that they were enjoying being new parents. I indicated I would call them the next week to make arrangements for a home visit when the baby was a month old.

Post birth week 3: I telephoned all treatment and comparison couples. Arrangements were made for a home visit when the baby was between 28 and 30 days old. Both parents needed to be present. I made the visit with a camerman. The mother-infant team was videotaped performing the three activities for the mutual interaction and infant development assessment. Parents filled out the posttest-one questionnaires. They included a parental expectation survey, identical to the pretest survey, and a parenting confidence questionnaire analogous to the pretest measure.

Post birth week 5: Neither group had contact.

Post birth week 6: Neither group had contact.

Post birth week 7: The infants' 6-week height and weight data was collected by telephone conversation. Parents were informed the posttest two questionnaire would be administered the following week.

Post birh week 8: The posttest-two confidence questionnaire was administered to all subjects.

Video Tape Recording Procedures

The video recordings were made by a professional cameraman. For training, the cameraman taped six mothers and infants performing the activities to be done by subjects in the study. He was guided through the actual taping of the first four mothers and infants. After each recording session he participated in analyzing the tapes. The analysis was concerned with whether all interactions were recorded in a way that the physical connection between parent and infant and their individual movement could be seen clearly. Adjustments in position, angle of recording, and distance were made in each consecutive recording session. The fourth taping session was judged as sufficient in all respects. He videotaped the last two mothers without guidance. We analyzed the footage and agreed it was possible to analyze the motion qualities of the mother-infant interaction.

When filming the actual subjects, the cameraman was blind to subject assignment. He did not discuss the study with the subjects while recording.

I, as project director, was present during the recordings to direct the activities and to control for consistent conditions for all 22 interactions. I knew all

experimental and comparison group subjects. I had attended, and purposely participated in all 5 weeks of all birthing classes. They knew I was interested in parent-infant interaction, and they were all comfortable in my presence. I set up the recording environment and presented them their instructions for each activity during the video taping sessions. In order to ensure uniform instructions, I read them from a sheet of paper (see Appendix I).

The recordings were made in the homes of each of the study participants when the infant was 1-month old. In order to accommodate any scheduling difficulties, 1-month of age was considered as being between 27 and 30 days. The primary caretaker (which in all cases was the mother), was video-taped while performing the three activities with her infant on a sturdy 3X2.5 foot table, 46 inches high, with a sheepskin covering. Indirect television lights were used to control picture quality.

Rater Training Procedures and Guidelines

Three raters were trained to determine the degree of mutual interaction of the mother-infant teams by viewing the tape recordings. Four persons participated in the rater training program. They included a cultural anthropologist, a clinical psychologist, a movement therapist, and a mother of a newborn baby. They were chosen based on their willingness

to participate in the 8-hour training and to dedicate sufficient time to rate the videotape recordings. The cultural anthropologist was a nonjudging trainee. She provided an assessment of the cross-cultural appropriateness of the training program and study.

Raters were trained in an experiential format. In the training, raters used touch to interact with each other in structured activities. The activities were those that parents would be involved in with their newborns. Concepts were presented for them to consider during their interactions. A discussion followed each activity linking the activities and presented concepts to parent-infant interaction. For a rater training narrative see Appendix J.

The training was composed of four, 2-hour sessions. The first session consisted of assessing skill and knowledge in the areas of:

1) touch communication
2) motion components of communication
3) recognizing goal-oriented vs. process-oriented interactions

After assessing the present skill and knowledge level of raters, experiential training was provided during sessions 2 and 3 to improve skill in the assessed areas. Training focused upon:

1) understanding functional anatomy from the inside out: Experiencing the alternating pattern of stable and unstable levels of motion.
2) applying functional anatomy to the concept of mutual interaction
3) developing effective touching skills as a means of enhancing the ability to recognize effective touching
4) group discussion and rating of the degree of mutuality in videotape recordings of mother-infant interactions using the rating scales and criteria reference lists (see Appendix E).

Session 4 was concerned with assessing the raters' ability to recognize effective touching and analyze the motion components of communication via:
1) independent rating of videotape recordings of mother-infant interaction using the rating scales and criteria reference lists, and
2) initiating and carrying out a mutual interaction with the trainer using touch as the medium for communication.

Video Analysis A: Mutual Interaction Assessment

The recordings were evaluated blind by the three independent raters now trained to identify levels of tactile communication skill in parent-infant interaction. They independently graded the skillfulness of parent-infant interaction during the three structured activities:

1) Changing clothes (including diapers)

2) Changing positions from a prone to supine position; and from a position of lying to standing and back to lying

3) Bringing the infant to sitting using the grasp reflex, then lifting the infant to a vertical carrying position and returning the infant to the table

An electronic video recorder with varying speed control was used for grading skillfullness of parent-infant interactions. The electronic recorder provided easy recall of all subjects and activities. Subject pairs were randomly assigned a number between 1-22 for identification and for locating them on the recorder. Each activity was assigned a letter from "A" to "C." In this way the raters were able to find the recording of any participant and any of the three activities by indicating a number and a letter. The order of activities was randomized across raters to control for bias in presentation.

STEP 1: Raters worked independently. They viewed the series of parent-infant interactions in their first activity three times without doing anything.

STEP 2: Raters scored the three components of parent-infant interaction involved in one activity:

1) EFFORT (referring to muscular actions taking place in the interaction)

2) TIMING in the interaction

3) SPATIAL aspects of the interaction

The rating was done in an isolated room in my home. They worked one at a time. Each rater took a period of 2 days to score all subject-pairs, viewing the tapes about 4 hours per day. I insisted on 15-minute breaks every half hour during the viewing process. Two raters took 8 hours to score the tapes and one took 9. For a full description of the Mutual Interaction Schedule and scoring sheets see Appendix E.

STEP 3: The scores determined by the above method were analyzed statistically to determine the degree of difference in the interaction skills of trained and untrained parents and their infants.

Video Analysis B: Apparent Infant Development

The apparent infant development rating was made from the videotape recordings of mother-infant interaction. They were made while observing the same activities filmed for the Mutual Interaction Assessment. However, in this assessment only the infant was being observed and scored. The assessor watched all of the mother-infant interaction tapes once. (The tapes were in random order.) She then scored each infant according to the three categories: infant state, stress level and motoric integrity using the Infant Behavioral Assessment Scale. Scoring was done by watching the infant's behavior in

15-second intervals and counting the behaviors from each category that were exhibited in that time frame (see Appendix G for scoring sheets).

Data Analysis

This was a treatment-comparison design. Data analysis was done with Statistical Analysis System (1982).

CHAPTER FIVE

RESULTS

Except when noted otherwise, analyses were ANOVA [2 (group) x 2 (gender of parent) x 2 (baby gender)]. Analyses were run by The Statistical Analysis System User's Guide: Basics (1982) and adjusted for unequal N. Interaction terms were not calculated because of small cell sizes (22 mothers, 22 fathers and 22 babies).

Comparability Data

There were three categories of dependent variables on which the two groups were compared: demographic; birth related and parent expectations (see Table 1). T-tests and chi-square analyses were used for comparisons on all comprability data.

Groups differed significantly for 2 out of 19 variables: years of school and gender of baby. The mean number of years of schooling for the intervention group was 13.4 (S.D. = .80) while the mean for the comparison group was 12.9 (S.D. = 1.0). Baby's gender was also significant ($X^2 = 9.09$, $p \leq .01$) Intervention group parents had 8 boys and 3 girls while comparison group parents had 3 boys and 8 girls.

Table 1
Comparisons of Treatment and Control Groups on Selected Variables

Variables	t-test	N	df
demographic			
length of partnership	0.14	44	42
age	0.89	44	42
years of school	-2.03*	44	42
birth related information			
gestation	-0.26	22	20
labor hours	0.08	22	20
length of hospital stay	-0.32	22	20
delivery question: Are you prepared?	0.78	44	42
Birth height	-0.96	22	20
Birth weight	-0.76	22	20
Pretest Expectations of Infant Behavior			
1) when baby is aware of surroundings	0.10	44	42
2) when to start teaching baby	-0.10	44	42
3) when can baby see clearly	-0.25	44	42
4) when can baby hear clearly	-0.80	44	42
5) when is talking to baby important	-0.84	44	42
Chi square calculations			
	X		df
Occupation	0.00	44	2
Ethnicity	1.53	44	1
Birth Compl.	0.26	22	1
Medications	0.37	22	1
Gender of Baby	9.091**	22	1

*p<.05. **p<.01

In addition, a 37-item pretest questionnaire was administered to 22 mothers and 22 fathers (N=44) as another means of establishing comparability in the nonrandomized sample. As seen in Table 2, the two groups differed significantly on items related to self-report of depression, shortness of temper and tenseness during pregnancy. Significance was affected by group and parent gender. Intervention parents and mothers reported experiencing more depression, shortness of temper and tenseness during the period of pregnancy. Baby gender was not significant.

Low means indicated the symptom occurred more frequently. The mean for self-report of depression during pregnancy for the intervention group was 2.2 (S.D. = 1.2); for self-report of short-tempered was 2.4 (S.D. = 1.1); and for tenseness was 2.3 (S.D = 0.9). The mean for self-report of depression during pregnancy for the comparison group was 3.4 (S.D. = 0.7); for short tempered was 2.7 (S.D. = 0.8); and for self-report of tenseness was 3.4 (S.D. = 0.6). Overall, intervention parents and mothers reported having a rougher pregnancy than comparison parents.

Table 2
Influence of Treatment, Parent's Gender and Baby's Gender on Pretest Comparability Questionnaire (two-page table)

		Main Effects		
		1	2	3	4
Item	Overall F	Group	Gender	B Gender	
1) labor is easy	1.08				
2) woman to help	0.78				
3) image of having baby	0.63				
4) feeling depressed	10.07***	13.42***	13.42***	3.36	
5) ready for delivery	1.79				
6) scared to be a parent	0.86				
7) first feelings	0.91				
8) women care for babies	0.63				
9) tiresome pregnancy	0.70				
10) baby feels attached	0.60				
11) birth pain worry	2.73				
12) which baby gender	1.63				
13) baby effects marriage	0.69				
14) happy over pregnancy	0.28				
15) parenting feelings	0.51				
16) tense in pregnancy	4.80***	5.99*	8.37**	0.05	
17) baby and social life	1.17				
18) with baby after birth	0.00				
19) normalcy concerns	1.67				
20) short-tempered	4.63***	1.92	11.98***	0.0	
21) planned baby	1.04				

Item	Overall F	1 Group	2 Gender	3 B Gender	4
22) can calm crying baby	2.08				
23) babies are frustrated	0.04				
24) babies in childhood	0.60				
25) energetic in pregnancy	0.61				
26) support in delivery	2.14				
27) rooming-in wishes	1.14				
28) peaceful pregnancy	1.25				
29) worry over sick baby	0.36				
30) frequencies babies cry	1.16				
31) know baby's needs	1.11				
32) need rest after birth	0.51				
33) affectionate person	0.79				
35) drugs and delivery	0.00				
36) parenting instruction	0.00				
37) attachment feelings	1.09				

Note. Item 34 does not exist.
1 df (2,42)
2 Group = Intervention vs Comparison
3 Gender = Parent gender
4 B Gender = Baby gender
*p< .05. **p< .01. ***p< .001

Hypotheses:

Hypothesis One: It was anticipated that trained mothers and fathers would have more accurate expectations of their infant's early abilities, behavior and development than would untrained mothers and fathers. A 5-item parental expectation survey was administered to 22 mothers and 22 fathers (N=44). Identical measurements were taken as a pretest and a 1-month postnatal follow-up. Each item was scored as a dependent measure. There were no significant differences between groups on the five pretest survey items.

The groups differed significantly on three out of five posttest variables (see Table 3). The three items were concerned with newborn behavior. The mean number of weeks parents thought the baby would be aware of the surroundings for the intervention group was 0.1 (S.D. = 0.5), while the mean number of weeks for the comparison group was 2.6 (S.D. = 2.5). The mean number of weeks intervention parents thought the baby would see clearly was 0.1 (S.D. = 0.3) while the mean number of weeks for the comparison group on that variable was 4.5 (S.D. = 2.9). The difference in when parents thought the baby would hear clearly was also significant with the mean number of weeks for the intervention group being 0.2 (S.D. = 0.7) while the mean number of weeks for the comparison group was 2.0 (S.D. = 2.8).

The two nonsignificant items were concerned with parent behavior: when parents would begin teaching their child and when it would be especially important to talk to the baby. All 22 intervention group parents thought they would begin teaching their child at birth. Thirteen out of 22 comparison group parents thought they would begin teaching when the child was between 1 week and 3 months old. (Most comparison group scores were clustered between one and three weeks). The numbers were not statistically significant with the small sample. However, intervention parents had more accurate information about the possibility of teaching their infant from birth.

All but two parents in the whole sample thought it important to begin talking to their child at birth. As talking is the primary mode of interaction for most adults I expected no difference between groups on when they thought talking would be especially important for their baby. Thus, Hypothesis One was partially confirmed.

Table 3
Effects of Treatment, Participant's Gender and Baby Gender on Posttest Parent Expectation Scores

		Main Effects		
	1	2	3	4
Epectation Scores	Overall F	Grp	Gender	B Gender
1) when baby is aware of surroundings	7.95***	19.23***	2.05	0.32
2) when to start teaching baby	1,70			
3) when can baby see clearly	23.78***	69.77***	.65	.63
4) when can baby hear clearly	3.94**	9.44**	2.29	1.27
5) when is talking important	1.49			

1 df (2,19)
2 group=Intervention vs Comparison
3 gender=Parent gender
4 B gender=Baby gender
** $p < .01$
*** $p < .001$

Hypothesis Two: Trained mother-infant teams would exhibit a greater degree of mutual interaction skill than would untrained mother-infant teams. Measurement was drawn from videotape recordings of 22 mother-infant teams at a 1-month postnatal home visit. The Mutual Interaction Scales (MIS) were used for the assessment.

The MIS is a new measure. Its psychometric properties were examined before using it to test the hypothesis. The three raters reached 87% agreement when assessing mother-infant interaction on three training tapes before rating the study subjects. The 87% agreement was determined by subtracting from 100 the ratio of the total number of rater dissagreements from the total number of observations made. Correlation coefficients were used to determine interrater agreement for the actual study (see Table 4). When rating the 22 mother-infant teams, there were interrater correlations between .977 and .995 for each of the three scales: total effort, total timing and total space scores.

Table 4
Interrater Agreement for MIS Scales Used in the Study

	Rater Two			Rater Three		
	Effort	Time	Space	Effort	Time	Space
Rater One						
Effort	.99***			.99***		
Time		.99***			.99***	
Space			.98***			.99***
Rater Two						
Effort	1.0			.99***		
Time		1.0			1.0***	
Space			1.0			.98***

*** $p<.001$

Table 5 describes the inter-correlations obtained among MIS scales. Correlations among the scales were .98 (Space), .99 (Total) and 1.0 (Effort and Time). The high correlations indicate that a total score would have been an appropriate dependent measure. However, given the newness of the measure, the scales of effort, time, space, and a total score were examined separately.

Table 5
Intercorrelations Among Mutual Interaction Scales

	Effort	Time	Space	Total
Effort	1.0	1.0***	0.98****	1.0***
Time		1.0	.98***	1.00***
Space			1.0	.99***
Total				1.0

*** $p<.001$

In another procedure, MIS correlations were determined between mothers' MIS scores and their Posttest Expectation Survey scores (see Table 6). The expectation survey questions regarding newborn and new parent behavior are founded on extensive research of newborns. Use of the survey in parent-infant research has indicated that parent expectations influenced what they actually did with their babies (Barnard & Eyres, 1979; Novers et al., 1984).

The MIS is a new measure for assessing mutuality in the actual, parent-infant interaction at the nonverbal, motoric level of exchange. As parent expectations had been found to relate to parent behavior using other measures, I thought it appropriate to see how they compared with MIS scores based on observation of the non-verbal motoric exchanges between parents and infants. The comparison was made of mothers only (N=22) using ANOVA [2 (group) x 2 (gender of baby)].

Posttest Expectation question one regarding when the baby would be aware of the surroundings was non-significant. Question three regarding when the baby could see clearly was significant on the space and total MIS scales. Questions two regarding when parents would begin teaching their baby, four regarding when the baby could hear clearly and five regarding when talking would important for the baby were significantly related to the MIS scores indicating some relation among the variables.

Table 6
Correlations Between Mutual Interaction Scores and Post Test Expectations Scores

	Exp1	Exp2	Exp3	Exp4	Exp5
Effort	.o4	0.57**	0.42**	0.69***	0.47**
Time	.05	0.55**	0.41	0.72***	.45**
Space	.06	.56**	.42**	0.70***	.46**
Total	.05	.56**	.42**	0.71***	.46**

*p< .05. ** p< .01. ***p< .001

The three Mutual Interaction Scales of effort, timing, space and a summary score were the four dependent variables for Hypothesis Two. ANOVAs [2 (group) x 2 (baby gender)] were done on each dependent variable to compare the scores of 22 intervention and comparison group mother-infant teams (see Table 7). The overall F ratios were significant for all four dependent measures. Main affects were found for group for each dependent measure but not for baby gender. Hypothesis Two was confirmed.

Table 7
Effect of Group and Baby Gender on MIS Scores

MIS Scores	Overall F [1]	Group [2]	Baby Gender [3]
Effort Total	166.92***	145.51***	1.49
Time Total	181.85***	156.92***	1.29
Space Total	171.14***	159.26***	4.53
Total MIS	187.35***	166.11***	2.35

1=df= (2,19)
2= group (intervention vs comparison)
3= baby gender
*** $p<.001$

Inspection of the group means on MIS scores illustrated a consistent pattern of comparison group mother-infant teams obtaining higher scores (representing poorer mutual interaction) than did the intervention group mother-infant teams (see Table 8).

Dispersion around the group means was large in the intervention group ranging from 24.5 on the space scale to 28.2 on the effort scale. Review of individual scores revealed that three mother-infant teams had received consistently higher scores (indicating less mutuality) than the other intervention group teams, thus causing the large dispersion. It is important to note that in spite of the dispersion, the means of all intervention group mother-newborn teams were lower than comparison group means indicating greater mutual interaction skills.

Table 8
T-Tests for Intervention vs. Comparison Groups on Mutual Interaction Scores

	Comparison (N=11)		Intervention (N=11)		
Score	M	SD	M	SD	t
Effort	170.0	6.4	58.8	28.2	12.76****
Time	166.3	7.9	59.0	25.4	13.39****
Space	160.2	10.7	63.0	24.5	12.06****
Total	496.4	21.7	180.8	76.0	13.25****

1 df = (20)
**** $p<.0001$

Hypothesis Three: Babies of trained parents would appear more developed than the babies of untrained parents at 1 month. Three apparent development scales, state, motor integrity, and stress behavior, plus a total apparent development score were the four dependent variables. As the measure had not been used before I calculated the intercorrelations among the scales (see Table 9) before using it to answer the hypothesis. The three scales were highly correlated with each other and to the total development scale. The inter-scale correlations were .76 between motor and state .89 between stress and state and .88 between motor and stress.

Table 9
Intercorrelations Among Apparent Development Scores

	State	Motor	Stress	Develop
State	1.0	.75***	.88***	.94***
Motor		1.0	.82***	.92***
Stress			1.0	.96***
Develop				1.0

***$p < .001$

I then went on to use the measure to answer the hypothesis. In spite of the high correlations I used each scale, plus a total development scale as four separate dependent measures. ANOVA [2 (group) x 2 (baby gender)] were used to investigate the effects of group and baby gender (see Table 10). Lower scores represent greater development.

Overall F ratios were significant for Stress, Motor and Total Development scores. Main effects were found for group but not for baby gender. The mean score for the baby's motor integrity for the intervention group was 2.18 (S.D. = 1.08) while the mean for the comparison group was 3.64 (S.D. = .92). The mean score for infant stress for the intervention group was 2.18 (S.D. = .98) while the mean for the comparison group was 3.36 (S.D. = 1.03). The baby's total development score was also significant with the mean for the intervention group being 6.55 (S.D. = 2.88) while the mean for the comparison group was 10.27 (S.D. = 2.80). The consistently lower scores of intervention babies indicate that parents' handling practices positively affected their development.

In spite of the high inter-scale correlations, the overall F scores for infant state were nonsignificant. While the motor integrity and stress items can be scored during handling, an accurate assessment of infant state requires

periods of observing the infant when the infant is without physical contact. Infant state was difficult to measure on the actual study subjects due to the limited amount of time infants were without contact. It is possible that the training did influence infant state development but this difference was obscured due to measurement error. Overall, Hypothesis Three was partially supported.

Table 10
Effects of Treatment and Baby Gender on Apparent Development Scores

Develop Scores	Overall F [1]	Group [2]	B Gender [3]
State	2.61		
Stress	3.65*	7.25**	0.04
Motor	5.48**	10.95***	0.00
Develop	4.52*	9.02**	0.01

1 df = (2,19)
2 Group = intervention vs comparison
3 B Gender = baby gender
*$p<.05$. **$p<.01$. *** $p<.001$

Exploratory Questions:

a. Would training affect the infant's physical growth? Height and weight measurements were taken at birth and at a 6-week health examination? The dependent measures were the birth to 6-week gain scores for both height and weight on the 22 babies. Anovas [2 (group) x 2 (gender of baby)] were done on height and weight gain. Overall *F* ratios were not significant for height or weight. Hence, the training program had no significant effect on infants' physical growth.

b. Would trained mothers and fathers have higher self-report confidence scores than untrained mothers and fathers on the posttest one or posttest two confidence measurements (*N*=44)? Only identical confidence items were scored on the two posttest measures administered at 1 and 2 months postpartum. Each item was scored as a separate dependent measure. Posttest one items are identified as P11-P19. Matched posttest two items are identified as P21-P29).

Overall, there were more consistent significant differences found in posttest two (7 out of 9 *F* ratios were significant). On posttest one 5 out of 9 *F* ratios were significant (see Table 11).

On the posttest one measure there were significant main effects for group on items P12, P14 and P18. Main effects were found for parent gender on items P16 and P17. Baby

gender had no affect on posttest one items. All data were coded so that higher numbers indicated higher confidence while lower numbers indicated lower confidence. Inspection of the group means (Table 12), illustrated that at the time of the posttest one measurement (1-month postpartum), intervention group parents on the whole, had more parenting confidence than comparison group parents. They had more confidence in dealing with crying (P12). They felt more sure of themselves (P14). They felt more confident (less discouraged) about being able to care for the baby (P18). Fathers, were less confident that they understood their baby's wants and needs (P16) and were more afraid something could happen to their child during bathing (P17).

Table 11
Influence of Treatment, Parent's Gender and Baby Gender On Posttest One Confidence Items

Post 1 Items	Overall F [1]	Grp [2]	Gender [3]	B gender [4]
P11 worry over food (item 1)	1.71			
P12 worry over crying (item 3)	5.28**	9.66**	2.42	3.77
P13 confident in caring (item 11)	2.60			
P14 if more sure of self baby more relaxed (item 12)	4.03**	6.93**	0.28	0.03
P15 difficult to calm baby down (item 17)	2.25			
P16 know baby's wants and needs (item 19)	6.39***	3.75	15***	0.42
P17 worry over bathing (item 20)	3.47*	2.06	6.30*	2.06
P18 discouraged (item 28)	3.91*	7.98**	0.89	2.87
P19 affectionate with baby (item 31)	.043			

1 df (3,40)
2 group = intervention vs comparison
3 gender = participant gender
4 B gender = baby gender
*p <.05. **p <.01. *** p <.001

Table 12
Means and Standard Deviations on Significant Posttest One Confidence Items

	Intervention (N=22)		Comparison (N=22)	
	M	S.D.	M	S.D.
P12 worry over crying	3.3	0.6	2.5	1.0
P14 if more sure of self the baby would be more relaxed	3.6	1.5	2.5	1.5
P16 know baby's wants and needs	3.7	0.5	3.4	0.6
P17 worry over bathing	4.3	0.6	3.9	1.1
P18 discouraged in caring for baby	3.6	0.5	3.0	1.0

In posttest two 7 out of 9 dependent measures had overall F ratios that were significant (see Table 13). All had significant main effects for group.

Three items had significant main effects for group and parent gender (items P23 concerning confidence in caring for the baby, P25 regarding confidence in calming the baby down, and P26 concerning knowing the baby's wants and needs). Mothers reported more confidence in those areas than did fathers.

Significant main effects for group and baby gender were found on two items (P22 worry over crying and P28 discouraged about caring for the baby). Parents of male babies indicated more confidence (less worry) over crying.

Inspection of the group means on posttest two confidence scores illustrated a consistent pattern of intervention group parents obtaining higher scores (representing higher confidence) than did comparison group parents (see Table 14). All items were coded so that higher numbers indicated higher confidence. The findings of posttest two support the conclusion that handling training positively effected parenting confidence.

Table 13
Influence of Treatment, Parents' Gender and Baby Gender On Posttest Two Confidence Items
(Posttest Two Items are identical to posttest one items P11-P19)

Post 2 Items	Overall F [1]	Group [2]	Gender [3]	B Gender [4]
P21=P11 worry over food (item 1)	4.98**	12.18***	1.35	1.35
P22=P12 worry over crying (item 2)	17.56***	18.26***	0.73	4.57*
P23=P13 caregiving confidence (item 3)	6.18**	13.06***	4.03*	1.45
P24=P14 sure of self (item 4)	2.90*	5.65*	2.29	0.75
P25=P15 can calm baby (item 5)	16.40***	38.41***	7.94**	2.86
P26=P16 know baby's wants and needs (item 6)	8.74**	17.24***	6.21*	2.76
P27=P17 worry over bathing (item 7)	2.63			
P28=P18 discouraged (item 8)	7.17**	20.75***	1.44	4.66*
P29=P19 affectionate with baby (item 9)	1.64			

1 df (3,40)
2 group = intervention vs comparison
3 gender = participant's gender
*$p<.05$. ** $p<.01$. ***$p<.001$

Table 14
Means and Standard Deviations on Significant Posttest Two Confidence Items

	Intervention Group		Comparison Group	
	M	S.D.	M	S.D.
P21=P11 worry over amount of food	3.5	0.7	2.7	0.9
P22=P12 worry over crying	3.5	0.6	2.6	0.8
P23=P13 caregiving confidence	5.0	0.2	4.5	0.5
P24=P14 if more sure of self baby would be more relaxed	3.8	1.3	2.8	1.5
P25=P15 can calm baby down	3.2	0.7	2.2	0.5
P26=P16 know baby's wants and needs	4.0	0.2	3.5	0.5
P28=P18 discouraged over caring for baby	3.8	0.4	3.0	0.8

Group comparisons were also made on unmatched posttest confidence items for the sake of completion (see Table 15 for the sample). Of 9 posttest one items, only one significant overall F ratio was found (item 25) asking whether one partner wished the other partner would do more with the baby. The significant difference was effected by gender while main effects for group and baby gender were nonsignficant. The mean for women was 3.8 (S.D = 1.4) while the mean for men was 3.4 (S.D. = 1.4) indicating that the women wished that their male partners would do more with the baby. The difference between genders could be expected in the early phase of the parent-infant relationship.

For both extra items on posttest two overall F ratios and main effects for group alone were found to be significant. On item 10 regarding feeling scared of being a parent the intervention group mean was 3.5 (S.D. = 0.7) and comparison group mean was 2.5 (S.D. = 0.9). Parents with the highest scores were the least fearful of being a parent. On item 11 regarding parent self rating, the intervention group mean was 1.3 (S.D. = 0.5) and the comparison group mean was 2.1 (S.D. = 0.7). Parents with the lowest scores had the best self-ratings. Once again, the effect of group on these differences indicated the positive impact of the treatment on the development of parental confidence and parental self-image over time.

Table 15
Influence of Treatment, Participant's Gender and Baby Gender on Unmatched Posttest Confidence Items

Confidence Items	Overall F	1 Grp	2 Gender	3 B Gender	4
Posttest One					
1: handling is only for caring (item 4)	1.61				
2: wish for compliments on parenting (item 9)	1.54				
3: how much babies cry (item 24)	2.27				
4: wish partner did more (item 25)	3.29*	1.06	8.16**	0.64	
5: if I knew more about handling--less problems with baby (item 35)	0.18				
6: picking up baby spoils him/her (item 38)	1.09				
7: attachment--feel close to baby (item 39)	1.62				
8: baby feels close to you (item 40)	1.98				
9: when felt baby was yours (item 41)	0.39				
Posttest Two					
Scaredofbeing a parent (item 10)	7.69***	20.65***	0.14	2.29	
Self rating of being a parent (item 11)	9.57***	23.48***	0.11	0.11	

1 df
2 group = intervention vs comparison
3 gender = parent gender
4 B gender = baby gender
*p<.05. ** p<.01. ***p<.001

CHAPTER SIX

DISCUSSION

The findings of this study are best considered within a cybernetic systems framework where it is thought that children develop their perceptual and communication skills by following the motion patterns of their parents during caretaking and play interactions (Smith, 1968). Overall, this study found that handling training positively affected: (1) accuracy of parent expectations of infant behavior; (2) the degree of mutuality in parent-infant interaction; (3) the apparent development of the infant; and, (4) parenting confidence. The study indicated that handling training prepared parents to engage their infant confidently in mutual exchanges that enhanced family interaction and the infant's development.

Hypotheses

The findings of each hypothesis were as follows:

1) It was anticipated that handling training would positively influence the accuracy of parents' expectations of infant behavior. Hypothesis One was partially confirmed.

Intervention group parents demonstrated significantly more accurate expectations on the posttest measure on three items concerned with newborn behavior: infant awareness;

visual abilities; and auditory abilities. In addition to looking at group posttest differences, I looked at the direction of individual change from pretest to posttest scores. While all intervention group parents moved toward more accurate posttest expectations, many comparison group parents moved toward less accurate knowledge of newborn sensory abilities on the posttest measure. Rather than guessing why this should be so, I asked them. They indicated that when they tried to interact with their baby visually or verbally they did not think the baby knew what was happening. As a result, they found the baby less aware of the surroundings and less able to see and hear than they had expected.

Comparison group parents seemed to confuse the baby's sensory abilities with the ability to bring meaning to an exchange. These findings suggest the importance of not simply informing parents about newborn abilities. They indicate that parents should be taught how to take advantage of the baby's sensory abilities to develop habits of using shared activities to make meaning together with their infant.

The two nonsignificant items were those concerned with parent behavior: talking to and teaching the baby. As talking is the predominant method of adult exchange it is logical that virtually all parents considered it important to begin talking to their baby at birth. The trend was in the

predicted direction on the nonsignificant item regarding when the parent would begin teaching the baby, though the differences between groups did not reach statistical significance. All 22 intervention parents thought they would begin their teaching role at birth. However, 13 out of 22 comparison group parents thought they would not begin their teaching role until their child was between the ages of 1 and 12 weeks. The frequency data are important as they indicate that intervention parents had more accurate information about their newborns' readiness to learn.

In light of previous developmental research findings one could assume that the intervention group parents were better prepared to begin their relationship with their infant. That research had found that parents' expectations influenced what they actually did with the child, (Barnard & Eyres, 1979; Novers et al., 1984); influenced how they designed the child's learning environment (Barnard & Eyres, 1979; Davidson, 1979); and influenced the child's development over time (Barnard & Eyres, 1979). These findings suggest that as parents' expectations are related to other behavioral variables, improving them should be one goal of parenting programs aimed at minimizing pathology and enhancing infant development.

2) It was anticipated that intervention parents would have more skill in having mutual interactions with their infant than would comparison group parents. Hypothesis Two was confirmed.

Hypotheses One and Two are closely related. Parents' expectations refer to their abstract ideas about newborns in general. Parents' behavior refers to the concrete actions they make when relating to their particular infant. Unlike abstract ideas, behavior takes place in real time, in specific space, and with a particular dynamic.

It was my assumption that an intervention program should give parents accurate expectations about their newborn and provide them with a theoretical framework and practical means of transfering that information into real-time behavior specific to their particular infant and their unique parent-infant relationship. When reviewing parenting programs I discovered no existing intervention method that successfully provided parents with information and skill.

The handling training evaluated in this program was designed to address both issues. Its success validates the usefulness of cybernetic theory of behavior and communication in general (Bateson, 1972; Bertalanffy, 1968; Powers, 1973; K.U. Smith, 1971; Weiner, 1948, 1950) and the social tracking theory of development in particular (Smith, 1968, 1972) in

expanding the parameters of both clinical and developmental psychology.

Social tracking theory suggests that infants develop by following the motion patterns of their parents during caretaking and play activities. The theory integrates the more general research findings concerning the importance of touching (Montague 1978), and close bodily contact (Ainsworth, 1973) in establishing nurturing bonds essential for positive development (Bettleheim, 1967; Erikson, 1950) into a theory of parent-infant differentiation. Rather than doing things to or for their infant, intervention parents were taught to continuously adjust their timing, force, and use of space to make up the difference between what their infant could do, and which organized behavior was required of them to mutually accomplish a particular human function.

The concept of mutuality was the cornerstone of the handling training. The ability to have balanced, mutual, tactile-guided interactions is assumed to be of central importance to the parent-infant relationship and the infant's development. Evidence exists that parents and infants develop patterns of comunication long before the child has even a passive understanding of words (Bruner, 1977; Halliday, 1975; Trevarthen, 1977). Cybernetic research on touch (Smith and Sturgeon, 1971; Stein and Meyer, 1971) indicates that parents and infants are able to communicate

using the medium of touch long before the infant has the sensory skills to use other avenues of communication. Though more evidence is necessary, it is possible that patterns of tactile communication, established in the first weeks of life during handling exchanges serve as the foundations of life-long patterns of learning and communication.

The idea of mutual interaction provides parents with a means of going into parenting with a question regarding "how can we do this together?" It sets up an environment conducive to exploration. I believe that the idea of mutal interaction coupled with handling skills gives parents both an attitude and the manual tools necessary to establish their interactions with the infant as the main resource for learning. They are able to use all caretaking and play interactions as learning laboratories where they and their infant are developing patterns of communication which serve as the foundations for effective complex social behavior.

Prior developmental research findings have led to the idea that parent-child response patterns influence social, emotional, cognitive, and motor differentiation during the child's development (Barnard & Bee, 1984; S. Greenspan & N. Greenspan, 1985). It is thought to be important that the parent provide responses <u>contingently</u> <u>appropriate</u> to the behavior of the child (Barnard & Bee, 1984).

Descriptions of contingent response have primarily been derived from observation of complex visual and auditory exchanges between parents and infants. Until now, they have overlooked the simpler, more immediate mutual exchanges occurring at the tactile level.

Mutual interactions, which occur through tactile contact, combine the efforts of parent and infant (equally or unequally), in the same time frame, to accomplish specific human functions such as eating (nursing), changing diapers and clothing or moving into positions of lying, sitting or standing (Maietta & Hatch, 1985). Due to the simpler nature of tactile exchanges infants are capable of participating in mutual tactile exchanges long before they are capable in carrying out contingent exchanges. An effective intervention to enhance mutual interactions is important because it is likely that mutuality precedes contingency and makes contingent responses possible.

3) It was anticipated that handling training would positively effect the apparent development of the child. Hypothesis Three was confirmed.

The current, popular theory of infant development proposes that it results from a combination of maturation and learning (S. Greenspan & N. Greenspan, 1985). Cybernetic theory offers a refined description of how maturation and learning relate in development. It suggests that, though

learning is primarily a social process and maturation is primarily an organic process, there is a reciprocating interaction between the two, through social tracking processes, that influences the rate and complexity of development (Smith, 1972).

Research findings suggest that through social tracking (following) processes involving touching exchanges, alone, or in combination with visual and auditory stimulation, children develop their smooth motor control, bi-lateral coordination, hand-eye, hand-eye-ear and hand-eye-ear-speech coordination that constitute the foundations of complex learning (Smith, 1971).

Teaching social tracking skills was the basis of providing intervention parents the handling skills to continuously explore and expand their infant's degree of maturity. I anticipated that infant development would be facilitated by handling that allowed for mutual accomplishment of human functions such as sitting, dressing or eating. The 1-month postnatal apparent development assessment found that to be the case, confirming Hypothesis Three.

Significant differences were found between intervention and control babies on the motor integrity and stress scores. The infant state scores were nonsignificant. The assessment was made from the video-tape recordings which were primarily

structured for the mutual interaction assessment. Added footage of the infant coping with conditions of no contact with the mother and with remaining in postural positions of lying, sitting and standing was required to adaquately assess infant state. The importance of the significant differences found on two out of the three scales indicates that mutual interaction has a direct effect on infant development. The findings provide evidence that handling training is a useful developmental intervention program.

Exploratory Questions

a) Would handling training affect infant height and/or weight gain? The assessment was made out of curiosity. Touch and other sensory stimulation had been found to support development in premature infants (Gottfried, 1984b). I wondered if specific touching interactions would effect height and weight gain in a population of healthy infants. Birth heights and weights of both groups were spread over a wide range. At the 6-week assessment the spread still persisted. There were no significant differences found between groups. There were no trends evident on either variable at the 6-week assessment. The first weeks of a healthy baby's life are full of new sensory experiences. While the behavioral aspects of development (from Hypothesis Three) were affected by the single factor of handling, height and weight gain were not.

b) Would handling training affect parenting confidence? It had been found in previous research on parenting programs that even minimal information about newborns and/or caretaking increased parenting confidence (Joy, 1980). I anticipated that trained intervention parents would be found to have more parenting confidence and more skill in interacting with their child than untrained comparison group parents. Analysis of the mutual interaction scores of parent-infant teams and the posttest one and two confidence scores found that to be the case.

At the first posttest confidence measure administered at 1-month postpartum intervention parents were more confident than comparison parents on 5 out of 9 confidence items. At the second posttest confidence measure administered at 2-months postpartum, significant differences in confidence persisted. Intervention subjects were more confident than comparison subjects on 7 out of 9 confidence items matching the posttest one confidence measure. Intervention parents were also more confident on 2 additional posttest two items regarding self-rating of being a parent and fear of being a parent.

I assume that the increased confidence was a benefit for the intervention subjects in approaching their new task of parenting. The findings provide more evidence that the

handling training is an effective intervention with many benefits, including increased confidence.

It is important to note that significant differences on some pretest, posttest one and posttest two measures were affected by both group and parent gender or baby gender. On the pretest comparability questionnaire intervention subjects and mothers were found to be more anxious on three self-report confidence variables concerning depression, shortness of temper, and tenseness during pregnancy. The positive change in confidence of intervention parents from the pretest to posttest measures indicated the effectiveness of the handling training in reducing the anxiety of these first-time parents.

On the posttest one measure intervention subjects and mothers reported more confidence on one variable regarding knowing the baby's wants and needs. The finding persisted on the posttest two measure. Additionally, parent gender affected two other posttest two varibles. Intervention subjects and mothers reported having more caregiving confidence and more ability to calm their baby down.

Mothers were the primary caretakers of all of the babies. It is not surpising that they would feel confident in caring for and understanding their baby. Perhaps more noteworthy is the fact that intervention fathers (who were not primary caretakers) reported increased confidence in

those areas. This points to the usefulness of handling training in developing confidence in first-time fathers.

Two items on the posttest two measure were affected by group and baby gender. Intervention subjects and parents of male babies were found to have more confidence (to be less discouraged) in caring for their newborns. They also reported more confidence (worried less about doing something wrong) when their baby cried.

It is important to note that intervention group parents had 8 boys and 3 girls. Comparison group parents had 8 girls and 3 boys. Though interaction terms would have been necessary to establish a relationship between group and baby gender on those items, 8 of the 11 male babies were born to intervention group parents. (Interaction terms were not possible because of small cell sizes.) Another possible speculation is that parents of male babies may be less discouraged and/or worried about their baby's crying, or their role in their baby's crying, than parents of female babies.

Anecdotal Information

Though not an object of my initial inquiry, there was evidence that the training had a positive effect on: (1) stability of the subject families comprising the intervention group; and, (2) the health of the intervention group babies in the sense of reducing incidents of colic.

Sample

The sample had two weaknesses. (1) The sample size was small (22 mothers, 22 fathers and 22 babies). Despite the small sample size, the differences between groups were highly significant on most measures thereby confirming the potent impact of the training.

(2) The study sample is not representative of the national population of primiparous parents, raising concern for external validity since the sample pool is weighted with low-income couples. However, the sample was readily available and fostered the internal validity of the study. The comparability data revealed that the two groups were very similar when the study began. While the results may not be generalizable to all parent-infant populations, the aim of the study was to assess the effects of a particular parenting intervention procedure on infant development and family relationships. The study can and should be replicated with other parent-infant populations.

Measurements

There were two new measures used in this study. The Mutual Interaction Scales evaluated the objective movement factors in parent-infant exchanges yielding valuable information about the motoric foundations of behavior. ANOVAs were done to determine if the Mutual Interaction

Scales were equally affected by training. MANOVAs could not be done to determine how the three scales were related because of the small sample. The three scales were highly correlated indicating .pa we were probably measuring one uniform quality rather than three.

Future research should investigate what unitary quality is being tapped by the three measures (effort, timing, and space) so that one meaningful label can be applied. There is also a need for more convergent and discriminate validity studies to be done on the scales.

The high correlation between raters' scores indicated that the rater training for the Mutual Interaction Scales was effective. I assume that the success of the rater training was partially due to its experiential nature. Raters learned to analyze touch interactions by analyzing their own tactile exchanges. At this time, there are no indications of the need to change the content or scoring procedures of the scales or the training of raters.

The Mutual Interaction Scales are useful as both a research and educational tool. In research involving any interaction it can be used to analyze the movement components of the interaction. In learning situations the categories of effort, timing and space can be used to adjust the learning environment to fit the needs and abilities of the learner, thereby optimizing learning.

The second new measure was the Infant Behavioral Observation Scales considering infant state, motor integrity and stress level. Traditionally, professional assessors have evaluated the development and potential of infants by observations of the effects of their own handling on the infant. However, the development of children is rarely influenced by such assessments.

Children develop in the company of and through interaction with family members. I maintain that infants and parents should be assessed as a functioning unit if any truth of their relationship and the child's developmental status and potential is to be understood. This assessment of infant development is therefore indirectly derived through observation of videotape recordings of parents handling their own infants.

The scales of motor integrity and infant stress were easily scored from the videotapes. However, it became apparent that some changes in the instructions to parent-infant teams need to be made in order to accurately assess infant state using the videotape format: (1) periods of time are needed when the infant is not being handled; (2) during an activity the mother needs to maintain the infant in positions such as lying, sitting or standing for long enough periods that it is possible to see how the infant copes with the situation; (3) the camera needs to run continuously to

provide a complete picture of infant state during the entire visit.

In spite of the difficulty in scoring infant state, high correlations were found among the scales. There is a need for more convergent and discriminate validity studies to be done to elucidate the similarities and differences among the three scales.

The Infant Behavioral Observation Scales compliment the Mutual Interaction Scales. They make it possible to analyze the affect of real-time behavior of the parent-infant team on infant development. The non-value-laden categories of the mutual interaction scales provide parents with a handle for systematically examining and altering their patterns of relating with their child.

Shortcomings of the Design

Design flaws included: (1) a non-randomized sample (comparability helped but the design was not pure); (2) lack of equal attention between the groups; (3) the difficulty with having truly comparable confidence items on the pretest and posttest measures.

The advantages of the design included: (1) having only one independent variable so that the decisive outcomes are more dependent on control as against a number of independent variables or confounding variables; and (2) using videotape

recordings for assessments which provided a behavioral record of the affects of the training.

Future Research

The study has important implications for researchers investigating child development in the context of parent-child interaction. The concepts of mutuality and social tracking (expecially tactile tracking), description of handling and the assessment measures designed for analysis of handling provide means of expanding research of touch from its effect on emotional patterns of relationship to the effect of specific touching patterns on cognitive, social emotional and motor aspects of development. The results of this study point toward a number of areas for future research including:

(1) studies to separate the effects of some of the variables in the training program, to determine how much such aspects as the duration of infant-parent contact, the presence of myself and my husband as charismatic teachers, the number of pre-birth and post-birth contacts, trance induction etc., contributed to the success of the training

(2) replication of this study with other samples, in different parts of this country, and examination of the longitudinal affects of handling training on those populations.

(3) looking at the effects of handling training on various parent-infant groups: colicky, blind or deaf infants; other homebound handicapped infants such as those with cerebral palsey or neuromuscular diseases.

(4) relationship between mutuality and contingency

(5) refinement of the Mutual Interaction and Infant Behavior Observation Scales as assessment and intervention tools.

(6) basic studies to determine how infants and parents influence each other's behaviors at the motor-sensory level

(7) projects for demonstating the usefulness of this training for persons other than parent-infant dyads, such as nurses, the general adult population, the aged, handicapped persons of all ages

(8) longitudinal studies to evaluate the long term effects of handling training on any population that receives it.

Conclusions

The differences found between groups on all assessment measures paint a picture of two distinctly different parent-infant teams. One group was comprised of parents who (1) were knowledgeable about a newborn's abilities; (2) expected to begin teaching their child at birth; and, (3) were skilled in mutually engaging their newborn during shared activies. The knowledgeable, skilled behavior of those parents significantly enhanced their child's development.

In the other group we find parents who: (1) were relatively uninformed about a newborn's abilities; (2) expected to begin their role of teaching when the child was between 1 week and 3 months of age; and (3) had no idea it would be possible or important to engage the child in mutual interactions during daily activites. The children of these parents were determined to be not as well developed.

Effective parenting requires information and skill. It is not enough to inform parents about newborn abilities and admonish them to love, touch and hold their children. The handling training evaluated in this study was an effective method for providing parents with a way to transfer that information into skilled mutual behavior supporting family and individual differentiation beginning the day the child is born. A generation of children growing to maturity in this way could dramatically change our culture.

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Appendix A
Birthing Class Description: Maternity and Infant Care Project, Albuquerque, New Mexico

Birthing classes are offered to clients when the woman begins her third trimester of pregnancy. The classes are free. They are an optional part of the Project's program. Birthing classes are given in a 5-week series. Participants meet once a week for a 2-hour class from 7-9pm. There are around 25 couples in each class series.

CLASS CONTENT

Class 1:
a) anatomy
b) physiology
c) film and discussion of the emotional aspects of pregnancy

Class 2:
a) one hour pre-natal exercises including breathing techniques for delivery and exercises for relaxation
b) presentation of the psychological aspects of child birth
c) description of the mother during labor and delivery

Class 3:
a) one hour pre-natal exercises
b) description of medical preparation of mother for delivery
c) description of hospital nursery procedures

Class 4:
a) one hour pre-natal exercises
b) Cesarean birth film and discussion

Class 5:
a) one hour pre-natal exercises
b) description of care of infant after birth including care of umbilical cord, circumcision, and jaundice; description of breast and bottle feeding and bathing of a newborn.

Program After Birth:

If the mother and infant are healthy, they will not be seen until the infant is 6 weeks old. If there is any indication of possible neglect, or abuse, they will be seen

1-month post partum. All unmarried women under the age of 18 are considered at risk and will be seen when the infant is 1 month old.

Appendix B
Treatment Process Narrative
Phase One

CLASS ONE LOG

In order to set up a personal environment we began learning each other's first names. We played a simple game of saying our name, then repeating everyone else's first name that we could remember easily. The game served two purposes: People had to look at and acknowledge each other; and my assistant and I could quickly see what sense, visual, auditory, or kinesthetic, each person relied upon most to elicit information. With that information in hand we could present our responses to a particular individual in a form that the person could best understand.

SENSORY ABILITIES AT BIRTH

A general question was presented: "What are your thoughts about a newborn infant?" The responses were just as general as the question: A baby is totally helpless. A baby can't do nothing except eat and poop and cry. A baby means lots and lots of work. A baby can't go nowhere by himself.

The question was made more specific. "What is a baby able to perceive at birth? Can a baby see? Can a baby hear?" Several people thought a baby can see shadows, but not colors. Some people thought a baby can see clearly up

to 8 inches away from the face. Others thought that they had heard 18 inches was the limit for clear vision. The source of their information was almost 100% hearsay.

The mother's had clearer ideas about a newborn's auditory skills. Several related stories of their baby's movement responses to different sounds while in utero. There were stories of violent kicking at rock concerts; rythmic kicking to classical music and/or drumming during Indian dances; frantic movement in response to new or unnexpected noises such as a loud machine or something being dropped. Almost all of the expectant mothers thought their babies could hear very well in utero. But they did not readily transfer their experience that the baby could respond to sounds inside of their bodies, to the baby's ability to hear after birth. Most mothers and fathers had not thought about how well their babies would be able to hear.

Why might a parent's ideas about whether or not, or how much or how little, their newborn baby could see or hear be important? An expectant father quickly supplied the response I was seeking: "If he can't see me or hear me why should I bother doing very much with him?"

We presented the idea that a parent's expectations about the infant's abilities to perceive and respond most likely influences how they interact with the infant; the

kind of learning environment they provide the infant; and how the infant develops over time.

If we assume that an infant can only see 7 or 8 inches away for a certain period of time, then we will probably only try to interact with the baby at that distance. If we assume that an infant cannot make any meaning from, or respond to what we say then we probably won't put much effort into talking, at any distance. If we interact based on our limited assumptions we won't do very much with our infant for the first several months. That is a sure way to both limit the baby's potential, and miss a lot of special times with the baby.

I said that many studies had been done indicating that newborn infants see and hear much more than was previously thought. Each newborn baby is different. A few weeks less, or more in utero will make a tremendous difference in the degree of sensory development at birth, but newborn infants can see, and they can hear when they are born. And you will learn here how you can immediately use handling practices to help them to see and hear better.

MOVEMENT ABILITIES AT BIRTH

We asked people to describe an infant's movement abilities at birth and they were unable to do so. The woman who had described a baby as helpless said that her image was based on the fact that a baby just can't move without its

mother. We agreed. We suggested that a newborn infant is extremely limited in terms of making any differentiated movement. A newborn baby either flexes everything (pulls all of its parts together), or extends everything (lengthens in all direction).

Visual and auditory skills are more highly developed at birth than movement skills . The problem is that a baby can only look at and listen to stimuli that it is in a position to see and hear. It needs its parents help to move into positions and places where it is possible to pay attention and respond to sensory stimuli in order that it can make sense out of the environment.

There is an interesting paradox: At birth, a baby's visual and auditory systems appear more highly developed than the motor system. Yet a baby, (as well as an adult), can follow and adjust to someones motion with much more clarity, and for much longer periods of time than he or she is able to follow visual patterns or sounds.

ROLE OF TOUCH IN DEVELOPING ALL SENSORY-MOTOR SKILLS

We suggested that touch, coordinated with other specific sensory information would enhance the development of all senses. Touch-guided motion interactions where they simultaneously followed and led their baby's movement efforts into organized, effective motion patterns would help develop their baby's motor skills. Together they

would assist the baby in developing a large perceptual and response vocabulary. The ideas and practical skills would be developed in Class Two.

MUTUAL INTERACTION

We did a structured interaction to demonstrate the above idea and provide the experience of having a mutual interaction.

Partners sat facing each other. They each raised one hand and placed it so that the palm was almost touching the palm of their partner. One person began moving the palm, and the other tried to follow. It was almost impossible to follow accurately at any speed. Next, one partner began making a tone. The second person made the same tone. Then the first person began a tonal pattern and the partner tried to follow by making the same sounds simultaneously. Again, it was impossible to follow. Last of all, the partners put one of their hands together with their partner's hand. The palms were flat together. The fingers were not intertwined. One partner began moving the hand/arm, and the other followed. With tactile contact, the partners were able to follow each other with great accuracy. The more that the timing, effort, and spatial relationships were determined mutually the more elegant and complex their movement. Both partners were learning.

Their movement was new. It was a combination of both motion and perceptual patterns and skills.

We presented the idea that the more parents use their handling and motion to facilitate the baby's ability to look at, listen to, and respond to stimuli, the broader will be the baby's sensory/motor abilities.

ORIENTATION AND MUTUAL INTERACTION

We asked the women to lie on the floor on their backs. Their partners were asked to put their hand on the highest part of the woman's body. Hands were mainly placed on her stomach. The women were asked to change position and lie on their sides. Again, the partner placed a hand on the highest part of her body. Most hands were placed on the shoulder area. Two men placed their hand on their partner's head. The women were asked to sit up and the same instructions were given. Everyone placed his hand on his partner's head.

A discussion about orientation began. We asked what reference people were using when the woman's high point changed with her position? Everyone agreed the room was the reference being used. In a room, the highest point is in the direction of the ceiling. We asked people to consider that if we use our body as a reference, the highest point will be constant. It will be a point on the tip of the head. When you stand up or lie down and push on

it you can feel a response all the way through your body to the lowest point in one of your toes. We suggested that for moving yourself or another person through space, knowing the direction of up (toward the head), down (toward the feet), side (toward the side), forward (toward the front) and backward (toward the back) were important.

MOVING ANOTHER PERSON USING DIRECTIONS IN THE BODY AS REFERENCE

The women lay on their backs. The men were requested to bring them to standing. All of the men tried to lift their partners by grabbing them under the arms and raising their mass toward the ceiling. The women were requested to express how it felt to be handled in such a manner. They reported they felt like a sack of potatoes. We asked the partners to consider the idea that they would mutually come to standing together. To do so, it was necessary for the woman's upper body to move forward, bringing her weight over her feet. Men were instructed to hold their partner's wrists. They lifted forward to free the shoulder girdle, then they simply walked backward. The woman came to sitting. The position of her arms was adjusted so they remained at her waist level and the man continued to walk backward. The woman's legs rolled out. Her knees bent. She slid forward until her weight came over her feet and she stood. Everyone

was amazed and pleased at the ease in their interaction. They said they felt very connected to their partner.

We changed roles and the women brought the men to standing. They made an initial attempt to lift the men using the room as their reference. They laughed at the absurdity of their efforts. They then brought their partners to standing using the body as their orientation reference. Both partners were impressed by the ability of the women to move the men so easily. We asked them to consider from their own experience that their babies would receive different kinds of messages and have different degrees of competence during their interactions, depending on how they were handled.

Demonstration: I lay down. I asked that a couple of the men turn me over. They either rolled me over in one piece as if I were a tree, or, they lifted and threw me over as if I were a sack of potatoes. Everyone laughed.

My assistant instructor turned me over. He worked with the idea that we would turn over together. He initiated the turning motion while holding on to my hip, then my ankle, my ribs, and finally my wrist. The rotational motion necessary to change my position moved through both of our bodies.

The first two men again moved me. They were asked to consider that we were rolling over together. It was the

same idea they had worked with when bringing their partners to standing. The rotational movement necessary to roll me over would need to move through both of our bodies. We made suggestions to assist them recommending that they systematically make adjustments in their effort, space (where they moved), and timing to help my movement be more organized and our interaction more mutual.

We discussed the differences between the three interactions involving myself and the three men. The principal observation was that the first two men were not concerned with how they did it, while the third man and I were having a conversation over the act of rolling. Participants returned to interacting with their partners through the process of rolling over for another few minutes before we sat down to talk.

We presented the idea that a principal way that the parents would be communicating with their child was through their touch. Because of the size differences between themselves and their baby it would be easy to manipulate them like a sack of potatoes. If you handle babies like a sack of potatoes they learn to organize their bodies as if they are a sack of potatoes. It is our understanding that babies begin learning at birth. They are learning during all caretaking interactions. When parents change their diapers, carry them, feed them and play with them they are

together developing patterns of communicating with each other. They are also learning how to organize their bodies to move through space, engage in activities of all kinds, and socially interact with people.

One mother said she had always thought that if you just leave your baby alone he/she would develop well. Another said she had never imagined that the way she touched and moved her baby might help her baby learn. I set up an experience to respond to their statements.

Participants were asked to stand up. When they were standing they were asked to sit back down on the floor. The instruction was repeated several times. They were asked to try and make their movement easier each time. All of them were quickly tired from their efforts. When they tried to make their movement easier, all of them worked harder.

Next we gave them the following verbal instructions for moving from sitting to standing through a spiraling pathway: Sit in the tailor position with the right leg in front. Place the palm of your left hand on the floor at the side against your buttocks. Let your head hang down on your chest. Push on the floor with your hand and notice that your butt comes off the floor and you begin to rotate to the left. If you don't, adjust your left hand position until you find that movement. When your body begins to

turn, push with your hand in a direction that it turns farther. Let your weight come over your right foot as you rotate. (Your head is still hanging on your chest.) As you continue to turn your weight will come also over your left foot. When it is over both feet roll your back downwards until your head is high. Now, the return: Your feet are now about as wide apart as your shoulders. Have the image of a square form in which the length of the sides is the distance that is between your feet. One side of the square is between your feet. The other sides move out in front of you. Notice where the upper right-hand corner of the square would be. (It is out in front of your right foot.) Reach across your body with your left hand and place your palm on that point. Leaving your head down on your chest again swivel to the right and come to the same position you started in. They played with that pattern of standing and sitting for a few minutes without any assistance.

They were all asked to return to sitting in a tailor position with their legs crossed and the right leg in front. My assistant teacher and I brought them all to standing several times. We placed one hand over their left shoulder, and one on their right shoulder blade. We displaced their weight and swiveled them in a circular pattern to the left so that their weight came over the right foot, then the left foot, and they stood up. When

standing they were facing the opposite direction from when they were sitting. Throughout the interaction we combined verbal instructions with tactile instructions to make our communication more effective.

In bringing them to standing we used the idea of coming to standing together. Each person had come to standing in slightly different pathways. Because of differences in their body tensions (relationship of their parts to each other), the effort, timing and spatial displacements necessary to have a mutual interaction over coming to standing, were different. All participants recognized the differences between the effort required to stand up in the partner activity, from when they were given only verbal instruction, and when they were given no step-by-step instructions at all. They all wanted to learn how to stand alone with little effort, and gain pleasure from it.

They were requested to sit and stand in their habitual manner. All of them laughed as they heaved themselves away from the floor and thumped back down. Next they were asked to begin moving in their habitual manner but to see if they could make systematic small adjustments in their timing, effort and pathway through space so that the quality of their motion slowly became more similar to what they experienced when they spiraled to sitting and standing. We wandered

through the room giving combined verbal and tactile assistance.

We sat on the carpet to talk. We discussed the differences between the kinds of learning situations and experiences they had just had. They included: 1) trying to learn alone, with vague instructions; 2) trying to learn with clear, but only verbal instructions; 3) trying to learn with combined and coordinated tactile, auditory, and visual instructions. Participants expressed the opinion that in the first learning situation they had felt helpless. They knew they were supposed to change how they were moving but they had no idea how to do so. The harder they tried to change, the more effort it required to move. In learning situation two, several people said they initially thought they had understood the verbal instructions very well. Then, they noticed that almost everyone had understood the instructions differently. They immediately thought they were wrong in their interpretation of the instructions. Others said that the verbal instructions seemed to make sense, but they couldn't translate them into movement. In the third learning situation they all said that they realized they really had learned. They were surprised at how easy it was to learn when verbal instructions were coupled with touching instructions.

They were all excited about applying the ideas to their interactions with each other, and their coming infant.

CLASS TWO NARRATIVE

The information was presented in an experiential format. Expectant parents went through a series of stepped activities that illustrated an infant's sensory and motor abilities at birth, the elements of development, and demonstrated methods of using touch to expand those abilities.

The class began with a general question regarding development. What do the words, "child development," refer to? Responses came in the form of phrases: "growing up," "learning how to take care of yourself," "learning how to walk, use a toilet, build things, feed yourself."

The responses offered a way of presenting different aspects of development. A child develops social skills, movement skills and perceptual skills. How does a child develop those skills? Most participants thought that they just appear when the child is old enough. We suggested that parents could play a major role in influencing their child's development in all areas. To play such a role they needed to discover what their baby's abilities were at birth. They needed to understand the steps of development. And, they needed to have the experience of

having their own sensory and motor skills improve through effective touching practices.

DEVELOPMENT

Participants were led experientially through the development process. I wanted to demonstrate the ineffectiveness of trying to develop sensory and motor skills alone, with only verbal instructions. Instructions were first given verbally. Understanding and learning were minimal under such conditions.

A newborn baby has the ability to move the eyes from side-to-side. At first, eye motion is not synchronized with motion of the head. The movement is not random in direction, but it is random in terms of distance. The range of controlled side-to-side motion varies continuously. Later, a baby discovers that when the eyes move sideward to the end of their motion possibility they initiate the head to turn in the same direction. Now their range of motion and their visual field is much greater.

Everyone lay on their backs. They let their eyes look side to side, but only so far that they did not engage any head motion. They estimated for themselves how truly side to side their motion was. They increased the range of motion until the motion of the eyes initiated turning of the head. They estimated the 'trueness' of the direction

of motion and noticed whether their skill was greater when turning to the left or right.

Sometime during the first month the baby begins to have control to look up and down. Again, at first the control involves only the eyes. Later when the eyes pass through the full range of up-and-down motion they initiate the head to follow. Participants followed the same procedure as earlier to determine their skill in looking up and down at first with the eyes only, and then with the eyes and head.

The next level of skill involves combining the two directions of motion. The baby is able to move the eyes look to the side. The head is engaged to follow. When it is not possible to look farther sideward the baby looks up. Again, the head is engaged to follow. Now, the baby is looking sidewards and upwards at the same time. A baby does not have the complex skill necessary to change direction in midstream. The result is that when a baby begins looking to the side and then continues to look side and up at the same time his or her body is organized to roll over. The organized motion pattern is initiated by the movement of the eyes.

Participants attempted to find the rotational pattern of motion in their own bodies with only a verbal description. No one succeeded.

Next, partner activities involving touch-guided assistance were set up to explore the same ideas. The participants remained interested and enthusiastic throughout the process. All of them had a good understanding of the concepts of mutual interaction and touch-guided communication when the session was over.

They were requested to consider that the movement activity they were participating in was a medium of communication. What was important was how they treated each other, rather than what they accomplished. The men lay on the floor. The women sat above their heads. They held an 18 inch long string with a small object at the end of it. The men moved their eyes side to side. They discussed the accuracy of the movement. The woman held the string so that the object dangled about 6 inches in front of the man's eyes. She moved it according to her own understanding of side-to-side. His eyes followed it. They discussed the differences in their understanding of side-to-side and made adjustments in the direction of motion accordingly. They noticed the smoothness of his motion noting if the eyes jumped or changed direction.

The woman increased the range of side-to-side movement of the object so that the man followed the path of motion with his eyes and then his head. She kept adjusting her timing so that he could follow. She then began making a

circular pattern with the object. The path of motion went to the side and then circled around above the head. She helped guide the man's motion by keeping her free hand on his chin in order to remind him to keep it tucked in. This helped him to keep his head continuously moving in the same direction. His eyes moved to the side. His head turned, followed by his shoulders, rib cage, pelvis and legs. He rolled over in a sequential and organized manner.

Now the man lay on his stomach. She moved the object up and down. He followed with his eyes and then with his head. We asked him to reach for it with the right hand and his thorax became engaged in the motion. Using his left hand/arm for support he extended upward until his entire chest was away from the floor. The woman kept the object just out of his reach. She now made a circle to the right, around his head toward the back of his body. While reaching for the object he spiraled and came to sitting in the tailor position. She retraced her circle, again toward the back of his body and he came onto his hands and knees. From this position he could travel through space or return to sitting. From sitting he could return to lying, then to his hands and knees or to a standing position.

Each change in position involved making a spiraling pattern. Our body is designed to make circular or spiraling patterns. Such patterns of motion enable us to

roll over, come to sitting, come onto our hands and knees and come to standing with very little effort.

The participants played with those patterns of motion. They sometimes worked as partners, organizing their motion by following and reaching for an object or turning to an auditory stimulus. They sometimes facilitated more accurate following of visual and/ or auditory stimuli with tactile guidance. They sometimes worked alone. When working alone they initiated their motion with movement of the eyes.

FUNCTIONAL ANATOMY

Partners were presented the problem of moving each other through the spiraling and circular patterns of motion we had been exploring. The person being moved would remain passive while the active partner provided the effort and guidance for the motion. They tried to move each other for several minutes without more instruction but had little success.

We presented a minimal description of alternating patterns of stable and unstable levels of motion in the body. We pointed out that the stable areas from top to bottom are the head, chest, pelvis, knees, ankle, middle foot, and toes. From the middle of the body outward through the arms they include the breastbone, elbow, wrist, middle hand, and fingers. We moved each area systematically to experience that each of them is limited in its direction of movement possibilities. When trying to communicate via

motion signals with another person, those are the most effective areas to touch. All of the unstable areas are needed to make the adjustments necessary for the individual to continue to have self-control. From top to bottom they include the neck, lumbar spine, hip joint, lower leg, arch of the foot and the proximal phalanx of the toes. From the middle of the body outward through the arms they include the shoulder girdle, lower arm, ball of the hand, and knuckle. The participants laughed. When they moved with, or guided their partners they almost exclusively held onto unstable areas. The effect was such that the passive partners could not understand or adjust to the tactile messages they were receiving. They experienced minimal control and minimized movement when guided from unstable areas.

We returned to our activity. The partners rolled each other over many times making contact at each stable level of motion. Then they explored moving each other into a sitting position. When they needed two hands they helped each other to discern on which stable areas contact would be most effective. They followed the same format for bringing each other to standing.

We kept repeating that the goal was not to achieve the end position of lying, sitting or standing. Our goal was to help them develop effective touching skills. We hoped they

would talk freely about the quality of touching. We explained that their baby would be able to cry when he or she was not touched/handled with respect. But the baby could not use words to describe the experience so the parents had to adjust their handling practices accordingly. The expectant parents, on the other hand could talk to each other. We therefore requested that they talk about their interactions. We suggested the topics of timing, effort, and use of space as a means of adjusting how they related to each other. They worked for about twenty minutes on this and we gave them individual assistance when it was needed.

A discussion followed. Several of the men said that they had been weary when they arrived at class after a long day of work. They now felt light and playful. Several people expressed the feeling that they were much more at ease with their partners. They were touching and talking with each other very differently. They realized that when they were touched and moved in ways that were effortless and more organized, they were more alert, calm and felt more connected and available to their partner. They were all to apply the ideas to their babies.

TOUCH AS A MEDIUM FOR DEVELOPING VISUAL SKILLS

Partners worked together. Our intent was to demonstrate that touch could be used to facilitate locating and tracking visual stimuli. The man lay on the floor.

The woman held an object and presented a simple visual pattern for him to follow. They discussed their accuracy in following each other via a specific visual pattern. The woman then adjusted her position so that she could place one hand under the man's head. She made the same visual pattern for the man to follow. She facilitated his efforts to follow the visual pattern with the hand she had placed behind his head. They discovered that his ability in following the visual pattern (that she was making) was improved when she facilitated his movement. They did the same exploration with the man in a sitting position. They discovered that they could facilitate the man's ability to follow the visual pattern by supporting his rib cage even better than supporting his head motion. Supporting his rib cage gave him more control over the movement of his neck, head and eyes.

We suggested that they develop the idea at home. Suggestions included presenting side-to-side and up-and-down visual patterns to a person in a sitting, lying, or standing position. The visual pattern could be occurring in the environment, or produced by the active partner. If the active partner produced the stimulus, one hand was to be used to present the pattern and the other was to be used to facilitate the more passive person's ability to follow the visual pattern. It was suggested that visual patterns could

be made with the face, other parts of the body, with an object, or it might be something happening in the environment.

TOUCH AS A MEDIUM FOR DEVELOPING AUDITORY SKILLS

It is very difficult to locate the specific source of sounds when you do not also have a visual reference. This was proven when the woman lay on her back and closed her eyes with the man about 2 feet away from her. He moved around her body and randomly stopped and made a sound. She pointed in the direction she thought the sound came from. She was rarely accurate.

The woman lay in the same position with her eyes closed. The man now remained very close to her body. He kept his face at the level of her knee and made a sound. She attempted to locate the direction of the sound. He then touched and moved her knee while making a sound at the same place. With a kinesthetic reference to locate the sound she located the direction very easily and accurately. When he again made a sound at the same place she was able to locate it without a kinesthetic reference.

He moved to a new location. Her hands were extended out to the side. He made a sound just in front of her fingers. Then he made a sound and pulled on her fingers to help locate the direction and source of the sound by establishing a kinesthetic reference. When he moved farther

back from her hand and made a sound she was still able to exactly locate the source of the sound.

The more passive person assumed new positions. The active person made sounds from the front, side, back, top, or bottom of the body. He touched or moved the body at the level where he was making sounds to help the more passive person locate the source of the sound. Later, when he made sounds at a distance from the body, the kinesthetic memory assisted the more passive follower to accurately locate the direction of the sound. Again, we suggested the ideas be developed at home.

In the final discussion we emphasized the importance of the couples playing with the ideas presented until (and after) the baby was born. If they saw the effectiveness of using touch to develop their own sensory and motor skills and to improve their own relationships they would be more inclined to apply the ideas to interacting with their infant.

Appendix C
Home Teaching Narrative
Phase Two

Home teaching sessions took place when the baby was 5 or 6, and 11 or 12 days old. Both parents were present for the half hour sessions. I will describe a home teaching session from each of the 2 weeks.

Week One: The baby is a healthy 5 day-old girl. We discussed the birth process and conditions and then moved on to discussing the application of the training when interacting with the newborn. I will describe the conversation. The mother is identified by the letter M. The father by F. The baby by B. The trainer by T.

> M: I have been having a good time thinking that I am having a conversation with my baby through my touch. The one time we have difficulty is changing clothes. She cries no matter what we do.

She demonstrated. She pulled on each of the baby's arms to move her into a position to remove her sleeves. The baby cried. She then held onto both ankles and lifted the legs, pelvis, and part of the chest cavity to remove the jumpsuit. The image was one of a hanging chicken. Again, the baby cried. I asked her to stop.

T: What is your baby doing?

M: I think she is fighting to get away.

T: I don't know if she is trying to get away, but do you see that the way you are holding her legs does not give her much self control. You are moving all of her parts together. Lie down on your back for a moment and I will move you as you are moving her. You are laughing but do you see how helpless you are when I hold on to your ankles and hang you like a chicken? Now, look at the movement your daughter is doing. What is she doing with her legs when you are not holding them together at the ankles? Do you see she is trying to extend them? Help her extend each one individually.

The mother extended one of her baby's legs slowly. When the extension was complete the baby flexed it and stopped crying. The mother helped her roll first to one side and then to the other in order to take off her clothes. The baby was attentive. She did not cry again. The mother kept her movements slow and waited for the baby's responses as she put more clothes back on the infant.

M: I think what I have been doing is just getting it done as quickly as possible because I assume she will cry. It really shows me what I am doing when you move me

like I move her. My partner and I can move each other when she cries when we are doing something with her.

T: You can also ask yourself if you are doing it to your baby or with your baby. When you think you are doing it to her then make some changes. Try changing your contact. Change how, where, or in what direction you exert your effort. Change your position in relationship to your child's position. There is usually not one correct solution. But do you see that when you make a change, then your interaction changes? You will find that there are many ways of solving a problem, or making your interaction more effective.

M: We have been doing that. Our baby hardly ever cries except when we change her clothes. And she seems real smart. She likes bright colors. One of us moves things around the room and the other one moves her so she can follow it. She also likes to follow our faces and hands when we use those patterns you showed us in class. We also make sounds on different parts of her body. She always pays attention.

T: That's wonderful. The suggestions we made in class were just to get you started thinking. You will think of many other ways to use how you touch and move her to

help her learn. Let's see how you move together from one place to another.

The baby was lying on the mother's lap. The mother was sitting on the floor. She crossed the baby's left leg across her body and rotated it at the same time. She used her other hand to support the upper body, and the baby slowly rolled onto her stomach on the floor.

T: What is your baby trying to do now? Or, how could you organize the efforts she is making?

M: She seems to be trying to crawl or roll over.

T: What could you do to help her to do either or both of those activities?

The baby flexed the left leg. The mother pushed on it, increasing the flexion. She extended the left hand and arm at the same time and the baby rolled over. The mother took her hands away and the baby began to cry. The mother laughed and said that the baby just never wanted to stop. She helped the baby rotate to sitting. And then return to her stomach.

T: Where does she need support and assistance to crawl?

M: Under her chest, I think.

She placed her hand under her chest but the baby stayed in one place. She began trying to push with her feet.

T: Visualize crawling. To crawl, one side needs to move forward and then the other. You need to make a pivoting motion with your hand under her chest to assist her in making that motion. Then she needs to use her legs differentially.

The mother very quickly made systematic adjustments necessary to support the crawl reflex. She realized the baby needed to be farther off of the floor so that the legs could function. She raised the baby with her hand under the chest. She used a pivoting motion and noticed that the baby began to extend her arms forward one at a time and flex both legs together. She used her free hand to help the baby flex one leg at a time by pushing alternately on the sole of each foot. The mother and baby began to creep forward. The mother was very excited by the interaction.

T: You are doing great. Just now you made systematic changes in your contact, effort, and position which ended up in both of you crawling together! An important idea to remember is that you do not need to ever do something <u>for</u> your baby. You just need to make up the

difference between what the baby can do and what it is that both of you are trying to accomplish together.

We arranged to meet when the baby was 11 days old.

Home Teaching: Week Two

The baby weighed 11 pounds at birth. He weighed 13 pounds at 12 days of age when we visited. Both parents were present for the home teaching session. The first week they exhibited good understanding of using touch to develop visual and auditory skill. The mother had a good grasp of the idea of mutual interaction. The father still needed assistance in that area. Both of them were working effectively with orientation in space using the body as a reference and the idea of sequential motion. They needed some assistance with the idea of indirect support.

F: I'm upset that the baby cannot hold his head up.

T: Move with him into a few positions where his head would be <u>sitting</u>.

The father tried to apply techniques from the class. The baby lay on his back. The father pulled the baby's arms forward and his head fell backward. When the baby came to sitting his head fell forward.

T: We presented techniques in class as a medium for communicating an idea about mutual interaction. Behind the techniques are questions. How can you assist your infant in actively participating in the activity? How can you adjust a technique to fit a particular baby and situation? Let us try. We will stay with your interest in helping the baby to control his head. What are you trying to do now?

F: Sit him up and get him to hold his head.

T: He is sitting. At least, his trunk is sitting. Where does he need support so that his head is also sitting?

F: I don't know.

T: Is your arm and hand contact helping?

F: No.

T: Then change how you are supporting him.

The father put his hand around the baby's chest like a cage and the baby slumped farther forward.

T: Look at the difference in the size of your hand and the baby's body. When you exert equal pressure in all parts of your hand all you can do is push or pull. If

you use your fingers like you are playing a piano keyboard then you can support your baby with little bits of pressure in specific directions in the rib cage. Play with that idea.

The father was tense. He fumbled with his hands and looked helpless.

F: I don't have any idea how his head would sit.

I looked at the father's pattern of sitting. His head was extended forward regardless of his position.

T: We perceive someone from our own self image. Close your eyes and pay attention to your own head. Adjust it until you have a clear sense of it sitting. Now, from my perspective your head is still very much forward. You hold your head as you are supporting your son to hold his head. Let me give you some support so that your perception and experience of sitting might begin to change.

I sat on my heels. The father sat on my thighs. I placed my hands lightly on his rib cage. I moved my legs side to side, forward and backward so that he felt his sitting bones. I used my fingers differentially to adjust his upper body so that his weight was on his sitting bones.

His spine lengthened and he sat up very tall with his head resting lightly on the top of his spine.

> T: I am supporting your head through your whole skeleton. Your sitting bones act as feet or legs for the upper body. By pushing up on them I am supporting your whole upper body through your bone structure. I will try to support you in some other ways.

I put my arms around his chest, holding him in a cage-like grip. This is the way most infants are held. I asked him to try to move. He tried to turn his head and to sit up but was unable to do so.

I let go of my tight hold. but kept my hands on his ribcage. I tried to move his upper body by pushing and pulling with my hand as a solid unit. It was a way he had tried to support his son. He wavered back and forth.

I returned to supporting him via the sitting bones while using my fingers to make directional adjustments of his upper body. He shook his head indicating that he recognized the difference. He then held his son, giving him support under his sitting bones in several ways: while being carried; while standing; while sitting. The father's perception of sitting had begun to change and he was able to give the infant more help.

T: There is a belief that a baby is fragile and must be protected. Of course, in many aspects that is true. But we often overdo it. If you try to protect your baby by holding all of his parts together you end up unintentionally making him more helpless. When you handle him lightly and adjust to his motion in ways that help his parts to differentiate, you help him learn to protect himself by helping him learn how to make continuous, and if necessary, fast adjustments.

M: I think we almost have done the opposite. He is so big that we forget how little he can do. Maybe we expect to much.

T: I hope you are not expecting him to do things by himself. He is an extension of you. In order to remember this you might ask yourself the question, "What can we, or are we doing together?"

The baby was fussing on the floor. The mother helped him to sit, and then to stand. During the process of moving from one position to the next she facilitated his actions very well. Once they were standing she put her hands under his arms and lifted his weight off of his feet. He cried.

T: Let the baby use his feet.

She let his weight down and he immediately stopped crying. She did very well in adjusting his weight so that he could stand.

T: The function of bones is to carry weight. The function of muscles is to move bones. If you allow him to keep moving so his weight is supported by his bones he can then support himself. And he will stand only as long as he wants to or is able to. If you hold him in place, then he does not have a choice. You can force his bones to hold weight that they are not yet able to hold, and that can cause some damage. Hold him lightly and follow his motion, rather than trying to manipulate it. My goal in offering you this information is not to try to help your baby to stand or walk earlier. It may even take him longer because he is not specializing and developing just a few movement patterns. You are helping him develop a very broad base of sensory/motor skills that will allow him to have a very wide range of response patterns over time.

We made arrangements to return when the baby was a month old to do the videotaping.

Appendix D

Parent Expectation Survey

(Nursing Child Assessment Project: Univ. of Washington)

These questions refer to the development of infants. Please check the time that you think an average infant would be able to do or participate in what is being asked. If you do not think that the age selections are appropriate for a question, please write your response in the space marked "other" and label it in weeks, months, or years.

1) At what age do you think your baby will start to be aware of his/her surroundings or know what is going on around him/her?
At birth ( )
1( ) 2( ) 3( ) weeks
1( ) 2( ) 3( ) 4( ) 5( ) 6( ) 7( ) 8( ) 9( ) 10( ) 11( )months
At one year ( )
Other_____

2) At what age do you think you will start teaching things to your baby?
At birth ( )
1( ) 2( ) 3( ) weeks
1( ) 2( ) 3( ) 4( ) 5( ) 6( ) 7( ) 8( ) 9( ) 10( ) 11( )months
At one year ( )
Other_____

3) At what age do you think your baby will first be able to see objects and people clearly?
At birth ( )
1( ) 2( ) 3( ) weeks
1( ) 2( ) 3( ) 4( ) 5( ) 6( ) 7( ) 8( ) 9( ) 10( ) 11( )months

4) At what age do you think your baby will be able to hear sounds and voices clearly?
At birth ( )
1( ) 2( ) 3( ) weeks
1( ) 2( ) 3( ) 4( ) 5( ) 6( ) 7( ) 8( ) 9( ) 10( ) 11( )months
At one years ( )
Other_____

5) At what age do you think talking to your baby will be especially important?
At birth ( )
1( ) 2( ) 3( ) weeks
1( ) 2( ) 3( ) 4( ) 5( ) 6( ) 7( ) 8( ) 9( ) 10( ) 11( ) months
At one year ( )
Other_____

Appendix 5

Mutual Interaction Scale (MIS)
(Developed by Maietta, 1985)

The MIS is a movement observation schedule influenced by the movement notation systems of Laban (1950) and Eshkol (1976). The three primary elements of those systems, time, effort and space, are used to assess mutuality of parent-infant teams while performing three common activities: (1) changing clothes, (2) changing positions (3) lifting the baby to a carrying position.

The primary caretaker is videotaped while performing these three activities with their infant or child on a sturdy 3X2.5 foot table, 46 inches high, with a sheepskin covering. Indirect television lights are used to control picture quality. A mirror is held by an assistant so that the video image of baby and parent are seen from two sides simultaneously. Approximately 40 minutes is needed to set up, tape the activities and wrap up. The data collection team consists of the researcher, camera person and assistant. The researcher leads the parent-infant team through the activities.

Rating

The three elements of effort, time and space are observable compontents of motion in an interaction. Each element is further broken down into four aspects of effort, time and space.

EFFORT	TIMING	SPATIAL CHANGES
Direction	Stepped Intervals	Distance
Quantity	Contact	Positioning
Quality	Synchrony	Contact
Contact Location	Motion Continuity	Magnitude

The purpose of including three activities in the scale is so that the predominant pattern of interacting can be seen from a continuously changing perspective. It is assumed that patterns of interacting are persistent across activities. In each activity raters are able to observe some aspects of the pattern of interaction more clearly, and rate them more accurately, than in other activities. The large number of opportunities to rate each motion element of the parent-infant interaction helps to insure that a rater's final score is representative of the degree of parent-infant mutual interaction skill.

Step 1: Three raters work independently. They view all subjects performing one activity without scoring.

Step 2: Raters look at subject #1 performing activity # one. They assign scores for each of the four aspects of the three elements of effort, time and space.

They rate each item on a scale of (+1) to (+5). They check boxes representing answers of Definitely yes (+1), Probably yes (+2), Cannot say (+3), Probably no (+4), Definitely no (+5), to indicate whether the target behavior is present or absent in the interaction being observed. The highest possible score of (+1) would indicate that the unit of a component being observed, e.g., the direction of effort, definitely facilitates mutual participation in accomplishing the particular activity. The lowest possible score of (+5) on the same observation would indicate that the direction of effort definitely does not facilitate mutual participation in accomplishing the particular activity.

An example is given here for rating the component, "Effort" in a parent-infant clothes-changing interaction. In arriving at an "Effort" score, raters rate, on a scale of (+1) to (+5) whether 1)the direction of effort; 2)amount of effort 3)the quality of effort (bound or free); and 4) the location where effort was applied, each facilitated the target behavior of mutual participation between parent and infant in accomplishing the clothes-changing process. The sub-scores for each of the four aspects is totaled to give the score for effort in that activity. The scores could range

from (+4) to (+20). All three activities are graded in this way using the element of Effort. The score for effort in the three activities is added for a possilbe range of (+12) to (+60).

The same process is used to determine the combined activity scores for Timing and Space. When the assessment is complete a subject pair has a total score on each of the scales: EFFORT, TIMING, SPACE. Scores for the individual scales indicate whether the combined Effort, Timing and Spatial qualities of the parent-infant team supported mutual participation in the task being observed.

OBSERVATIONAL SCHEDULE: CRITERIA REFERENCE LIST

EFFORT

1) Direction:

Trace the line of effort. Are the directional changes appropriate to organize the infant's motion to effectively participate in the interaction?

Example: When changing diapers does the parent exert unidirectional effort on the infant that pulls and straightens the infant's legs into a position for changing diapers? Or, does the direction of muscular effort continuously change as parent and infant, in small steps, discover the pattern of rotational and extension motions necessary to mutually move the legs into an appropriate position for changing a diaper?

2) Quantity:

Is the amount of effort expended to accomplish the activity mutually shared by parent and infant? Does the parent exert more effort than the infant? Does the infant exert more effort than the parent? Is the effort of parent and infant in different directions resulting in resistance to accomplishing the task at hand?

Is the effort of parent and infant complementary resulting in the task being accomplished through an equal

amount of expended effort on the parts of both parent and infant?

Example: When bringing the infant to standing, does the parent lift the infant, meaning does the parent exert most of the effort to accomplish the task at hand? Or, when bringing the infant to standing is the amount of effort expended by parent and infant more equal? Does the parent pull a little on the infant -- and does the infant pull back with about the same amount of effort? Does the parent exert the same amount of effort again, and so on, until the infant arrives at a position of standing?

3) Quality:

Is the effort exchange appropriately bound (done with internal resistance), or free (ballistic) for efficiently and mutually carrying out the specific interaction or task at hand?

Bound Flow: As the motion travels along its path is it obviously resisted in some way by the person making the motion, another person, an environmental situation, or an object in the environment?

Free Flow: As the motion travels along its path does it obviously do so without any resistance? Free flow motion is often faster than bound motion, and the motion sequence comes to an obviously complete end (follow through).

Whether bound or free motion is appropriate depends on the context of the particular activity taking place, and the particular phase of the interaction. When changing the infant's clothes in a way that the infant can mutually participate, a parent, at different times, would try to engage in both bound and free motion patterns with the infant. When rolling the infant over or bringing the infant to standing the parent would try to engage in bound flow motion exchanges with the infant. In carrying the infant the parent must use bound motion to hold the infant up, but if the motion is too bound, the infant cannot make any adjustments during the activity. A play activity may appropriately involve patterns of bound or free motion depending on the context of the play interaction.

4) Contact Location:

Are the places of contact where the parent applies effort, appropriate for assisting the infant in contributing during the activity or interaction?

Does the parent exert effort at contact points that inhibit or organize the infant's effort?

Look at the parent's points of contact. In bringing the infant to standing, or rolling the infant over does the effort exerted through those points of contact serve to facilitate the infant's motor efforts?

TIMING

1) Intervals:

In determining whether the lapsed time between actions are appropriate to support mutuality, one must be careful not to confuse the concept of mutuality with the concept of contingency. In a mutual interaction, the behavior of both participants is combined in the same time frame. The intervals, or pauses during the interaction mark rest periods in the exchange. Intervals of this nature are different than the stepped alternations in response that characterize contingency.

A determination of contingency begins with the baby's signals regarding stress, alertness, etc. The question is raised whether or not the parent's behavior was appropriate to, or took into account, the infant's behavioral cues. There is already a predetermination of what the infant's behavioral cues mean.

Questions of mutuality include: Are there rest periods during the interaction? When rest periods come to an end, do both parent and infant begin together? Or, do you see that the parent imposes a long effort or action onto the infant which serves to stop the infant's responses. Such may be the case when the parent rolls the infant over. The parent may roll the infant over as a block by holding onto

the pelvis with one hand, while using the other to stop the infant's efforts to differentiate motion.

Another possible pattern of response can go something like this: parent-parent-parent-parent-infant. Such a sequence may occur when the parent is changing the infant's clothes. The parent may carry out a series of actions upon the child-- without the infant's permission or cooperation-- that result in the infant's clothes being changed. When such is the case, no mutality exists in the interaction.

2) Contact

During any interaction, does the parent make contact at the appropriate time, and maintain that contact for the appropriate length of time to facilitate the infant's ability to contribute during the interaction?

3) Synchrony

When you look at the parent and infant during a specific interaction, does it appear that all parts of both persons are involved in following the process? Does the parent adjust the motion of the head, limbs, torso to make it more possible for the infant to actively participate in the interaction? For example, when changing the infant's clothes does the parent bring the infant to the clothes and push or pull the child inside? Or, does the parent bring the clothes to the infant? Are the body parts of the

parent used to support the infant's motion so that the infant's body parts can move into a place where they can be used to put clothes on? Does the parent wait until the infant's body parts are in an appropriate place, and then adjust the openings of the clothes and speed of putting them on so that the infant can actively participate in the process?

4) Continuity of Motion:

Beginning at the place(s) of contact, does a motion pattern move sequentially through the bodies of both the parent and infant during an interaction? Or are motions erratic and discontinuous? Does the parent or infant make extraneous motions that have nothing to do with what they are supposedly trying to accomplish?

SPATIAL ASPECTS

1) Distance

When interacting, the parent and infant are considered as one functioning system. Their linkage is through their points of contact.

In an interaction are the bodies of the parent and infant an appropriate distance apart to allow the infant to make a fully extended motion in any direction and the parent to follow and adjust to that motion? If the distance between parent and infant is too great or too small the excursion of

motion possible between them, and for both of them individually is limited. When they are too close their proximity limits the directions it is possible to move in, and demands that their limbs remain comparatively flexed. When they are too far away from one another they must extend their limbs in order to remain in contact. The amount and direction of motion they can follow and adjust too is very limited.

2) Position/Positioning

Look at the positions of the parent and infant relative to each other.

Is the body of the parent placed in a position from which it is possible to follow and adjust to the infant's motion? If the parent is rolling the infant over or bringing the infant to standing is the parent's body placed where the infant's body needs to go, or is the parent's body in a position from where it is possible to follow the infant's pathway of motion.

Does the parent place the infant in a position that allows the infant to move and adjust to the parent's motion? During feeding, is the infant's body positioned on top of the parent's so that the infant's action can be directed towards making small adjustments that make eating easier.

When the parent carries the infant, is the infant able to move arms and legs to adjust to the parent's motion. Can the infant's head be held in a balanced position?

3) Contact

During an activity, does the parent have one place of contact, or many. If the contact remains the same thoughout the activity, or if the contact is varied frequently, was it appropriate? Did the change, or lack of change facilitate the mutual completion of the parent-infant interaction?

4)Magnitude

Compare the possible range and complexity of motion in one action of a parent to that of an infant. Considering the difference in size and motor control, are the parent's actions small and simple enough for the infant to be able to follow and respond to them?

GRADING FORMAT for activity_____Grader #_____

Indicate to what degree the item being observed facilitates the infant's participation/competence during an activity by checking the appropriate ( ): definitely( ) probably( ) can't say( ) probably not( ) or definitely not

EFFORT:
The direction that the parent applies muscular effort facilitates the infant's participation/competence during the activity being observed:
definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not( )

The amount of effort that the parent uses during the activity supports the infant's participation/competence during the activity: definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not ( )

The effort exchange between parent and infant is appropriately bound (done with internal resistance), or free (ballistic) for efficiently and mutually carrying out the specific activity:
definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not ( )

The places of contact where the parent applies effort are appropriate for assisting the infant's participation and competence during the particular activity:
definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not( )

TIMING
There is stepped alternation in the response pattern between parent and infant during the activity:
definitely ( ) probably ( ) can't say( ) probably not( ) definitely not( )

The duration of contact(s) is appropriate for facilitating the infant's participation/competence during an activity:
definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not( )

The rate of motion of the parent's head-limbs-torso is/are appropriately synchronized with those of the infant so as to facilitate the infant's participation/competence during the activity:
definitely ( ) probably ( ) can't say ( ) probably not ( ) definitely not ( )

There is a continuity of smooth-graded motion that moves sequentially through the bodies of both parent and infant during the activity.
definitely ( ) probably( ) cant' say ( ) probably not( ) definitely not( )

SPATIAL CHANGES
The parent maintains a distance from the child that allows maximum range of possible motion excursions between them, thereby supporting the infant's participation/competence during the activity: definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not( )

The parent varies the places of contact appropriately to facilitate the infant's participation/competence during the activity. definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not( )

The parent's body is placed in positions relative to the infant from which it is possible to follow and adjust to the infant's motion during an activity, thereby supporting the infant's participation /competence during the activity.
definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not ( )

The parent's actions are small and simple enough for the infant to be able to follow and adjust to, thereby supporting his/her participation/competence during the activity:
definitely ( ) probably ( ) can't say ( ) probably not( ) definitely not( )

Appendix F
Questionnaires

QUESTIONNAIRE FOR EXPECTANT COUPLES

Name_____
Age_____
Your partner's name_____
Relationship status: partners ( ) married( )
Length of relationship/marriage_____
Ethnic background: _____
Years of school_____
Occupation_____
Due Date:_____

We are interested in knowing some of your thoughts about pregnancy, labor, and being a new parent. Please check the blank that best describes your response to each statement. If you have "no opinion" for a question please check 0( ).

1. Most women go through labor without difficulty.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

2.I would like to have an older motherly woman help take care of my baby. strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

3. I have a clear picture now of what it will be like to have a baby.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

4. I have been easily depressed during the pregnancy.
often ( ) sometimes( ) 0( ) rarely ( ) never( )

5. I feel very well prepared for the delivery process.
strongly agree ( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

6. I have been scared and worried about being a parent.
often ( ) sometimes( ) 0( ) rarely ( ) never( )

7. When I first found out about the pregnancy, I was:
happy( ) just accepted it( ) 0( ) somewhat unhappy( ) extremely unhappy( )

8.Nowoman should be expected to care for an infant all by herself.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

9. I have felt that the pregnancy has been long and tiresome.
often ( ) sometimes ( ) 0( ) rarely ( ) never ( )

10. When do you think your baby will develop a strong feeling for you?
Birth to 2 weeks ( ).
Within the first month ( ).
Between 1 and 3 months ( ).
No opinion( )
Between 3 and 6 months( ).
After the first 6 months ( ).
He/she already has ( ).

11. I worry about the possibility of a great deal of pain during the birth.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( )
strongly disagree( )

12. I would like to have:
a boy( ) a girl( ) it makes no difference( )

13. Thebaby will have a positive effect on my relationship with my partner.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( )
strongly disagree( )

14. Right now, I feel very happy about this pregnancy.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( )
strongly disagree( )

15. I would consider my motherly/fatherly feelings as:
strong( ) fairly strong( ) 0( ) weak( ) very weak( )

16. I have been tense and edgy during the pregnancy:
often( ) sometimes( ) 0( ) rarely( ) never( )

17. Having a baby will interfere with my social life.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( )
strongly disagree( )

18. I think it is important to be with my baby right after birth.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( )
strongly disagree( )

19. Any expectant mother is concerned whether her baby will be normal.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( )
strongly disagree( )

20. I've been more short-tempered during the pregnancy.
often ( ) sometimes( ) 0( ) rarely ( ) never ( )

21. Beforeknowing about the pregnancy,we were hoping to have a baby.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

22. Ifeel confident that when my baby cries,forreasons otherthanhunger or a wet diaper,that I will be ableto calm him/her down.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( ).

23. I think babies are frustrated:
very often( ) sometimes( ) 0( ) rarely ( ) never( )

24. When I was a child:
Iwantedtoplay with babies and youngchildrenwhenever possible( ).
I liked playing with babies and young children sometimes( ).
I have no opinion( )
Iwasindifferentaboutplayingwithbabiesandyoung children( ).
I thought babies and young children were a nuisance( ).

25. During the pregnancy period, I have felt more energetic than usual.
often( ) sometimes( ) 0( ) rarely ( ) never ( )

26. I think it important to have a support person other than the medical staff present during labor and delivery
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

27. I think the baby should always be with the mother in the hospital.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

28. I've felt very calm and peaceful during the pregnancy.
often( ) sometimes ( ) 0( ) rarely ( ) never ( )

29. I worry about my baby being weak or sickly.
often ( ) sometimes ( ) 0( ) rarely ( ) never( )

30. I think that babies cry:
often( ) sometimes( ) 0( ) rarely ( ) never( )

31. I think my baby will be able to let me know his/her wants and needs.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

32. Most women need more time than they are given to rest up after having a baby.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

33. I am content with what a warm and affectionate person I am.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

35. If it is possible to choose during delivery, I would prefer to be:
"out"( ) awake, but have drugs for the pain ( ) awake, without drugs ( ) 0 ( )

36. A parenting class before the baby was born would be very useful.
strongly agree( ) mildly agree( ) 0( ) mildly disagree( ) strongly disagree( )

37. When do you think you will develop a strong feeling toward your baby?
Right at the birth( ).
Within the first month( ).
Between 1 and 3 months( ).
No opinion( ).
Between 3 and 6 months( ).
After six months( ).
I already have( ).

ONE-MONTH POSTNATAL RESEARCH INVENTORY

Participant's Name_____
Length of gestation:_____weeks
Length of labor_____
Was your support person present? yes( ) no( )
Did you have medication? yes( ) no( )
If you did, what was it?_____
Were there any birth complications? yes( ) no( )
If there were, what were they?_____
What was the length of your hospital stay?_____
Your baby is a boy( ) or a girl( )
Baby's name_____

Please check ( ) the response which most closely describes your feelings about each statement.

1. I worry about whether my baby is getting the right amount of food
often ( ) sometimes( ) rarely ( ) never ( )

2. I miss my freedom since my baby was born
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

3. When my baby cries a lot, I worry about what I'm doing wrong
often ( ) sometimes( ) rarely( ) never( )

4. I think my baby should be handled only as much as is necessary to care for him/her
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

5. I'm afraid I'll lose my temper with my baby
often ( ) sometimes ( ) rarely ( ) never ( )

6. If a parenting class were offered now I would take it
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

7. The delivery was:
hard( ) somewhat difficult( ) average ( ) easy ( )

8. How long did you stay with your baby right after birth?
I didn't ( )
10-15 minutes( )
15-30 minutes( )
15-45 minutes( )
30-60 minutes( )
if more time please write in_____

9.I have wished someone would tell me if I am doing a good job caring for my baby
often ( ) sometimes ( ) rarely ( ) never ( )

10. I have been unhappy and in low spirits since my baby was born
often ( ) sometimes ( ) rarely ( ) never ( )

11 After having our baby in our family for a month, I feel confident in caring for him/her
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

12. If I could only be more sure of myself in caring for my baby I think he/ she would be more relaxed
strongly agree( ) mildly agree ( ) no opinion ( )
mildly disagree( ) strongly disagree( )

13. There's no use in talking to my baby until he/she gets a little older
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

14. Taking care of my baby leaves me on edge and tense
often ( ) sometimes( ) rarely ( ) never ( )

15. My baby is frustrated:
often( ) sometimes( ) rarely( ) never( )

16. How is your baby fed? Answer both a and b:
a) regular schedule ( ) demand( ) combination( )
b) breast feeding( ) bottle feeding( ) combination( )

17. When my baby is crying or fussing for no apparent reason I find it difficult to quiet him/her down
often ( ) sometimes( ) rarely ( ) never ( )

18. I have felt happy doing mothering/fathering activities:
often( ) sometimes( ) rarely( ) never( )

19. I feel able to tell what my baby wants and needs
often ( ) sometimes( ) rarely ( ) never( )

20. I worry that something might happen to my baby when I bathe him/her
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

21. We manage to go out since having the baby
often( ) sometimes( ) rarely( ) never( )

22 I communicate best with my baby through:
my voice( ) my eyes( ) my words( ) my touch ( )

23 The best way to bring up my baby is to put him/her on regular feeding and sleeping schedules from the beginning
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

24. My baby cries:
often ( ) sometimes( ) rarely ( ) never ( )

25. I wish my partner would participate more with our baby
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

26. Constantly feeding, changing diapers/clothes, and bathing a baby gets on my nerves after a while
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

27. My baby has had a good effect on my relationship to my partner
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

28. I have been discouraged about not being able to care very well for my baby
often( ) sometimes( ) rarely( ) never( )

29. I am concerned whether my baby is growing as he/she should
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

30. My baby is not social enough to be fun
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

31. I am content with how warm and affectionate I am with my baby
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

32. Ihave felt that it would help if an experienced woman would tell me if my baby was all right
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

33. I had the "baby blues," (was depressed and discouraged) for more than a week( ) for several days( ) for 1 or 2 days( ) not at all( )

34.Taking care of my baby keeps me from doing other things I would like to do
often( ) sometimes( ) rarely( ) never( )

35.If I knew more about handling my baby, I wouldn't have as many problems with him/her
strongly agree( ) mildly agree( ) no opinion( )
mildly disagree( ) strongly disagree( )

36. I've been calm and peaceful since my baby was born
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

37. I feel that I or my partner should always be close enough to the baby to hear any crying
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

38. If I picked my baby up at every cry, he/she would get spoiled
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

39. Some parents and babies feel close to each other right away, and some take a while to feel close. How close do your feel to your baby now?
very close( )
somewhat close( )
close ( )
not very close ( )
not close at all ( )

40. How close would you say your baby feels toward you now?
very close( )
somewhat close( )
close ( )
not very close ( )
not close at all ( )

41. When did you begin to feel that the baby was really yours?
before birth( )
right when he/she was born ( )
within the first few hours( )
within the first few days( )
within the first few weeks( )
I still don't feel that way ( )

42 I was well prepared for the birth process
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

43. It would have been easier for me to take care of my baby if I could have stayed longer in the hospital
strongly agree( ) mildly agree( ) no opinion ( )
mildly disagree( ) strongly disagree( )

Question 43 is for mothers only.

TWO MONTH QUESTIONAIRE FOR NEW PARENTS

NAME:_____
DATE:_____
Has your baby been healthy? Yes( ) No ( )
If no, what is wrong_____

Please check( ) the response which most closely describes your thoughts about each statement.

1. I worry about whether my baby is getting the right amount of food:
often ( ) sometimes( ) rarely ( ) never ( )

2. When my baby cries a lot, I worry about what I'm doing wrong:
often ( ) sometimes( ) rarely( ) never( )

3. I feel confident in caring for my baby:
strongly agree( ) mildly agree( ) no opinion ( ) mildly disagree( ) strongly disagree( )

4. If I could be more sure of myself in caring for my baby I think he/she would be more relaxed
strongly agree( ) mildly agree( ) no opinion( ) mildly disagree( ) strongly disagree( )

5. When my baby is crying or fussing for no apparent reason I find it difficult to quiet him/her down:
often( ) sometimes( ) rarely( ) never( )

6. I feel able to tell what my baby wants and needs:
often( ) sometimes( ) rarely( ) never( )

7. I worry that something might happen to my baby when I bathe him/her:
strongly agree( ) mildly agree( ) no opinion( ) mildly disagree( )
strongly disagree( )

8. I have been discouraged about not being able to care very well for my baby:
often( ) sometimes( ) rarely( ) never( )

9. I am content with how warm and affectionate I am with my baby:
strongly agree( ) mildly agree( ) no opinion( ) mildly disagree( ) strongly disagree( )

10.I am scared and worried about being a parent:
often( ) sometimes( ) rarely( ) never( )

11.As a parent I would say that I am:
very good( )
good( )
fair( )
poor( )
very poor( )

Appendix G
Infant Behavior Observation Schedule
(Ginny Munzik-Bruno, Pediatric Unit, UNM Medical Center, Albuquerque, New Mexico, 1986)

This measure was designed to assess infant development in the context of parent-infant interaction. The assessment was made while watching infants being handled by their mothers.

INFANT RESPONSE ASSESSMENT SCORING CRITERIA

State Maintenance and Approach Behaviors

1	2	3	4	5
Maintains alert calm state consistently; when loosing control, regains quickly, easily		Some variability in state maintenance; some successful attempts at regaining control		Little to no attempt at self-quiet poor success at regaining lost control

AVOIDANCE BEHAVIOR

1	2	3	4	5
Few signs of stress; able to handle all maneuvers easily		Some signs of stress with no more than one prolonged period of unmodulated stress		Multiple periods of unmodulated stress

MOVEMENT QUALITY

1	2	3	4	5
Smooth excursions some control against gravity in upper extremities. Several hand-to-mouth or clasping with no startles		Some hand-to-mouth or clasping some waving but basically smooth movements		More than 2 startles plus tremors and jerky movements

SCORING SHEET SUBJECT#

Time
Situation
State

APPROACH
Quiet
Smile
Turn Twd.
Follows
Mouthing
Hand to Mouth
  Insert
  Clasp
  Open
  Hold
Foot Clasp
  Brace

AVOID
Turn Away
Frown
Fuss
Cry
Yawn
Tongue P.
Limb Ext.
Trunk Arch
Swipes

Movement Quality
Startles
Tremor
Waving
Smooth
Jerky

COURSE:

Appendix H
Consent Forms

Lenny Maietta
Rt.9 Box 86 HM
Santa Fe, NM 87501
983-8061

Doctoral Student
The Fielding Institute
2112 Santa Barbara St.
Santa Barbara, Calif.

CONSENT FORM FOR EXPECTANT MOTHERS PARTICIPATING IN THE STUDY ON PARENT-INFANT INTERACTION

1. I understand that this study is of a research nature. It may offer no direct benefit to me.

2. Participation in this study is voluntary. I may refuse to enter it or may withdraw from it at any time without creating any harmful consequences for myself. I understand also that the investigator may drop me at any time from the study.

3. The purpose of this study is: to gather information about the experience of pregnancy, parenting, and parent-infant interaction.

4. As a participant in this study I will be asked to take part in the following procedures:
a) Fill out two questionnaires about the experience of pregnancy, and my thoughts about parents and infants. The questionnaires will take about 15 minutes to complete.

b) When my infant is one month old I will be visited in my home. I will be given two questionnaires to complete about the birth experience, my experience as a new parent and my thoughts about infants. The questionnaires will take about 5 minutes to complete. Then a short videotape recording will be made of me and my infant interacting during four activities that the two of us do very often. The video-taping will take about 15 minutes to complete. It will take about 15 minutes to set up the video equipment so the entire visit will be about 35-45 minutes long.

c) When my infant is two months old, I will be given a short questionnaire about parents and infants to fill out. The questionnaire will take about two minutes to complete.

d) I will be asked information regarding my infant's health status at birth, and after the 6-week checkup. This information will be taken from his/her medical chart.

My total participation in the study will take about 1 1/2 hours of time.

5) I understand there are no anticipated risks or discomforts in my participation. All answers to questionnaires and the video recordings will be kept confidential. My responses on the questionnaires and my part in the video recordings will be listed under a number, not my name. The video recording will be seen only by the investigators and three persons trained to look at parent-infant interaction. They will not be seen by any other persons. Any findings of this research will be written in such a way that I or my responses cannot be identified.

6) The possible benefits of the procedures might be:
a) the direct benefits to me might be to start you thinking about what kinds of educational information or other kinds of assistance might help me in my role as a parent.
b) The benefit to others is that the information provided by my participation may help in the development of parenting education programs that better fit the expressed wants, needs, and interests of new parents.

7) Information about this study was discussed with me by Lenny Maietta. If I have further questions, I can call her at 983-8061.

8) If I would like information regarding the results of the study I may contact Lenny Maietta after April 1, 1985.

Date_____Signature_____Telephone_____

Lenny Maietta
Rt.9 Box 86 HM
Santa Fe, NM 87501
983-8061

Doctoral Student
The Fielding Institute
2112 Santa Barbara St.
Santa Barbara, Calif.

CONSENT FORM FOR EXPECTANT FATHERS PARTICIPATING IN THE STUDY ON PARENT-INFANT INTERACTION

1. I understand that this study is of a research nature. It may offer no direct benefit to me.

2. Participation in this study is voluntary. I may refuse to enter it or may withdraw from it at any time without creating any harmful consequences for myself. I understand also that the investigator may drop me at any time from the study.

3. The purpose of this study is: to gather information about the experience of pregnancy, parenting, and parent-infant interaction.

4. As a participant in this study I will be asked to take part in the following procedures:
a) Fill out two questionnaires about the experience of an expectant father during pregnancy and my thoughts about parents and infants. The questionnaires will take about 15 minutes to complete.

b) When my infant is one month old I will be visited in my home. I will be given two questionnaires to complete about the birth experience, my experience as a new parent and my thoughts about infants. The questionnaires will take about 15 minutes to complete.

c) When my infant is two months old, I will be given a short questionnaire about parents and infants to fill out. The questionnaire will take about two minutes to complete.

d) I will be asked for information regarding my infant's health status at birth, and after the 6-week check-up. this information will be taken from his/her medical chart.

My total participation in the study will take about 45 minutes of my time.

5) There are no anticipated risks or discomforts in my participation. All answers to questionaires will be kept confidential. My responses to the questionnaires will be listed under a number, not my name. Any findings of this

research will be written in such a way that I or my responses cannot be identified.

6) The possible benefits of the procedures might be:
a) the direct benefits to me might be to start me thinking about what kinds of educational information or other kinds of assistance might help meu in my role as a parent.
b) The benefit to others is that the information provided by my participation may help in the development of parenting education programs that better fit the expressed wants, needs, and interests of new parents.

7) Information about this study was discussed with me by Lenny Maietta. If I have further questions, I can call her at 983-8061.

8) If I would like information regarding the results of the study I may contact Lenny Maietta after April 1, 1985.

Date_____Signature_____Telephone_____

Lenny Maietta
Rt.9 Box 86 HM
Santa Fe, NM 87501
983-8061

Doctoral Student
The Fielding Institute
2112 Santa Barbara St.
Santa Barbara, Calif.

CONSENT FORM FOR EXPECTANT MOTHERS PARTICIPATING IN THE PARENTING PROGRAM

PROJECT TITLE: STUDY ON PARENT-INFANT INTERACTION

1.I understand that this study is of a research nature.

2. Participation in this study is voluntary. I may refuse to enter it or may withdraw from it at any time without creating any harmful consequences for myself. I understand also that the investigator may drop me at any time from the study.

3. The purpose of this study is: to gather information about the experience of pregnancy, parenting, and parent-infant interaction.

4. As a participant in this study I will be asked to take part in the following procedures:
a) Fill out two questionnaires about the experience of pregnancy, and my thoughts about parents and infants. The questionaires will take about 15 minutes to complete.

b) Participate in two touch-in-parenting classes. Each class will be 1 1/2hours long.

c) I will receive two home teaching sessions after my infant is born. Each session will be about 1 hour long.

d) When my infant is one month old I will be visited in my home. I will be given two questionnaires to complete about the birth experience, my experience as a new parent and my thoughts about infants. The questionnaires will take about 15 minutes to complete. Then a short videotape recording will be made of me and my infant interacting during four activities that the two of us do very often. The video-taping will take about 15 minutes to complete. It will take about 15 minutes to set up the video equipment so the entire visit will be about 35-45 minutes long.

e) When my infant is two months old, I will be given a short questionnaire about parents and infants to fill out. The questionnaire will take about two minutes to complete.

f) I will be asked for information regarding my infant's health status at birth, and after the 6-week checkup. This information will be taken from his/her medical chart.

My total participation in the study will take about 6 hours of time.

5) There are no anticipated risks or discomforts in my participation. All answers to questionnaires and the video recordings will be kept confidential. My responses on the questionnaires and my part in the video recordings will be listed under a number, not my name. The video recordings will be viewed only by the investigators and 3 persons trained to look at parent-infant interaction. They will not be seen by any other persons. Any findings of this research will be written in such a way that I and my responses cannot be identified.

6) The possible benefits of the procedures might be:
a) the direct benefits to me might be to give me educational information and provide me with training in touching my infant that might assist me in my role as a parent.
b) The benefit to others is that the information provided by my participation may help in the development of parenting education programs that better fit the expressed wants, needs, and interests of new parents.

7) Information about this study was discussed with me by Lenny Maietta. If I have further questions, I can call her at 983-8061.

8) If I would like information regarding the results of the study I may contact Lenny Maietta after April 1, 1985.

Date_____Signature_____TELEPHONE_____

Lenny Maietta
Rt.9 Box 86 HM
Santa Fe, NM 87501
983-8061

Doctoral Student
The Fielding Institute
2112 Santa Barbara St.
Santa Barbara, Calif.

CONSENT FORM FOR EXPECTANT FATHERS PARTICIPATING IN THE PARENTING PROGRAM

PROJECT TITLE: STUDY ON PARENT-INFANT INTERACTION

1. I understand that this study is of a research nature.

2. Participation in this study is voluntary. I may refuse to enter it or may withdraw from it at any time without creating any harmful consequences for myself. I understand also that the investigator may drop me at any time from the study.

3. The purpose of this study is: to gather information about the experience of parenting, and parent-infant interaction.

4. As a participant in this study I will be asked to take part in the following procedures:
a) Fill out two questionnaires about the experience of an expectant father during pregnancy and my thoughts about parents and infants. The questionnaires will take about 15 minutes to complete.

b) I will participate in two touch-in-parenting classes. Each class will be 1 1/2hours long.

c) I will be offered two home teaching sessions after my baby is born. Each session will be about 1 hour long.

d) When my infant is one month old I will be visited in my home. I will be given two questionnaires to complete about the birth experience, my experience as a new parent and my thoughts about infants. The questionnaires will take about 5 minutes to complete.

e) When my infant is two months old, I will be given a short questionnaire about parents and infants to fill out. The questionnaire will take about two minutes to complete.

f) I wil be asked asked for information regarding my infant's health status at birth, and after the 6-week checkup. This information will be taken from his/her medical chart.

My total participation in the study will take about 5 hours of my time.

5) There are no anticipated risks or discomforts in my participation. All answers to questionnaires will be kept confidential. My responses on the questionnaires will be listed under a number, not my name. Any findings of this research will be written in such a way that I or my responses cannot be identified.

6) The possible benefits of the procedures might be:
a) the direct benefits to me might be to give me educational information and provide me with training in touching my infant that might help me in my role as a parent.
b) The benefit to others is that the information provided by my participation may help in the development of parenting education programs that better fit the expressed wants, needs, and interests of new parents.

7) Information about this study was discussed with me by Lenny Maietta. If I have further questions, I can call her at 983-8061.

8) If I would like information regarding the results of the study I may contact Lenny Maietta after April 1, 1985.

Date_____Signature_____telephone_____

Appendix I

Videotaping Procedures: Setting and Instructions

We arranged for an hour of time. The mother and baby were both in the room as we set up. Both of them needed to get used to the filming lights. They were turned on as soon as we arrived. Using the description on the consent form, I reminded the mother why we were filming and how the material would be used. In order to put the mother at ease, I carried on a social conversation with her while the recording equipment was set up. I used the same topic with all subjects. Motherhood. I described my first month of being a mother including how it affected my friendships, sleep, and my ability to function. The mothers responded in kind.

In order to maintain consistency, I read the descriptions of the activities to be filmed. I read them once clear through to let the mother know what all of them were. I then read each one individually as they were videotaped.

There are four activities we would like to film.

1) Changing the baby's clothes, including diapers.

2) Beginning with your baby lying on the back turn him/her onto the chest and back onto the back. Then bring your baby to standing and return to lying again.

3) Using the grasp reflex where your baby grasps your fingers/thumbs, bring your baby to sitting. Then, bring your baby into a carrying position as if you were carrying the baby into the bedroom. Then lie the baby down again.

Appendix. J

Rater Training Narrative

Session One:

(1) Activity: Assessment of Handling Skills

The four graders and two trainers participated. Everyone had the experience of moving everyone else through specific movement sequences. They included rolling another person over from the back to the stomach and return; moving someone through a sequence from lying to sitting to standing and back down; moving someone to a sitting position and supporting him/her there. The intent of the activity was threefold: To assess their skill in using movement as a medium for communication; to illustrate that when the theme/topic of interaction remains constant, the qualities of interaction change as the partners change; to present the basic ideas for analyzing an interaction through the motion of participants.

Assessment of Motion Analysis Skills

The participants were presented with three general questions to consider as they worked. Did some interactions involve less effort? Was the timing different from one interaction to the next? Was the use of space different from one interaction to the next?

Next, all of us watched one set of partners rolling over. The following questions were asked and everyone made comments as we watched.

"What can you say about the quality or use of effort in their interaction?" The active person is putting out lots. The active person is pushing. The passive person rolls over like a log. It doesn't look like much of the effort being put out is involved in rolling over.

"What do you notice about the timing of actions between the two participants? The active person moves much more and much faster than the passive one. The active person makes lots of small movements and touches the passive person in lots of places before the passive person actually moves at all. The active person makes lots of small movements and the passive person makes one large movement.

"What do you notice about the way that space is used in the interaction? The active person stays far away from the passive person. When the passive person starts moving the active person does not follow her. The active person is too close and has to work very hard to roll her over.

CONCEPT PRESENTATION

(1) Goal Oriented Interaction

(2) Process Oriented Interaction: Mutual Interaction

Ideas related to goal-oriented and process-oriented interaction were presented in relationship to the interaction being observed:

"Is the attention of the partners on the goal of their interaction or on their process of interacting?" They are both concentrating on getting the job done. It does not look like there is any concern at all for how they are interacting.

We watched another pair interact over rolling. The same questions were asked and basically the same responses were given. A discussion about goal directed-vs.-process directed parent-infant interactions followed.

In goal-directed interactions the attention is on the goal. The process through which the goal is achieved is of little concern. During a mother-infant activity of this nature the mother's effort, timing, and use of space will most likely not take the infant's efforts or timing into account. There is an impression that the mother is doing something to the baby. Their interaction during the activity appears to be of little importance.

A process-directed interaction is characterized as a mutual interaction. In such an interaction attention is on the process itself. The activity is seen as a medium for communicating. In a process-directed mother-infant interaction the mother uses her effort, times her actions, and uses the space in ways that facilitate the infant's

participation during the activity. The impression is that the mother and infant are taking part in an activity together.

Experience of Mutual Interaction:

I wanted each grader to have an experiential understanding of the concept. I moved every grader through the series of motion patterns. I continuously adjusted my effort, timing and use of space until my working partner and I felt, and those observing thought, that our interaction could be characterized as being mutual.

Introduction of Rating Scales and Criteria Reference List:

I handed out the observation graphs and criteria reference list. The criteria list corresponds to the observational graphs for the individual items in the three components to be scored for each activity. The raters were able to refer back to it for clarification whenever they had questions during the grading of the video recordings. The categories of effort, timing, and use of space that we had been using during the session to assess the movement and observation skills of the raters were the categories of the rating schedule. They were asked to read over the graph and criteria reference list several times before the next meeting four days later.

Session Two:

(1) Review Activity and Discussion:

We began the session with questions and discussion regarding the observation graph and criteria reference list. Questions were answered experientally using the activity from the previous session of rolling someone over. "What do you mean by an appropriate place of contact?"

"There are places on a body where when you place your hand there, assist an individual in being more differentiated. And, there are places where you can make contact that render an individual more undifferentiated. You can have an experience while touching yourself that illustrates the idea. We will support our neck. We need a movement reference to refer back to later. Turn your head/neck to look side to side. Notice what your range of motion is. Notice anything about your effort that stands out. Now, place your hand around the back of your neck and support your neck with your hand. This is a position of support that many people assume. It is a common way that parents attempt to support their infants. Use your hand to try to assist in turning your head/neck to look side to side. Compare your movement now to your movement without support on your neck.

Bring your head again to a rest position in the middle. Turn your head to look right and left. Place the fingers of your right hand lightly on your lower jaw bone and turn your head passively to the left a few times and bring it back to the middle. Do the same with your right hand on your cheek bone and forhead. Now actively turn your head to the right and left. You will find your head, neck, and chest are much more differentiated in their motion and there is a much greater range of motion when you turn your head to the left in comparison to when you turn your head to the right.

Concepts:

(1) Indirect Support

The above experience illustrated that support is usually most effective when it is indirect.

(2) Recurring Pattern of Less Stable and More Stable Areas of Motion in the Body:

Support is most effective when offered at a stable level of motion. In regard to the neck, that suggests that support can be most effective when offered indirectly via the head, chest, or some other stabile area of the body.

Functional Anatomy Experience: Recognizing Patterns of Stable areas (mainly characterized by bending motion that

are limited in directional possibilities) and Unstable areas (mainly characterized by rotational motion that are multidirectional in their movement possibilities)

Levels of Motion in the Body:

When we consider the body in terms of the ways it is possible to move we discover a recurring pattern which allows for limited (mainly bending) motion, and unlimited (mainly rotational) motion. The pattern is apparent regardless of whether we look at the body from head to feet, feet to head, middle to extremities (in all directions), or extremities to the middle of the body.

We studied our own bodies and discovered the pattern, beginning with our head. I will present it by describing each level of motion coupled with an activity to experience it.

The movement of the head is allowed by the atlas rocking on the occipital condyle. When moving only at that level the head nods very slightly up and down. You can experience it by nodding your head very quickly and slightly like an old man with palsy.

Just under that level of limited motion are the seven cervicle vertebrae which allow for motion of the neck in all directions. In order to separate the two motions, continue to make the small nodding motion of the head while turning the head side to side, bending the neck forward and

backward, and making diagonal patterns of bending with the neck.

The 12 thoracic vertebrae allow for limited directions of motion. Lie on your back. Interlace your fingers and place them behind your head. Point your elbows toward the ceiling. Use your hands to roll your head forward so that your chin comes toward your chest. What you are looking for is the end of motion allowed by the cervicle vertebrae. You will notice that the effort needed to roll your head toward your chest remains constant until you come to the end of the cervicle vertebrae. If you want to roll farther you must change your effort. At that point you begin engaging the thorax. Now roll your pelvis backward so that your lumbar spine rolls over the floor. You will again notice that the effort to roll the pelvis remains the same until you come to the border between the lumbar and thoracic spine. Roll your head forward and your pelvis backward assuming the position the immobilizes motion of the cervicle and lumbar spine. Now, move your thorax. You will find that only forward and diagonal bending motion is possible.

This is followed by unlimited directions of motion in the lumbar spine. Roll your pelvis backward until your pelvis is off the floor and your weight is on the thorax. This will immobilize your thorax and free the lumbar area for movement.

Move the lumbar area by wagging or shaking your buttocks. You can pivot your hips or make one move forward while the other moves backward. The movement at this level is multidirectional.

The iliosacral joint, joining the pelvis with the spine allows for limited directional motion. Lie on your back. Make a fist with both hands. Hit your ischia, the bone protruding forward out of your pelvis, in this position. Hit first the left side, and then the right. Listen and you will hear that the tone from one side is hollower than the other. This indicates that the joint in the back of your pelvis has more motion on one side than it has on the other.

This level is followed by the hip joint allowing for motion in all directions. Hold on to your knee or foot and move your leg to the front, side, rear, and across your body.

The knee is limited in its directional possibilities. Sit up. Stand your foot on the floor. Hold on to your thigh to immobilize the motion of your hip. Now try to move your knee side to side. You will see that you cannot even think about it. The knee only bends forward and backward.

Next, comes the lower leg which allows for motion in all directions. While sitting, stand your foot on the

floor. Just below the knee are the two lower leg bones. You can place a hand on them. Rotate your foot side to side while leaving the sole of your foot in contact with the floor. You will feel the lower leg bones move under your hand.

The ankle bends only forward and backward. The talus and collection of nine small bones under the ankle move in all directions. To experience the two levels tap your foot on the floor while moving your foot side to side at the same time. You are able to tap your foot by bending your ankle. The side-to-side rotation of your foot is allowed by the movement of the several small bones below the ankle.

The movement of the middle foot is limited in its directional possibilities, moving only forward and backward. The middle foot is made up of the long toe bones just above the part that most people call the toes. Hold onto the long toe bone in the big toe with one hand, and the long toe bone of the little toe bone with the other. Move them backward and forward. Do that movement with each of the other toes. You will find that there is only forward and backward motion.

The first joint of the tarsal section of the foot allows for multi directional motion. Hold on to each toe just below that joint and move the toe passively to discover what motion is possible. You will find that at

this level rotation, circumduction, bending, and side-to-side movement is possible.

The last two joints of the toes, and last joint of the big toe, allow for only forward and backward motion. Hold onto each of them and bend them at each of the joints. You will see that they only bend. They provide a stable connection into the environment which moves in many directions.

In summary, the stable areas of the body from top to bottom include the head, rib cage, pelvis, knees, ankles, middle foot, and toes. The unstable areas of the body from top to bottom include the neck, lumbar spine, hip joint, lower leg, arch of the foot and the first joint of the tarsal section of the foot.

The pattern is similar from the middle of the body out through the arms. Lie on your back. Press down sharply a few times on the top of the breastbone just below where it joins with the clavicle. Notice where you feel any effects of that pressure. You will most likely feel movement or a little pain between your shoulder blades. That is because your shoulder girdle is connected to the bony skeleton at this level by a joint about a half inch down on the breastbone. Now, press down sharply a few times about half way down the breast bone. Again, notice where you feel any effects of that pressure. You will most .pa likely feel

movement or pressure in your ribs, or where they connect with the spine in the back.

The next level of motion is multidirectional. It includes the entire shoulder girdle apparatus made up of the clavicle, arm socket, and shoulder blade. This entire section moves as a unit. Move your arm in all directions. Place your other hand alternately on your shoulder blade, clavicle, or in the arm socket. Notice that all of them move together in synchrony. The rest of the arm and hand have the same patterns of motion as the leg and foot. Because that is the case I will describe the alternating pattern of motion but not the activities to experience it. You can carry outthe same activity as we did to experience the levels of motion in leg and foot.

The elbow has limited motion, bending only forward and backward just as the knee did. Next, the lower arms rotate allowing for multidirectional motion. The wrist bends forward and backward followed by a collection of small bones in the lower hand allowing for motion in all directions. The bones of the middle hand move only forward and backward. The next joint at the base of the fingers allows for rotation, circumduction, bending and side to side motion while the last two joints of the fingers and the last joint in the thumb are limited in their directional possibilities bending only forward and backward. We then

go into the unlimited movement possibilities of the environment.

In summary, the pattern of stable levels of motion moving from the center of the body outward includes the sternum, elbow, wrist, bones of the middle hand and last two joints of the fingers. The unstable areas along this pathway include the shoulder girdle, lower arm, ball of the hand, knuckles and environment.

Application of the Concept of Mutual Interaction:

Experiential knowledge of the alternating patterns of motion possibilities in the body is important in order that the parts of our body work together. When the parts of our body follow each other sequentially our movement is efficient and effortless.

This knowledge is very important for parents who will be handling their infants. If parents offer support to their infants at levels that allow for multidirectional motion they immobilize their infant, removing the infant's ability to adjust to any movement input. They make it necessary for the infant to move the area above and below their support as an undifferentiated unit. If they offer their infant support in an area of limited movement possibilities the infant can use multidirectional levels of motion to adjust to their movement signals. The result is that the infant becomes more

competent and can actively respond during the interaction with the parents.

Viewing and Scoring of Mother-Infant Interaction:

We viewed a videotape of an untrained mother and infant when the infant was 2 weeks old. We viewed a second tape of the same mother and infant after the mother had had two training sessions. The infant was one month old when the video was made. Using the observation graphs we discussed the differences in movement communication skill between mother and infant from the first to the second tape.

Review Activity:

Using the context of mutual interaction we rolled each other over and brought each other to a standing position. Partners discussed their interaction in terms of effort, timing, and space. They made adjustments in each category in order to make their interactions more mutual. Each pair then did a demonstration for the group. They demonstrated mutual participation in the process of rolling over and coming to a standing position. And they demonstrated non mutual interaction in the process of rolling over and coming to standing position. They described each of their interactions according to each component of each category on the observation graph.

Home Assignment:

The graders were requested to spend 2 hours on 2 separate days observing parents and young children interacting at a park before our next meeting.

Session Three:

Discussion of Park Observations:

The graders are becoming skilled in observing and anylyzing motion messages. They are becoming concerned about the messages being conveyed by unskilled interactions and they are responding emotionally to how mothers and fathers touch their infants. I told them the reason for my interest in designing this training and carrying out this study. It was because my perception was that the messages that pareants communicate through their handling very often do not match their intentions. Most parents are doing the best that they can. Their way of handling and moving an infant is usually the same way that they move themselves.

For example, I asked one of the mother in the training group to turn her newborn over with one hand. She put her hand on the baby's ribs and pushed sideward. The baby slid a little bit and starting kicking. I asked her to try again. She placed her hand on the same spot and pushed sideward again. This time she kept pushing. The baby slid sideward, tilted, flipped over and began to cry. The mother's face was white. The father's face was bright red.

I asked the mother to lie down and turn herself over. She made the same pattern of motion that she had imposed on the baby. She lay on her back and slid her ribs to the side. When they could not go any farther her body tilted and she flipped over. I asked her husband if he noticed any similarity in how both of them turned over. He commented that their motion was identical.

I asked her to turn her baby over together with me. I placed my hand on the side of the baby's pelvis. She placed her hand on top of mine. She followed my, and the baby's motion in the process of rolling over. Using the same format, she placed her hand on top of mine and we rolled the baby over from the foot, knee, ribcage, elbow, wrist, and fingers. The baby was quiet and attentive. I then asked her to roll the baby over alone. They followed each other closely. Their motion was smooth and seemingly effortless. The mother began to cry. When she could talk she said that many people, including her husband, had been asking her if she loved or wanted her baby. They accused her of not treating (touching) the baby very lovingly. She listened to the interpretations that observers placed on her behavior. She observed her own actions. And, already after having her baby only for 5 days, she was beginning to wonder. It took literally a matter of minutes to help

her begin to develop the skill necessary to bring her intentions and her behavior closer together.

It is necessary when observing parent-infant interaction to begin with the assumption that parents are doing the best that they can. Consider that since they were 6 or 7 years old they have most likely relied very little on touch as a medium for casual or intimate (but nonsexual) social communication. When they began dating and mating, touch was most likely a tool for intimate sexual communication. Now they have an infant. The context for their interaction with the baby is nonsexual. The infant cannot understand words or follow visual stimuli for any length of time. They need to communicate with their infant through their touch, yet most of them have not had any consistent experience of nonsexual tactile communication in 20 years. It is quite a dilemma.

When you observe parents and infants interacting in real time, or via videotapes you have a number of options on how you bring order to your observations. You can categorize and judge the parent's behavior as being good, bad, manipulative, or whatever else. Or, assuming that they are doing the best that they can, you can set your judgements aside and analyze their movement interactions determining whether they are effective. You can then use that information to reassess your judgements or to help parents become more effective in their interactions wiath their children.

Activity: Changing an Adult's Clothes

I wanted the grader's to have the experience of how difficult it is to communicate effectively through touch in a complex interaction. Each of them had the experience of changing someone else's clothes (meaning taking someone's clothes off and putting them back on). And they also had the experience of playing a passive role while having their own clothing changed. Everyone agreed that developing a mutual interaction with their partner during such an activity was not an easy task.

Activity Two: Using touch to communicate with a 5-month-old infant. Again, I wanted them to experience what a difficult task parents are faced with. One of the raters was a mother. She had brought her baby with her to every session so the raters, and baby, were familiar with each other. I gave the following instructions: "I want you to communicate with your touch in ways that help the baby be more alert and competent during your interaction". Again, they realized the difficult task that parents are faced with. I requested that they use the categories of effort, timing, and space to ask themselves systematic questions and make systematic improvements in their way of interacting. All of them acknowledged that the components

of effort, timing, and space were useful tools for assessing and improving their own communication skill.

Video Assessment: We observed a video of an untrained mother and 1-month-old infant. Each individually scored their interaction, alone, then we compared scores and discussed discrepancies.

Session Four:

Movement Assessment Activity: Everyone moved me individually from lying to a standing position. When I would fall back to the floor they had to begin their interaction in whatever configuration I came to rest. I asked them to remember as they worked that when we did not succeed, no one was at fault. Our success or failure was dependent on our communication process which we could continuously and systematically alter.

(2) VideoTape Assessment:

We did a trial run of the grading process with three new mother-infant tape clips. Both trainers, the cultural anthropologist, and three raters participated. We viewed all pairs performing the activity of changing positions. We returned to the first subject pair. Each of us scored it. We followed the same procedure for the next two subject pairs performing the same activity. We then followed the same format for the second activity of coming to sitting and

holding the infant, and the third activity of changing clothes. We then compared scores. There were only three items of disagreement between the six of us. The raters were ready to grade.