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Social interaction of developmentally delayed and normal toddlers with their mothers.

Sheila M. Kelly

University of Massachusetts Amherst

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SOCIAL INTERACTION OF DEVELOPMENTALLY DELAYED
AND NORMAL TODDLERS WITH THEIR MOTHERS

A Dissertation Presented

by

SHEILA M. KELLY

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION

September, 1984

School of Education

Shelia M. Kelly

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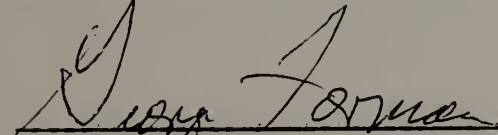
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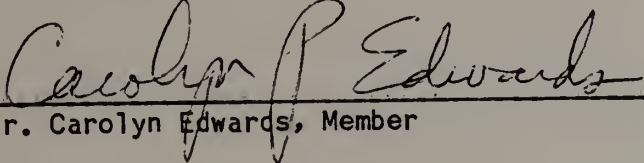
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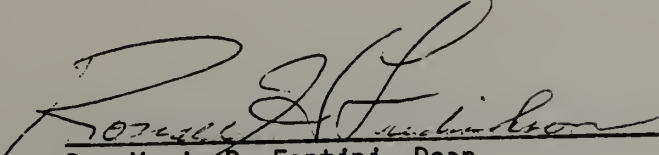
Approved as to style and content by:


Dr. George Forman, Chairperson of Committee


Dr. Roberta Collard, Member


Dr. Carolyn Edwards, Member


Dr. Peter Pufall, Member


Dr. Mario D. Fantini, Dean
School of Education

DEDICATION

For my daughters
Sara, Katherine, MaryJill
and my mother, Isabella
who have helped, hoped
and finally, cheered.

"Supposing is good but finding out is better."

- Mark Twain

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Many people have contributed to the completion of this work. Each member of my committee needs a special thank you as do the friends and colleagues who allowed me to observe them with their toddlers, and the mothers I did not know who welcomed me into their homes. I shall list names alphabetically as I attempt to thank each one.

Roberta Collard's knowledge and editorial skill has been remarkable in making this a finished product. Carolyn Edwards guided the work of the proposal and was the first person to make me conscious of how toddlers may perceive others in terms of the service they provide for the children. As chairman, George Forman has always made himself available to help solve both theoretical and procedural problems and share the challenge and excitement of trying to look at the world through the eyes of a two-year-old. As outside committee member, Peter Pufall has given generously of his time to discuss and refine the work, always conveying belief in the importance of the question.

I am especially indebted to Tracy Osbahr, Director of the REACH PROJECT. She and her staff not only welcomed discussion of my topic but put me in contact with the target population for this study. I am also grateful to Dennis Rosen, his secretary, Pat Gavioli and the other members of the pediatric offices in Franklin county where I solicited mothers and children for this study.

It was especially helpful to have friends who are busy

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ABSTRACT

SOCIAL INTERACTION OF DELAYED AND NORMAL TODDLERS WITH THEIR MOTHERS

September 1984

Sheila M. Kelly, B.A., University of Alberta, Canada

M.S., University of Massachusetts, Ed.D., University of Massachusetts

Directed by: Professor George Forman

Ten male toddlers who measured delayed on the Michigan Developmental Profile were matched in age with ten normally developing males and in Michigan Level with another group of ten males. It was hypothesized that normally developing toddlers would show more variety in how they contacted mothers and their mothers would express more pleasure in parenting. Twelve child and seven mother behaviors were recorded during home observations and mothers were interviewed. Mothers of delayed children received lower pleasure scores, but variety scores did not differentiate among the groups. Compared with normal children of the same age, the delayed children sought teaching and joint activities with their mothers less often. They required less intervention, and their mothers responded less immediately and tended to initiate activities more often, as did mothers of the younger normals. Among mothers of delayed toddlers, responses measuring hesitation and ignoring correlated with requests for joining. Mothers of normal children were much more likely to respond to their teaching requests. These results have clinical implications for facilitating the relationship between mothers and delayed toddlers.

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INTRODUCTION

Social interactions between mothers and young children have been described in classic studies of attachment behavior. In these studies, the term "attachment" implies the affiliative feelings the child has for the mother, as shown by the child's reactions during separation from and reunion with the mother. Studies have been done to determine which attachment behaviors characterize a child who is developing well, and some clinicians diagnose and understand serious psychological problems in terms of the child's attachment relationship with the mother on separation and reunion.

Studies made during the past ten years have revealed a relation between desirable attachment behaviors in infancy and social and cognitive competence in toddlerhood. The importance of this area has led researchers to study not only what mothers do to facilitate attachment behaviors, but also to study what skills the infants bring to bear on this important social interaction.

More studies have been made of older infants' attachment behaviors at separation and reunion than have been made of attachment behaviors observed in mother-child interaction. Most studies of mother-infant interaction have been made on infants under 6 months of age, and most studies on attachment behaviors at separation and reunion have been made on one-year-old infants. Although secure early attachment has been related to later competence, and many studies have shown a relationship

between the social background of high risk infants and later competence, there have been few investigations of attachment studied by observing mother-child interactions in toddlers with delayed development.

Most studies on attachment and separation have used Ainsworth's test in which infants are observed during a three-minute separation from the mother, while alone and with a stranger (Ainsworth, Bell, & Stayton, 1971). Gainsbauer and Harmon (1981) feel that "Beyond 21-24 months, many infants have developed sufficient evocative memory and language ability so that situations such as stranger approach or a three-minute separation are no longer highly charged events." Cohen (1974) pointed out earlier that we cannot use the same kind of response to measure attachment in babies of all ages. Thus, discovering how a young child is affected by the presence or absence of the mother, and how the interaction between child and mother is manifested in later development is a challenge.

Finding more appropriate ways to study attachment seems especially important as infants grow older. To understand the development of the relationship of attachment and competence, it would be particularly important to observe specific behaviors related to attachment in the mother-child interaction. One way would be to observe the mother-child interaction in the natural setting of the home to see how the child communicates an awareness of the mother and a need or wish to have her involved in interaction. In this situation, the mother's response to the child's attempts at contact could also be observed.

The present study is an investigation of attachment in older

toddlers with normal and delayed development in which the interaction between the toddlers and their mothers was observed while they were alone together in their homes. Three groups of toddlers were selected to observe: mild developmentally delayed male two-year-olds, normally developing male two-year-olds, and normally developing male toddlers of approximately the same developmental level as the delayed children.

Thus, differences in the toddler's ways of contacting the mother were studied as a function of age and developmental level, and the mother's responses to these social behaviors were also noted. The investigator devised a system for observing and coding toddlers' social interactions with their mothers during a typical time at home and was thus able to compare these affiliative behaviors in normally developing and delayed toddlers. One aspect of competence was measured by comparing the number and variety of social interactions and the persistence in play with novel toys in the three groups. The mothers were interviewed to determine the degree of pleasure they felt in caring for their particular two-year-old to see if the level of enjoyment differed among the groups of mothers.

REVIEW OF THE LITERATURE

The relationship between a mother and her young child has been of increasing interest since the work of Spitz (1945, 1965) and Bowlby (1958, 1969). As clinicians and theorists, Spitz and Bowlby studied the acute distress suffered by infants when separated from their mothers. Bowlby called the infant's relationship to the mother "attachment", and studies of attachment and bonding have had as their counterparts, studies of separation and distress.

Attachment Studied as Separation and Reunion

Spitz (1965) found that normal, healthy eight-to-nine-month-old babies give evidence of discriminating their mothers from a stranger by showing a fear reaction if separated from their mothers in the presence of a stranger. Bowlby (1960) studied babies' separation reactions and interpreted their desire for proximity with the mother as a biologically determined response essential to survival and indicative of a "primary anxiety" reaction to loss of the social comforter.

More recently, attachment behaviors have been described in terms of the distress or comfort shown by a child at separation from and reunion with the mother (Ainsworth, 1967, 1969; Sroufe & Waters, 1977). The relationship between the quality of attachment and the babies' competence, defined in terms of exploration of their environment have also been studied (Morgan, Harmon, Gaiter, Jennings, Gist & Yarrow,

1977; Lamb, 1974, 1977), and longitudinal studies have shown how quality of attachment during infancy facilitates the socioemotional and cognitive competence during the preschool years (Lieberman, 1977; Matas, Arend, & Sroufe, 1978; Arend, Gove, & Sroufe, 1979).

Ainsworth (1967) related the degree or kind of security of attachment in Ugandan babies to differences in the mothers' attitudes and behaviors as caretakers. She found that mothers of securely attached babies showed sensitivity in responding to their babies' signals promptly and appropriately and derived pleasure from frequent interaction with them. In a later study with Bell and Stayton, Ainsworth (1971) developed a laboratory situation for studying separation and reunion behaviors in one-year-old infants and their mothers. Using the degree of distress and searching the babies showed at separation and the behavioral signals (such as looking, smiling, vocalizing and proximity seeking) they showed upon reunion, these researchers described three main groups of babies: the anxiously attached (or ambivalent), the unattached (or avoidant) and the securely attached. In the strange situation, babies who were "anxiously attached" showed high distress and were difficult for the mother to soothe on reunion. They both sought and avoided her efforts in an ambivalent manner and seemed preoccupied with keeping her in sight. The "avoidant" babies cried little at separation and seemed to ignore, avoid or even rebuff the mother upon reunion. Babies showing avoidant behaviors had mothers who were less sensitive, less accepting, and more intrusive in their caretaking practices in the home.

When the mothers were present, the securely attached infants tended to explore the environment immediately, and although separation from the mother for three minutes increased proximity-seeking on reunion, they readily resumed curiosity behavior after the mother returned and simply continued to keep tabs on her while exploring. The mothers of the securely attached babies were observed to be sensitive, accepting, available, and cooperative (Ainsworth, Bell & Stayton, 1971).

Ainsworth's strange situation technique continues to be used as an important research strategy in attachment studies. Sroufe (1977) also found that securely attached babies readily overcame their wariness in a strange situation in the presence of the mother and exhibited more signs of affiliation and exploratory behaviors than did the anxiously attached babies. The strange situation technique has been used with groups of children up to 32 months of age (Marcus, 1979; Matas, Arend & Sroufe, 1978).

Mahler, Pine and Bergmann (1975) also discussed the need infants have to use their mothers as a secure base from which to explore. Mahler terms their checking-in behavior "refueling." She based her findings on a longitudinal observational study of children from infancy through 32 months.

Attachment Studied in Relation to Competence

The importance of attachment for the development of social and cognitive competence continues to hold research interest. The significance of sensitivity, acceptance, availability and cooperation on the

part of the caregiver, emphasized in studies of normal development, is being researched in relation to the problems presented by atypical infants (Bell, 1971; Korner, 1974; Harmon, 1977). Such studies turn our attention to how attachment is affected by characteristics within the child. In this section I shall review studies relating competence to attachment and those examining individual differences within babies which may affect attachment.

Attachment, as defined by Ainsworth, has been studied as predictive of competency. Quality of attachment in infancy has been related to competence in toddlers defined in such terms as enthusiasm, persistence, acceptance of instructions, and peer interaction (Morgan, Harmon, Gaiter, Jennings, Gist & Yarrow, 1977; Matas, Arend & Sroufe, 1978; Arend, Gove & Sroufe, 1979; Jennings, Harmon, Morgan, Gaiter & Young, 1979). Block and Block (1980) use the constructs, ego-control and ego-resiliency, defined in terms of a child's resourcefulness, flexibility and persistence in solving problems, and they also include ratings of a child's impulse control, level of aspiration, curiosity and interpersonal problem solving with peers. The Blocks found that children's problem-solving capacity between three and four years of age correlated with their problem-solving capacity at between five and seven years.

Arend, Gove and Sroufe (1979) related quality of attachment, assessed with the Ainsworth at 18 months, to problem solving at 24 months, and to some of the Blocks' measures of ego-resiliency and ego-control in five-year-olds. They demonstrated that secure attachment in

infancy is related to social and problem-solving competencies in toddlerhood and that the curious, persistent, exploring toddler has experienced smooth interpersonal transactions in infancy.

Morgan, Harmon, Gaiter, Jonnings, Gist and Yarrow (1977) have used similar measures to study competency in toddlers. By examining the children's persistence and interest in exploring objects, they focus on the cognitive motivational aspects of competence, labeling these "mastery motivation." The simplicity of their operational definition and scoring system provide a basis for the toy exploration measures used in the present study.

Attachment Studied in Relation to Temperament and Mothers' Expectations

Harmon and associates (1977) found specific factors within the baby such as level of irritability (as well as past social experiences) to be related to the baby's degree of separation distress and stranger avoidance in the laboratory. Their results corresponded with case material published by Thomas, Chess and Birch (1968) on individual differences in temperament. Their studies document the importance of the infant's contribution to what Ainsworth has called the "match or mismatch" between infant and mother.

Belsky, Goode and Most (1980) direct attention to the importance of phase of development in stimulating appropriate maternal behavior, i.e., how mothers' responses to their babies change as the babies get older. They demonstrated that mothers use an increasing number of

verbal strategies to focus their child's attention as the child becomes more verbal, and this mediation plays a major role in fostering the development of their children's attention and exploratory skills. They also point out that children who had learned to orient frequently to their mothers benefited from the mothers' orienting remarks. Their study emphasizes the relationship of affiliation and exploration and cognitive development that Sroufe and his associates (1977) have described and also tells us more about the mother's role with the older, more verbal toddler.

Brazelton, Koslowski, and Main (1974) described the patterns of reciprocal interaction between infant and caregiver; and using video, Tronick, Als and Brazelton (1975, 1977) have analyzed face-to-face interaction of infants and mothers. They concluded that "long before language, the infant is a skillful communicator" (Tronick, Als & Brazelton, 1977).

Attachment Studied in Atypical Children

Studies have been made on how attachment is affected when babies are not developing normally by studying babies who are unable to respond adequately to the caregiver's overtures or who are extremely difficult to calm. Ainsworth (1971) and Stern (1974) have described caregivers as "neutralizers of stimulation" and have discussed how mothers and babies can be mismatched if they are not comfortable with the degree of stimulation they give each other. As early as 1967, Moss wrote of the mother-child interaction in learning terms, speaking of mothers as

reinforcing agents but also emphasizing the mother's need for the baby's response to reinforce her responsiveness.

In a review of the literature on attachment in 1971, Bell cautioned that there had been an overemphasis on the effects of the parent on the child and advised recognition of how each can affect the other, citing the damaging effects on attachment of the excessive crying of a brain-damaged child who frustrated the mother's efforts to comfort. Gil (1970) found a high frequency of behaviors described as exasperating to parents in the history of abused children. Korner (1974) believes that the nature of a mother's response to her infant is largely determined by the infant's level of neurophysiological development and that mothers automatically modify their responses as their babies grow older. Mothers do not consciously plan to vocalize and smile or turn away as they wordlessly negotiate with their newborns until each is satisfied with the level of gazing, smiling and engaging or averting, nor do mothers of older children (like those in the 1980 Belsky study) plan the verbal strategies with which they stimulate their toddlers to notice something. Korner (1974) concludes with the same concern Bell (1971) expressed: that there has been an overemphasis on the behaviors the parents elicit from the child without considering the behaviors the child elicits from the parent.

There has been limited research on the effect of developmental delay on the parent-child relationship. Field (1979, 1980) observed that mothers tended to overstimulate their underresponsive high-risk infants, causing them to turn away frequently. These mothers also

tended to stereotype their responses which possibly led to boredom in their infants. Field believes that these maternal behaviors are based on anxiety. On the infants' side, she found that high-risk infants have a higher threshold for smiling and a lower threshold for crying which made interaction with them less rewarding than interactions with normal infants.

Emde, Katz and Thorpe (1978) describe the effect upon the caregiver of the slower-paced development of babies with Down's Syndrome. They found that at 3 to 4 months, the absence of expected response to an adult's approach in terms of brightening of the eyes and activation of the limbs led to depressed reactions in these parents, and clinical intervention was required to help them continue to provide the social stimulation their babies needed. A study by Jones (1979) contributes further to our understanding of the excessive demands placed upon a parent whose baby cannot play social games in the expected manner. Jones found a difference in vocalization patterns between babies with Down's Syndrome and that of normal babies. Normal babies repeat a sound phrase and then pause, allowing the caregiver to respond, whereas babies with Down's Syndrome do not intersperse their vocalizing with a pattern of pauses. Jones concluded that the mother of a baby with Down's Syndrome is forced to interrupt her baby and insist upon providing vocal stimulation.

As was mentioned earlier, Moss (1967) observed the way babies reinforce their mothers during the development of attachment. Tyler, Kogan, and Turner (1974) studied the way the interaction patterns of

mothers and cerebral-palsied children are affected by the inability of these children to respond as normally expected, and they emphasized the need for therapists to find ways to prevent "affect turn-off" in parents who become discouraged by their child's lack of progress.

Speculation on the Facilitating of Attachment

Beckwith (1980) studied the social interaction of adoptive mothers and their infants and found that the most significant factors in successful interaction were whether or not the child initiated social behaviors, and responded to, or ignored, the mother when she initiated such behaviors. Everyone likes a social partner to take some responsibility for stimulating social interaction, and normal, healthy mothers have been observed to respond to this quality in their infants. Bell (1971) remarked on the "continuing kaleidoscope of novelty" to which the parent is treated as the infant matures. It is commonplace to hear a parent remark enthusiastically about her infant, "There is something new every day." Bell has noted that fifty percent of the mother-child interactions are started by the child. He believes the rapid succession of novel behaviors in the child makes an important contribution to attachment. He goes so far as to say, "The novelty could very well contribute to the positive quality of the interaction and thus play a role in maintaining a social system." Bell acknowledges that the changes the parents observe are indicators of the direction of the child's growth toward what he terms "ever more adult-like behavior". This suggests that if a child does not show novelty or variety in his

activities, it could have an adverse effect on his relationship with his parent, especially if the parent interprets such behavior as a sign of maturational delay.

Need for Present Research

The literature in mother-child interaction stresses the mutual effects of mother and child upon each other and the need for mutual reinforcement in that relationship. Normally developing children have been found to delight their mothers, thus enhancing the feelings of the mothers for them, and a nurturing bond with the mothers has been found to enhance the child's cognitive and social development. Mothers of atypical children are reported to feel less rewarded and more stressed by their children and thus may involve themselves less or inappropriately with these children. These findings emphasize the importance of facilitating the relationship between mothers and their delayed children, not only by working to overcome the delay in functioning that these children show, but also by enhancing the social relationship between mother and child. This relationship cannot be worked on in a specific way unless we acquire a good understanding of what behaviors we can expect to see a normal child and mother exhibit in contacting each other and how developmentally delayed children and their mothers differ in this respect. We must discover whether developmentally delayed children actually do use qualitatively different behaviors to seek contact with their mothers. Perhaps their behavior resembles that of younger children and is experienced as under-stimulating for the mothers

because it is less novel, varied, or disappointing to them. Kurt Lewin (1935) noticed that retarded children made more stereotyped responses and that their behavior was not as flexible as that of normal children.

Mothers of mildly delayed toddlers have described their children to this investigator in ways that suggest feelings of weariness or lack of novelty in the demands the children make. They implied that the children's purpose in contacting them was the same day after day. For example, one said, "Every time I go into the kitchen, he runs to the fridge for something." Another said, "He seems to do pretty much the same thing every morning . . . putters around on his own." In contrast, the mothers of normally developing children were heard to say, enthusiastically, "I never know what to expect from one day to the next" and "There is always something new." These observations led to the following questions: Do mildly delayed children actually exhibit less variety in the purposes for which they approach their mothers? Does variety in the purposes for which they approach mothers increase with age and development and relate to greater feelings of pleasure in mothers?

In the present study I shall examine the way differences in developmental levels are reflected in toddlers' behavior when they contact their mothers and how their behavior affects their mothers' responses. To do this I developed a coding system to record the purpose of active and passive contact of toddlers with mothers and the mothers' responses. The children's contact was analyzed in terms of frequency and variety of purpose, and the mothers' responses were analyzed in terms of compliance and variety of alternatives they suggested. These measures were made on

three groups of children: a target group of mildly delayed male toddlers, a second group of children the same chronological age, and a third group, matched to the delayed children in performance on a developmental profile. A measure of toy exploration was used to test further differentiation among these groups, and an index of the mothers' pleasure in the parent role was made.

In this way the variety of ways normally developing children seek contact with their mothers was assessed and compared with the variety of ways shown by mildly delayed children. Differences between the mothers' pleasure in their roles were also examined in the three groups.

METHOD

Subjects

The target group of subjects for this study was ten developmentally delayed two-year-old boys between 27 and 36 months of age, who were found eligible, (through developmental screening) for participation in a toddler stimulation program and had been participating in it for three to six months. Children were eligible for this program if they were 4 months or more delayed in one area of the Michigan Developmental Profile. Subjects in the present study are all male because the majority of children in the program are male. None of the subjects had been found to have a physical, sensory or neurological impairment. Two comparison groups were matched with these children: the first comparison group was matched by chronological age (± 1 month) and the second comparison group was matched in terms of developmental level (± 1 month). Thus, two-year-olds with mild developmental delay were compared with normally developing two-years-olds and with normally developing one- or two-year-old toddlers who measured at the same developmental level as the delayed children. The three groups were balanced in terms of socioeconomic status, but it was not found possible to balance them for sibling order (number of firstborns, only children, and later borns). Table 1 portrays the age and developmental level of the subjects. The average level on the Michigan Developmental Profile of the delayed subjects was 21.1 months, of the age-matched subjects, 30.6 months, and of the

Michigan-matched subjects, 22.6 months. Finally, all subjects were members of intact families in which the mother was the primary caregiver; that is, she was not employed outside the home more than ten hours a week.

The developmentally delayed subjects were recruited through personal contact with teachers and therapists of toddler-stimulation programs in Franklin, Hampshire and Hampden (Massachusetts) Counties. Children are referred to these programs by their parent or pediatrician. The normally developing subjects were recruited with the cooperation of pediatricians who allowed the investigator to solicit subjects from among their patients.

Table 1

Chronological Ages & Michigan Levels of Matched Groups in Months						
Delayed Children		Age-matched		Michigan-matched		
Chronolog- ical Age	Michigan Level	Chronolog- ical Age	Michigan Level	Chronolog- ical Age	Michigan Level	
36	19	36	35	20	19	
35	23	35	35	24	23	
31	19	30	27	20	19	
34	23	33	35	24	23	
30	19	30	31	20	23	
28	23	29	31	23	27	
27	19	26	23	20	23	
33	23	33	35	22	19	
27	23	27	27	23	23	
27	20	27	27	21	23	
Means	30.8	21.1	30.6	30.6	22.4	22.6

Procedures

Preliminary Contact and Instructions to Subjects

The work of Lamb (1977) and Dunn and Kendrick (1980), using home observation techniques, is used as a model for this study. Two 40-minute observations of each child were conducted in his home at a time of day when mother and child were accustomed to being at home, without visitors, and when the child was usually in a pleasant, alert state. Mothers had been informed about the procedure by telephone and letter, and they were prepared to have specific behaviors coded during the observations.

It had been discovered during a pilot study that an observer spontaneously learns to think in terms of the code whenever observing a toddler and mother. Therefore, the behavior of child and mother was recorded in code on a specially devised record sheet at one-minute intervals during two 40-minute observations one month apart. The time was signaled by an electric beeper (less audible than a digital watch alarm) The entire procedure from the time of contacting the volunteering mothers to completing the data collection was as follows.

Initial Telephone Call

Following receipt of the name of a possible volunteer, the mother was telephoned and the investigator explained her purpose as follows: "I am interested in knowing more about what toddlers like to do when alone at home with their mothers and am doing research about this. I

need to do two observations, one month apart. I will be in your home approximately one hour each time, during which I would like you to go about the house doing customary tasks which would keep you in sight of your toddler, reading, writing, doing laundry, or dishes, but not intentionally involving yourself with him. I am mainly interested in the child's activities and need you to be present to respond to him only if he requests it--the way you would if I were not there, but without starting an activity with him."

It was explained that the observer would not interact with children during the observations, and would be bringing toys a child might play with if he wished. Finally, it was explained that the children would be asked to perform some specific tasks at the end of the second visit. Mothers were then encouraged to ask any questions they might have, and the first observation was scheduled.

Letter to Mothers

A letter (see Appendix A) was sent to all the volunteer mothers with an attached permission slip to be given to the observer at the time of the first observation.

Observation Technique

The investigator arrived at the home at the agreed upon time bringing a small collection of toys selected to increase the likelihood of seeing the varieties of behavior in the behavior codes. The toys are listed below. After greeting the mother and talking briefly, the investigator said to the child: "Your mother said I could do my work at your

house today. I'm interested in how children play and I brought some toys for you to use while I do my work." The observer then seated herself in as removed a place as possible, within sight of the child and mother, and proceeded to code the observations on the coding sheet (see Appendix A), avoiding eye contact with the child.

The contents of the toy box, a red plastic milk carton, were:

3 cardboard books: Lowly Worm Word Book by Richard Scary, published by Random House, 1981; Trucks by Harry McNaught, published by Random House, 1979; Grover's New Kitten, a Sesame Street Book, published by Muppets, Inc., 1981.

A set of toy dishes including two cups and saucers, a coffee pot, creamer and sugar bowl.

A plastic fireman's hat.

A baby doll with easily removable hand-knitted overall and hat and boots.

A draw-string bag filled with bristle-blocks.

Twelve child behaviors and seven mother responses were coded during the home observations. These behaviors were identified during an observational pilot study the investigator did in 1980. They describe the actions of two-year-olds and their mothers when the two-year-olds seek contact with their mothers. At that time the investigator conducted three one-hour observations of each of three two-year-olds in intact families while they played at home with their mothers nearby doing housework. As in the present case, the mothers were asked not to seek interactions with their child unless the child invited it. The following are the child and mother behaviors identified at that time and used in the present study. (The underlined words and letters are the

abbreviations used for each behavior.) Except for the first, eighth and eleventh, the definitions are descriptive of what the child's actions require or prompt the mother to do with or for him. The other three require less specific responses.

Child Behaviors

1. The child contacts the mother over space, smiling, looking, vocalizing, but making no specific request. (OS)
2. The child contacts the mother in momentary physical contact, touching, patting, or leaning on her for less than one minute. (PC)
3. The child contacts the mother during lengthier physical contact, for comfort, perhaps for reasons of fatigue, hurt, or stranger fear. The child may lean or climb up or seek lifting and holding, and maintain the contact for one or two minutes. (EPC)
4. The child contacts the mother for prolonged physical contact or comfort. The child seeks to be held with or without a toy, book, or favorite object, being held but not played with, while being soothed for more than two minutes. (PPC)
5. The child contacts the mother for physical help. The child signals the mother with voice and/or gesture to let her know he cannot reach an objective or is not strong enough to accomplish something he wants to do, although he knows how to do it. (Note that times of diapering or toileting which necessitate high frequency of contact were omitted from coding. The timer was turned off and reset when that task was completed.) (Ph.H)
6. The child contacts the mother because he needs technical help--to make something work, to reach something, to get something unstuck. His behavior makes it clear that he cannot figure out how to make something work. (TH)
7. The child contacts the mother to give/seek information. He may take her a book and point to something to have her tell him the answer to "What's that?" or look up and ask or tell her something. This behavior describes verbal telling or asking only. (I)

8. The child contacts the mother merely by passing/placing an object in her lap without lingering to play with it or watch her manipulate or play. It is given in passing. (P)
9. The child contacts the mother to have her join him in manipulating or exploring or playing with an object or game, placing a toy in her lap, handing it to her and involving himself and her with it. This category also includes situations in which the child succeeds in joining mother with her tasks such as vacuuming, bedmaking or dishwashing, or folding clothes. (J)
10. The child contacts the mother to get her to notice something he has just done or is doing--a feat with his body or an object, like blocks. His behavior signals "look at me." It is called show. (S)
11. The child frets, thus contacting the mother to let her know he feels frustrated, by making whining sounds or gesturing, without indicating that any event or specific object is the cause of his frustration. He does not want her to do something specific. He may shove, push, throw, or make cross, cranky sounds, indicating a fussy state. (F)
12. The child contacts the mother by behaving in a way that requires adult intervention to protect or redirect to avoid harm of some kind either to him or to some object. (NI)

A numbered coding chart allowed the investigator to assign to a specific category each of the above behaviors which were checked as they occurred. The mothers' responses were similarly recorded.

Seven Mother Responses were identified. The first four are defined in terms of variation in the speed and specificity of the mother's response to her child. (The underlined letters in parentheses are the abbreviations used for each behavior.) The last three are defined in terms of content, and duration.

Times when mothers read to their children, fitting a category described as "read," were omitted from analysis, and interaction around diapering or toileting was not included in the observation time. (The

timer was shut off at these times and reset when the activity ended.) These behaviors were omitted because the activities involve several kinds of contact with mother and are usually directed by her.

Mother Responses

1. The mother stops what she is doing and immediately responds to the child's request. (RI)
2. The mother ignores the child's request at first and seems to be reluctant to comply. She responds in between 30 and 60 seconds, after hesitation. (RH)
3. The mother acknowledges the child's request immediately but then suggests an alternative, or provides one for him. (A/A)
4. The mother ignores the child's specific behavior or request, but responds to him by providing, showing, or doing something else for him, an alternative. (A)
5. The mother acknowledges the child without ceasing her own activity, and with no direct recognition of the specific behavior of the child. She may smile or say "hi" or "uh-huh" but provides no further contact or response--not attending to what it is he said or did. Or, the mother continues with her activity and gives no response to the child whatsoever. (NR)
6. (This is not a measure of responsiveness but was coded because it was a potential source of useful information.) The mother initiates an activity with her child, regardless of the fact that she has been asked not to do so, during the observations. (I)
7. This category, called prolonged initiation, allowed the recording of continuous involvement of the mother with the child and includes talking to him or watching him for more than one minute of time. (PI)

The second observation proceeded as the first and at the end included the administration of toy exploration tasks followed by the administration of the Michigan Developmental Profile Items to the normally developing children. These are described below.

Measures of Toy Exploration

Studies by Morgan (1977) and Arend (1979) and their associates have shown a relationship between toddlers' so-called mastery motivation scores and their quality of attachment (Ainsworth situation) during infancy. The toy exploration tasks chosen for this study are based upon those described in the studies by Morgan and Arend and their colleagues. They were pilot-tested with three two-year-old children to determine interest of items and to confirm the appropriateness of the time limits. The three tasks were presented at the end of the second observation and prior to administration of the Michigan Items.

Morgan, Harmon, Gaiter, Jennings, Gist and Yarrow (1977) used toys that required the subjects to achieve some kind of sensory effect, get a toy past a detour, or demonstrate an emerging skill. For example, their subjects were encouraged to make bells rings, get something from behind a barrier, or put shapes in bottles. The experimenters measured such things as latency to on-task behavior, duration of on-task behavior, and number of effects produced. They used these measures to yield an overall score of the child's persistence in practicing an emerging skill, solving a problem, or getting a desired effect. On the basis of their work, persistence and latency to on-task behavior were judged to be appropriate measures of toy exploration, defined as eagerness to explore a physical object and curiosity about how to make it work. The following describes the tasks chosen for the present study, and the method used for scoring toy exploration.

Materials. The Montessori Pink Tower, a modification of the Banta Curiosity Box and the Childcraft Knobby Robot were presented one at a time to the subjects. A stopwatch was used to time the subjects' latency and on-task and off-task behavior.

The Montessori Pink Tower consists of ten pink, wooden cubes varying in size from one cubic centimeter to one cubic decimeter. The task is described in the correspondence course of the St. Nicholas Training Center for the Montessori Method of Education (1974) as having the following purpose: "Visual and muscular perception of dimensions and an awareness and understanding of dimension and coordination of movement." The manual recommends presenting the task to children between the ages of two and one-half years and four years and requiring them to build a tower. Therefore, it was judged appropriate for the subjects of this study.

The Banta (1970) Curiosity Box was modified for use in this study. The Banta Box is a wooden box, 38 x 23 x 29 cm, containing such items as a slinky and nuts and bolts. A box the size of Banta's was constructed for this study; it contained the following items:

- Kiddicraft "Billie and His Barrels"--nesting barrels in which a small plastic lamb had been placed to add a rattling sound.
- Slinky of the small plastic type.
- Zippered, clear plastic make-up purse, in which a Matchbox truck containing two miniature pigs and three miniature lambs had been placed.

- 8" x 12" plastic covered metal board with 8 strong magnets-- red, yellow and blue--in the shape of stars, circles and arrows.

The Knobby Robot is a toy advertised in the Childcraft Catalogue, Spring, 1982. Its knobs invite manipulation, and four different effects can be achieved without any indication of what each knob does until it is tried. It was not for sale in retail stores and unfamiliar to the subjects in the study. The catalogue description reads: "Twist knobs (5 red and 2 yellow) and see the top knob make the eyes move. Yellow knobs make the arms rise. 'Heart' knob turns the robot's head. And 'Tummy' knob makes him taller." The item is over a foot tall and made of plastic.

Administration. The toys for these tasks were kept in the examiner's car until it was time for their presentation. As she gathered up the first carton of toys, she explained to the child: "I brought some other things I would like to see you play with before I go." The toys were not seen by the child until they were presented one at a time, in the following manner.

First, the examiner carried a wicker basket containing the Pink Tower over to the child and dumped the blocks on the floor in front of him, piling up three and removing them again while saying: "See, you do it; you see if you can pile these up." The examiner then clicked on the stop-watch and seated herself on a chair about three feet from the child.

The second the child began to look at, touch, or manipulate the blocks was written down in an "on" column and the second the child shifted interest to something else was written in an "off" column. This recording of the exact second of "on" or "off" behavior continued throughout the 180 second administration time for this task. Thus the examiner was able to total the number of seconds a child actually played with the toy, and express this as a percent.

The second toy presented was the Curiosity Box which was given to the child for 240 seconds. After gathering up the Pink Tower and putting it in an adjacent room, the examiner placed the Banta Box in front of the child and said: "Find out all the things you can do with this. Go ahead." Once again the seconds the child was "on" and "off" the task were recorded, yielding a final score of number of seconds the child engaged with the toy, expressed as a percent.

The Robot was presented last, after the Curiosity Box was removed. The Robot was kept in a bag until placed before the child by the examiner. "Find out what you can make this do," said the examiner as timing was begun. A period of 180 seconds was allowed for this task and then the examiner said: "Thank you for showing me all these things you can do. That is all the work we are going to do today."

Scoring. As described, the scores for all three exploration tasks were determined by recording the actual number of seconds that the child attended to the task, defined in terms of eyes or hands on the toy. The timing began the moment the examiner finished speaking and the stopwatch

was not clicked off until the total time allowed had elapsed. The total time the child spent on the task was summed after the administration of each task was completed. The data allowed for a latency to beginning the task to be calculated. The total time was then expressed as a percent of the total time allowed to yield a final score for each child with each toy.

The Michigan Developmental Profile

The Michigan Preschool Developmental Profile is widely used by developmental pediatricians and hospital-based developmental evaluation teams as a means of determining developmental delay and fitness for referral to an early intervention program. (See Appendix A for the definition of such a program in Massachusetts.) It is the instrument used to identify the target group in this study, a clinic population, work with whom led to the research questions. A description of the instrument is to be found in Appendix A.

Original plans to have a research assistant administer the Michigan Developmental Profile items to the normally developing subjects were abandoned because of a lack of funds to pay such an assistant. Therefore, while the teachers or therapists in the toddler program administered the Michigan to the delayed subjects as planned, within a month of the first observation, the investigator administered the Michigan to all the normally developing children. Testing was done at the end of the final contact with the child, one month after the first observation and when active involvement with a subject could not interfere with the observation.

Rating of Mothers' Pleasure

In order to assess the pleasure the groups of mothers were feeling in performing their roles as parents of the subjects, each one was telephoned following the second observation. Each was thanked for her participation and asked if she believed the observer had seen a typical time in her home. Before ending the call, the researcher inquired about her youngster's toy interests and then asked the following question: "If you were to sum up the experience of being the parent of your particular toddler, what would you say?" The mother's responses were repeated in question form to encourage her to elaborate, but no further questions were asked. The mothers' answers to this question were written down verbatim for later typing on index cards. Three experienced clinicians were asked to rate the responses on a seven-point rating scale with respect to "pleasure in parenting."

This technique for gathering data on mother's "pleasure" was chosen after a pilot study which is described in Appendix B.

The three clinician judges, each of whom had worked approximately twenty years as psychotherapist or teacher of psychotherapy, were given copies of the thirty mothers' quotations typed on separate cards. They were asked to sort the quotations independently according to the seven-point scale, diagrammed below.

Figure 1

Displeasure-Pleasure Continuum

2	3	6	8	6	3	2
Maximum Dis- pleasure	Medium Dis- pleasure	Mild Dis- pleasure	No Strong Pleasure or Displeasure	Mild Pleasure	Medium Pleasure	Maximum Pleasure (Joy)
Score 1	2	3	4	5	6	7

They were also given the following instructions:

"Think in terms of a normal distribution of scores along a 7-point rating scale of displeasure to maximum joy or pleasure. Read all thirty quotations, and as soon as you can, begin to sort them. First, select the two responses which suggest to you the most joy or pleasure in parenting. Place these at the Maximum Pleasure end of your sorting. Next, select the two responses which suggest to you the least joy or pleasure in parenting, and place these at the opposite end. Now pick eight responses which suggests to you neither extreme joy nor extreme displeasure, and place those in the middle of your sorting. Next, find six statements that suggest mild pleasure, and six that suggest mild displeasure; place these in the appropriate position, one on each side of the larger middle pile. Six cards will remain. These are to be sorted into two piles of three each, signifying "Medium Pleasure" and "Medium Displeasure" and placed in position next to the two ends of the continuum."

When the sorting was completed the three clinician judges reported the position or score assigned to each response, and discussed their differences, until a final position and score was agreed upon.

Reliability Measures

Reliability of Observation Codes

The reliability of the observation technique was established before data collection was begun and reassessed when two-thirds of the data had been collected. This was done by training two colleagues in the use of the instrument, and then calculating the agreement between two observers who observed simultaneously.

Three audio-cassette recordings of one-hour observations of two-year-olds, other than those in the study, were dictated by the investigator for use in training the two colleagues in the observation technique and coding system. The format for coding and definitions of the coded behaviors were discussed and then the investigator and colleagues listened to the tapes together. Each one coded as she listened, pausing to discuss disagreements. The training took approximately eight to ten hours. Following this, the two colleagues used the coding system to observe other two-year-olds of their acquaintance. Each reported feeling comfortable with the system before the reliability testing observations were scheduled.

Before the study began, three mothers and children between 18 and 28 months of age, other than those in the study or those used to make the above-mentioned tapes, were recruited for the reliability testing.

The mothers were given the same telephoned information and letter as the mothers of the children in the study, and in addition it was explained that two observers would be coming to their homes. On each occasion a pair of observers (the investigator and one colleague) observed and coded the behavior of the child and mother using the previously described technique. Following the observations, the percentage of agreement was calculated according to the following formula, described by Sears, Row and Alpert (1968).

$$\frac{2 \times \text{Number of Agreements}}{\text{Total Judgments Recorded by Both Judges}} \times 100$$

Percentage of agreement on the items recorded ranged from 75 to 100 percent. Tables 17-21 in Appendix B shows the findings from this reliability testing.

When the study was two-thirds completed, three other subjects between the ages of 24 and 28 months were recruited, and the reliability testing procedure was repeated with one of the previously trained colleagues. The results of this testing which are reported in Appendix B show a range of 80 to 100 percent agreement between judges (with the exception of one occasion, on which agreement was 75 percent).

There were three repeated problems during the reliability testing, as well as three issues which were discussed and resolved. These problems indicate some areas of potential confusion for users of the coded observation system and the complexity of having more than one observer in a child's home at one time. The repeated problems had to do with hearing the timing device, visibility of the child, and clarity of the

child's speech. Some disagreements between observers were not disagreements about what the child or mother did or the code, but disagreements about whether the incident occurred in one particular minute or the next, before or after the beeper sounded. These disagreements were disregarded. The second problem, visibility, had to do with the layout of the home. On two occasions, the observers were unable to sit where both had a good view of child and mother. The only disagreements in the over-space (#1) category occurred because of this. Finally, there was a problem because one of the observers had difficulty understanding two of the children, and could not always tell if the child was asking for something specific or telling something. This is the reason for disagreements in categories designated as information (#7) and physical help (#5). A further source of error, especially in the information (#7) category, resulted from the effort to have every single contact recorded, just as if the observer were tapping an event recorder. One observer reported finding this a most difficult thing to remember to do. The investigator believes this happened most when the observer became interested in the content of the verbal transaction.

There were certain categories about which there was little or no dispute. These included physical contact (#2, #3, #4) with the exception of when an observer missed seeing a child touch or pat the mother in passing. Passing (#8) something to mother was found easy to judge as was fret (#9) where the only disagreements came as a result of the observer taking the cue from the mother, and because she did not treat it as fretting, neither did the observer.

The observation criteria which needed the most clarification involved discriminating between these codes:

- (i) mother intervenes (#12) and mother gives alternative (#A)
- (ii) pass (#8) and show (#10)
- (iii) information (#7) and technical help (#6)
- (iv) technical help (#6) and physical help (#5)

Discrimination is made between mother intervenes and mother gives alternative by noting whether the mother moved physically toward the child to protect from hurt or harm, or whether she suggested an alternative without physically moving to protect something or someone. For example, a mother was considered to be intervening when she let the cat out because it was getting its tail pulled, or reached for and moved a plant that was being bumped by a tricycle, or put sketching pens on a high shelf as she saw them being reached for by her toddler. She might also say words like, "you may not use these" but she was not suggesting an alternative. Mothers were judged to be giving an alternative when they offered juice, although coke had been requested by the child, or passed some facecloths to fold when the child had pulled the towels from the clothesbasket.

Discrimination is made between pass and show by noting whether the child stayed by the mother and looked toward her face for a response. To show is to expect a response, but to pass is simply to place an item on or near the adult with no apparent expectation of a response.

Information is distinguished from technical help because in the case of the latter, there is an object which the child cannot make work.

In behaviors coded as information, the remark or statement made by mother to child has nothing to do with teaching the child how to do something for which he has asked for help. For example, a mother might say, "I'm going to put the wash on; I'll be right back" or the child might say "Daddy home," hearing a car, and these would be coded as information. When a mother says, "Push down" to tell the child how to turn on the waterspray, or "Put the little pegs in the spaces," as she shows him how to fit bristle blocks together, these remarks are part of the technical help she is giving and are coded as such.

Technical help is distinguished from physical help by remembering that a child is understood to need physical help when he knows what to do, but his size or strength prevents him from doing it--turning a door handle, reaching a toy on a shelf. As mentioned above, a child is considered to be asking for technical help when he does not know how to do something.

Finally, it was learned that when mothers and toddlers were involved with each other because of the child's need for diapering or toileting, the timing and behavior recording should be stopped because this specific behavior involves routine contacts determined by the mother directing the activity. For a similar reason, data on reading activity was excluded from the observations. Furthermore, with reading activity it was not clear whether children asked to be read to, because it meant mother would sit and provide them with physical contact, or whether they wished to be shown pictures, or given information about the story.

Reliability of Toy Exploration Scoring

The investigator developed the system of timing the toy exploration tasks with two colleagues who were not otherwise involved with this study. These colleagues observed the investigator through a one-way mirror while she gave the tasks to three toddlers who were not a part of the study, as the toddlers played in a family therapy room and their mothers read nearby, simulating a living room scene at home. Since the colleagues were seated approximately six to eight feet away from the child in an observation booth they reported some difficulty in seeing where the child was looking, although they could always see what he was doing with his hands. The administrator was seated to the left and in front of the child and approximately three feet from him. The mother was behind the child. The higher degree of agreement in timing reported by the two colleagues than between either colleague and the investigator supports the observation that position of observer affects timing. Table 21 in Appendix B shows the times assigned by the investigator and the observing colleagues.

Reliability of Mothers' Pleasure Rating

The method of assigning a Mothers' Pleasure Score has been discussed and the scores assigned by the three judges are recorded in Appendix C. Interjudge agreement was assessed by computing Pearson Product Moment Correlations. These are reported in the following table.

Table 2

Inter-judge Correlations

Judge A with Judge B	.6066
Judge B with Judge C	.7694
Judge A with Judge C	.7828
Mean Correlation	.7916

Statistical Treatment of Data

Differences among the groups were analyzed by Analysis of Variance and Chi Square. A difference was considered significant if the probability of its occurrence by chance was equal to or less than .05 ($p \leq .05$). The relationship between the children's contacting scores and the mothers' response scores was analyzed using the Pearson Product Moment Coefficient of Correlation and a correlation was considered significant if the likelihood of its occurrence was .05 ($p \leq .05$) or less.

HYPOTHESES

It was predicted that:

1. The age-matched and younger normally developing subjects would show more varieties of ways of contacting their mothers than would the delayed subjects, with the older, normally developing children showing the greatest variety.
2. The mothers of the normally developing subjects would show more varieties of ways of responding to their children's contacts than would mothers of the delayed children.
3. Mothers of normally developing children (both groups) would obtain higher pleasure ratings than would mothers of developmentally delayed children.
4. Normally developing children (both groups) would obtain higher mean toy exploration scores than would developmentally delayed children.

RESULTS

Varieties of Contacts of Children and Mothers

The hypotheses that the developmentally delayed children would show less variety than would normal children in the ways they contacted their mothers and that the mothers of delayed children would show less variety in their responses to their children than would the mothers of normally developing children were not upheld (see Appendix C). The mean number of varieties of contacts for the delayed group was 7.7 in the first observation and 7.3 in the second; for the age-matched children, it was 8.6 in the first observation and 7.6 in the second; for the Michigan-matched children, it was 8.1 in the first observation and 7.9 in the second. The mean numbers of varieties of responses from mothers were as follows: 5.4 and 5.1 for mothers of the delayed group, 5.4 and 6.2 for mothers of the age-matched group, 5.6 and 5.1 for mothers of the Michigan-matched group.

The variety score for the children was the number of categories, out of a potential of twelve, in which a child scored when observed to seek contact with his mother while she was busy with adult pursuits. The variety score for the mothers was the number of categories, out of a potential seven, in which the mother scored when she was observed responding to contact initiated by her child. If a child contacted the mother in several of the twelve different ways during an observation, his variety score would be high. If a mother responded in several of

the seven different ways, her variety score would be high. These results may have occurred because the method of measuring variety in contact between mother and child is too unrefined, or the hypotheses may be invalid. An alternative method of measurement was sought.

It was thought that while there was no difference between the groups in terms of the number of categories in which scores for the different groups fell (the variety score) there might be a difference between the groups in terms of the frequency distribution of scores within each category. If this were found it might suggest a need for a certain frequency of occurrence before a parent would experience a specific behavior as novel or as providing variety. Therefore, the distribution of scores for the normally developing, age-matched children was assumed to be the expected distribution, and chi-square tests were performed to compare the other two groups with these children. No significant differences in the distribution of scores were found.

Mothers' Pleasure in Interacting with Child

A significant difference was found between the pleasure scores received by the mothers of both groups of normally developing children and those received by the mothers of the developmentally delayed children. The Mean Pleasure Score for mothers of the delayed children was 2.8, and for mothers of the age-matched children it was 4.9, and for mothers of the Michigan-matched children, 4.1. The analyses of these differences are presented in Table 3. These findings suggest that differences in the amount of pleasure a mother feels in her job as a parent

may be related to the developmental appropriateness of her child, that is, whether or not her child's level of cognitive and social functioning is as advanced as that of most children this age.

Table 3

ANOVA Table of Mothers' Pleasure Scores

Source of Variation	Sum of Squares	df	Mean Square	F	Significance of F
Differences Between Delayed x Age-matched	22.050	1	22.050	11.504	.003
Differences Between Delayed x Michigan-matched	8.45	1	8.45	4.409	.05
Differences Between Age-matched x Michigan-matched	3.2	1	.20	1.524	.233

Children's Toy Exploration Scores

No significant differences were found between the groups in terms of the percentage of allotted time the children spent exploring the toys. The Mean Exploration Scores (in percents) are shown in Table 4. The results probably reflect the interest value the toys had for all the children rather than differentiating the groups.

Table 4
Mean Percents of Time Spent in Toy Exploration

	Pink Tower	Curiosity Box	Robot
Delayed Children	78.77	96.13	75.00
Age-matched Children	48.23	91.83	59.31
Michigan-matched Children	67.23	94.60	64.31

Significant Differences Among the Child Behavior Scores

Three of the twelve coded child behaviors have mean frequencies which show a significant difference between two or three of the groups of toddlers during one or both observations:

1. seeking technical help (age-matched normals > delayed children), during both observations;
2. joining the mother (age-matched > delayed > younger children), during one observation;
3. needs intervention (age-matched > delayed), during one observation.

The mean frequencies and the analysis of variance of the above results are reported in Tables 5 - 8. Analysis of the remaining nine behaviors is reported in Appendix D.

Significant differences were found between the developmentally delayed children and the normally developing children of the same age in frequency of seeking technical help from their mothers. The older normally developing children requested help to make an object work

Table 5

Mean Frequencies of Significantly Different Child Behavior Scores

	Delayed Children		Age-matched Children		Michigan-matched Children	
	Obs. 1	Obs. 2	Obs. 1	Obs. 2	Obs. 1	Obs. 2
Technical Help	1.4	.8	4.8	3.3	3.9	3.6
Joins	2.9	4.2	9.0	8.206	2.8	4.638
Needs Intervention	6.2	3.0	3.6	12.1	7.7	5.2

significantly more often than did the developmentally delayed children. The age-matched children had a significantly higher frequency than the delayed children did during both the first observation ($F = 5.475$, $p < .031$) and the second ($F = 5.619$, $p < .0289$).

During the first observations, the older, normally developing (age-matched) children were more likely to join their mothers in an activity than were the developmentally delayed children ($F = 4.72$, $p < .0433$), or the younger normally developing (Michigan-matched) children ($F = 4.327$, $p < .0521$).

The child behavior called needs intervention describes activity which requires the mother to physically stop or remove the child to protect him or something else. During the second observations, the age-matched children required such intervention significantly more often than did the delayed children ($F = 7.9042$, $p < .0115$). There was no significant difference between the older and younger normally developing children in needs intervention.

Table 6
ANOVA Tables of Significantly Different Child Behaviors
"Technical Help"

	Observation One			Observation Two		
	Sum of Square	df	Mean Squares	Sum of Square	df	Mean Squares
Age-Matched Groups	Between Groups	(1)	57.8	31.25	(1)	31.25
	Within Groups	(18)	10.5556	.7	(18)	5.5289
	Total	(19)	247.8	130.95	(19)	
F = 5.4758 Sig. = .0310* F = 5.6419 Sig. = .0289*						
Michigan-Matched Groups	Between Groups	(1)	31.25	39.2	(1)	39.2
	Within Groups	(18)	10.18	196.0	(18)	10.8889
	Total	(19)	214.55	235.2	(19)	
F = 3.0687 Sig. = .0968 F = 3.6 Sig. = .0739						
Normally-Matched Groups	Between Groups	(1)	4.05	.450	(1)	.450
	Within Groups	(18)	17.361	256.50	(18)	14.25
	Total	(19)	316.55	256.95	(19)	
F = .2333 Sig. = .6349 F = .0316 Sig. = .8609						

* p ≤ .05

Table 7
ANOVA Tables of Significantly Different Child Behaviors
"Join"

	Observation One		Observation Two	
	Sum of Square	df	Sum of Square	df
Age-Matched Groups				
Between Groups	186.05	(1)	174.05	(1)
Within Groups	708.9	(18)	1016.5	(18)
Total	894.95	(19)	1190.55	(19)
	F = 4.7241 Sig. = .0433*		F = 3.082 Sig. = .0962	
Michigan-Matched Groups				
Between Groups	.05	(1)	4.05	(1)
Within Groups	296.5	(18)	211.7	(18)
Total	296.55	(19)	215.75	(19)
	F = .003 Sig. = .9567		F = .3444 Sig. = .5646	
Normally-Matched Groups				
Between Groups	192.2	(1)	231.2	(1)
Within Groups	799.6	(18)	1037.0	(18)
Total	991.8	(19)	1268.2	(19)
	F = 4.3267 Sig. = .0521*		F = 4.0131 Sig. = .0604	

* P ≤ .05

Table 8
ANOVA Tables of Significantly Different Child Behaviors
"Need Intervention"

	Sum of Square	Observation One df	Mean Squares	Sum of Square	Observation Two df	Mean Squares
Delayed and Age Matched	Between Groups	(1)	33.8	414.05	(1)	414.05
	Within Groups	(18)	1014.0	942.90	(18)	52.3833
	Total	(19)	1047.8	1356.95	(19)	
				F = 7.9042		Sig. = .0115*
Delayed and Age Michigan Matched	Between Groups	(1)	11.25	24.2	(1)	24.2
	Within Groups	(18)	1631.7	421.6	(18)	23.4222
	Total	(19)	1642.95	445.8	(19)	
				F = 1.0332		Sig. = .3229
Michigan Matched & Age Matched	Between Groups	(1)	84.05	238.05	(1)	238.05
	Within Groups	(18)	790.5	1076.5	(18)	59.8056
	Total	(19)	874.55	1314.55	(19)	
				F = 3.9804		Sig. = .0614

* $p \leq .05$

In summary, these results show that the age-matched (or normally developing children) were more likely to seek technical help from their mothers than were delayed children. The older normally developing children were also found significantly more likely to find ways to join their mothers' activity, or be joined by them than were the delayed children. The delayed children did not differ significantly from the younger normal group (matched in developmental level) with respect to either of these variables. In addition, there was one occasion when the older normally developing children showed a significantly higher frequency of needs intervention than did the delayed children.

The frequencies of seeks information, or makes verbal contact, were high for all groups, but the groups did not differ from each other significantly in information scores, nor in the frequencies for contacting the mother over space.

The frequency of the child behavior called show (which describes a child contacting the mother to show her an object or action) was not significantly different among the three groups. Scores for pass (passing an object to the mother) were low for all groups, and the differences in amount of physical contact and physical help were not significant. Frequencies of the child behavior, fret (which describes whining and thus contacting the mother with a complaining frustrated sound), were not significantly different among the three groups.

Significant Differences among the Mother Response Scores

When the frequencies of the mothers' response scores for each group are compared, significant differences are seen in three of the seven response categories during one but not both observations:

- 1) mother responds immediately (mothers of age-matched normals > mothers of delayed children),
- 2) mother initiates activity (mothers of delayed children > mothers of age-matched normals),
- 3) mother gives alternatives (mothers of age-matched normals > mothers of delayed children).

The means and analysis of variance of these four categories are reported in Tables 9 - 12. The analysis of the scores for the three nonsignificant mother response categories are reported in Appendix D.

The mothers of the normally developing older children (age-matched) have significantly higher scores in the category, responds immediately, than do mothers of the delayed children during the first observation ($F = .1547, p < .0357$). No significant differences were found between the other groups in this regard.

Table 9
Mean Frequencies of Significantly Different Mother Response Scores

	Delayed Children		Age-matched Children		Michigan-matched Children	
	Obs. 1	Obs. 2	Obs. 1	Obs. 2	Obs. 1	Obs. 2
Responds immediately	39.3	36.8	52.0	48.2	54.5	48.8
Initiates activity	28.3	23.8	9.6	28.8	15.7	8.7
Gives alternatives	3.8	1.0	3.6	7.0	4.3	2.4

Table 10
ANOVA Tables of Significantly Different Mother Responses
"Responds Immediately"

	Observation One			Observation Two			
	Sum of Square	df	Mean Squares	Sum of Square	df	Mean Squares	
Age-Matched Groups	Between Groups	806.45	(1)	806.45	649.8	(1)	649.8
	Within Groups	2816.1	(18)	156.45	3149.2	(18)	174.956
	Total	3622.55	(19)	3799.0	3799.0	(19)	
		F = .1547	Sig. = .0357*		F = 3.7141	Sig. = .0699	
Michigan-Matched Groups	Between Groups	1155.2	(1)	1155.2	720.0	(1)	720.0
	Within Groups	5074.6	(18)	281.922	6165.2	(18)	342.51
	Total	6229.8	(19)	6885.2	6885.2	(19)	
		F = 4.0976	Sig. = .058		F = 2.1021	Sig. = .1643	
Normally-Matched Groups	Between Groups	31.25	(1)	31.25	1.8	(1)	1.8
	Within Groups	5986.5	(18)	332.583	5955.2	(18)	330.844
	Total	6017.75	(19)	5957.0	5957.0	(19)	
		F = .094	Sig. = .7626		F = .0054	Sig. = .942	

* p ≤ .05

Table 11
ANOVA Tables of Significantly Different Mother Responses
"Initiates Briefly"

	Observation One		Observation Two		
	Sum of Square	df	Mean Squares	Sum of Square	
				df	
				Mean Squares	
Age-Matched Groups					
Between Groups	1748.45	(1)	1748.45	125.0	(1)
Within Groups	5212.5	(18)	289.58	4315.2	(18)
Total	6960.95	(19)	4440.2	4440.2	(19)
	F = 6.0378 Sig. = .0244*		F = .5214 Sig. = .4795		
Michigan-Matched Groups					
Between Groups	793.8	(1)	993.8	1140.05	(1)
Within Groups	5434.2	(18)	301.9	2809.7	(18)
Total	6228.0	(19)	3949.75	3949.75	(19)
	F = 2.693 Sig. = .1233		F = 7.304 Sig. = .0146*		
Normally Matched Groups					
Between Groups	186.05	(1)	186.05	510.05	(1)
Within Groups	630.5	(18)	35.0278	2129.7	(18)
Total	816.55	(19)	2639.75	2639.75	(19)
	F = 5.3115 Sig. = .0333*		F = 4.3109 Sig. = .0525		

* $p \leq .05$

Table 12
ANOVA Tables of Significantly Different Mother Responses
"Gives Alternative"

	Observation One			Observation Two		
	Sum of Square	df	Mean Squares	Sum of Square	df	Mean Squares
Age-Matched Groups	Between Groups	.20	(1)	.20	(1)	180.0
	Within Groups	456.0	(18)	25.333	(18)	12.22
	Total	456.20	(19)	400.0	(19)	
		F = .0079	Sig. = .9302	F = 14.727	Sig. = .0012*	
Michigan-Matched Groups	Between Groups	1.25	(1)	1.25	(1)	9.8
	Within Groups	475.70	(18)	26.427	(18)	4.8
	Total	476.95	(19)	96.2	(19)	
		F = .0473	Sig. = .8303	F = 2.0417	Sig. = .1702	
Normally-Matched Groups	Between Groups	2.45	(1)	2.45	(1)	105.8
	Within Groups	364.5	(18)	20.25	(18)	15.9111
	Total	366.95	(19)	392.2	(19)	
		F = .121	Sig. = .732	F = 6.649	Sig. = .0189*	

* $p \leq .05$

During the first observations the mothers of the delayed children initiated activity significantly more often than did mothers of the age-matched children ($F = 6.0374, p < .0244$). During the second observations the mothers of the delayed children initiated activity significantly more often than did mothers of the Michigan-matched group ($F = 7.304, p < .0146$). Scores comparing mothers of the older and younger normally developing children with regard to initiating show that during the first observations, mothers of the younger normal children initiated more often ($F = 5.3115, p < .0333$) and during the second observation mothers of the older children tended to initiate more often but not significantly.

During the second observations the mothers of the older, normally developing children were significantly more likely to give an alternative than were mothers of the delayed children ($F = 14.727, p < .0012$) or mothers of the Michigan-matched children ($F = 6.649, p < .0189$).

No significant differences were found in the categories described as responds with hesitation, continuous initiation, acknowledges with alternative, or no response categories.

In summary, mothers of the age-matched, normally developing children showed a significant tendency to give an immediate response more often than mothers of the delayed children, and they more frequently gave alternatives in response to their children's contact. In one instance, the mothers of the delayed children were more likely to initiate activity with their children, but it was not clear whether mothers of the younger normally developing children initiated more often than

mothers of the older normally developing children.

Significant Correlations Between Child Behaviors and Mother Responses

Table 13 shows significant correlations between eight child behaviors and six mother response behaviors. (Correlations were not done with behaviors of very low frequency.) These findings will be discussed from the point of view of the child behaviors which tend to elicit a particular response from a group of mothers.

Mothers of the delayed and younger normally developing children were significantly likely to show no response to contact from their children over space, a response that might have been expected from all, because when the mothers are busy around the house, they may not see their children glancing at or watching them.

Mothers of the delayed and younger children gave responses significantly correlated with their children's request for physical contact. The mothers of the delayed children were unlikely to acknowledge with an alternative, and the mothers of the younger normals were.

Only mothers of the normally developing children (both age groups) gave responses significantly correlated with the child behavior, fretting and physical help. These mothers responded to fretting promptly or after hesitation or by giving an alternative or initiating activity. They responded to requests for physical help by giving alternatives in the case of the younger children and alternatives with an acknowledgment to the older children.

Table 13

Pearson Correlation Coefficients

Between Children's Contacting Behaviors and Mothers' Responses

		Mother Behaviors					
		Responds Immedi- ately	Responds with Hesit- ation	Acknowl- edges with Alternative	Gives Alterna- tive	No Response	Initi- ates
Over- space	D	.2586	.2586	.1810	-.0245	.6742*	-.2864
	A	.0212	.0832	.0552	-.0465	.2255	.1802
	M	.4040	.2404	-.0463	.0290	.6350*	.1973
Summed Physical Contact	D	.0219	-.310	-.5768*	-.3362	.3444	-.1774
	A	.1750	.2170	.2194	-.0581	-.4227	-.0176
	M	-.0500	-.1814	.5708*	.0864	.2870	.1973
Physical Help	D	.1520	.0485	.4620	.4517	-.2919	-.0597
	A	.4205	.4983	.8083**	.2663	.3170	-.1395
	M	.2308	.1151	.6389*	.9517***	.0909	.2534
Techni- cal Help	D	.2520	-.1213	.0599	.3696	-.2121	-.0681
	A	.2178	-.1883	.5363*	-.2608	-.6094*	-.1271
	M	.0744	.3331	.1630	.2250	-.5544*	.0409
Infor- mation	D	.7217**	.8776***	.6473*	.5490*	.4835	-.2457
	A	.3952	.0805	.2289	.3780	.7160**	-.0459
	M	.8840***	.8356***	.4725	.1539	.6851**	.7030**
Join	D	.4882	.5672***	.0555	.0685	.5849*	-.2644
	A	-.1367	.4023	.2110	.4947	.3236	.3470
	M	.2164	.0221	-.1752	.0150	-.0464	.3666
Frets	D	.3436	.0908	-.0202	.4875	-.4055	.3819
	A	.6110*	.0645*	.0794	.2723	.4106	-.0536
	M	.6451	.2657	.5732*	.5934*	.4742	.6013**
Needs Inter- vention	D	.5653*	.3683	.6128*	.9026***	.0909	.0909
	A	.7412**	.3208	-.1496	.4205	.1030	.2058
	M	.1029	-.3212	-.0419	.8053**	.1039	.2139

Note: D = Delayed Group; A = Age-matched; M = Michigan-matched.

* $p < .05$; ** $p < .01$; *** $p < .001$

Mothers of the developmentally younger children, normal and delayed (or older), tended to respond immediately or after hesitation to information, the verbal contact from their children. Mothers of the younger normally developing children might also initiate in response and mothers of the delayed children might give an alternative, but only mothers of the normally developing children (older and younger) were inclined to give no response to a verbal contact.

It has been mentioned that the delayed and normally developing subjects of the same age differed significantly in frequency of seeking technical help from their mothers, joining or being joined by them and in receiving intervention from them. Only mothers of the normally developing children had responses which correlated significantly with technical help. Mothers of both the older and younger normally developing children were found significantly unlikely to give no response to such requests, and mothers of the older normals also tended to give an alternative.

Scores of the normally developing children for join did not correlate significantly with responses of their mothers; however, for the delayed group, there was a significant positive correlation between requests to join and hesitation or no response from mothers.

When children needed intervention, mothers of the older children (delayed and normally developing) were likely to respond immediately. Mothers of the developmentally younger children (delayed and normally developing) tended to give alternatives.

Frequencies of Children's Contacting Behaviors at Beginning, Middle and End of Each Observation

The data were examined to see if the frequencies of the child's contact behaviors at the beginning, middle and end of each observation differed. This was done to see if any group habituated to the observation differently from another. Therefore the observations were divided into beginning (minute 1 through 13), middle (minute 14 through 27), and end (minute 28 through 40) period, and the percentage of times a coded response occurred during each of these intervals was calculated for each group. The data are reported in Appendix D. Inspection of graphs of this data showed no pattern of increased or decreased frequency for any group across all the coded behaviors. None of the children tended to consistently give more or fewer response at the beginning, middle or end of the time periods.

Total Frequencies of Contacting Behavior

The groups did not differ significantly in number of times any group of children contacted their mothers. Mean number of contacts of delayed children was 65.0; mean number of contacts of age-matched children was 82.9; and mean number of contacts of Michigan-matched children was 73.1.

DISCUSSION

The results of this study uphold the common-sense notion that mothers of developmentally delayed children derive less pleasure from parenting their toddlers than do mothers of normally developing children of the same age. The mothers' remarks in the interviews suggested that their worry about their children's slow development, especially of speech, lessened their enjoyment in their role of mother. The results of the study do not support the hypothesis that the developmentally delayed toddlers and their mothers would show fewer ways of contacting and responding to each other than would the normally developing toddlers and their mothers. Also, no significant difference was found between the delayed and the normally developing children in the number of contacts the children made with the mothers or how long the children spent exploring the novel toys presented.

The results do point to some important ways that the delayed male toddlers in this study differed significantly from the normally developing males of the same developmental level and from the normally developing males of the same chronological age. These differences had to do with why the toddlers initiated contact with their mothers and how their mothers responded. Two particular child behaviors which did show significant differences are joining the mother (called join) and asking for technical help with the toys. During the first observation period, the older, normally developing (age-matched) children, whose mean age was

30.6 months when first observed, tended to get their mothers to join their play or to allow them to join their mothers' activities significantly more often than did the delayed or younger toddlers. As a group, the developmentally delayed children showed significantly less joining behavior than did the age-matched normals, and in this respect the delayed children resembled the younger normally developing children (matched on Michigan Profile scores) whose mean age was 22.4 months at the time of the first observation. The developmentally older normal toddlers were the children who were most likely to get the mother to stop what she was doing and talk to their puppet, for example, or accept a pretend cup of coffee or play catch.

On the second observation (when the children were a month older) the age-matched children were also the ones who required more intervention than did the delayed children. It was the older normal children who pulled a chair up to the sink, climbed up and assumed that they too could wash dishes when the mother was. They saw to it that they were given turns to wield a vacuum wand, to take laundry out of the drier and to sweep the floor. That their need intervention scores were higher suggests that they were also the children who assumed they could put a log in the wood stove, pour water on the porch steps to wash them, use mother's drawing pen and ink or spray the insect repellent. In other words, they apparently needed more intervention, because their abilities and desires to perform more complex activities were greater than in the delayed children (although their judgment did not match their desires and abilities yet). The correlation coefficients show that the mothers

of the older (normal and delayed) children responded immediately when their children needed intervention. It is likely that these children can see more things and reach more things which are potentially harmful than can the younger children who were also physically smaller. When intervening, the mothers of the younger toddlers and the delayed toddlers gave their children more suggestions for alternative behaviors which could increase their behavior repertoire as well as help them learn approved substitute behaviors.

That the mothers of the delayed children were the only mothers who gave a response significantly correlated with their children's attempts to join their activities invites speculation. These mothers tended to give no response to such contacts from their children or to respond with hesitation. One wonders whether these mothers may have been especially vulnerable to having an observer in their home, because home teachers come to their homes as part of the participation in the infant-toddlers' stimulation group. This might have influenced their response to joining their children when an observer was present, but, as a later discussion will show, the mothers' remarks do not support this. Also, during the first observation, the mothers of delayed children tended to receive higher scores for initiating activities with their children, suggesting that they were not inhibited by the observer's presence nor were they especially alert to following instructions.

Brazelton, Koslowski and Main (1974) and Tronick, Als and Brazelton (1975, 1977) among others have emphasized the importance of reciprocity in social interaction between mothers and infants. Belsky, Good and

Most (1980) have reported that much learning occurs when children who are oriented to their mothers have their attention directed by her. If it is true that delayed children do not join their mothers' activities nor have her join theirs as frequently as their normally developing age-mates do, the delayed children's learning opportunities may be further jeopardized. Another way of considering these findings is by noting what is involved in the act of mother and child joining in the same activities. If the mother joins the child in play, she follows his lead, yielding her control, and if it is fantasy play, she suspends her reality to enter the reality of his play. If, however, the mother allows the child to join her, she takes seriously his effort to join the adult world, and she must take seriously his performance, even if it is less accomplished than hers. Delayed children may need special help from their mothers to facilitate their joining behaviors, and their mothers may need help in identifying why it is hard for them to do so (if indeed it is). The possibility that the mother's responses to her child's demand to join her activities is related to her perception of her child's competence has clinical importance. It may show her lack of belief in his capacity to learn through imitating or identifying with her. The child's lack of identification with her may affect her pleasure in him.

The delayed children resemble the younger normal children both in developmental level on the Michigan Profile and in the frequency of their join scores which suggests that joining may be related to developmental level. Joining in household tasks may make cognitive demands of

which a normal child of 22-23 months of age is incapable. We know that role play and fantasy play increase after the second birthday. It is puzzling to assess the role that developmental skills play in determining how a child seeks contact with the mother. There were no significant differences among the groups of children in the frequency of verbal contact with the mothers. However, the number of mothers' behaviors that correlated with the information category suggests that the mothers were especially responsive to this kind of contact. The fact that the groups did not differ in this respect suggests that language development (as measured on the Michigan Profile) need not affect how often a male toddler seeks or gives information to his mother verbally.

Developmental level did seem to affect the children's' technical help scores. The age-matched normally developing children sought technical help significantly more often than did the delayed children. (Mean frequencies for seeks technical help were higher, but not significantly so for the younger normal children.) The older normally developing children were the ones who frequently came to their mothers with behaviors which said, "How do I make this work?"

Furthermore, the mothers of both groups of normally developing children were significantly more likely to respond to the request to show or tell their children how something worked (technical help). The correlations show that the more their children requested technical help, the more likely these mothers were to respond, which implies that the mothers of normal children like to show or teach their children how to

do things. The mothers of the delayed children were more likely to respond to these requests with acknowledgement and by suggesting an alternative, which may be a teaching behavior. The important question is "Why do delayed children appear either to be less curious about how things work, or less likely to ask?" Are delayed children less curious or does their reluctance imply disbelief in their own ability to be shown how to do something? A child's expectations about himself or belief in his competence may be just as important as actual ability when it comes to trying to figure out how to do something with the mother's help. Field (1979, 1980) has commented that anxiety influences the way mothers of high risk infants behave toward them. It may be that the mothers of the delayed children in this study felt anxious about deficiencies in their children's' ability and defended themselves against disappointment by not encouraging them to ask questions about how things work. By behaving in this way, they would not stimulate curiosity in children who may not be showing high curiosity to begin with. These mothers may not have explained how the toys worked because they assumed (or feared) that their delayed children might not understand.

The frequencies of passing an object to the mother without communicating or seeming to expect anything from her (called pass) were low in all groups. It may be that this behavior is more common in younger toddlers and is a precursor of more complicated social behavior.

The frequency of looking or gazing or vocalizing to the mother over space did not discriminate among the groups, possibly because all of the children were mature enough to show these behaviors. It is interesting

that these behaviors often occurred when the child picked up a bottle or cup with spout, and began to suck. Although the mean frequency of physical contact was higher in the 22- to 23-month-old children, these differences were not significant by ANOVA. Mahler, Pine and Bergman (1975) have pointed out that frequency of physical contact with the mother during play diminishes as children reach the end of the third year.

In the category called show there were no significantly different frequencies among the groups, and it should be noted that the frequencies in this category may have been an artifact of the situation. After all, the observer had arrived with a box of toys which were probably new to the children, and this suggested the idea of showing the mother what had been brought. Also, showing toys to the mother frequently occurs in most babies of 12-15 months of age, so all of the children in the present study would have reached this level of communication.

The effect of an observer's presence was mentioned in discussing factors that might have made the mothers uneasy or self-conscious about joining their children or including the children in the mothers' activities. Three times the mothers had been given instructions not to initiate activity unless invited to by the child: by letter, by telephone and by the observer upon arrival. Nevertheless, the mothers did initiate activities with their children. The frequency of the mothers' initiation tended to be higher with the delayed group of children during the first observation and varied in the normally developing on different

occasions but not significantly. The correlations of mothers' initiations with the child behaviors show that mothers were most likely to initiate an activity when the children in the youngest group showed fretting or made verbal contact, but no other child behaviors were correlated with this response. Thus, the meaning of the mother's initiating behavior is not clear from these data unless the mothers were using it as a distracting device in the case of fretting.

When asked, no mother said her child had behaved differently than usual during the observation. "Pretty much as usual" was the frequent reply. Many of the mothers remarked that they were surprised by this and by how much they themselves had enjoyed the observation period. This may have been an expression of relief that their child's behavior had not been an embarrassment, but it seems more than that. Several mothers said the observation period had been "peaceful," although their child was "not really different." It is of clinical interest that although the observer had very little conversation with the mothers, except to exchange amenities and answer questions to expand upon information given about the study, many of the mothers said they would "miss" the observer's visits. It is suspected that the mothers identified with the observer and became watchers of their child's behavior, granting themselves an objectivity or distance and separateness from their child that felt enjoyable. Several mothers spontaneously told the observer that they had realized during the observations that they need not make so many suggestions to their child as he really did not need them. The children themselves readily ignored the observer after approximately the

first ten minutes, although some of them were more persistent than others in seeking a response or eye contact with the observer, and a few found a pencil and paper and sat down beside the observer to do as she did. On the second visit, the children showed that they remembered the toys and began immediately to check the box as if to see whether the same toys were there. Only one child did not seem satisfied when the observer responded to his overtures with "I can't talk with you now because I need to do my work while you play." The child said: "But why can't you talk to my mommy; will you later?" He was one of the older normally developing children in the study and the only one who also asked: "After, could you stay a little while to play with my toys?"

The children in the older groups were approaching their third birthdays when the second observations were made, and it was during the second observations only that significant differences were found among the groups with regard to the mothers' response: gives alternatives. Mothers of the normal 31- to 32-month-old children showed this response more often than did the other mothers, and the frequencies of this response in all groups were low, but it may mean as Korner (1974) has suggested that the child's age and the mother's understanding of the child's development determines the mother's responses. For mothers of the Michigan-matched and delayed children, the response, gives alternatives, correlated with needs intervention, but in the younger children it also correlated with needing physical help and frets.

Mothers of the younger children and the delayed children gave more responses which correlated with verbal contact with their children. It

seems logical that mothers would be especially sensitive to the speech behavior of children who are just learning to talk. The effects of the mothers' expectations and beliefs about their children was raised in the discussion of join and technical help. If it is true, as this study suggests, that delayed toddlers are less likely than normally developing toddlers to seek help from their mothers to be shown how to do things and are also less likely to seek to join her in practical activities or to involve her in their role playing, does the presence or absence of these behaviors affect the pleasure the mother feels in parenting her child? Jones (1979) demonstrated that mothers of Down's Syndrome children had to learn how to interrupt their infants' vocalizations in order to provide the imitative response mothers of normally developing babies are stimulated to give by the pauses their babies provide. Is there a similar need for mothers of delayed toddlers, such as those in this study, to actively seek chances to follow their child's lead in play, to imitate him, or to encourage him to try to figure out how to make things go or work? Do these mothers also need help to find out how to respond and what to respond to?

Tyler, Kogan and Turner (1974) wrote of the need to find ways to prevent what they called "affect turn off" in parents who are discouraged about the lack of progress in their delayed children. As early as 1967, Moss wrote of the "mutual reinforcement" between babies and mothers. It is not clear whether the delayed children in this study showed significantly less join and technical help behaviors because they did not initiate these behaviors on their own or because the mothers had

not reinforced these behaviors. It does seem important that people working with delayed children and their families explore the situations where such interactions between mothers and children could occur and try to discover how easy or difficult they are to facilitate and whether these behaviors enhance the pleasure of parent and child in each other.

Since the completion of the data analysis, the investigator has had the opportunity to consider this question while working clinically with two mothers who have children with mild motor delay. One of the children, a four-year-old boy who is receiving occupational therapy, was referred to the writer because of an oppositional disorder. When asked whether, as a toddler, her son had attempted to help with any household tasks or whether he did so now, the mother replied emotionally that he had never wanted to be doing things along with her. She speculated upon how quick she is to do everything herself and how the parents always thought this little boy was a "klutz." At the same time, she said she had always wanted to do things with him. Facilitating joint activity has been a goal of my treatment of this mother and child, and recently the child spontaneously suggested that he would fix the hamburgers for a "cook-in." His mother was surprised but prepared to go along and was able to show him how to shape the patties. In the case of the second child, a ten-year-old, the mother was asked to recall whether or not her son, as a toddler, had ever asked her to help him figure out how something worked or to involve himself with her activities. She was tearful as she said that he was the only member of the family who had never wanted to be involved in her household tasks or wanted to try to make

things work. She was sad that the only thing they ever shared was reading stories together, and he still will not let her show him how to do things around the house.

The joining behavior described in this study involves imitation of child and mother. The child's ability to imitate is necessary for his adaptation to life and conveys a message of acceptance and validation to the parent. In 1954 Donald Hebb discussed the fear in human societies of behavior which is different, and he described the process of socialization as providing "a protective cocoon of uniformity" which reduces such fear. In clinical work with parents of developmentally "different" children, the likelihood of the parents' fear about their children's differences may have to be addressed in a way that can relieve their anxiety about encouraging joint activity.

LIMITATIONS OF THE STUDY AND HEURISTIC VALUE

The major limitation of this study is that the qualitative aspects of the differences among the groups was lost in recording by code, a method which was found necessary to allow the study to be done at all as a doctoral dissertation. After tape-recording the observations of a group of subjects, it was decided that the time and money involved in transcribing and coding the tapes would make this method impractical to use. If it had been possible to use recordings of the specific methods the children used to contact their mothers verbally or of their specific uses of the toys, certainly the behaviors of the age-matched normal subjects would have been more complex and possibly different from those of the delayed and younger normal subjects.

The results of this study (as with most studies using human subjects) must be considered within the limits of the population represented by this specific sample (see Appendix A). All mothers were volunteers (therefore the sample was selective), and the sample sizes are small. The subjects were from a particular area of the country, were from intact homes, were all males, and were only mildly delayed. Thus the differences reported between the ways normal and developmentally delayed male toddlers relate to their mothers may apply only to a population of mildly delayed male toddlers in two-parent semi-rural families living in New England. The groups were balanced with respect to occupational category of father but not with respect to number of

siblings, an imbalance which occurred because more parents of only children volunteered to take part in the study. The influence of siblings on the variables examined is unknown but may be significant.

In addition, the delayed subjects were chosen only on the basis of their performance on the Michigan Developmental Profile. Hence these findings are descriptive of toddlers who are more than 6 months delayed on the language part of the Michigan and one other of the three parts: cognition, self-help, or social-emotional development.

Despite these limitations, the results of this study may shed some light on the nature of social differences between delayed and normal toddlers and their mothers which the investigator has observed clinically and which should be explored further.

The findings that the delayed toddlers differed from the age-matched normal toddlers in the degree to which they joined their mothers in activities and sought help to make things work makes one wonder whether the mothers differed in the degree to which they expected such things from their toddlers. This question reveals a further limitation of the study, in that no assessment of the mothers' expectations was made during the final interview. This is unfortunate, because there is no way to verify what the findings suggest about the mothers' beliefs about this. Consequently, there is a need not only to replicate the study with different criteria for developmental delay, with more control of sibling influence, and in subjects from different socio-economic levels or family life-styles, but also with more complete follow-up questions for mothers. Mothers might be questioned about how highly

they value the parent's role as teacher and what things they would choose to teach. They might be asked about what activities they would welcome having their toddler join.

It is tempting to conclude that the lesser degree of pleasure in parenting expressed by parents of delayed children is related to the fact that delayed children and their parents may not have found ways to share in the exploration and performance of practical life activities as much as normally developing toddlers and parents have done. The mothers of delayed children may seldom try to help them learn by letting or encouraging them to share in their activities and by showing or explaining to them "how things work." This study has focused attention on these kinds of reciprocity between toddlers and mothers at home, and further research is needed to verify and extend the findings.

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APPENDIX A

Letter to Parents of Prospective Subjects

This letter was given to parents of the infant-toddler stimulation programs and left beside posters in pediatricians' offices.

Dear Parent:

As part of the requirements for a doctoral degree in Child Development, I am undertaking a study of what two-year-old children do, and how they react, when alone at home with their mothers. I would like to be able to include your child in my study.

Researchers are discovering the importance of studying a child in his own surroundings. My purpose is to contribute to our understanding of differences in the ways children have of busying themselves at different stages when their mother is present and available to them, but not doing something special with them, unless they ask her to do so. At the end of the observations I will be calling you to ask if I saw a typical day. The results of my study will be shared with you when completed.

The following outlines exactly what would happen if you are interested in participating.

1) If you are interested, please mail the attached form to me (stamped envelopes are provided) and I will telephone you to answer any questions you may have about the study. I will let you know whether your child's age and sex matches the requirements of the study, or if that quota is filled, by the time I talk with you. (The groups of toddlers I am studying are being matched for sex and age.)

2) I may telephone a second time to arrange a day and time for coming to your home to observe your child.

3) I will come to your home at the agreed upon time bringing with me a few toys which your child may use while I am there--if they happen to interest him at the time. I will be at your home approximately one hour.

4) After you and I talk briefly, I will sit down where I can see both you and your child, and try to be as invisible as possible, while I record your toddler's activities. (Because I seem to ignore them, the toddlers soon ignore me. I simply tell them that I am doing my work,

and that I am interested in how children play.

5) It is important that the mother go about her house as usual, although remaining, as much as possible, where her toddler can see her. She might be reading, folding laundry, drinking coffee, washing dishes, sewing, or making a grocery list. It is your child's activities that I will be watching. I need you to be present to do things with him, only if he requests it.

6) I will schedule a second observation approximately one month after the first.

7) At the end of the second observation I will ask your child to perform three specific activities and a variety of simple games or tasks while I observe him. This will take about 20 minutes.

8) Finally, I will telephone, when the observations are completed, to learn whether I saw a typical day at your home.

If you are interested in participating with your toddler in this study, please fill out, tear off, and mail the form provided below. (Stamped, addressed envelopes are available at the desk.)

Sincerely,

Sheila M. Kelly

I am interested in participating with my two-year-old in child development study:

Name: _____

Telephone Number: _____

Birthdate of my two-year-old: _____

Birthdate and sex of my two-year-old's brothers and sisters:

1) _____

2) _____

3) _____

Excerpt from Guidelines for REACH PROGRAM--The Early Intervention
Program of Which the Target Group are Members

DEFINITIONS

EARLY INTERVENTION

All but three of the early intervention programs described in the Project WELCOME Early Intervention Director is funded, either singly or jointly, by the Massachusetts Department of Public Health. The two agencies have collaborated to develop the definition of early intervention which follows.

Early intervention provides community-based services to infants and children from birth to three years of age who have identified handicapping conditions or who are at risk for developmental delays due to biological, established or environmental factors. The goals of early intervention are to assist a child to achieve and function at his or her optimal developmental level.

Description of Michigan Developmental Profile

The so-called "Michigan" is an early intervention profile derived by checking off whether a child is able to perform certain behaviors, categorized in six areas: perceptual/fine motor, gross motor, cognition, language, social/emotional, self-care. The items for each category were chosen from measures used on earlier test instruments with the goal of having one individual rapidly assess a child's level. The developers of the test, Rogers, D'Eugenio, and their colleagues wished to relate a profile assessing a toddler's needs to specific services available through funded educational programs. The manuals which accompany the profile provide behavioral goals for teachers in each of the areas assessed. Four areas are of interest for the subjects of this study (the motor areas were not used): cognition, language, social/emotional, self-care. The authors of the test report the following correlation coefficients between developmental levels attained on the Michigan Profile in these areas and on other scores obtained on other standardized tests.

Profile Scale Score on Cognition correlated with the Bayley Scale
.96

Profile Scale Score on Cognition correlated with the Vineland Scale
.90

Profile Scale Score on Language correlated with the Bayley Scale
.90

Profile Scale Score on Language correlated with the Vineland Scale
.85

Profile Scale Score on Social/Emotional correlated with the Bayley Scale .96

Profile Scale Score on Social/Emotional correlated with the Vineland Scale .91

Profile Scale Score on Self-Care correlated with the Bayley Scale .80

Profile Scale Score on Self-Care correlated with the Vineland Scale .77

The revision of the Michigan, in use since December 1975, includes items for children between 0 and 36 months. Each age grouping covers a three-month span in the first year and a four-month span in the second and third years. The testing focuses on one area of development until a child fails six consecutive items, or all items in two age spans. This establishes a ceiling for that child. The basal level is the level which precedes a child's first failure.

Two methods of scoring are suggested by the authors. One requires the recording of all passed items on a graph, marked off at each age level in months. A second scoring method requires the recording of both items passed and those almost passed (scored PF). The authors suggest a means of averaging the score to arrive at a "condensation" of all scores. The score PF was not used in this study and only the items a child clearly passed were marked on the graph. A subject was judged to be at a certain developmental level only if all items at that level were passed. In other words, a subject's basal level of functioning was used to determine his developmental level in each area, and of the four levels assessed the lowest of the number of months at the upper end of the basal score was used, rather than manipulating the scores arithmetically. For example, a child obtained basal levels as follows on the Michigan profile:

Cognition:	24-27 month level
Language	20-23 month level
Social-Emotional:	20-23 month level
Self-Care	20-23 month level

Therefore his Developmental Level was arbitrarily determined to be 23 months--the highest number of months at his basal level. The authors of this scale note emphatically that the developmental levels obtained on the Michigan do not indicate a mental age. The terms mental age or developmental age are not used, although the assessed levels of functioning are stated in months.

Table 14. Employment Classification of Subject's Fathers

Group I Developmentally Delayed	Group II Age-matched	Group III Michigan-matched
Owner of Restaurant	Bank Manager	Owner of Automobile Business
Union Administrator	Factory Supervisor	Factory Supervisor
Physician	Physician	Manufacturing Company Executive
Telephone Co. Executive	Prep. School Teacher	High School Teacher
College Security Guard	Telephone Co. Lineman	Psychiatric Hospital Aid
Plant Administration	High School Teacher	Journalist
Factory Machinist	Builder	Small Lumber Mill Owner
Retail Salesman	Retail Salesman	Retail Salesman
Mill Worker	Factory Worker	Factory Worker
Factory Machinist	Fireman	Mechanic

The groups were balanced in terms of socio-economic level shown by fathers' employment: professional; white collar; skilled and unskilled labourers. All the families but two lived in a single family home. These two families were both professional (physician and prep. school teacher) and lived in large apartments.

Table 15. Sibling Pattern of Subject's Families

# of Children in Family	Subject's Position	Group I Developmentally Delayed	Group II Age-matched	Group III Michigan-matched
1	First Born	1	4	4
2	First Born with Toddler Sibling	2	0	0
2	First Born with Infant Sibling	0	1	1
2	Second Born with 4-5 yr. (kgn.) old Sibling	3	1	2
2	Second Born with 6-8 yr. old Sibling	2	2	1
3	Second Born with Infant and 6-8 yr. old Sibling	0	1	1
3	Third Born with 7-8 & 10-12 yr. old Sibling	1	1	0
4	Third Born with 2 14-16 yr. and Infant Sibling	0	0	1
4	Fourth Born with 2 14-18 & 2 10-12 yr. old Siblings	1	0	0

The table shows the number of children in each group who belong to the kind of family described by the columns on the left. It is evident that the groups are not balanced in terms of the sibling pattern of the subjects' families.

Group I contains one only child; two first-born children with one younger, walking sibling; five second-born children with one latency-age, pre-school or kindergarten-age sibling; one third-born child with one latency-age and one pre-teen sibling, and one fourth-born, youngest child with two teenage and one pre-teen sibling.

Group II contains four only children; two first-born children with infant siblings; three second-born children with pre-school and kindergarten-age siblings; one third-born child with latency-age and pre-teen siblings, and no fourth-born children.

Group III contains three only children; one first-born child with an infant sibling; three second-born children with pre-school or kindergarten age siblings; one second-born child (in a three-child family) with one kindergarten age and one infant sibling; one third-born child, with two teenage siblings and an infant sibling.

Table 16. Design of Coding Form

Actual coding sheets were 22 by 17 inch graph paper marked in 1/2 by 1 inch rectangles. The top 1/2 inch square was used to check the occurrence of the child's behavior and the bottom 1/2 inch was used to record the code for the mother's response. The bottom was turned up and the sheet was folded in half to fit a legal size clip board.

		Minutes																
Observation	Codes	1	2	3	4	5	6	7	8	--	33	34	35	36	37	38	39	40
1.	OS	c																
		m																
2.	PC	c																
		m																
3.	EPC	c																
		m																
4.	PPC	c																
		m																
5.	PH	c																
		m																
6.	TH	c																
		m																
7.	I	c																
		m																
8.	P	c																
		m																
9.	J	c																
		m																
10.	S	c																
		m																
11.	F	c																
		m																
12.	NI	c																
		m																
Mother																		
Initiates																		

The numbers across the top indicate the minutes. The letters down the side represent the child behavior codes: overspace; physical contact (of 3 different durations); physical help; technical help; information; pass; join; show; frets; needs intervention. The c shows where the child behavior was checked and the m the place where the abbreviation for the mothers responses were filled in: RI, RH, A/A, A, NR. These letters stand for: Responds Immediately, Responds with Hesitation, Acknowledges with Alternative, Alternative, No Response. The last line allowed space for checking if the mother initiated (I) an activity with the child, and if she prolonged such initiation (PI).

APPENDIX B

Table 17. Percentage Agreement Between Observers of Child Behaviors Before Study

Item	Occasion	Pair	# of Judgements	# of Agreements	Percent
I	1	A	6	3	100
	2	A	14	6	78
	1	B	16	6	75
	2	B	21	10	95.2
II	1	A	10	5	100
	2	A	7	3	85.7
	1	B	6	3	100
	2	B	6	3	100
III	1	A	0		
	2	A	2	1	100
	1	B	4	2	100
	2	B	0		
IV	1	A	0		
	2	A	0		
	1	B	0		
	2	B	0		
V	1	A	37	17	91.8
	2	A	2	1	100
	1	B	14	7	100
	2	B	23	11	95.6
VI	1	A	5	2	80
	2	A	0		
	1	B	6	3	100
	2	B	2	2	100
VII	1	A	40	20	100
	2	A	25	10	80
	1	B	14	7	100
	2	B	16	8	100
VIII	1	A	7	3	85.7
	2	A	0		
	1	B	6	3	100
	2	B	12	6	100
IX	1	A	0		
	2	A	18	9	100
	1	B	0		
	2	B	2	1	100

Table 17. Percentage Agreement Between Observers of Child Behaviors Before Study (continued)

Item	Occasion	Pair	# of Judgments	# of Agreements	Percent
X	1	A	8	3	75
	2	A	4	2	100
	1	B	0		
	2	B	2	1	100
XI	1	A	4	2	100
	2	A	0		
	1	B	10	4	80
	2	B	0		
XII	1	A	10	5	100
	2	A	4	2	100
	1	B	14	7	100
	2	B	10	5	100

Toddlers observed were not subjects.

Each occasion represents 40 time periods.

Each pair include the investigator and a trained colleague.

Table 18. Percentage Agreement Between Observers of Child Behaviors at Midpoint of Study

Item	Occasion	# of Judgments	# of Agreements	Percent
I	1	0		
	2	18	9	100
	3	8	4	100
II	1	2	1	100
	2	11	5	90.9
	3	2	1	100
III	1	0		
	2	4	2	100
	3	0		
IV	1	0		
	2	0		
	3	0		
V	1	0		
	2	16	8	100
	3	7	3	85.7
VI	1	3	3	100
	2	0		
	3	12	6	100
VII	1	145	68	93.7
	2	28	14	100
	3	26	12	92.3
VIII	1	0		
	2	0		
	3	0		
IX	1	61	30	98.3
	2	32	15	93.7
	3	2	1	100
X	1	74	36	97.3
	2	15	7	93.3
	3	16	14	87.5
XI	1	0		
	2	10	5	100
	3	20	10	100
XII	1	0		
	2	2	1	100
	3	8	4	100

Toddlers observed were not subjects.

Each occasion represents 40 time periods.

The same pair (Investigator and trained colleague) made each observation.

Table 19. Percentage Agreement Between Observers of Mother Responses Before Study

Item	Occasion	Pair	# of Judgments	# of Agreements	Percent
Responds Immediately	1	A	148	72	97.3
	2	A	53	25	94.3
	1	B	71	31	88
	2	B	66	31	80
No Response	1	A	0		
	2	A	0		
	1	B	4	2	100
	1	B	8	4	100
Responds with Hesitation	1	A	5	2	80
	2	A	0		
	1	B	4	2	100
	2	B	4	2	100
Acknowledges and Gives Alternative	1	A	18	9	100
	2	A	4	2	100
	1	B	8	4	100
	2	B	4	3	100
Gives Alternative	1	A	0		
	2	A	0		
	1	B	0		
	2	B	4	4	100
Mother Initiates	1	A	10	4	80
	2	A	0		
	1	B	25	11	88
	2	B	5	2	80

Each occasion represents 40 times periods. Observations were made at the same time as the child observations.

Table 20. Percentage Agreement Between Observations of Mother Responses at Midpoint of Study

Item	Occasion	# of Judgments	# of Agreements	Percent
Responds Immediately	1	254	124	97.6
	2	51	25	98.0
	3	93	40	94.6
No Response	1	18	9	100
	2	2	1	100
	3	4	2	100
Responds with Hesitation	1	4	2	100
	2	2	1	100
	3	4	2	100
Acknowledges and Gives Alternative	1	2	1	100
	2	2	1	100
	3	2	1	100
Gives Alternative	1	0	0	
	2	0	0	
	3	0	0	
Mother Initiates	1	57	26	91.2
	2	57	28	98.7
	3	53	25	94.3

Each occasion represents 40 time periods.

The same pair (investigator and trained colleague) made each observation.

Table 21. Timing of Toy Exploration in Seconds by Investigator and Two Colleagues

Toy	S	Investigator	Colleague A	Colleague B
Tower	1	111	113	113
	2	134	135	137
	3	142	142	142
Box	1	228	230	230
	2	240	240	240
	3	234	230	236
Robot	1	90	92	92
	2	84	85	87
	3	26	28	28

Three toddlers who were not subjects were used for this test of the technique. The similarity of the times assigned by colleagues A and B, who were seated side by side in an observation booth, is noted. The investigator was seated only three feet away from the child and her stopwatch tended to be stopped earlier, probably because the child's action was seen earlier.

Description of Pilot Study Leading to Method
of Rating Mothers' Pleasure

During a pilot study three mothers were video-taped in a clinic setting talking with me about their toddlers. The interviews were open-ended and 20 minutes in length. After being asked about her child's responses to strangers, new foods, sleep habits, and play patterns, the mother was asked: "In general, how has it been to be the mother of?" The final ten minutes of the taped interviews was shown to experienced clinicians at a later time and they were asked to independently rate the mothers in terms of "pleasure in parenting" and to describe the criteria they believed they used as a basis for their rating. Each clinician judge was shown all three interviews in the following arrangement: (1) both video and audio; (2) audio only; (3) video only. The clinicians reported that they found they relied mostly on audio information. The video was actually distracting; no closeups were available and they felt they missed things when they attended to both video and audio. The mothers themselves reported feeling uneasy while being video-taped. Thus, it was concluded that the time and effort involved in bringing mothers to the clinic or in going to their homes with video-pack were excessive for the amount of information that would be gained.

A simple telephone technique was piloted with three mothers who knew nothing about the study except that one was in process. I sought their opinion about what toys most interested two-year-olds and then asked: "If you were to sum up the experiences of being the parent of a two-year-old, what would you say?" Their answering remarks were typed on index cards and shown to experienced clinician judges who had no trouble rank-ordering the responses in terms of "pleasure in parenting," so this technique was used for the study.

APPENDIX C

Table 22. Children's Variety Scores for Each Group

Group I Delayed		Group II Age-matched		Group III Michigan-matched		
Obs. 1	Obs. 2	Obs. 1	Obs. 2	Obs. 1	Obs. 2	
5	8	8	9	9	9	
8	6	9	8	8	8	
7	9	10	9	7	6	
9	4	9	7	8	8	
9	7	7	6	8	10	
9	6	6	8	9	4	
8	8	10	8	6	10	
9	9	10	6	8	8	
6	7	8	7	10	8	
7	9	9	8	8	8	
Means	7.7	7.3	8.6	7.6	8.1	7.9

These scores show the number of categories in which each child scored during each observation.

Inspection shows an insignificant difference between the means for each group.

Table 23. Mothers' Variety Scores for Each Group

Group I Delayed		Group II Age-matched		Group III Michigan-matched		
Obs. 1	Obs. 2	Obs. 1	Obs. 2	Obs. 1	Obs. 2	
4	6	6	6	6	3	
4	4	6	7	6	5	
6	5	4	5	6	5	
7	5	5	7	7	5	
5	5	5	6	7	6	
6	5	6	6	6	6	
5	5	6	6	5	4	
6	5	4	6	3	5	
6	6	6	6	5	7	
5	5	6	7	5	5	
Means	5.4	5.6	5.4	6.2	5.6	5.1

These scores show the number of categories in which each mother scored during each observation.

Inspection shows an insignificant difference between the means for each group.

Table 24. Percentage of Allotted Time Each Child Explored Toy and Group Means

	Subject #	Tower	Curiosity Box	Robot
Group I Delayed	1	100%	100%	100%
	2	100	100	100
	3	100	100	100
	4	100	100	100
	5	100	100	100
	6	44.4	100	51.67
	7	68.3	83.3	45.5
	8	100	100	12.77
	9	40	77.9	40
	10	35	100	100
Group II Age-matched	11	41.6	100	100
	12	56.5	100	30
	13	31.6	55	27.7
	14	72.2	100	66.6
	15	100	100	34.4
	16	88.8	100	100
	17	4.4	100	60
	18	40	100	100
	19	30.5	63.3	23.3
	20	16.6	100	51.11
Group III Michigan- matched	21	74.4	80	26.6
	22	95.5	100	48.3
	23	65.5	91.6	32.2
	24	100	74.2	88.8
	25	52.2	100	100
	26	63.8	100	100
	27	23.8	100	100
	28	100	100	100
	29	68.3	100	65
	30	28.3	100	12.2
Means - Group I		78.77	96.13	75
Group II		48.23	91.83	59.31
Group III		67.23	94.6	64.31

Table 25. Pleasure Ratings Assigned by Each Judge and Agreed Upon Score

	Subject #	Judge A	Judge B	Judge C	Agreed Upon Score
Group I Delayed	1	5	3	3	3
	2	5	4	5	5
	3	1	2	2	1
	4	1	2	1	1
	5	4	4	4	4
	6	3	5	4	3
	7	2	1	1	2
	8	5	3	4	4
	9	2	3	4	2
	10	1	5	2	3
Group II Age-matched	11	4	4	3	5
	12	5	6	5	4
	13	4	4	3	4
	14	7	6	6	7
	15	6	3	4	5
	16	6	6	7	6
	17	3	4	4	4
	18	5	7	5	6
	19	6	5	5	6
	20	4	5	4	4
Group III Michigan-matched	21	7	7	7	7
	22	2	2	3	3
	23	3	1	2	2
	24	3	4	4	4
	25	4	4	3	4
	26	3	3	3	3
	27	4	3	4	3
	28	4	5	5	5
	29	4	5	6	5
	30	5	4	6	5

Samples of Mothers' Responses to Pleasure Question
With Assigned Pleasure Rating

Assigned Score 7, A Group 3 (Michigan-matched) Mother.

"It's wonderful, he can make you so happy and other times you feel so sad for him. He's thoughtful even though he can get frustrated. I think he's perfect. It's a great age. He's always finding out new things.

Assigned Score 7, A Group 2 (Age-matched) Mother.

"Oh it has all just been a lot of fun. We just think he's pretty great even since the baby came. We enjoy him."

Assigned Score 6, A Group 2 (Age-matched) Mother.

"It's been a lot of fun, something new everyday. I've been surprised at how much phantasy play he has shown. It gets very complicated. I think he has more phantasy than some of the other children his age. Maybe because he's an only child. I love listening to him."

Assigned Score 5, A Group 3 (Michigan-matched) Mother

"Well, it's got nicer and nicer as he's gotten older because they can talk to you more and I really enjoy that!"

Assigned Score 4, A Group 2 (Age-matched) Mother

"It hasn't been as negative a time as I expected. I was thrilled with him when he was born and it just gets better and better. It balances out, in some ways it gets easier and in other ways harder, yeah it balances out."

Assigned Score 4, A Group 1 (Delayed) Mother.

"It's alot easier now than when he was a baby because he was really colicky. He's a good boy. He gives me no trouble."

Assigned Score 3, A Group 3 (Michigan-matched) Mother.

"It gets easier because they understand more. They take a lot of energy and he has more than I. It gets easier the older he gets, but every month is easier. Two-year-olds are a lot easier than infants. They can tell you what's bothering them."

Assigned Score 2, A Group 1 (Delayed) Mother.

"Mostly it's been a trying of my patience. He is a real clinger, different from his brother and very stubborn and quiet. That's just the way he is although he is very loving and would rather be with me than anyone else."

Assigned Score 1, A Group 1 (Delayed) Mother.

"Hectic! He's a very demanding child. I had to be with him all the time. As he has begun to get more language it has got easier. But, hectic!"

Assigned Score 1, A Group 1 (Delayed) Mother.

"Oh gosh, I don't know what to say. Oh God... I'm trying to think whether I should say things got better. We're still having trouble with potty-training. We thought our older son was worse until this one hit two. He's not really BAD, he's full of energy and you have to chase him all the time, but he's very loving, too. My daughter was the easiest. The boys have been harder."

APPENDIX D

Table 26
ANOVA Tables of Nonsignificant Child Behavior Variables
"Overspace"

	Observation One		Observation Two	
	Sum of Square	df	Sum of Square	df
Age-Matched Groups				
Between Groups	72.2	(1)	14.45	(1)
Within Groups	721.0	(18)	429.3	(18)
Total	793.2	(19)	443.75	(19)
	F = 1.8025	Sig. = .1961	F = .6059	Sig. = .4465
Michigan-Matched Groups				
Between Groups	125.0	(1)	6.05	(1)
Within Groups	127.8	(18)	474.9	(18)
Total	1396.8	(19)	480.95	(19)
	F = 1.7691	Sig. = .2001	F = .2293	Sig. = .6378
Normally-Matched Groups				
Between Groups	7.20	(1)	1.80	(1)
Within Groups	803.0	(18)	402.4	(18)
Total	810.2	(19)	404.2	(19)
	F = .1614	Sig. = .6926	F = .0805	Sig. = .7798

Table 27

ANOVA Tables of Nonsignificant Child Behavior Variables
"Brief Physical Contact"

	Sum of Square	Observation df	Mean Squares	Sum of Square	Observation df	Mean Squares	Sum of Square	Observation df	Mean Squares
Age-Matched Groups	8.45	(1)	8.45	14.45	(1)	14.45	14.45	(1)	14.45
	245.3	(18)	13.6278	88.1	(18)	4.8944	88.1	(18)	4.8944
	253.75	(19)		102.55	(19)		102.55	(19)	
	F = .6201	Sig. = .4413		F = 2.9523	Sig. = .1029				
Michigan-Matched Groups	11.25	(1)	11.25	12.8	(1)	12.8	12.8	(1)	12.8
	279.3	(18)	15.5167	299.4	(18)	16.6333	299.4	(18)	16.6333
	290.55	(19)		312.2	(19)		312.2	(19)	
	F = .7250	Sig. = .4057		F = .7695	Sig. = .3919				
Normally-Matched Groups	.2	(1)	.2	54.45	(1)	54.45	54.45	(1)	54.45
	326.8	(18)	18.1556	258.5	(18)	14.3611	258.5	(18)	14.3611
	327.0	(19)		312.95	(19)		312.95	(19)	
	F = .011	Sig. = .9176		F = 3.7915	Sig. = .0673				

Table 28
ANOVA Tables of Nonsignificant Child Behavior Variables
"Prolonged Physical Contact"

	Sum of Square	Observation One df	Mean Squares	Sum of Square	Observation Two df	Mean Squares
Age-Matched Groups						
Between Groups	.45	(1)	.45	.2	(1)	.2
Within Groups	12.5	(18)	.6944	34.6	(18)	1.922
Total	12.95	(19)		34.8	(19)	
	F = .648	Sig. = .4313		F = .104	Sig. = .7507	
Michigan-Matched Groups						
Between Groups	1.8	(1)	1.8	4.05	(1)	4.05
Within Groups	37.0	(18)	2.05	116.9	(18)	6.4944
Total	38.8	(19)		120.95	(19)	
	F = .8757	Sig. = .3618		F = .6236	Sig. = .44	
Normally-Matched Groups						
Between Groups	.45	(1)	.45	2.45	(1)	2.45
Within Groups	41.3	(18)	2.294	130.5	(18)	7.25
Total	41.75	(19)		132.95	(19)	
	F = .1961	Sig. = .6631		F = .3379	Sig. = .5682	

Table 29

ANOVA Tables of Nonsignificant Child Behavior Variables
"Extended Physical Contact"

	Sum of Square	Observation df	Mean Squares	Sum of Square	Observation df	Mean Squares
Age-Matched Groups						
Between Groups	8.45	(1)	8.45	6.05	(1)	6.05
Within Groups	204.1	(18)	11.3399	195.7	(18)	10.8722
Total	212.55	(19)		201.75	(19)	
	F = .7452	Sig. = .3993		F = .5565	Sig. = .4653	
Michigan-Matched Groups						
Between Groups	.45	(1)	.45	4.05	(1)	4.05
Within Groups	6.1	(18)	.339	206.5	(18)	11.47
Total	6.55	(19)		210.55	(19)	
	F = 1.3279	Sig. = .2463		F = .353	Sig. = .5598	
Normally-Matched Groups						
Between Groups	5.0	(1)	5.0	.2	(1)	.2
Within Groups	207.0	(18)	11.5	43.0	(18)	2.3889
Total	212.0	(19)		43.2	(19)	
	F = .4348	Sig. = .5180		F = .0837	Sig. = .7756	

Table 30

ANOVA Tables of Nonsignificant Child Behavior Variables
"Physical Help"

	Observation One		Observation Two	
	Sum of Square	df	Sum of Square	df
Age-Matched Groups				
Between Groups	16.2	(1)	22.05	(1)
Within Groups	870.0	(18)	176.5	(18)
Total	886.2	(19)	198.55	(19)
	F = .3352	Sig. = .5698	F = 2.2487	Sig. = .15111
Michigan-Matched Groups				
Between Groups	.20	(1)	33.8	(1)
Within Groups	660.8	(18)	231.0	(18)
Total	661.0	(19)	264.8	(19)
	F = .0054	Sig. = .9420	F = 2.6338	Sig. = .1220
Normally-Matched Groups				
Between Groups	12.8	(1)	1.25	(1)
Within Groups	790.0	(18)	263.3	(18)
Total	802.8	(19)	264.55	(19)
	F = .2916	Sig. = .5958	F = .0855	Sig. = .7734

Table 31
ANOVA Tables of Nonsignificant Child Behavior Variables
"Information"

		Observation One		Observation Two			
		Sum of Square	df	Mean Squares	Sum of Square	df	Mean Squares
Age-Matched Groups	Between Groups	387.2	(1)	387.2	115.2	(1)	115.2
	Within Groups	3073.8	(18)	170.7667	2900.6	(18)	161.14
	Total	3461.0	(19)	3015.8	3015.8	(19)	
		F = 2.2674	Sig. = .1495		F = .7149	Sig. = .4089	
Michigan-Matched Groups	Between Groups	140.45	(1)	140.45	51.2	(1)	51.2
	Within Groups	5633.3	(18)	312.9611	5478.6	(18)	304.36
	Total	5773.75	(19)	5529.8	5529.8	(19)	
		F = .4488	Sig. = .5114		F = .1682	Sig. = .6865	
Normally-Matched Groups	Between Groups	61.25	(1)	61.25	320.0	(1)	320.0
	Within Groups	4069.3	(18)	226.0722	4082.2	(18)	226.7889
	Total	4130.55	(19)	4402.2	4402.2	(19)	
		F = .2709	Sig. = .6091		F = 1.411	Sig. = .2503	

Table 32
ANOVA Tables of Nonsignificant Child Behavior Variables
"Pass"

	Sum of Square	Observation df	Mean Squares	Sum of Square	Observation df	Mean Squares
Age-Matched Groups						
Between Groups	4.05	(1)	4.05	.45	(1)	.45
Within Groups	36.9	(18)	2.05	26.5	(18)	1.47
Total	40.95	(19)		26.95	(19)	
	F = 1.97	Sig. = .177		F = .306	Sig. = .587	
Michigan-Matched Groups						
Between Groups	7.2	(1)	7.2	1.8	(1)	1.8
Within Groups	36.6	(18)	2.0333	22.4	(18)	1.24
Total	43.8	(19)		24.2	(19)	
	F = 3.541	Sig. = .0761		F = 1.44	Sig. = .245	
Normally-Matched Groups						
Between Groups	.45	(1)	.45	.45	(1)	.45
Within Groups	8.5	(18)	.472	40.1	(18)	2.228
Total	8.95	(19)		40.55	(19)	
	F = .953	Sig. = .342		F = .202	Sig. = .659	

Table 33
ANOVA Tables of Nonsignificant Child Behavior Variables
"Show"

	Sum of Square	Observation df	Mean Squares	Sum of Square	Observation df	Mean Squares
Age-Matched Groups						
Between Groups	7.2	(1)	7.2	.45	(1)	.45
Within Groups	1573.8	(18)	87.43	524.5	(18)	29.14
Total	1581.0	(19)		524.95	(19)	
	F = .0823	Sig. = .7774		F = .0154	Sig. = .9025	
Michigan-Matched Groups						
Between Groups	28.8	(1)	28.8	20.0	(1)	20.0
Within Groups	2161.0	(18)	120.0556	1070.2	(18)	59.45
Total	2189.9	(19)		1090.2	(19)	
	F = .2399	Sig. = .6302		F = .3364	Sig. = .5691	
Normally-Matched Groups						
Between Groups	7.2	(1)	7.2	14.45	(1)	14.45
Within Groups	1381.0	(18)	76.722	1174.5	(18)	65.25
Total	1388.2	(19)		1188.95	(19)	
	F = .0938	Sig. = .7639		F = .2215	Sig. = .6436	

Table 34
ANOVA Tables of Nonsignificant Child Behavior Variables
"Fret"

	Observation One		Observation Two	
	Sum of Square	df	Sum of Square	df
Age-Matched Groups				
Between Groups	7.2	(1)	6.05	(1)
Within Groups	574.0	(18)	53.7	(18)
Total	581.0	(19)	59.75	(19)
	F = .2268	Sig. = .6404	F = .0279	Sig. = .1715
Michigan-Matched Groups				
Between Groups	54.45	(1)	.45	(1)
Within Groups	400.1	(18)	72.1	(18)
Total	454.55	(19)	72.55	(19)
	F = 2.4496	Sig. = .1350	F = .1123	Sig. = .7414
Normally-Matched Groups				
Between Groups	22.05	(1)	3.2	(1)
Within Groups	834.9	(18)	42.6	(18)
Total	856.95	(19)	45.8	(19)
	F = .4754	Sig. = .4993	F = 1.3521	Sig. = .2601

Table 35
ANOVA Tables of Nonsignificant Mother Response Variables
"Responds with Hesitation"

	Sum of Square		Observation One		Sum of Square		Observation Two	
	df	Mean Squares	df	Mean Squares	df	Mean Squares	df	Mean Squares
Age-Matched Groups								
Between Groups	20.0	20.0	(1)		61.25		(1)	61.25
Within Groups	333.0	18.5	(18)		283.7		(18)	15.76
Total	353.0		(19)		344.95		(19)	
	F = 1.08		Sig. = .3122		F = 3.886		Sig. = .0643	
Michigan-Matched Groups								
Between Groups	16.2	16.2	(1)		64.8		(1)	64.8
Within Groups	260.6	15.4778	(18)		327.2		(18)	18.178
Total	276.8		(19)		392.0		(19)	
	F = 1.119		Sig. = .3041		F = 3.565		Sig. = .0752	
Normally-Matched Groups								
Between Groups	.20	.20	(1)		.05		(1)	.05
Within Groups	192.6	10.7	(18)		155.7		(18)	8.65
Total	192.8		(19)		155.75		(19)	
	F = .0187		Sig. = .8928		F = .0058		Sig. = .9402	

Table 36

ANOVA Tables of Nonsignificant Mother Response Variables
 "Acknowledges and Gives Alternative"

	Observation One		Observation Two				
	Sum of Square	df	Mean Square	Sum of Square	df	Mean Square	
Age-Matched Groups	Between Groups	24.2	(1)	24.2	36.45	(1)	35.45
	Within Groups	431.0	(18)	23.94	264.5	(18)	14.69
	Total	455.2	(19)	300.95		(19)	
		F = 1.01	Sig. = .3281		F = 2.48	Sig. = .1327	
Michigan-Matched Groups	Between Groups	6.05	(1)	6.05	48.05	(1)	48.05
	Within Groups	278.5	(18)	15.47	326.5	(18)	18.1389
	Total	284.55	(19)	374.55		(19)	
		F = .3910	Sig. = .5396		F = 2.649	Sig. = .1210	
Normally-Matched Groups	Between Groups	54.45	(1)	54.45	.8	(1)	.8
	Within Groups	461.3	(18)	25.63	341.2	(18)	18.956
	Total	515.75	(19)	342.0		(19)	
		F = 2.125	Sig. = .162		F = .042	Sig. = .839	

Table 37
ANOVA Tables of Nonsignificant Mother Response Variables
"No Response"

	Observation One		Observation Two	
	Sum of Square	df	Sum of Square	df
	Mean Squares		Mean Squares	
Age-Matched Groups				
Between Groups	.20	(1)	61.25	(1)
Within Groups	1516.8	(18)	861.7	(18)
Total	1517.0	(19)	922.95	(19)
	F = .0024	Sig. = .9617	F = 1.279	Sig. = .2728
Michigan-Matched Groups				
Between Groups	51.2	(1)	48.05	(1)
Within Groups	1088.0	(18)	800.5	(18)
Total	1139.2	(19)	848.5	(19)
	F = .847	Sig. = .369	F = 1.08	Sig. = .3124
Normally-Matched Groups				
Between Groups	57.8	(1)	.80	(1)
Within Groups	1520.0	(18)	671.0	(18)
Total	1577.8	(19)	671.8	(19)
	F = .685	Sig. = .419	F = .023	Sig. = .885

Table 38

ANOVA Tables of Nonsignificant Mother Response Variables
"Continuous Initiation"

	Observation One			Observation Two		
	Sum of Square	df	Mean Squares	Sum of Square	df	Mean Squares
Age-Matched Groups	Between Groups	6.05	(1)	6.05	(1)	72.2
	Within Groups	798.5	(18)	44.36	(18)	79.367
	Total	804.55	(19)	1500.8	(19)	
		F = .1364	Sig. = .7162	F = .9097	Sig. = .3528	
Michigan-Matched Groups	Between Groups	3.2	(1)	3.2	(1)	12.8
	Within Groups	666.8	(18)	37.04	(18)	11.967
	Total	670.0	(19)	228.2	(19)	
		F = .0864	Sig. = .7722	F = 1.0696	Sig. = .3147	
Normally-Matched Groups	Between Groups	.45	(1)	.45	(1)	24.2
	Within Groups	512.5	(18)	28.47	(18)	90.389
	Total	512.95	(19)	1651.2	(19)	
		F = .016	Sig. = .901	F = .268	Sig. = .611	

Table 39. Mean Frequencies of Nonsignificant Child Behavior Scores

	Delayed Children		Age-matched Children		Michigan-matched Children	
	Obs. 1	Obs. 2	Obs. 1	Obs. 2	Obs. 1	Obs. 2
Overspace	11.1	7.1	7.3	5.4	6.1	6.0
Brief Physical Contact	3.1	2.5	4.4	.8	4.6	4.1
Extended Physical Contact	.3	.5	.6	.7	.9	1.4
Prolonged Physical Contact	.2	1.8	1.5	.7	.5	.9
Physical Help	6.4	3.3	8.2	5.4	6.6	5.9
Information	23.1	25.5	31.9	30.3	28.4	22.3
Pass	1.5	.4	.6	.7	.3	1.0
Show	8.9	8.3	10.1	8.6	11.3	10.3
Fret	2.2	1.8	3.4	.7	5.5	1.5

Table 40. Mean Frequencies of Nonsignificant Mother Response Scores

	Delayed Children		Age-matched Children		Michigan-matched Children	
	Obs. 1	Obs. 2	Obs. 1	Obs. 2	Obs. 1	Obs. 2
Responds with Hesitation	2.5	2.3	4.5	5.8	2.7	2.2
Acknowledges with Alternative	4.7	2.1	6.9	4.8	3.6	5.2
No Response	13.4	14.2	13.6	10.7	10.2	11.1
Continuous Initiation	4.4	.5	3.3	4.3	3.6	2.1

Table 41. Percentage of Child Contacting Behaviors at Beginning, Middle and End of Each Observation

Child Behavior	Time Period	Group I Delayed		Group II Age-matched		Group III Michigan-matched	
		Obs. 1	Obs. 2	Obs. 1	Obs. 2	Obs. 1	Obs. 2
Overspace	Beginning	32%	38%	17%	26%	26%	27%
	Middle	25	16	31	31	36	40
	End	43	46	52	48	38	32
Brief Prolonged & Extended Physical Contact	Beginning	16	6	23	45	18	39
	Middle	35	54	45	5	41	30
	End	49	40	32	50	41	31
Physical Help	Beginning	15	16	25	4	17	23
	Middle	28	37	46	48	36	21
	End	57	47	30	48	47	42
Technical Help	Beginning	31	38	18	10	42	18
	Middle	61	37	28	51	42	33
	End	8	25	53	39	16	49
Information	Beginning	24	25	38	25	36	30
	Middle	31	37	36	43	35	30
	End	44	38	26	32	29	40
Join	Beginning	7	48	11	33	0	24
	Middle	61	21	63	31	48	30
	End	32	31	26	36	52	46
Show	Beginning	34	29	47	43	39	26
	Middle	28	29	35	30	38	37
	End	38	42	18	27	32	37
Frets	Beginning	10	14	28	93	15	28
	Middle	37	14	57	7	27	43
	End	53	72	15	0	58	29
Needs Intervention	Beginning	29	3	18	34	13	19
	Middle	58	54	20	28	44	33
	End	13	43	62	38	43	48

The percentages at the beginning, middle and end of the observation periods show no patterns that suggest a ceiling effect or that one group habituates differently from another. It is noted that the percentage of times passing behavior occurred was not calculated because all the frequencies were low (Group I, 18; Group II, 12; Group III, 12).

