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WASSERMAN, Gail Abramson, 1946-
INFANT BEHAVIOR, MATERNAL BEHAVIOR AND
MATERNAL REPORT: A CROSS-SITUATIONAL
EXAMINATION OF MOTHERS AND THEIR YEAR-
OLD INFANTS.

City University of New York, Ph.D., 1977
Psychology, general

Xerox University Microfilms, Ann Arbor, Michigan 48106

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INFANT BEHAVIOR, MATERNAL BEHAVIOR AND MATERNAL REPORT:

A CROSS-SITUATIONAL EXAMINATION OF MOTHERS

AND THEIR YEAR-OLD INFANTS

by

GAIL A. WASSERMAN

A dissertation submitted to the Graduate
Faculty in Psychology in partial fulfillment
of the requirements for the degree
of Doctor of Philosophy, The City
University of New York.

1977

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

May 12, 1977

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Abstract

INFANT BEHAVIOR, MATERNAL BEHAVIOR AND MATERNAL REPORT:

A CROSS-SITUATIONAL EXAMINATION OF MOTHERS

AND THEIR YEAR-OLD-INFANTS

by

Gail A. Wasserman

Adviser: Professor Michael Lewis

Mothers and their first-born year-old infants (30 girls, 30 boys) were observed alone under two situations in a counter-balanced order. In the Non-Interaction situation, mothers were to refrain from initiating any interaction; under Interaction, mothers were free to interact with their infants as they normally would. Following the observation, the Maternal Questionnaire was administered, assessing the degree to which the mother (a) typically engaged in the behaviors under observation, and (b) expected sex-differential in year-old infants. During Non-Interaction, girls engaged in more touching and proximity-seeking; boys vocalized more than girls. On the other hand, with the exception of more vocalizing to girls, maternal behavior was not sex-specific; mothers did not report sex-specific behavior; mothers did not expect sex-differential behavior in infants. Maternal and infant behavior were dependent upon the situation examined: during Interaction, mothers talked and initiated proximity more, while they showed

more and shorter looks. Infants vocalized and touched more during Non-Interaction. With the exception of more vocalizing by boys in both situations, sex differences in infant behavior were not apparent during Interaction. Maternal and infant behavior were dependent upon how the observed situation compared to the previous situation. Two models were presented to describe the ways in which behavioral changes in each member of the dyad affect the behavior of the other. In a reciprocal system, increases by the mother in a given behavior or in the general interactive level are related to decreases in the infant behavior, and vice versa. Infant and maternal vocalization, and to some degree, touching operate along these lines. In an incremental system, either increases or decreases in a given maternal behavior are met by increases in the level of the infant's behavior. Proximity-seeking and looking follow this pattern. Neither maternal behavior nor infant behavior is very well predicted by maternal report; nor is the relationship between infant and maternal behavior strong. This lack of consistency may result from (a) the three systems' essential independence from each other, (b) a time lag, resulting from altering socialization demands, between changes in maternal report and behavior and changes in infant behavior, and/or (c) mothers' inability, because of the highly situational nature of their own and their infants' behavior, to indicate verbally what their "usual" behavior is. This investigation underscores the need for both the clearer definition of the ecological dimensions along which observational situations may vary, as well as the

examination of the effect, on the mother-infant interaction, of systematically varying the situation along those dimensions.

ACKNOWLEDGEMENTS

The author would like to thank the members of her Committee (Joseph Glick, Phyllis Katz, Ann Rees and Daniel Stern) for their patient criticism and assistance in preparing this paper. Special thanks go to Michael Lewis, Chairman, for his help both in providing a secure framework on which to display ideas and also in achieving a clarity of mode of inquiry and of expression. Finally, thanks go to the many mothers and infants who participated in this investigation.

TABLE OF CONTENTS

ABSTRACT.....	iv
ACKNOWLEDGEMENTS.....	vii
LIST OF TABLES.....	ix
LIST OF FIGURES.....	xi
I. INTRODUCTION.....	1
II. METHOD.....	30
III. RESULTS.....	40
Observation Data.....	40
Questionnaire Data.....	82
Relationship between Mothers' Report and Behavior and between Mothers' Report and Infant Behavior.....	91
IV. DISCUSSION.....	122
V. CONCLUSIONS.....	149
APPENDIX.....	152
REFERENCES.....	197

LIST OF TABLES

1.	Mean Reliabilities for Mother and Infant Observation Variables.....	35
2.	Intercorrelations within Attitude and Stereotyping Scales.....	37
3.	Frequencies of Mothers' Responses to Stereotyping Items by Sex..	38
4.	Means for Observation Data by Order.....	41
5.	Means for Observation Data by Treatment.....	43
6.	Means for Observation Data by Sex.....	50
7.	Means for Observation Data by Intervals.....	62
8.	Correlations between Observation Measures in Interaction and Those in Non-Interaction.....	77
9.	Intercorrelations among Mother Observation Measures for Interaction and Non-Interaction.....	78
10.	Intercorrelations among Infant Observation Measures for Interaction and Non-Interaction.....	80
11.	Correlations between Maternal Behavior and Infant Behavior during Non-Interaction.....	81
12.	Correlations between Maternal Behavior and Infant Behavior during Interaction.....	83
13.	Levels of Alpha for the Five Attitude Subscales.....	84
14.	Intercorrelations between Stereotyping and Attitude Scales.....	86
15.	Attitude Means by Item and Subscale.....	87
16.	Stereotyping Mean Frequencies by Sex and Subscale.....	88

LIST OF TABLES - Continued

17.	Description of Factors.....	90
18.	Correlations between Questionnaire Subscales and Maternal Behavior during Non-Interaction.....	93
19.	Correlations between Questionnaire Subscales and Maternal Behavior during Interaction.....	95
20.	Correlations between Questionnaire Subscales and Infant Behavior during Non-Interaction.....	98
21.	Correlations between Questionnaire Subscales and Infant Behavior during Interaction.....	100
22.	Correlations between Factor Scores and Maternal Behavior.....	103
23.	Zero-Order and Partial Correlation Matrices for Non-Interaction..	107
24.	Zero-Order and Partial Correlation Matrices for Interaction.....	110
25.	Correlations between Factor Scores and Infant Behavior.....	111

LIST OF FIGURES

1. Effect of Order on Mother Behaviors during Interaction and Non-Interaction.....	44
2. Effect of Order on Baby Behaviors during Interaction and Non-Interaction.....	46
3. Sex Differences in Mother Behaviors across Treatments.....	51
4. Effects of Order during Non-Interaction and Interaction for Boys and Girls.....	53
5. Sex Differences in Baby Behaviors across Treatments.....	55
6. Sex Differences in Frequency Total Touch and Duration Total Touch during Non-Interaction and Interaction.....	58
7. Treatment Differences in Maternal Behaviors over Intervals....	63
8. Sex and Treatment Differences in Mother Touch and Mother Look over Intervals.....	64
9. Changes in Mother Proximity over Intervals for Boys and Girls.....	65
10. Sex and Treatment Differences in Mother Vocalization and Mother Proximity over Intervals.....	67
11. Treatment Differences over Intervals.....	69
12. Sex and Treatment Differences in Baby Touch and Baby Look over Intervals.....	70
13. Sex and Treatment Differences in Baby Vocalization and Baby Proximity.....	73

LIST OF FIGURES - Continued

14.	Sex and Order Differences over Intervals: Frequency	
	Total Proximity.....	75
15.	Effects of Sex, Order and Treatment over Intervals:	
	Frequency Total Proximity.....	75

I. INTRODUCTION

The nature of the relationship between a child and its social object is both theoretically important and sufficiently unique to warrant extended study. Most such investigations involve mothers, although other social objects such as fathers (Ban & Lewis, 1974) and peers (Bronson, 1975) are important and have also been examined.

There are several sources of input into the mother-infant relationship. Three such sources seem to play a major role. First, infant variables, such as age or sex, obviously profoundly influence the nature of both infant and maternal behavior. Second, maternal variables, such as social class or maternal attitudes, are likely to exert important effects upon both maternal and infant behavior. Finally, the situation in which mother and infant find themselves should also affect the nature of the immediate interaction between mother and child. While other sources of input obviously exist, these additional influences would have to be mediated through an effect upon one of the three primary sources.

Infant Variables and the Mother-Infant Relationship

Since there are two active participants in the mother-

infant relationship, attributes of the infant can affect that relationship in two ways. First, they will influence infant behavior in the mother-infant interaction; and second, they will influence maternal behavior in the mother-infant interaction.

Infant Variables and Infant Interactive Behavior

Age. According to ethological theory (Bowlby, 1969), the intensity of the behavior which the infant directs toward its mother is expected to increase up to a certain age when the infant can recognize her, and then to gradually decrease with age. On the infant's part, the decrease is due to the increasing competition provided by his exploratory behavior and curiosity.

Support for age changes in such behaviors has been provided by at least two separate longitudinal studies. Schaffer and Emerson (1964) and Ainsworth (1964), using very different populations and somewhat different approaches, report similar developmental changes in the origins of specific mother-directed behaviors over the first year of the infant's life. Both studies agree

that a phase of undifferentiated responsiveness precedes a phase of differentiated and discriminating social responsiveness, and that discrimination in turn precedes a phase in which the infant's attachment becomes more active (Ainsworth, 1973, p. 39).

Decreases in infant proximity-seeking have been reported between one and two years (Rheingold & Eckerman, 1970; Lewis & Ban, 1971; Lewis, Weinraub & Ban, 1973) as well as between two

and two-and-one-half years (Maccoby & Feldman, 1972). On the other hand, distal behaviors (looking, vocalizing) have been found to increase between one and two years (Lewis & Ban, 1971; Lewis, Weinraub & Ban, 1973) and between two and two-and-one-half years (Maccoby & Feldman, 1972). On the other hand, Coates, Anderson and Hartup (1972a) report few age changes in the frequency with which infants at 10-, 14- and 18-months directed various behaviors toward their mothers. Perhaps the age range investigated here was not great enough to reveal a developmental change.

It seems then that there is evidence for a decrease in measures of proximal behaviors over the first few years of life. On the other hand, certain behaviors, such as looking, smiling and vocalizing, may actually increase over this time period.

Sex. Studies of mother-infant interaction have documented the presence of sex differences in the infant's contribution to the quality of that interaction from the first few weeks of life. Moss (1967) observed 30 mother-infant pairs in their homes at 3 weeks and again at 3 months. Sex differences were reported in frequencies of infant behaviors. At 3 weeks, boys are more irritable and alert than girls, and similar differences are apparent at 3 months.

At 13 months, in an observation of play between white middle class infants and their mothers (Goldberg & Lewis, 1969), girls were more likely to return to the mother within 5 seconds after

being placed on the floor in an observation room. After moving away from the mother, girls returned more quickly and made more returns; girls touched their mothers more and vocalized to them more than boys did, while there were no sex differences in looking behavior.

Using the "free play" situation¹ (with mother not interacting), several other studies have also reported sex differences in the behavior which children one year and older direct toward their mothers. Lewis and Ban (1971) report sex differences which overlay the above-noted transformation from proximal to distal behaviors between one and two years. At 13 months, girls show more touching, more vocalizing, and more proximity-seeking than boys do, while at 25 months, the only sex difference to emerge is that girls are still vocalizing more to their mothers than boys are.

In observations of the behavior of 13-month old opposite-sex twins with a non-interacting mother, girls were found to look at and to maintain proximity with their mothers more than boys did. Girls also touched and vocalized somewhat more (Brooks & Lewis, 1974a).

At least one investigation using the strange situation (Feldman & Ingham, 1975) reported sex differences in infant

¹Descriptions and comparisons of the effects of situational variables (free play, strange situation) will be discussed in detail below.

behavior. One-year-old boys were more distressed by separation from an attachment figure than were girls. Boys played less and cried more than girls when left alone. No further sex differences in behaviors directed toward mothers were observed, although boys maintained proximity more than girls when accompanied by an "adult acquaintance" other than the mother. Sex differences in 2½ year olds were negligible.

Using 10-month-old infants who could locomote, Corter, Rheingold and Eckerman (1972) observed the speed with which the infant followed its mother from one room where she placed the infant on the floor to an adjoining smaller room, to which she walked. Generally, girls took significantly more time to follow. Similarly, Corter (1973) reported that when given the choice of going to either their mother or to a stranger, 10-month-old boys go to their mothers faster than do 10-month-old girls. In these two cases, sex differences may be accounted for by variations in motor ability, because taking a longer time to follow or to go to the mother seems to indicate less proximity-seeking, while most studies find that girls do more of this.

Not all studies of mother-child interaction, regardless of the ages investigated, have found sex differences in these behaviors. Thus, using the "strange situation" or a variant of this procedure, no sex differences in behaviors directed toward the mother have been reported at one year (Ainsworth & Bell, 1970), between 10 and 18 months (Coates et al., 1972a),

or between two and three years (Maccoby & Feldman, 1972).

Observations of 13- and 14-months olds in "free play" (with a non-interacting mother) prior to the presentation of a fear-producing stimulus (Maccoby & Jacklin, 1973) revealed that girls directed more proximity-seeking and touching (although not significantly so) toward the mother than did boys. No sex differences appeared in amount of looking at the mother.

When free to wander into an adjoining room, male and female 10-month-old infants do not differ in the frequency or duration of vocalization, locomotor activity, or latency to enter the adjoining room (Rheingold & Eckerman, 1969).

It seems, then, that in examining the behavior of infants older than 10 months, the following pattern can be observed. Girls are more likely to touch and to remain near their mothers than boys are, when observed in a free-play situation. Also, in this situation, and with this age group, girls have sometimes been found to direct more looking and vocalizing to their mothers, but evidence for this appears less firm than that supporting the proximal differences. When other situations have been observed, sex differences in the behavior which infants older than 10 months direct toward their mothers have not generally been found. Very little is known of sex differences in the behavior which younger infants direct toward their mothers.

Social class. Socio-economic status can be presumed to operate most directly upon the mother in the mother-infant dyad,

and will therefore be discussed in more detail below. However, at least one investigation (Messer & Lewis, 1972) has studied SES differences in the behavior which the infant directs towards his or her mother. In comparing the behavior of lower class white infants at 13 months with the middle class sample reported on by Goldberg and Lewis (1969), Messer and Lewis (1972) found a similar pattern: girls returned to the mother sooner and did so more frequently; girls spent significantly more time touching their mothers than boys did. Differences in vocalization and looking were not significant. The behavioral sex differences among the lower class sample were attenuated when compared to the middle class infants and the authors suggested that this might indicate a tendency for lower class parents to discriminate less between boys and girls, reflecting a lack of cognitive differentiation.

Other infant behavior. A further source of control over the behavior which the infant directs toward the mother is his own behavior. Does the performance of one mother-directed behavior bear any lawful relationship to the likelihood of appearance of any other mother-directed behavior? Such a question involves an analysis of structural relationships among such mother-directed behaviors. In view of the wide range of behaviors which may be directed toward the mother, or which may be precursors of such behaviors (Ainsworth, 1973), such a structural analysis is of value. Intercorrelations among mother-directed behaviors can

also assess the degree to which the mother-infant interaction constitutes a unitary phenomenon.

Ban and Lewis (1974) observed touching, vocalizing, looking and proximity-seeking in 13-month olds during a 15 minute observation period, with the mother present but not interacting. These authors suggest that, at least when considering these four behaviors, two rather distinct modes can be identified: proximal (touching and proximity-seeking) and distal (looking and vocalizing). For boys intercorrelations among all behaviors are positive, and that between touching and proximity-seeking is highly significant. For girls, proximal and distal behaviors appear to be dichotomous: the intercorrelations of behaviors within a mode are positive and significant, while those for behaviors across modes are negative. Lewis and Ban (1971), using a similar population and procedure, report significant correlations within modes, while correlations between modes are either negative or zero.

Some further evidence for the existence of separate clusters of infant behaviors is provided by Coates, Anderson and Hartup (1972b). Ten-, 14-, and 18-month olds were observed on two separate occasions: a 10-minute non-separation episode, with the mother present but not interacting; and a separation episode within which the mother left the room and later returned during the course of the observation. Infant behaviors measured were frequency of looking, of vocalizing, of touching and of crying. For those times when the mother was present, proximity-seeking was correlated positively and

significantly with touching, and vocalization was moderately correlated with looking and unrelated to either touching or proximity-seeking. While this seems to indicate the validity of clustering mother-directed behaviors into proximal and distal modes, an occasional cross-correlation (between modes) did appear. The pattern of these correlations did not change between 10 and 18 months.

Children up to the age of $2\frac{1}{2}$ also seem to organize their behavior toward their mothers into two separate clusters. Using a variation of the strange situation and older children (2, $2\frac{1}{2}$, 3 years) Maccoby and Feldman (1972) report such clusters whether or not the stranger is also present in the observation room. The presence of separate clusters in 3-year-olds was not indicated.

Therefore, there seems to be evidence that the several behaviors investigated do constitute a somewhat organized construct. It would seem, however, that that construct is not unitary, in view of the often cited evidence of proximal and distal clusters of behaviors.

Infant Variables and Maternal Interactive Behavior

A major difficulty with investigations of the mother-infant relationship lies in their treatment of the mother. Ethological theory implies that both mother and infant are attached to each other; social learning theory implies that the mother's reinforcement patterns should have a direct influence upon the infant's

behavior. In spite of this agreement that the role of the mother is important in the development and expression of the relationship between mother and child, the mother's behavior has not been given anything resembling equal time. This is true both of the effects of infant variables upon maternal behavior (to be discussed in this section) and of the effects of maternal variables upon infant behavior (to be discussed below).

Age. Ethological theory (Bowlby, 1969) suggests that, over the course of infancy, there should be a decline in the elicitation of maternal behavior. While the overall amount of maternal interactive behavior may or may not change, there is evidence that the quality of that behavior does change, even over the first few weeks of the infant's life. Thus, in comparing the behavior of a group of mothers with their 3-week-old infants with the behavior of the same mothers when their infants were 3 months old, Moss (1967) reports decreases in holding and feeding behaviors and increases in distal behaviors, such as looking, vocalizing and smiling.

These trends continue over the next year and a half of the infant's life. Mothers have been observed to engage in less physical contact, less caretaking and less social stimulation with their 10-month-olds than they do when their infants are 9 months old (Clarke-Stewart, 1973). Over this same time span, mothers show increases in leaving the child, punishing him, and scolding him.

Sex. Studies of mother-infant interaction have documented the presence of sex differences in maternal behavior from the first days of life. Observations of upper-middle-class mothers during breastfeeding and play with their two-day-old infants (Thoman, Leiderman & Olson, 1972) indicate that mothers of first-born sons spent a greater percentage of the observation time feeding their babies (and holding them close) than did mothers of first-born daughters. Multiparous mothers of daughters spent a greater percentage of the observation feeding (and holding their infants close) than did multiparous mothers of sons. A similar parity reversal was observed for sex differences in vocalization: primiparas talked to daughters more than to sons. Multiparas talked to sons more than to daughters.

In home observations of 3-month-old infants and their mothers, Lewis (1972) found that sex of infant accounted for differences in maternal behavior. Mothers of boys touched and held their babies more than mothers of girls did. Mothers of girls vocalized to and looked at their infants more than did mothers of boys.

In Moss' (1967) observations of mothers and infants at 3 weeks and again at 3 months, mothers of sons were more likely to be close to or to hold their infants at 3 weeks. By 3 months maternal behavior was no longer sex-differentiating.

At 6 months, using a sample of white middle class infants and mothers, Goldberg and Lewis (1969) found that girls were

touched and vocalized to by their mothers more than boys were. There is evidence, however, that such sex differences in maternal interactive behavior become attenuated as the infant gets older. Thus, Clarke-Stewart reports (1973) that the only maternal behavior to reveal a significant sex difference (at 9 and 18 months) is that mothers of boys expressed more positive attitudes toward their children than did mothers of girls.

Parity. As noted above, Thoman et al. (1972) report sex by parity interactions in vocalization and holding with newborns. Other studies have demonstrated parity effects with older infants.

Mothers of 3-month-olds vocalize less to second-borns than to first-borns, and differences increase among mothers of third- and fourth-borns (Judd, 1976). Similar patterns were observed for maternal kissing. Parity patterns have been observed to change as a function of the sex of the infant and as a function of the sex of older siblings, in second-borns (Jacobs & Moss, 1976). While mothers spent less time in social, affectionate, and care-taking interaction with second-borns than they had with their first-borns, this difference was greater if the second-born was a female. No decreases in maternal behavior toward second-born sons were observed, if the first-born was a female.

Infant behavior. Any analysis of the effects of infant behavior upon maternal behavior is obviously utterly confounded with an analysis of the effects of maternal behavior upon infant behavior. While the unravelling of cause and effect in time-linked

chains of behaviors has sometimes been attempted, through Markovian analysis, with younger infants and their mothers (e.g. Lewis, 1972; Stern, 1974), such methods have not been used with older infants. This is perhaps because the range of possible infant and maternal behaviors widens rapidly with increasing infant age.

Few studies have investigated, on a less microscopic scale, the ways in which maternal and infant behavior are interrelated. Positive correlations have been reported between forms of maternal and infant emotional expression, frequency of maternal and infant social behaviors, maternal restrictiveness and infant exploration, and maternal cuddling and infant proximity (Clarke-Stewart, 1973). More responsive neonates have mothers who stimulate them more, and neonates with poor tone or poor motor maturity have mothers who handle them more during feeding (Osofsky & Danzger, 1974; Osofsky, 1976).

Maternal Variables and the Mother-Infant Relationship

As was the case in considering the effect of infant variables upon the mother-infant relationship, there are two ways in which attributes of the mother can affect the quality of that relationship. First, maternal variables can affect maternal behavior; second, maternal variables can affect infant behavior.

Maternal Variables and Maternal Interactive Behavior

Of all the potential maternal attributes which might conceivably influence the behavior which mothers direct toward their infants, only the mother's verbal report and social class have been systematically investigated.

Maternal report. The beliefs or attitudes held by the mother, as well as her report of the degree to which she generally performs certain behaviors might be presumed to bear some relationship to her observed behavior. The study of maternal attitudes is somewhat problematic, however, because the relationship between what mothers say and what they are observed to do is not entirely clear. Further, retrospective accounts of maternal attitudes and reports of earlier maternal behaviors (Yarrow, Cambell & Burton, 1970) may have little validity.

On the other hand, as will be discussed further below when situational effects are considered, observations of mother-child interaction in the laboratory may expose only a very limited slice of such behaviors. Mothers may be inhibited by such a situation and may respond with a decrease in overall activity, or they may attempt to represent whatever they believe is the most socially acceptable form of interaction.

Most studies of the relationship between maternal report and maternal behavior have involved preschool children. Zunich (1962) administered subscales of the Parent Attitude Research Instrument

(PARI) to middle-class mothers of preschoolers. Mother-child pairs were also observed in a laboratory playroom as they played with available toys. Of 272 possible correlations between PARI responses and observed behavior, only 12 were significantly correlated (of these, the highest correlations were .46). Zunich (1962) concluded that either mothers do not behave in the laboratory as they do at home, or else their attitudes do not predict their behavior. Brody (1965) used the same observation procedure with middle-class preschoolers and their mothers. Mothers were told to act as they would during a free half hour at home, and were administered both the PARI and the Maryland Parent Attitude Scale. Generally, there were very few significant correlations between the attitude scales and the observed behavior, or even between the two attitude scales.

Other investigations have involved home observation of younger children and have recorded the behavior of those children as well as the attitudes and behavior of their mothers. Clarke-Stewart (1973) observed infants and their mothers in the home when the infants were between 9 and 18 months old. A "positive attitude" toward the child was measured during two interviews with the mother. Five factors of maternal behavior and attitudes emerged: optimal maternal care, maternal effectiveness, control, cuddling, warm physical contact, and intellectual aspects of mothering. The questionnaire material was found to be related to the maternal factor of cuddling. While there were no racial differences in the attitude

scores, mothers of boys expressed more positive attitudes than did mothers of girls. There were no significant sex differences in mothers' behavior, however, to correspond to the difference in positive attitudes. While maternal behavior (optimal maternal care) did predict to infant behavior (competency), maternal attitudes were unrelated to infant behavior and only minimally related to maternal behavior. Beckwith (1972) observed the behavior in the home of mothers and their adopted infants at approximately 8 and again at 11 months. Mothers' attitudes were also assessed, using the PARI. Assertive maternal control, as measured on the PARI, was related to maternal verbal discouragements and negatively related to infant social responsiveness. Overpossessiveness on the PARI was related to maternal verbal approaches and negatively related to giving the infant opportunities for exploration. Thus, there is some small consistency between measures of maternal attitudes and of behavior of mothers and of infant.

Social class. One dimension along which maternal attitudes and behavior are presumed to differ is that of social class. Tulkin and Cohler (1973) observed working class and middle class mothers with their 10-month old daughters. Time-sampled records were made in the home, and the authors used the Maternal Attitude Scale (Cohler, Weiss and Grunebaum, 1970) which yields five factors related to the mother's adaptiveness in resolving issues in her interaction with her infant. For middle-class mothers, attitudes related to encouraging reciprocity yielded the most frequent significant correlations

with maternal behavior (10 out of 17 possible correlations with behaviors such as: give objects, total interaction, and verbal imitations, were significant). The other scales resulted in few significant correlations. For working-class mothers, "encouragement of reciprocity" yielded no significant correlations with behavior, and, in fact, only four out of the total of 85 possible correlations were significant. The authors explain the social class differences as indicating the powerlessness in affecting her child's behavior which the working-class mother feels. They further suggest that the scale of "encouraging reciprocity" bears a reasonable resemblance to maternal behavior.

In a related presentation of behavioral data from these same mothers and infants, Tulkin and Kagan (1972) found a significant overall difference in frequency of interaction, which seemed to result largely from class differences in maternal vocalization. Upper middle-class mothers vocalized to their infants far more than did working-class mothers. Upper middle-class mothers were also more responsive to infant fretting; with respect to measures of physical contact, prohibitions, distance between mother and infant (except for face-to-face contact), or a percentage of positive responses to the child's nonverbal behavior, there were no significant differences.

Informal discussions with mothers about their behavior revealed class-related differences in attitudes about verbal behavior to infants:

Some working class mothers did not believe that their infants possessed the ability to express "adult-like" emotions or to communicate with other people. Hence, these mothers felt that it was futile to attempt to interact with their infants...Some working class mothers felt that it was only important for a mother to speak to her infant after the infant had begun to speak. (p. 39).

Working-class mothers were more likely to feel that their infant's characteristics were determined at birth and that the environment could have little influence upon a developing child. Tulkin and Kagan (1972) report on other maternal attitudes which do not seem to be class-related and which vary with maternal behavior. Infants whose mothers believed in the value of the baby's exploring and discovering spent less time in playpens, were prohibited less, and played more often with environmental objects. Maternal attitudes and behaviors can vary, then, within as well as between social class levels, and the authors suggest that there is a relationship between maternal attitudes and maternal behavior. Unfortunately, no information is provided about differences in infant behavior which might possibly covary with these clusters of maternal attitudes and behaviors.

The evidence discussed thus far seems to indicate at best a weak relationship between maternal attitudes and behavior, with the possible exception of social class effects (which presumably operate upon the mother-child relationship through differences in maternal attitudes). There are several possible explanations for

this inconsistency.

First, maternal attitudes may be communicated to the child in ways that are far more subtle than can be measured by categories of observed behavior such as "being cooperative" or "directing". Certain postural changes or bodily and facial gestures can very likely communicate disapproval or other evaluative responses on the part of the mother which might not be picked up by an observation technique using a broader category system. Infants as young as six months (Charlesworth & Kreutzer, 1973) can discriminate between the emotions portrayed by an experimenter. The discrimination may be even easier to perform when the facial expressions are those of someone with whom the infant is in frequent contact (such as his mother).

Mothers may be unaware that they are performing certain actions or that these behaviors have meaning and are responded to consistently by the child. Alternatively, a mother may believe that she is acting in keeping with her value system although certain behaviors appear to be inconsistent (to the observer) with her attitudes. Maternal behavior may be more in keeping with maternal report or attitudes in some situations than in other situations, and there may not be any such relationship when only the situations typically observed in laboratory investigations are considered.

Finally, most attitude measures employed are so general as to render any relationship to overt maternal behavior unlikely. Not only is it wise to ask questions about current behavior (Yarrow et al.,

1970), but it also seems sensible to ask questions directly related to the behavior to be observed. This would eliminate problems resulting from different meanings attached to concepts by different mothers, as well as differences between mothers and observers. Most research in this area has solicited maternal opinions or report of generalized concepts, rather than of specific behaviors and events, as suggested here.

Maternal Variables and Infant Interactive Behavior

What little evidence exists on interrelationships between infant behavior and maternal variables (without necessarily intervening maternal behavior) is largely confined to investigations of cultural differences. These would presumably affect the infant through differential cultural meanings attributed to the infant's or mother's behavior.

Culture-based attitudes. Lewis and Ban (1973) suggest that maternal attitudes may have a direct effect upon the child's behavior. Their discussion relates to differences among cultural groups, but is equally relevant for within-group differences:

...ideologies lead to certain maternal behaviors which in turn have consequences in the development of the child; however, there may be less relationship between maternal behavior and outcome[children's behavior] than between ideology and outcome. (p. 6).

Certain behaviors may not differ between individuals or between

cultures, but the meaning of the behavior for the child may vary as a function of its meaning for the mother. The result may be variations in children's behavior (outcomes).

As an example of the way in which parental attitudes may have a direct effect on children's behavior, Baumrind (1972) compared information from observations and interviews of parents and their preschool daughters. Both black and white families were used, with the black families averaging somewhat lower in social class. Families were divided into 8 patterns. The authoritarian-rejecting pattern (encouraging independence, firm enforcing of standards, and moderate rejection) was the most common pattern for black girls, while it was relatively rare for white girls. This cluster of parental behaviors seemed to affect black and white girls differently. Black girls of authoritarian parents were more independent and responsible than their white counterparts. Baumrind suggests that authoritarian child-rearing practices have different meanings for black and white families. They may, in fact, be viewed by black girls, not as rejecting, but as nurturing in light of the cultural necessity for black females to develop "toughness and self-sufficiency". Parental behavior is the same for black and white authoritarian parents, but the meaning of that behavior differs and this must be taken into consideration in discussing variations in children's behavior.

Maternal behavior. Very little work has been done in this area, although correlations between ongoing maternal and infant behavior

(as discussed above) as well as infant responses to "experimental manipulations" performed by the mother are both valid topics for investigation. As an example of the latter, Brazelton, Tronick, Adamson, Als and Wise (1975) have studied infant responses when the mother has been instructed to behave in an unusually unresponsive manner.

With the exception, however, of a few investigations of cultural-attitudinal effects upon infant behavior, almost nothing is known of the way in which individual differences in maternal attributes or maternal behavior are related to infant behavior. Further, investigations relating maternal variables, such as attitudes, to maternal behavior have failed to demonstrate consistent relationships.

Situational Variables and the Mother-Infant Relationship

Situational Variables and Infant Interactive Behavior

The behavior which the infant directs toward the mother has typically been studied in one of two ways, depending upon the age of the child. When the child is under 9 months, such studies are generally considered "mother-infant interaction" studies (e.g. Lewis, 1972; Moss, 1967; Stern, 1974); while investigations involving older children are usually considered "attachment" studies (Ainsworth, Bell & Stayton, 1971; Ainsworth & Wittig, 1969; Maccoby & Jacklin, 1973). It will be necessary to examine each in turn, in order to

understand the ways in which differences between these two most frequently used methods of inquiry (as well as situational variations within each category) affect infant interactive behavior.

Mother-infant interaction. Studies of mother-infant interaction are generally characterized by a natural setting as well as the interactive nature of the behavior of both partners in the interaction. Thus, mother-infant pairs have been examined in a free interaction in the home (Lewis, 1972) or in the hospital shortly after birth (Thoman et al., 1972). The behaviors examined in such observations have included any and all possible actions which either party might direct toward each other.

Because of the "naturalistic" orientation of such investigations, no attempt is made to structure the situation in any way. A frequent procedure is to record all of the behavior of mother and infant during frequent home visits, each lasting several hours (e.g. Thoman, 1975). While this furnishes a wealth of data, such an extended observation period obviously includes many overlapping situations, which are generally treated in a uniform fashion. Some system either for structuring the situation, or for recording existing situations would be of help in organizing the information available from such investigations.

The "strange situation". Studies of attachment, involving older infants, have, at various times, focussed upon the infant's responses to separation (Ainsworth & Bell, 1970), reunion (Ainsworth, Bell & Stayton, 1971) and differential infant responses to the

mother and to a stranger (Ainsworth & Bell, 1970), all within the context of the strange situation paradigm. This consists of eight 3-minute episodes in which the infant is observed either alone, with the mother, with a strange adult, or with both the mother and a stranger, in a fixed order.

Using this design, Ainsworth and Bell (1970) observed 56 while middle-class infants. Crying increased when the mother left the observation room and decreased when she returned. Proximity-seeking and contact maintaining were not strong in the initial episodes when the mother was present, but increased greatly when she returned, after having left the baby alone or with the stranger. Babies showed less exploratory behavior and more crying with the stranger than they did with the mother.

In a further analysis of the same subjects (Ainsworth et al., 1971) the authors centered upon reunion behavior during the strange situation as the best index for assessing the quality of the mother-infant relationship. Eight patterns of infant reunion behavior were defined, varying along such dimensions as the amount of proximity-seeking, smiling and avoidance behavior. Patterns of reunion behavior were related to exploratory behavior in the experimental situation, exploratory and attachment behaviors observed in the infant's home, and to ratings of maternal behavior with regard to sensitivity, acceptance, co-operation and accessibility in the home observation. It appears then, that a year-old infant can discriminate between its mother and an adult stranger, at this

age the infant directs a pattern of behavior toward its mother which it does not direct toward a stranger, and the infant responds to the stress of a short separation by increasing the frequency with which it directs these behaviors toward its mother.

Feldman and Ingham (1975), in a comparison of infant behaviors directed toward the mother, the father, and toward an adult acquaintance in the strange situation report that behavior at reunion discriminates less clearly between children with mothers and those with acquaintances than does behavior during interaction with the adults. These authors argue, like Lewis and Ban (1971), that the mother-infant relationship can best be observed in a situation in which both the infant and its mother are present. Unlike investigations of mother-infant interaction (above) or "free play" (below), the above studies do vary the structure of the situation and observe resultant changes in infant behavior.

The "free play" situation. Other investigators (Goldberg & Lewis, 1969; Lewis & Ban, 1971; Rheingold & Eckerman, 1969, 1970; Ross, Rheingold & Eckerman, 1972) have observed the behaviors which the infant directs to its mother in a more naturalistic situation, where the infant is free to engage in a range of behaviors. Lewis and Ban (1971) argue for the value of a free-play observation in allowing for "a more accurate measure of attachment by reducing the occurrences of other sets of motives" such as distress as a consequence of maternal separation and anxiety resulting from the appearance of a stranger (p. 5).

In spite of the use of the term "free play" to apply to investigations of infant behavior as discussed immediately above, such laboratory studies, with few exceptions, such as Weinraub and Lewis' (in press) examination of maternal styles of leaving their infants and differential infant responses, do not allow the mother to interact in any normal fashion, nor is maternal behavior itself usually recorded. In the typical "free play" situation, the mother is told to sit in a chair, not to initiate any interaction with the infant, and to respond as briefly as possible to infant interactive behavior. This procedure makes the implicit assumption that the presence of a minimally interacting mother appears "natural" to the infant. Without systematic examination of the way in which infants respond to different situations (separation, truly free play, the non-interacting mother, etc.), assumptions about the validity of the infant behavior observed are premature. It would be valuable to compare the child's behavior when his mother is instructed not to initiate interaction with his behavior when his mother is told she may do so, as a beginning in determining the ways in which situational variables affect infant behavior.

Other situational variables. Brooks and Lewis (1974b) identify six "ecological variables" which vary considerably from investigation to investigation: (1) the amount of time spent in the playroom; (2) the size and shape of the playroom; (3) the number and type of toys present; (4) the absence or presence of a female adult stranger; (5) the social class composition of the sample;

and (6) the operational definitions of the relationship to be measured.

These authors have investigated, to some degree, the effects of the first of these variables, amount of time spent in the playroom. Fifteen-minute observations of year-old infants and their mothers (mother present but not interacting) were analyzed into separate 3-minute episodes. Significant increases over time were reported for touching, vocalization, and proximity-seeking. Further, no sex differences emerged in the first 3 minutes of the observation, while sex differences increased over time, and were significant only when the entire 15-minute observation was considered. It would seem, then, that shorter periods of observation, such as the several 3-minute episodes from the strange situation paradigm (Ainsworth & Wittig, 1969) are less than optimal for assessing the quality of behavior which the infant directs toward its mother.

The Effects of Situational Variables upon Maternal Interactive Behavior

In view of the lack of investigations which have either systematically altered situations or have measured maternal behavior, it comes as no surprise that there are virtually no studies which have examined the effects upon maternal interactive behavior of situational variables. Even the effect of instructions (a form of context) upon maternal behavior has rarely been investigated. One exception is the above-noted investigation of maternal styles of leaving their infants (Weinraub & Lewis, in press).

Specific Issues to be Addressed

The above review has demonstrated the need for further examination of certain aspects of the mother-infant relationship. These can be defined in terms of four questions.

(1) How does infant interactive behavior change as a function of variations in the situation, or context? In view of the often contradictory evidence concerning the presence or absence of sex differences in the interactive behavior of year-old children, are these differences in any way a function of the situation?

(2) What is the nature of maternal interactive behavior with year-old infants, or with older infants? Are there variations in this behavior across situations? Are there sex differences in such behaviors which compare to those observed for infants?

(3) What is the relationship between infant and maternal interactive behavior? How does this relationship change across situations?

(4) What is the relationship between maternal report of her characteristic interactive behavior and either her own or her infant's observed behavior?

The present study has addressed itself to these four questions. By asking mothers to either interact or not interact with their year-old infants, two situations have been defined. These two situations have been frequently employed for the observation of mother-infant social behavior, although, as is the case for many

experimental settings, the degree to which either situation represents a valid slice of actual mother-infant interaction remains unknown. By recording infant and maternal behavior across these two situations, questions (1) and (2) above may be investigated. By examining intercorrelations between maternal and infant behavior across the two situations, the relationship indicated in question (3) may be examined. Finally, by questioning mothers first about the degree to which they perform the behaviors to be observed, and, second, about the degree to which they expect sex differences in infant behavior (an index of sex stereotyping), the interrelationships between maternal report and both maternal and infant behavior (or sex differences in that behavior) can be assessed.

II. METHOD

Subjects. Subjects were 60 white first-born infants and their mothers; there were 30 boys and 30 girls. Family backgrounds ranged from lower-middle to upper-middle class. All infants were between 11 and 14 months at time of testing, with a mean age of 52.8 weeks. Names of mothers who wished to participate were provided by their pediatricians and by La Maze group leaders. Some additional mothers volunteered to take part in the study because friends or relatives had done so. Fourteen additional babies were not included because they cried extensively during testing (9 during Non-Interaction, none during Interaction), because of equipment problems, or because their mothers failed to follow instructions.

Location. The observation room was located at Manhattanville College, Purchase, New York. It measured 15'11" by 11'4" (4.6m X 3.45m), and was divided into a grid of 12 equally sized rectangles by masking tape on the rug. The observation window was 41" high by 5'11" (1m X 1.8m). In addition to the observation window, there was a second window which was covered by a gold curtain. Walls were off-white, and carpeting was grey tweed. There were two doors. Inside the room there was a green chair for the mother (placed in one corner), several bookshelves along one wall (out of a baby's reach) which held toys when the room was not in use, but were empty when observations

were being made. The following toys were used:

1. a "Corn-Popper" push toy
2. a noise-producing pull toy
3. a plush dog
4. a pounding board with hammer
5. a set of natural wood blocks
6. a pail
7. a set of colored stacked rings
8. a plush elephant

One toy was placed in each of the squares, in a consistent pattern, with the exception of the three squares adjacent to the mother's chair, in order to encourage the baby to investigate the room.

Procedure. During a brief conversation with mothers, they were told that we would be observing their child at play and that they should act as naturally as possible. Mothers were assigned to one of two conditions: Interaction-first or Non-Interaction-first. Each mother-baby pair experienced both conditions, in a counter-balanced order. During Interaction, mothers were told they could interact in any way they wished with their babies. During Non-Interaction, mothers were asked to stay seated and not to initiate interaction with their babies, but to respond as briefly as possible if the baby initiated interaction.

Each mother entered the observation room, and sat down on the chair, holding her child on her lap. At a pre-arranged signal, the

mother placed the baby on the floor beside her and followed instructions relevant to whichever condition was first (Interaction or Non-Interaction). After 14 minutes, at a second signal from the Experimenter, the mother retrieved her infant, carried him back to the chair, and sat down with the infant in her lap. After several seconds, a third signal cued the mother that the second condition was to begin. She placed the infant on the floor beside her and followed instructions for whichever condition was second (Interaction or Non-Interaction). Sample instructions are included in the Appendix. Mothers read the instructions themselves and then discussed them with the Experimenter to insure their understanding.

After the observation, the mother was given a questionnaire to assess her report of the degree to which she engaged in certain behaviors with her infant and the degree to which her attitudes toward her child were sex-differentiating. The Experimenter read the questions and recorded the mother's answers.

Measurement. The following infant measures were taken: Frequency and Duration of touching the mother, looking at her, vocalizing, and being in proximity to her (defined as being within arms' reach, or about three feet). The following maternal behaviors were also measured: Frequency and Duration of looking at the infant, touching, vocalizing to and being in proximity with the infant. Maternal Proximity was recorded only when it was conceivably under her control, that is, when she was free to move around during Inter-

action, or if she actually got out of her chair to approach the infant during Non-Interaction. Proximity and touching were only recorded for the individual who was the initiator of the behavior. That is, if the infant moved from one side of the room to the square in which the mother was seated, only Infant Proximity would be scored. If the mother moved to her infant, Mother Proximity would be scored. Only the initiator of the proximity would get the proximity score even though both would be in proximity to each other. Infant Proximity and Mother Proximity were combined to produce a third measure of proximity: Total Proximity. This combined measure reflected the number of times or amount of time the mother and infant spent close to each other, regardless of who initiated the behavior. Previous studies have not differentiated between mother-initiated proximity and infant-initiated proximity, largely because previous studies have only considered the Non-Interaction condition.

A similar distinction was made for infant-initiated touching and mother-initiated touching; both were added together for a measure of Total Touch.

This set of 20 behaviors (eight for infant, eight for mother, four combined) were used to assess the quality of the interchange between the infant and the mother. Although these measures may perhaps appear somewhat dependent upon each other (and this will be considered below; see p. 76), they were sufficiently parallel to those in other studies as to allow comparison to previous research.

During the first weeks of data collection, inter-observer reliabilities were obtained by rotating three observers so that two recorded maternal behavior for one session and the third recorded infant behavior. A similar rotation allowed two observers to record infant behavior while the third recorded maternal behavior. Reliabilities (product-moment correlations) were obtained for each of 10 such records, on a minute-by-minute basis. Averaged across Subjects, these reliabilities are presented in Table 1. For both maternal and infant behavior, the average reliability coefficient is .77. For each behavior, Frequency reliabilities are rather lower than Duration reliabilities.

Questionnaire. The first part of the Questionnaire (see Appendix), The Maternal Attitude Scale, consisted of 27 items, assessing, on a 5-point scale, the degree to which a mother says she touches, looks at, vocalizes to, is nearby and plays with her infant. The first four categories of questions correspond to behaviors measured in the observation, and the fifth subscale, Play, was included as a measure of general interaction. Play might be thought to tap into the other four measures in addition to providing a general measure of interaction. Higher scores on all items on this portion of the Questionnaire indicate a verbal report of more interaction with the infant.

Items were chosen from a larger pool of 43 questions, after pretesting with an earlier group of 26 mothers of year-old infants,

TABLE 1

Mean Reliabilities for Mother and Infant
Observation Variables

	<u>Mother</u>	<u>Infant</u>
Frequency Touch	.83	.67
Duration Touch	.72	.98
Frequency Vocalization	.90	.71
Duration Vocalization	.91	.82
Frequency Look	.45	.67
Duration Look	.68	.76
Frequency Proximity	.74	.68
Duration Proximity	.92	.84
Overall Mean	.77	.77

which indicated relatively high intercorrelations among the chosen items within a given subscale.

Table 2 presents correlations among the Attitude subscales. These correlations are low, and with the exception of overlap between Play and Touch and between Play and Proximity the subscales appear relatively independent.

The second part of the questionnaire, the Maternal Stereotyping Scale, consisted of 23 items measuring the degree of sex-stereotyping of infant behavior which the mother would expect. These items used the form: "Do you think the following behaviors are more likely to be true of a boy, of a girl, or whether they are equally likely to be of either sex child at about a year?" Mothers could pick "Boy", "Girl" or "Either" in response to these items.

Although for all items, the majority of mothers picked "Either", there was considerable variation in the degree to which this was so, as well as in the degree to which mothers chose "Boy" or "Girl" for a given item if they did not chose "Either". On this basis, the following items did not show clear sex-stereotyped responses: 1,5,8,9,11,13,15 and 16, as seen in Table 3.

Of the remaining 15 items, if most non-"Either"-responding mothers chose "Boy", the item was considered to be a male-stereotyping item (items 4,7,18,19,20 and 23). If most chose "Girl", it was considered to be a female-stereotyping item (items 2,3,6, 10,12,14,17,21 and 22). Since it was found that some mothers

TABLE 2

Intercorrelations within Attitude and Stereotyping Scales

	<u>Touch</u>	<u>Voc</u>	<u>Play</u>	<u>Prox</u>	<u>Look</u>			
Touch								
Voc	-.05							
Play	.26*	-.19						
Prox	.14	-.11	.29*					
Look	.04	.00	.02	.30*				
	<u>Male Ster</u>	<u>Male Cster</u>	<u>Oth Male</u>	<u>Fem Ster</u>	<u>Fem Cster</u>	<u>Oth Fem</u>	<u>Wish Wash</u>	
MaleSter								
MaleCster	.03							
OthMale	.35**	.47***						
FemSter	.51***	.12	.41***					
FemCster	-.15	.38**	.08	.11				
OthFem	.20	.44***	.42***	.39***	.37**			
WishWash	-.72***	-.44***	-.68***	-.82***	-.25*	-.64***		

NOTE: p values are based on two-tailed tests.

*p < .05

**p < .01

***p < .002

TABLE 3

Frequencies of Mothers' Responses to Stereotyping Items by Sex

<u>Item</u>	<u>Daughters</u>			<u>Sons</u>			<u>Total</u>		
	<u>Boy</u>	<u>Girl</u>	<u>Either</u>	<u>Boy</u>	<u>Girl</u>	<u>Either</u>	<u>Boy</u>	<u>Girl</u>	<u>Either</u>
1	1	4	25	5	0	25	6	4	50
2	1	18	11	3	9	18	4	27	29
3	0	4	26	1	9	20	1	13	46
4	6	0	24	5	0	25	11	0	49
5	1	0	29	0	5	25	1	5	54
6	0	5	25	0	8	22	0	13	47
7	5	1	24	7	0	23	12	1	47
8	4	3	23	2	5	23	6	8	46
9	1	7	22	8	1	21	9	8	43
10	2	6	22	1	9	20	3	15	42
11	1	4	25	5	4	21	6	8	46
12	4	3	23	0	9	21	4	12	44
13	0	3	27	2	0	28	2	3	55
14	2	4	24	1	6	23	3	10	47
15	0	1	29	2	0	28	2	1	57
16	6	4	20	3	5	22	9	9	42
17	0	13	17	2	8	20	2	21	37
18	9	2	19	11	0	19	20	2	38
19	4	2	24	5	0	25	9	2	49
20	9	4	17	10	2	18	19	6	35
21	1	8	21	0	8	22	1	16	43
22	1	7	22	1	7	22	2	14	44
23	12	3	15	9	0	21	21	3	36

rather consistently responded in the direction OPPOSITE to that of the larger group of stereotyping mothers, subscales of female-counterstereotyping (choosing "Girl" on male-stereotyping items) and of male-counterstereotyping (choosing "Boy" on female-stereotyping items) were added. Two further subscales reflected the tendency to make consistently male or female choices on the eight items which did not show clear sex-stereotyped responses (items 1, 5,8,9,11,13,15 and 16). On this part of the questionnaire, then, there were six separate subscales.

Table 2 presents correlations among the Stereotyping subscales. Wishwash is, by definition, negatively correlated with all other subscales. There is considerable overlap among the subscales, primarily along the following lines: the two Stereotyping subscales are related, as are the two Counterstereotyping subscales; male choices (whether stereotyping or not) are related, as are female choices.

In an attempt to eliminate social-desirability bias, it was stressed that the difference between what mothers actually do and what they feel they should do was under investigation. Mothers were asked, for each item, what they thought the "Ideal Mother" should do, and what they themselves actually did with their infants.

III. RESULTS

Observation Data

Effects of Treatments and of Treatment Transitions

Mother

The first issues to be examined are: (1) the differential effects on the mother's behavior of her being told to interact or to not interact; and (2) the effects on the mother's behavior of moving from a condition of Interaction (high involvement) to one of Non-Interaction (low involvement) as opposed to the effects of moving from Non-Interaction to Interaction. The first question involves examining Treatment effects, while the second question involves examining the Order by Treatment interaction, or what will be called here Treatment Transitions. The main effect of Order assesses changes resulting from the passage of time over the entire 28 minutes of recording; none of the observed behaviors showed a significant main effect of Order (Table 4).

Duration and Frequency measures generally produced the same results. While the tables will present both measures, the Duration measures will be concentrated upon, since most studies use these; Frequency measures will be mentioned only when they generate different results. The behaviors (Touch, Vocalization, etc.) will be presented first separately, and then in combination.

TABLE 4

Means for Observation Data by Order

<u>Measure</u>	<u>Interaction First</u>	<u>Non-Interaction First</u>	<u>p</u>
Infant Touch			
Frequency	5.384	4.884	
Duration	47.732	45.516	
Infant Vocalization			
Frequency	82.732	69.648	
Duration	63.008	56.016	
Infant Look			
Frequency	27.632	24.468	
Duration	53.160	52.740	
Infant Proximity			
Frequency	8.316	6.948	
Duration	167.948	171.940	
Mother Touch			
Frequency	6.068	6.400	
Duration	16.132	17.468	
Mother Vocalization			
Frequency	70.232	72.100	
Duration	67.984	65.100	
Mother Look			
Frequency	48.968	52.348	
Duration	669.416	638.340	
Mother Proximity			
Frequency	5.148	4.148	
Duration	85.100	69.260	
Total Proximity			
Frequency	13.468	11.100	
Duration	253.048	241.200	
Total Touch			
Frequency	11.448	11.284	
Duration	63.868	62.984	

Touch. As Table 5 indicates, there is significantly less maternal touching during Non-Interaction than during Interaction [$F(1,56) = 7.414, p < .01$]. However, the mother's behavior is also dependent upon transitions of the treatment conditions (Figure 1a). If the mother moved from Interaction to Non-Interaction, the amount of her touching stayed about the same. If, however, she was first not interacting, her touching increased during the Interaction condition. Thus, she did not follow instructions and lower her level of touching when she went from Interaction to Non-Interaction, but when she was experiencing Non-Interaction first, she touched minimally and then increased her touching when free to do so.

Proximity. Mothers initiated less proximity when told not to interact (Table 5; [$F(1,56) = 50.262, p < .001$]) and this was not dependent upon the direction of the treatment transition (Interaction to Non-Interaction, or the reverse), as can be seen in Figure 1b.

Vocalization. Similarly, mothers vocalized less when instructed not to interact (Table 5; [$F(1,56) = 216.600, p < .001$]) regardless of the direction of the transition (Figure 1c).

Look. Although in most cases Frequency and Duration measures revealed similar results, this was consistently not the case for the maternal looking scores. Generally, the amount of times a mother looked at her infant was negatively related to the number of times she did so. Mothers looked longer [$F(1,56) = 82.295,$

TABLE 5

Means for Observation Data by Treatment

<u>Measure</u>	<u>Non-Interaction</u>	<u>Interaction</u>	<u>p</u>
Infant Touch			
Frequency	6.416	3.848	.01
Duration	69.468	23.784	.005
Infant Vocalization			
Frequency	92.316	60.068	.001
Duration	74.584	44.440	.001
Infant Look			
Frequency	23.448	28.648	.005
Duration	50.440	55.460	
Infant Proximity			
Frequency	7.148	8.116	
Duration	149.268	190.624	
Mother Touch			
Frequency	4.668	7.800	.025
Duration	11.884	21.716	.01
Mother Vocalization			
Frequency	17.516	124.816	.001
Duration	14.876	118.208	.001
Mother Look			
Frequency	41.884	59.432	.001
Duration	727.440	580.316	.001
Mother Proximity			
Frequency	0.284	9.016	.001
Duration	3.848	150.508	.001
Total Proximity			
Frequency	7.432	17.132	.001
Duration	153.116	341.132	.001
Total Touch			
Frequency	11.084	11.648	
Duration	81.348	45.500	.025

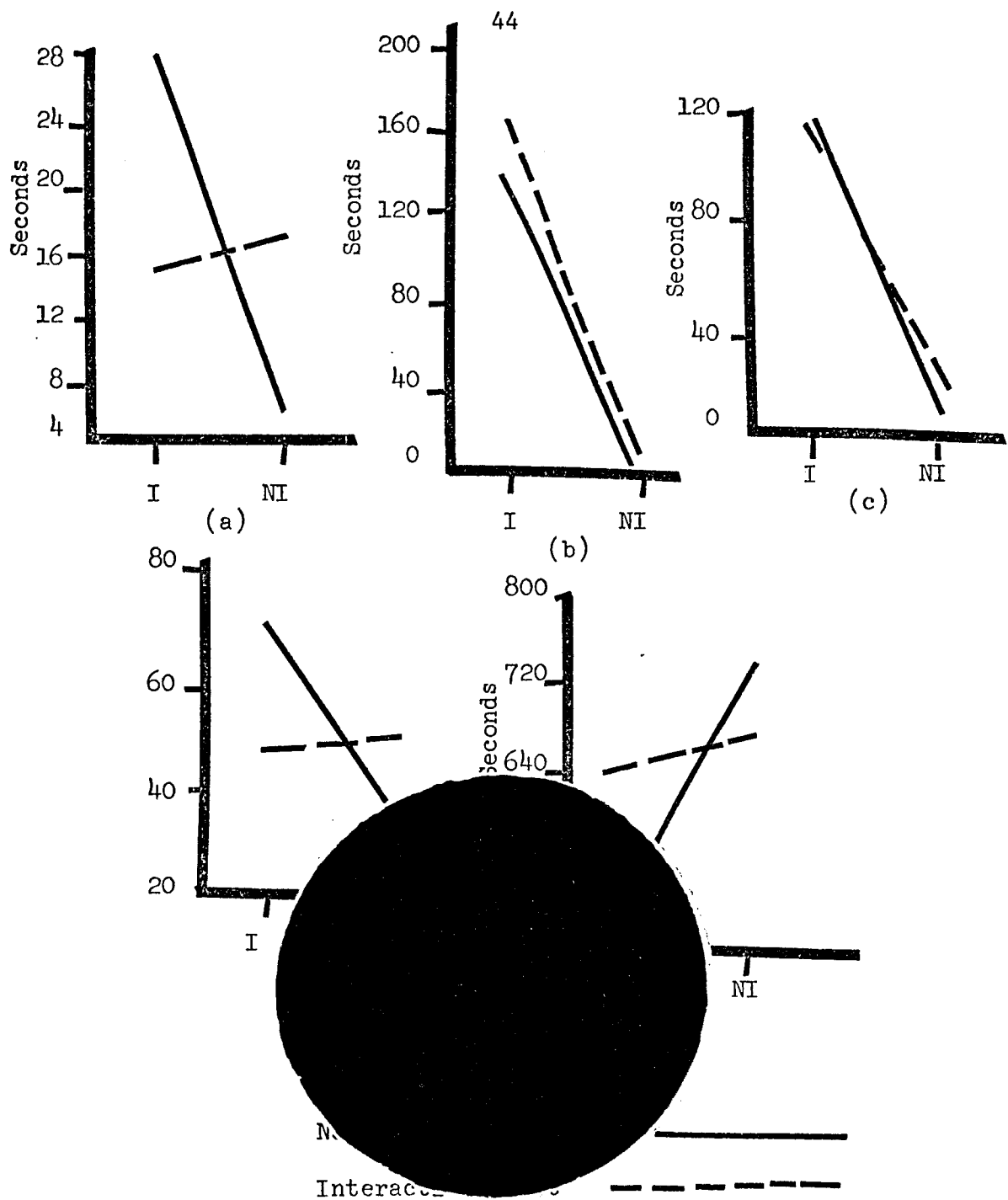


Fig. 1. Effect of Order on Mother Behaviors during Interaction (I) and Non-Interaction (NI): Duration Touch (a), Duration Proximity (b), Duration Vocalization (c), Frequency Look (d), and Duration Look (e)

$p < .001$] but less frequent at their infants during Non-Interaction also significant transition and less often during Non-Interaction who had Non-Interaction from Interaction to Non-Interaction looking under both conditions when the condition changed $p < .001$; for Duration,

Summary. During Interaction more proximity, to vocalization and more frequent looks to Interaction. These patterns of action preceded interaction to Infant

Touch. Table 3 indicates more during Non-Interaction 11.224, $p < .001$. If, first, these differences to infants who had the $F(1,56) = 4.913$, $p < .01$ (Fig. 2b) shows the same Interaction to Non-Interaction mentioned decrease.

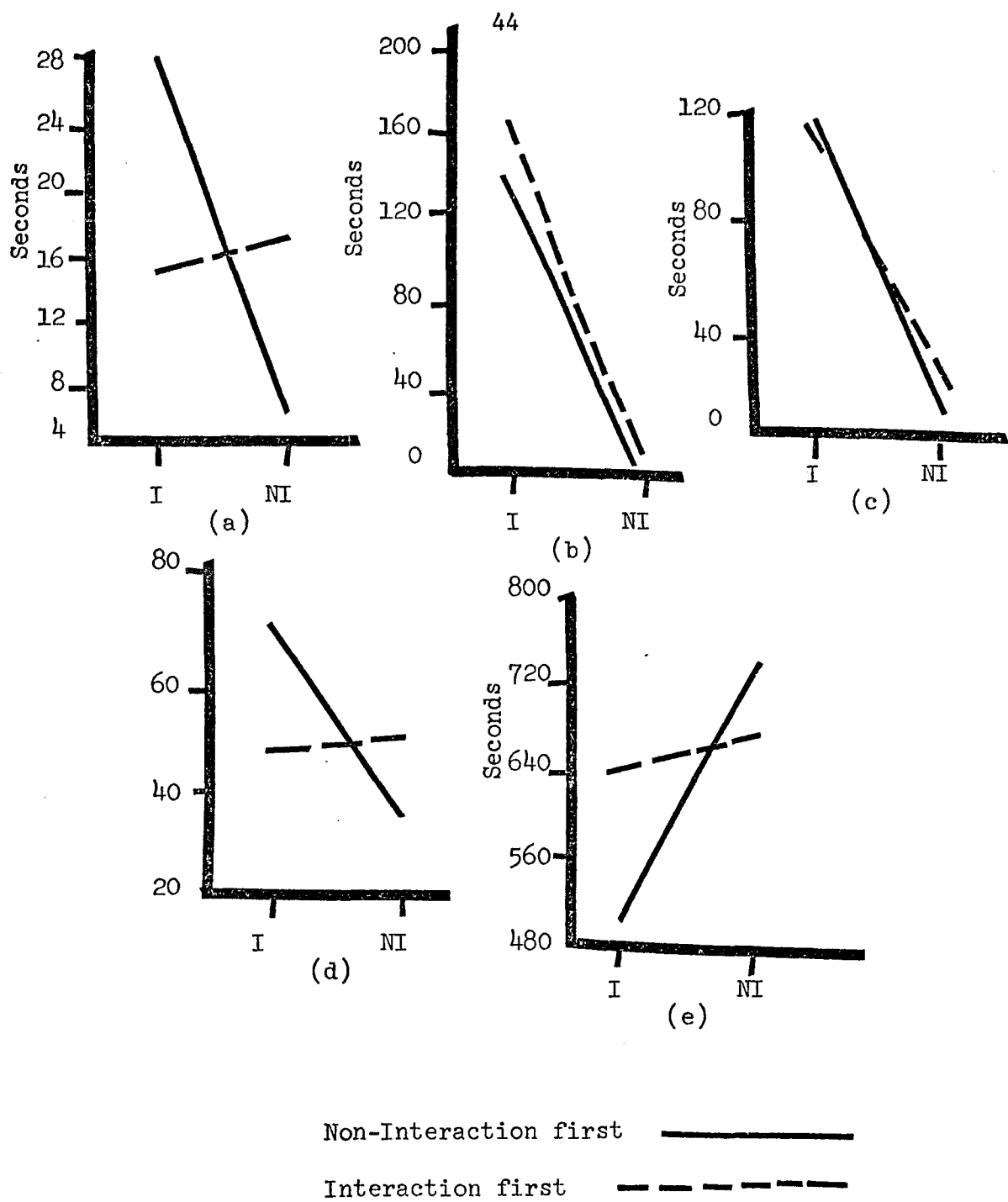


Fig. 1. Effect of Order on Mother Behaviors during Interaction (I) and Non-Interaction (NI): Duration Touch (a), Duration Proximity (b), Duration Vocalization (c), Frequency Look (d), and Duration Look (e)

$p < .001$] but less frequently [$F(1,56) = 18.472, p < .001$] at their infants during Non-Interaction (Table 5). There are also significant transition effects such that looking longer and less often during Non-Interaction was exaggerated for mothers who had Non-Interaction first (Figs. 1d & e). Mothers who moved from Interaction to Non-Interaction showed a moderate amount of looking under both conditions and did not change this very much when the condition changed. For Frequency, [$F(1,56) = 23.393, p < .001$]; for Duration, [$F(1,56) = 44.112, p < .001$].

Summary. During Interaction, mothers tended to initiate more proximity, to vocalize and touch more, and to direct shorter and more frequent looks toward their infants than during Non-Interaction. These behaviors were intensified when Non-Interaction preceded Interaction rather than the opposite order.

Infant

Touch. Table 5 indicates that infants touched their mothers more during Non-Interaction than during Interaction [$F(1,56) = 11.224, p < .002$]. If infants had the Interaction condition first, these differences in touching were magnified when compared to infants who had the Interaction condition second (Fig. 2a) [$F(1,56) = 4.910, p < .05$]. The Frequency score for touching (Fig. 2b) shows the same large increase when infants went from Interaction to Non-Interaction, and in contrast to the above-mentioned decrease, no change was seen in infants going from

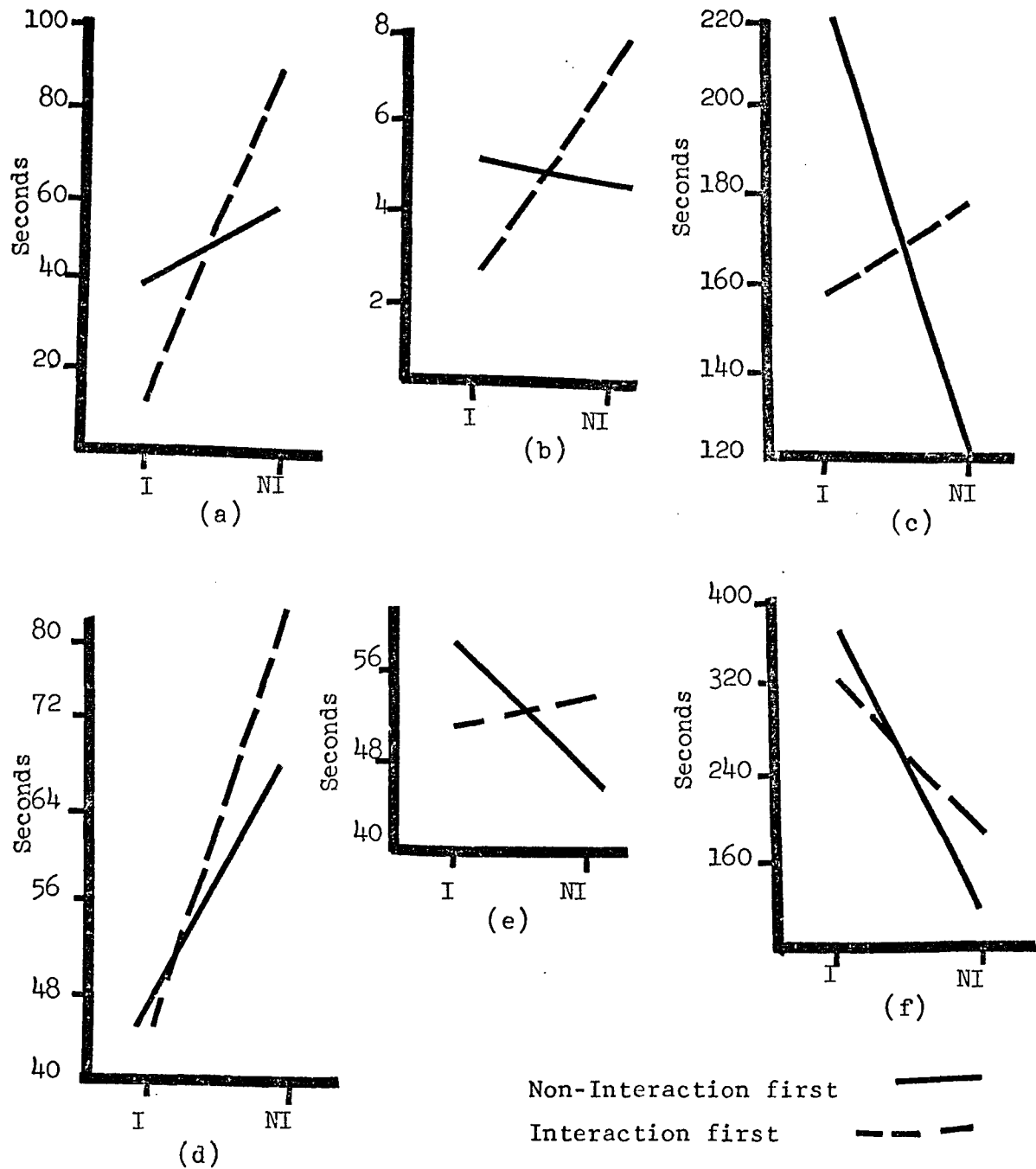


Fig. 2. Effect of Order on Baby Behaviors during Interaction (I) and Non-Interaction (NI): Duration Touch (a), Frequency Touch (b), Duration Proximity (c), Duration Vocalization (d), Duration Look (e) and Duration Total Proximity (f)

Non-Interaction to Interaction $[F(1,56) = 11.955, p < .002]$.

Proximity. As Table 5 indicates, there are no significant Treatment effects here, although infants tended to seek proximity more during the Interaction condition. This can be accounted for by the presence of the significant transition effect (the Order by Treatment interaction) $[F(1,56) = 5.431, p < .025]$. Figure 2c indicates that Interaction-first infants tended to increase the amount of proximity-seeking when they moved to the Non-Interaction condition. On the other hand, Non-Interaction-first babies also showed increases in proximity when they moved to the Interaction condition. Thus, the infant appeared to increase proximity-seeking to both the withdrawal of and the stepping up of maternal interaction, although the increase in infant proximity-seeking was much greater following an increment in maternal interaction.

Vocalization. Table 5 indicates that infant vocalization was greater under Non-Interaction regardless of the order of conditions $[F(1,56) = 35.449, p < .001]$. Infants who went from Interaction to Non-Interaction showed increases in vocalization, while babies moving from Non-Interaction to Interaction decreased their vocalization (Fig. 2d).

Look. As can be seen from Table 5, Duration of looking produced no overall Treatment effects because of the transition effect (Figure 2e). Either transition, whether it be an increase in interaction or a decrease in interaction, resulted in increased infant looking.

Total Touch. This measure parallels that for infant touching, discussed above, with regard to both Treatments and Treatment Transitions (Table 5). Regardless of who initiated the touching, infants and their mothers were in physical contact more during Non-Interaction [$F(1,56) = 5.640, p < .025$]. If the dyad had the Interaction condition first, these differences in touching were magnified when compared to dyads who had the Interaction condition second [$F(1,56) = 7.796, p < .01$].

Total Proximity. There was less overall proximity-seeking during Non-Interaction, obviously because the mother made almost no contribution to this measure when she was not free to move about (Table 5, [$F(1,56) = 50.344, p < .01$]). There are no significant transition effects: there was more proximity-seeking during the Interaction condition regardless of whether mother and baby moved toward increased or decreased interaction (Fig. 2f).

Summary. Overall, infants showed more touching and vocalizing during Non-Interaction than during Interaction, and there was more looking and proximity-seeking during Interaction than during Non-Interaction. When in Non-Interaction, the infant vocalized more and spent less time near his mother than he did during Interaction. For about half of the time that he was near his mother in Non-Interaction, he was touching her. During Interaction, the infant spent more time near his mother (about 25% more than during Non-Interaction), but less than 10% of this time

in proximity was spent touching her. Therefore, the proximity which appears in Non-Interaction was mostly in the service of touching, since the baby must be near the mother in order to touch her. Although there was more proximity-seeking in Interaction, a smaller percentage of it was for the purpose of touching. The baby also spent slightly more time looking at his mother during Interaction. If there was a high level of interaction (Interaction condition) followed by a low level of interaction (Non-Interaction condition), all four infant behaviors increased. The reverse transition (Non-Interaction followed by Interaction) resulted in increases in proximity and looking and in decreases in touching and vocalizing.

Effects of Sex and Sex Interactions

Mother

Touch. In general (Table 6), mothers showed no sex differences in their touching behavior, nor are there significant Sex by Treatment interactions (Figure 3).

Proximity. Maternal proximity-seeking was not sex-specific; neither the main effect of Sex (Table 6) nor the Sex by Treatment interaction is significant (Figure 3).

Vocalization. Mothers vocalized more to daughters than to sons, as Table 6 indicates $[F(1,56) = 6.169, p < .025]$. This difference is independent of whether the Interaction or the Non-Interaction condition is examined, as can be seen in Figure 3.

TABLE 6

Means for Observation Data by Sex

<u>Measure</u>	<u>Girls</u>	<u>Boys</u>	<u>p</u>
Infant Touch			
Frequency	5.300	4.968	
Duration	59.460	33.792	
Infant Vocalization			
Frequency	70.716	81.668	
Duration	52.508	66.516	.05
Infant Look			
Frequency	28.284	23.816	
Duration	56.276	49.624	
Infant Proximity			
Frequency	7.800	7.468	
Duration	196.148	143.740	
Mother Touch			
Frequency	5.716	6.748	
Duration	14.268	19.332	
Mother Vocalization			
Frequency	80.700	61.632	.025
Duration	76.308	56.776	.025
Mother Look			
Frequency	48.956	52.000	
Duration	660.816	646.940	
Mother Proximity			
Frequency	3.832	5.468	
Duration	81.960	72.400	
Total Proximity			
Frequency	11.632	12.932	
Duration	278.108	216.140	.05
Total Touch			
Frequency	11.016	11.716	
Duration	73.724	53.124	

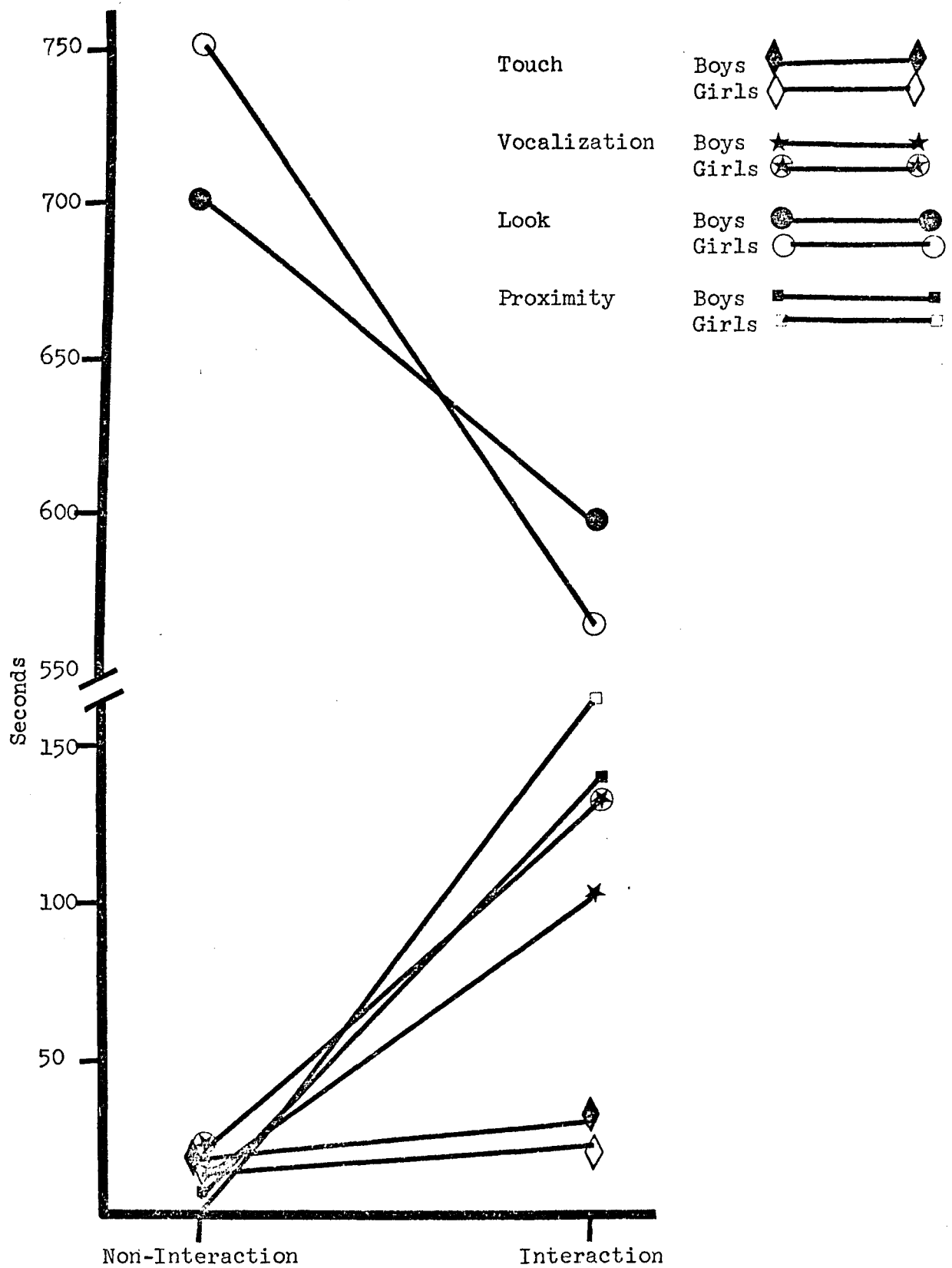
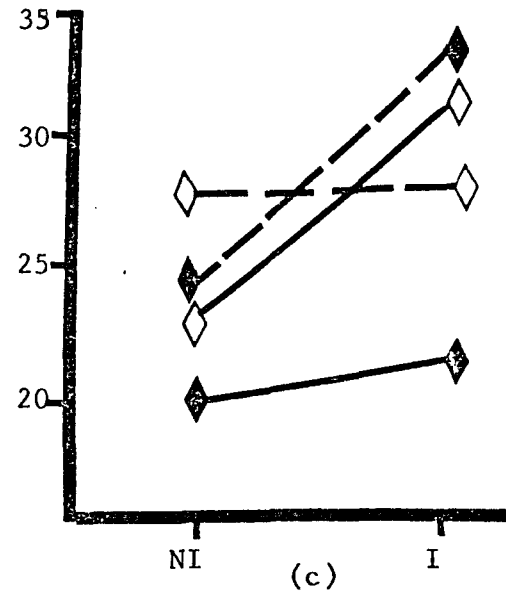
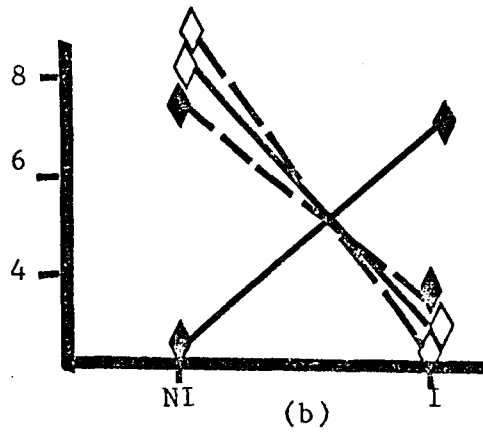
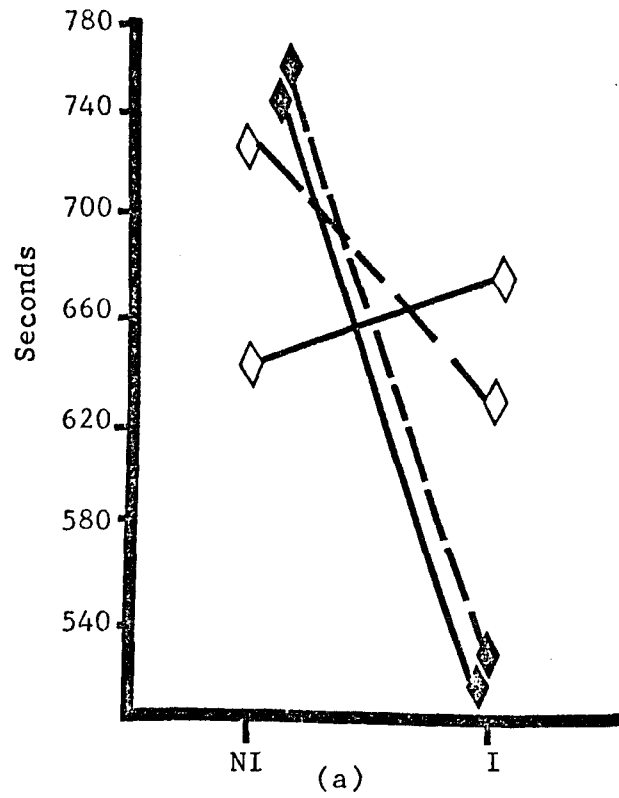


Fig. 13. Sex Differences in Mother Behaviors across Treatments

Look. As Table 6 indicates, there is no overall sex effect for looking, although both Frequency [$F(1,56) = 4.248$, $p < .05$] and Duration [$F(1,56) = 5.012$, $p < .05$] reveal significant Sex by Treatment interactions. Regardless of which condition came first, during Non-Interaction, mothers looked at girls longer than they looked at boys ($t = 2.6681$, $p < .01$), while there was no difference during Interaction (Figure 3).

As noted above, mothers looked longer at their babies during Non-Interaction (when they had little else to do) and they tended to less looking in Interaction (probably indicative of active play). This relationship is further complicated by the presence of a significant Sex by Order by Treatment interaction [$F(1,56) = 4.425$, $p < .05$]. Figure 4a shows that no sex differences in maternal looking occurred when the mother increased her level of interaction. When the mother was first free to play, and then had to stop interacting, she showed increased looking if she had a daughter ($t = 3.4257$, $p < .01$) but actually slightly decreased her looking time with a son.

Summary. There were few maternal sex differences. Mothers showed no sex-differential touching or proximity-seeking, nor were there significant Sex by Treatment interactions for these behaviors. Mothers vocalized more to daughters under both Interaction and Non-Interaction conditions. While there were no sex differences in looking behavior during Interaction, in Non-Interaction mothers looked at girls more than they looked at



Non-Interaction first

Boys
Girls



Interaction first

Boys
Girls

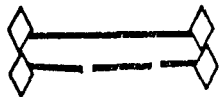


Fig. 4. Effects of Order during Non-Interaction (NI) and Interaction (I) for Boys and Girls: Duration Mother Look (a), Frequency Baby Touch (b) and Frequency Baby Look (c)

boys. This can be accounted for by the tendency of mothers having Interaction first to look more at daughters in the second episode than they looked at sons. This reflects increased gazing at girls during Non-Interaction, especially when mother and child are responding to the withdrawal of interaction.

Infant

Touch. Although girls touched their mothers somewhat more than boys did (Table 6), this overall difference only approached significance [$F(1,56) = 3.159, p < .08$]. However, as can be seen in Figure 5, the presence of a significant Sex by Treatment interaction [$F(1,56) = 7.456, p < .01$] obscures the main effect. While girls touched their mothers about three times as much as boys did during Non-Interaction ($t = 3.6795, p < .002$) this sex difference disappears under the Interaction condition. Boys' touching remained at the same low level regardless of whether or not the mother was interacting. Girls' touching, on the other hand, was more responsive to the level of interaction: if the mother did not interact, girls showed more touching, while if the mother was interacting, girls' touching declined to the level of boys' touching ($t = 3.4210, p < .002$).

While there were no significant sex differences in transition effects for the Duration measure, there were for the Frequency measure. Recall that infants who went from Interaction to Non-Interaction showed an increased frequency of touching, while those

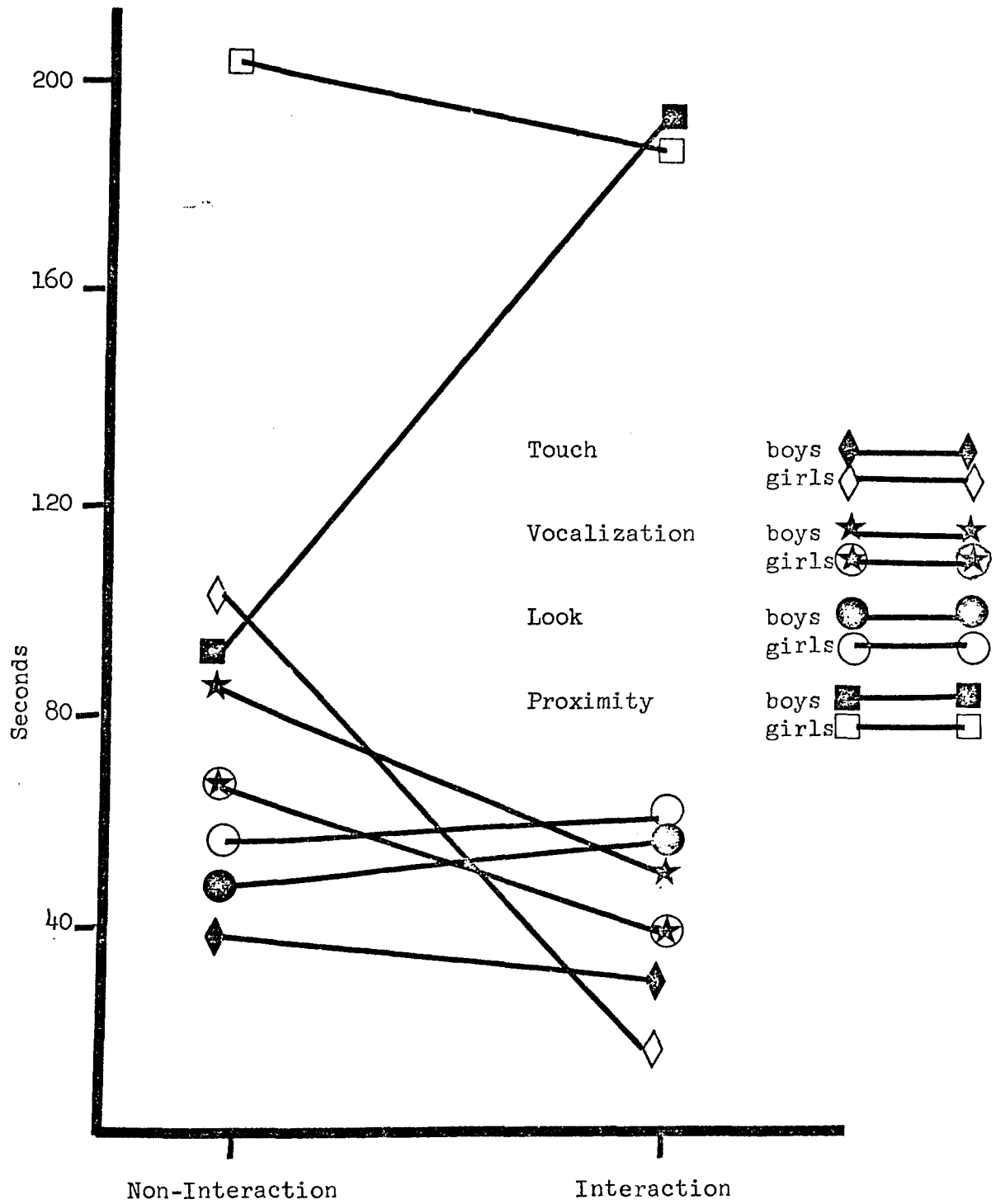


Fig. 5. Sex Differences in Baby Behaviors across Treatments

who first had the Non-Interaction condition showed no change. This transition effect is accounted for by the sexes differentially [$F(1,56) = 4.551, p < .05$]. As Figure 4b indicates, girls touched their mothers more often during Non-Interaction, regardless of transition effects, while boys touched their mothers more often during Non-Interaction only if they first had the experience of Interaction. Girls responded directly to the level of interaction of the mother, touching her more when she did not interact. Boys did this only if they had first been interacting with the mother and then she ceased to respond.

Proximity. The overall sex effect for proximity is not significant (Table 6), although girls initiated somewhat more proximity than boys did [$F(1,56) = 3.248, p < .08$]. However, as can be seen from Figure 5, there is a significant Sex by Treatment interaction [$F(1,56) = 4.685, p < .05$]. Girls stayed nearer their mothers than boys did during Non-Interaction, ($t = 4.9979, p < .002$), while there was no difference during Interaction. Girls' proximity-seeking remained the same whether the mother was interacting or not. Boys, on the other hand, initiated far less proximity-seeking during Non-Interaction and responded at the girls' level when the mother was available (and presumably doing something interesting enough to attract them).

Vocalization. Boys spent more time vocalizing overall than girls did, as can be seen in Table 5 [$F(1,56) = 4.833, p < .05$].

As Figure 5 indicates, this difference is independent of level of maternal interaction and of treatment transitions.

Look. Girls looked at their mothers more than boys did, although this difference is non-significant (Table 6). As Figure 5 indicates, there are no interactions with Treatment. While, in general, infants responded to a transition toward either increased or decreased interaction by increased frequency of looking, there are sex differences in this pattern. In fact, the significant Sex by Order by Treatment interaction [$F(1,56) = 5.997, p < .025$] indicates that infants of both sexes showed increased looking when their mothers increased the level of interaction (only for girls is this significant; $t = 2.7513, p < .02$) but when mothers decreased their interaction, boys decreased the frequency of their looking ($t = 2.3612, p < .05$) while girls showed no change (Figure 4c).

Total Touch. While there are no overall sex differences in the summed measure of touching (Table 6), the Sex by Treatment interaction is significant for both Duration [$F(1,56) = 7.010, p < .02$] and Frequency [$F(1,56) = 4.658, p < .05$]. Girls and their mothers spent more time in physical contact during Non-Interaction than they did during Interaction ($t = 2.926, p < .01$), while boys and their mothers spent slightly less time in contact during Non-Interaction than during Interaction (Figure 6b). Boys and girls do not differ very much in the amount of touching they experience (regardless of who initiates it) during Interaction,

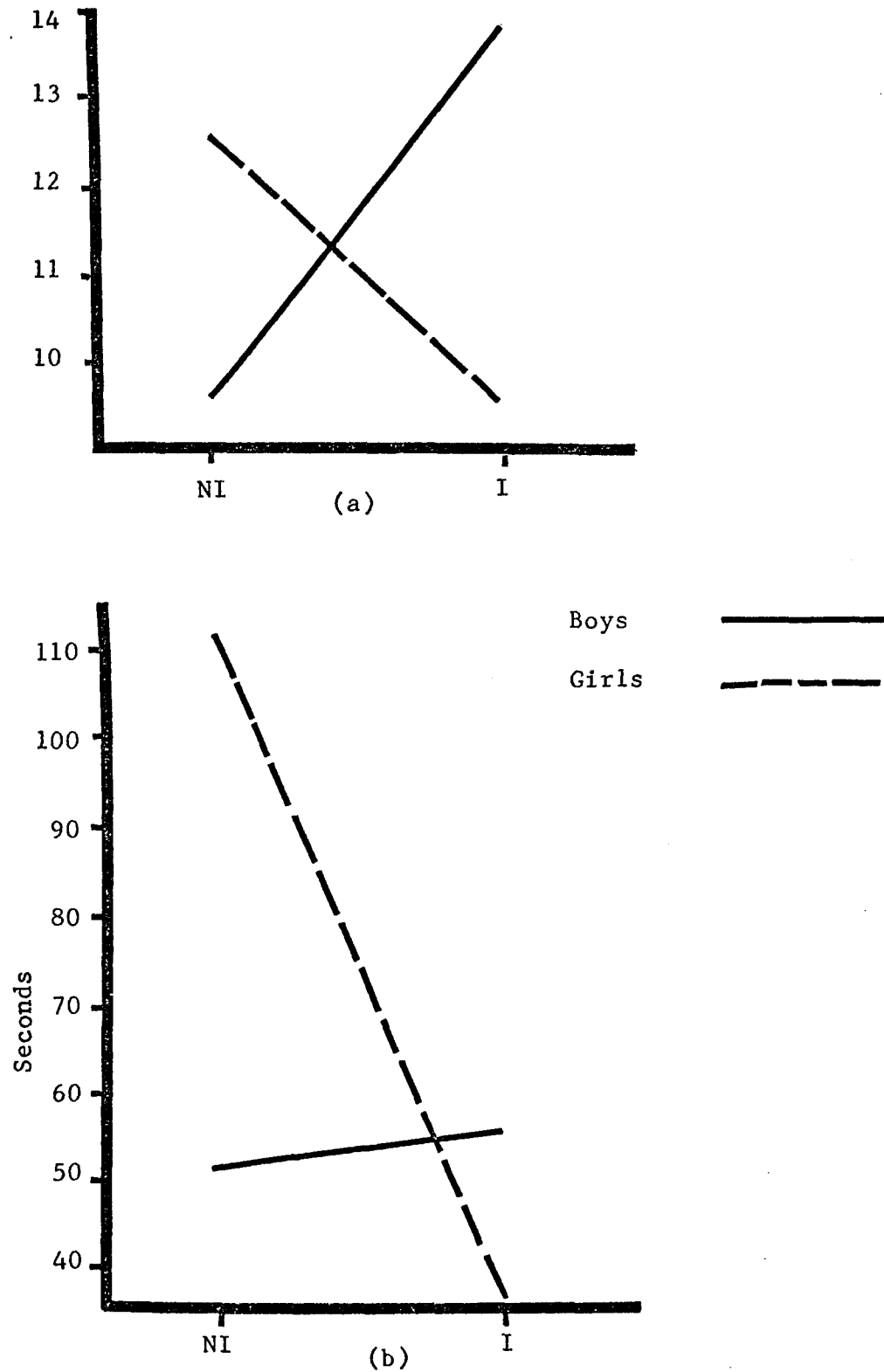


Fig. 6. Sex Differences in Frequency Total Touch (a) and Duration Total Touch (b) during Non-Interaction (NI) and Interaction (I)

but girls experience more touching during Non-Interaction than boys do ($t = 3.2447$, $p < .002$). As can be seen in Figure 6a, girls and their mothers were in physical contact during Non-Interaction somewhat more often than they were during Interaction while the reverse was true of boys and their mothers.

Total Proximity. When mothers' proximity scores are added to infants' scores (Table 6), girls spent significantly more time near their mothers [$F(1,56) = 4.291$, $p < .05$]. Although most of the contribution to this effect comes from a sex difference in infant behavior, the fact that maternal behavior is consistent with this sex difference (slightly more proximity directed toward daughters) causes the difference to become significant. The result is that, regardless of who initiated the proximity, girls actually spent more time near their mothers than boys did. There are no Order or Sex by Order effects.

Summary. Sex differences in distal behaviors were independent of the level of interaction: boys vocalized more than girls in both conditions, and there were no sex differences in looking behavior in either condition. Sex differences in proximal behaviors were dependent upon the level of interaction. Proximal behavior was greater for girls during Non-Interaction, with girls showing more proximity-seeking and more touching than boys showed. During Interaction, there were no sex differences in proximal behaviors.

Sex differences in reactions to treatment transitions

indicate that boys' looking and proximity-seeking were more sensitive to the activity of the mother than were the same measures for girls. When mothers increased their interaction, and perhaps their interestingness, infants of both sexes looked at mothers more. When mothers decreased the level of their interaction, boys moved away and looked less often. Girls' touching was sensitive to maternal availability: they touched when the mother was not interacting with them. Boys' touching was generally rather lower than that of girls, and boys tended to increase their touching during Non-Interaction only in response to the withdrawal of maternal interaction (that is, in the situation when Interaction had come first).

Effects of Intervals and Interactions with Intervals

The observation records were divided into four 3.5 minute intervals for each condition. The main effect of Intervals assesses time-related changes in behavior over Treatments. Also to be discussed below are Treatment by Intervals effects, Sex by Intervals effects, Order by Intervals effects, Sex by Treatment by Intervals effects, Order by Treatment by Intervals effects, Sex by Order by Intervals effects, and finally, Sex by Order by Treatments by Intervals effects.

Mother

Touch. When considering Interaction and Non-Interaction

periods, maternal touching remained stable over intervals within the 14 minutes (Table 7). The significant Treatment by Intervals interaction [$F(3,168) = 3.448, p < .025$] indicates that touching tended to decrease over the course of the Interaction episode (comparing Intervals 1 and 4, $t = 2.1977, p < .05$) and to increase over the course of the Non-Interaction episode ($t = 2.2612, p < .05$), as can be seen in Figure 7a. These trends are not sex-specific (the Sex by Treatments by Intervals interaction is non-significant); patterns are similar for boys and girls (Figure 8a). This pattern is also independent of whether the first or second episode is examined, as well as independent of the direction of the treatment transition.

Proximity. Over Non-Interaction and Interaction, maternal proximity-seeking shows a clear decline over time [$F(3,168) = 3.588, p < .025$] (Table 7). The fact that there was so little proximity-seeking during Non-Interaction, so that it could not really decrease appreciably, probably accounts for the significant Treatment by Intervals interaction [$F(3,168) = 2.918, p < .05$], as can be seen in Figure 7c. The significant Sex by Intervals interaction [$F(3,168) = 3.366, p < .025$] indicates that mothers initially directed more proximity-seeking to sons, but that this dropped off to below the level of mothers with daughters (Figure 9). This is again what is indicated by the Sex by Treatments by Intervals interaction [$F(3,168) = 3.941, p < .01$], with almost all of the difference occurring in Interaction, since

TABLE 7

Means for Observation Data by 3.5-Minute Intervals

<u>Measure</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>p</u>
Infant Touch					
Frequency	1.175	0.967	1.283	1.708	.025
Duration	10.279	11.625	9.871	14.850	
Infant Vocalization					
Frequency	17.450	18.692	19.383	20.667	.05
Duration	13.729	13.779	15.792	16.212	
Infant Look					
Frequency	6.817	6.617	6.358	6.258	
Duration	13.633	13.442	13.946	11.929	
Infant Proximity					
Frequency	1.925	1.758	2.067	1.883	
Duration	40.996	37.221	44.246	47.483	
Mother Touch					
Frequency	1.483	1.475	1.492	1.783	
Duration	4.275	3.954	4.158	4.412	
Mother Vocalization					
Frequency	18.917	17.017	18.400	16.833	.05
Duration	17.146	15.929	17.362	16.104	
Mother Look					
Frequency	12.042	11.717	12.992	13.908	
Duration	163.421	167.037	160.771	162.650	
Mother Proximity					
Frequency	1.575	1.183	1.058	0.833	.05
Duration	24.687	17.833	20.408	14.250	
Total Proximity					
Frequency	3.500	2.942	3.125	2.717	
Duration	65.583	55.054	64.654	61.733	
Total Touch					
Frequency	2.658	2.442	2.775	3.492	
Duration	14.554	15.579	14.029	19.262	

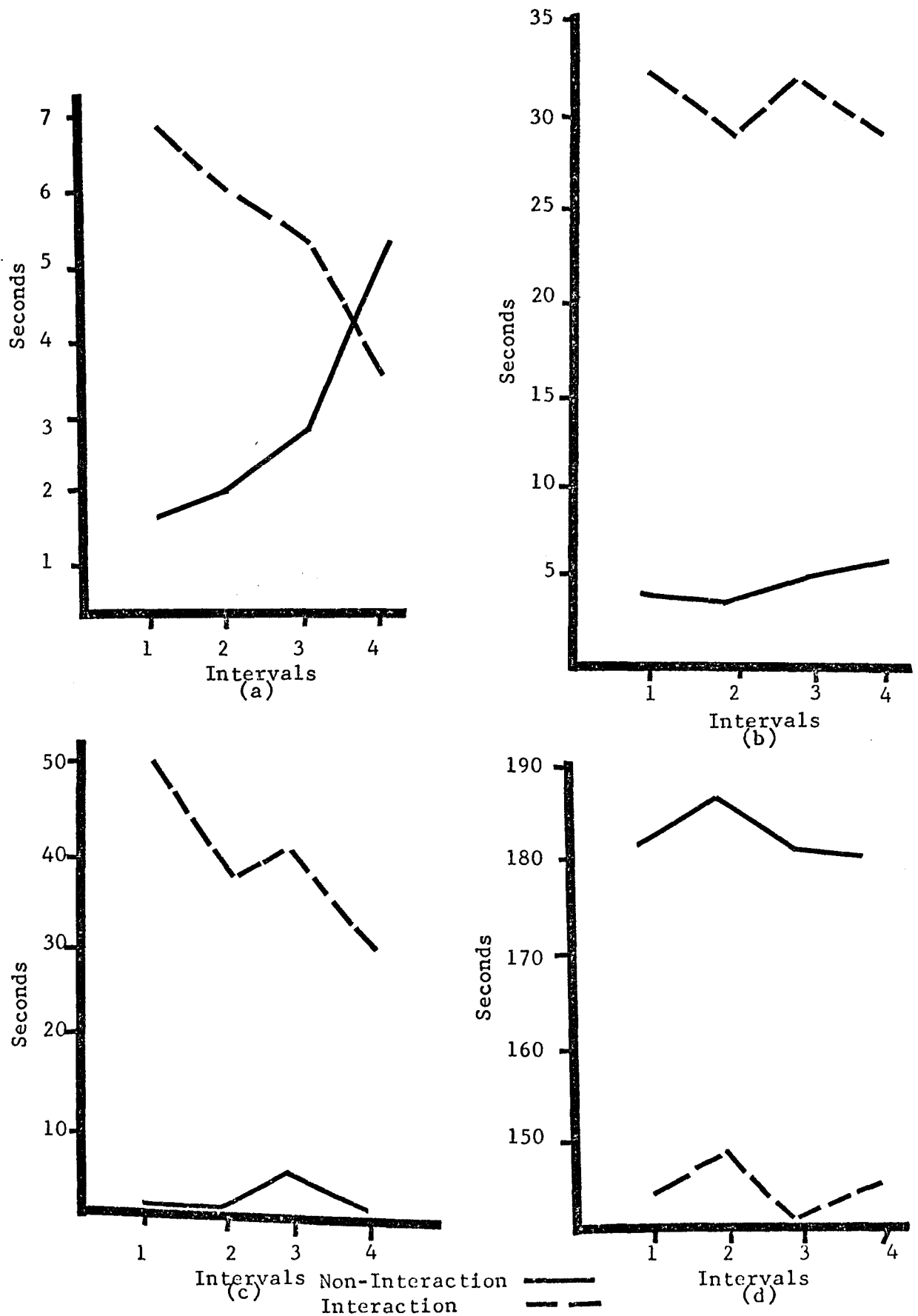


Fig. 7. Treatment Differences in Maternal Behaviors over Intervals: Duration Touch (a), Duration Vocalization (b), Duration Proximity (c) and Duration Look (d)

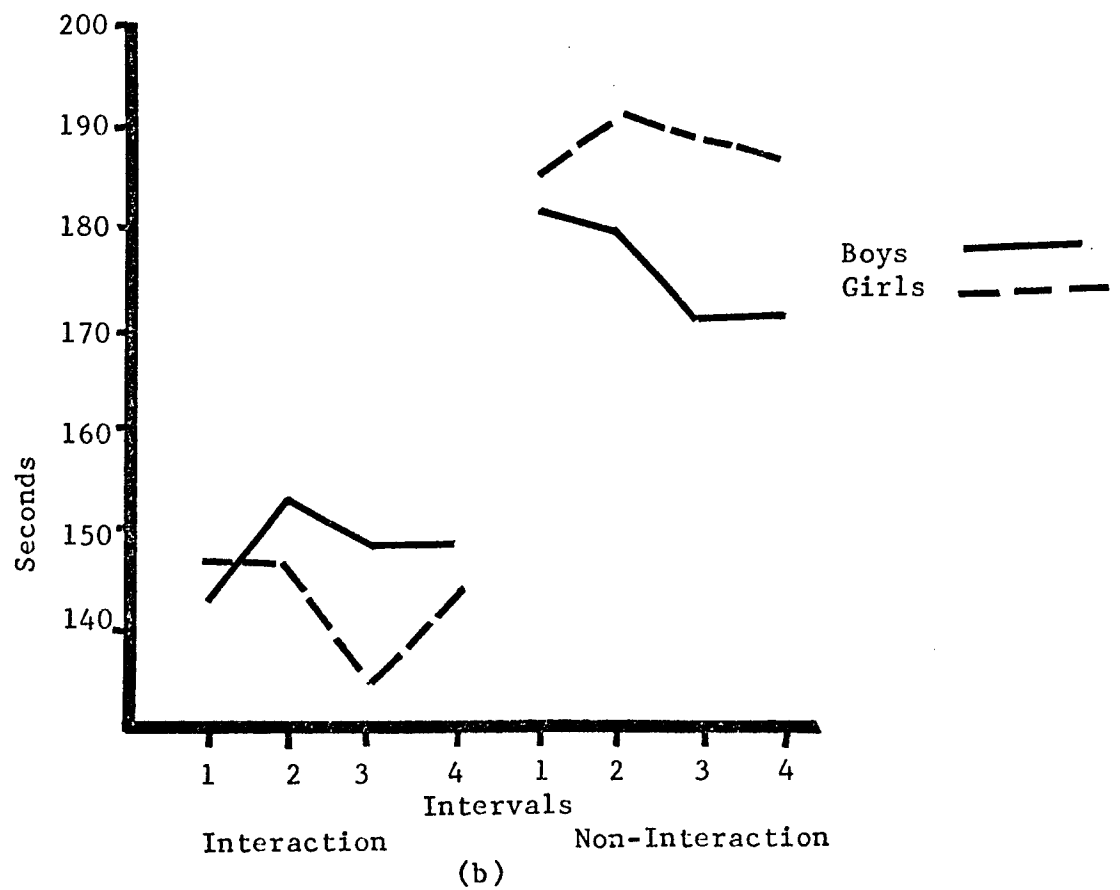
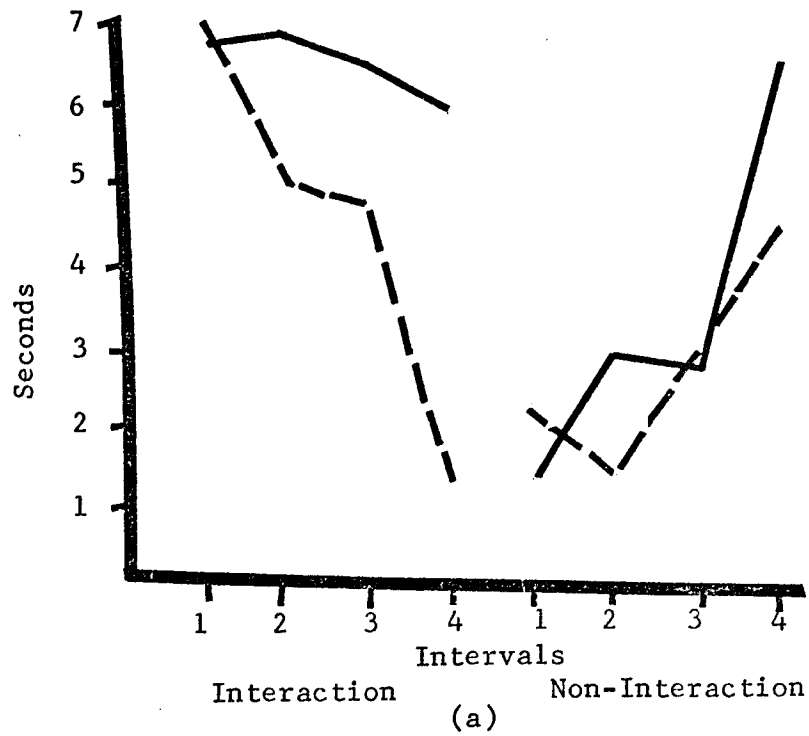


Fig. 8. Sex and Treatment Differences in Mother Touch (a) and Mother Look (b) over Intervals

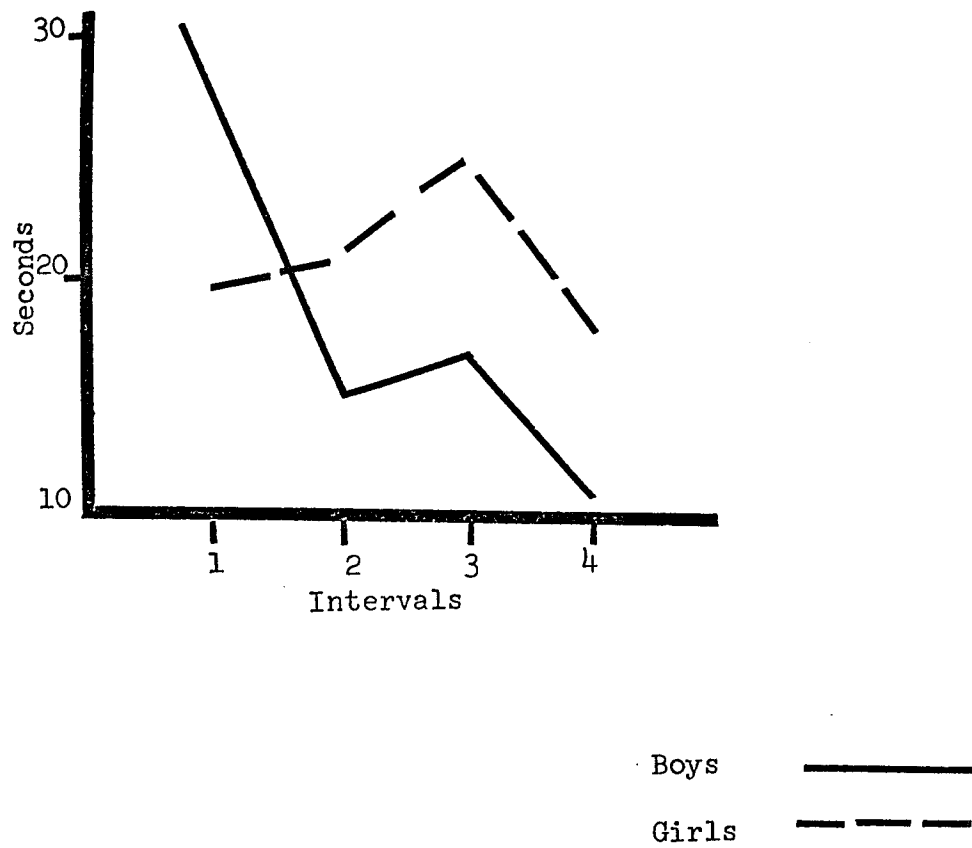


Fig.9.Changes in Mother Proximity over Intervals for Boys and Girls

maternal proximity scores were already so low during Non-Interaction (Figure 10b).

Vocalization. As Table 7 indicates, there were no consistent changes over time in the duration of maternal vocalization, although the frequency of vocalization tended to drop off over time [$F(3,168) = 2.647, p < .05$]. For Duration, the Treatment by Intervals interaction is significant [$F(3,168) = 2.928, p < .05$]; as Figure 7b shows, there was a slight increase in vocalization over the course of the Non-Interaction episode ($t = 1.6790, p < .10$) and a generally decreasing pattern during Interaction ($t = 2.0123, p < .05$). As Figure 10a shows, these patterns are not sex-specific (the Sex by Treatment by Intervals interaction is not significant); they are also independent of the direction of the treatment transition and of whether the first or the second episode is examined.

Look. Maternal looking showed no consistent change over time (Table 7), and this is independent of Treatments (Figure 7d). This pattern is not sex-specific (Figure 8b).

Summary. Over the course of Interaction, maternal touching, proximity-seeking and vocalization decreased, while looking showed no consistent change. During Non-Interaction, touch and vocalization tended to increase, while looking and proximity-seeking showed only slight changes. With the exception of proximity-seeking, these patterns had very little to do with the sex of the baby. Mothers stayed closer to sons for the first

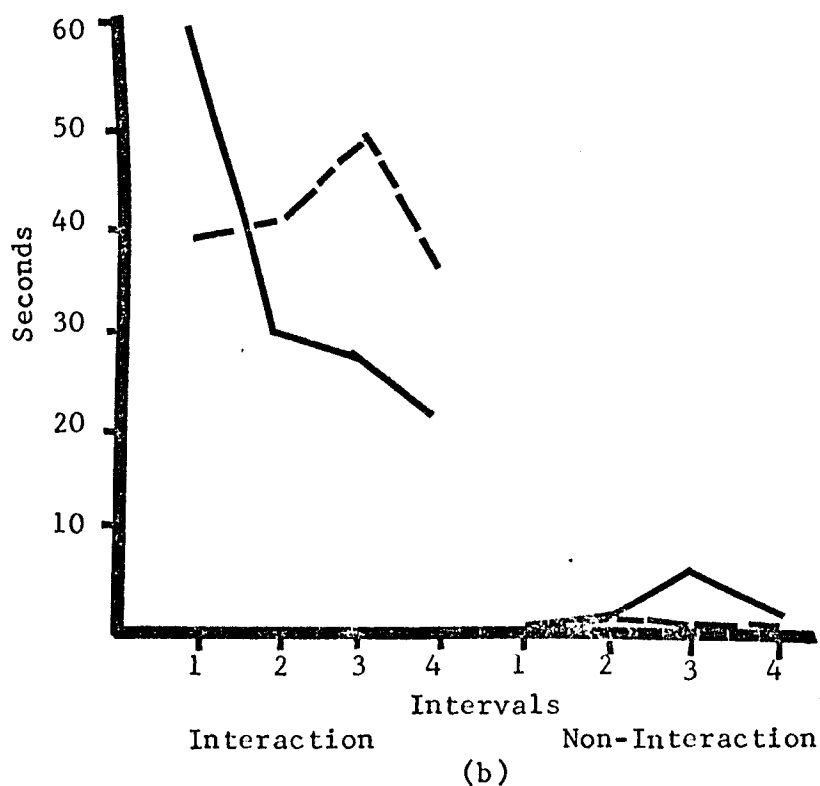
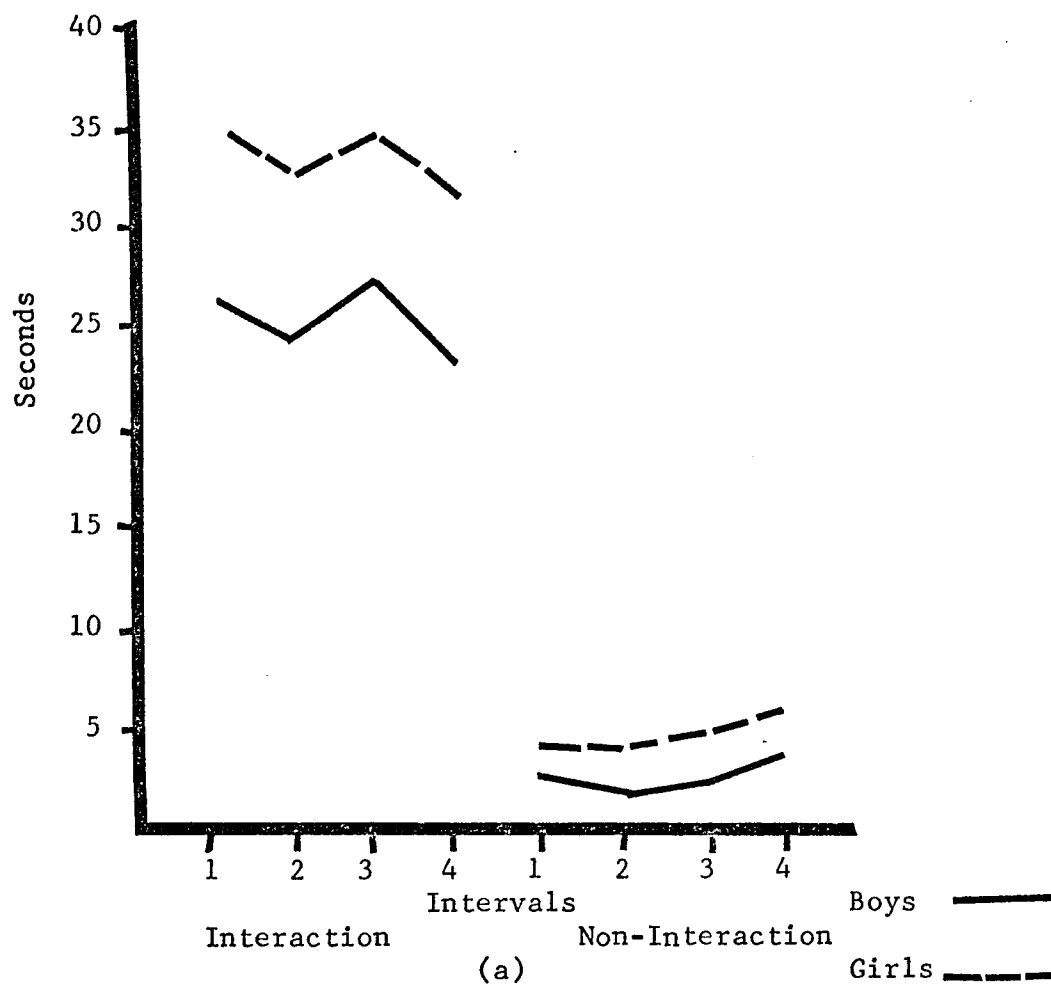


Fig. 10. Sex and Treatment Differences in Mother Vocalization (a) and Mother Proximity (b) over Intervals

few minutes of an Interaction episode, but this drops off rapidly, so that by the second interval (minutes $3\frac{1}{2}$ to 7), mothers spent less time near sons.

Infant

Touch. As Table 7 indicates, infants tended to touch their mothers more often as the session went on [$F(3,168) = 3.582, p < .025$]. This was also true of the total amount of time spent touching, although this difference is not significant. The lack of significant Treatment by Intervals, Order by Intervals, or Order by Treatment by Intervals interactions for either measure of infant touching indicates that this general increase is true of babies during both Interaction and Non-Interaction (Figure 11a), and depends neither upon which condition came first, nor upon the direction of the treatment transition. The increased touching within a condition is not secondary to boredom (and thereby increased touching) across the 28 minutes of recording. Since the significant Order by Treatment interaction discussed above indicates less overall touching in the second session if the infant had the Non-Interaction condition first. Even infants having Interaction first failed to show a monotonically increasing level of touching over the entire session.

Figure 12a presents data of touching separately for boys and girls under each condition. Although the Sex by Treatment by Intervals interaction is not significant, it is interesting

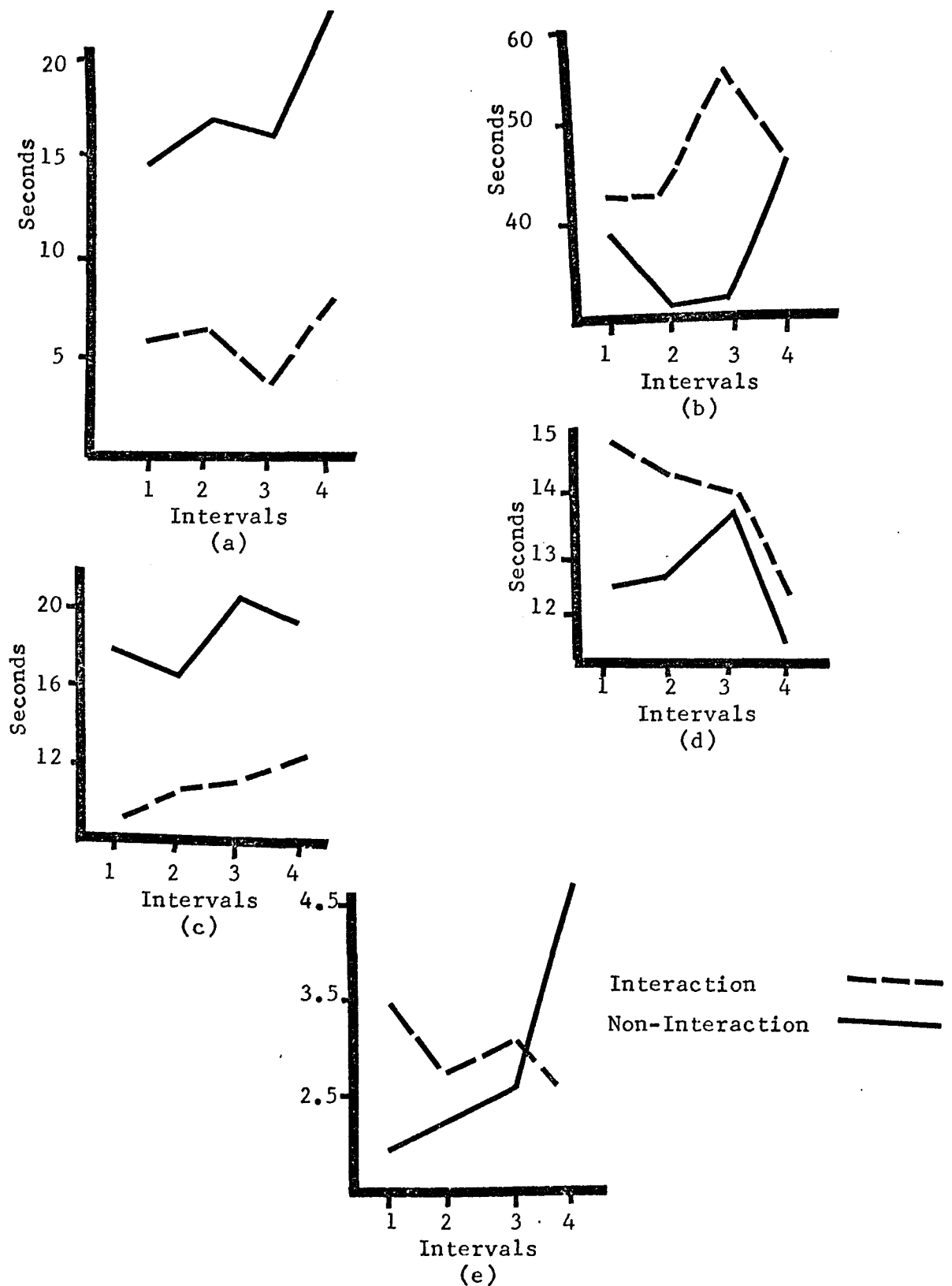


Fig. 11. Treatment Differences over Intervals: Duration Baby Touch (a), Duration Baby Proximity (b), Duration Baby Vocalization (c), Duration Baby Look (d) and Frequency Total Touch (e)

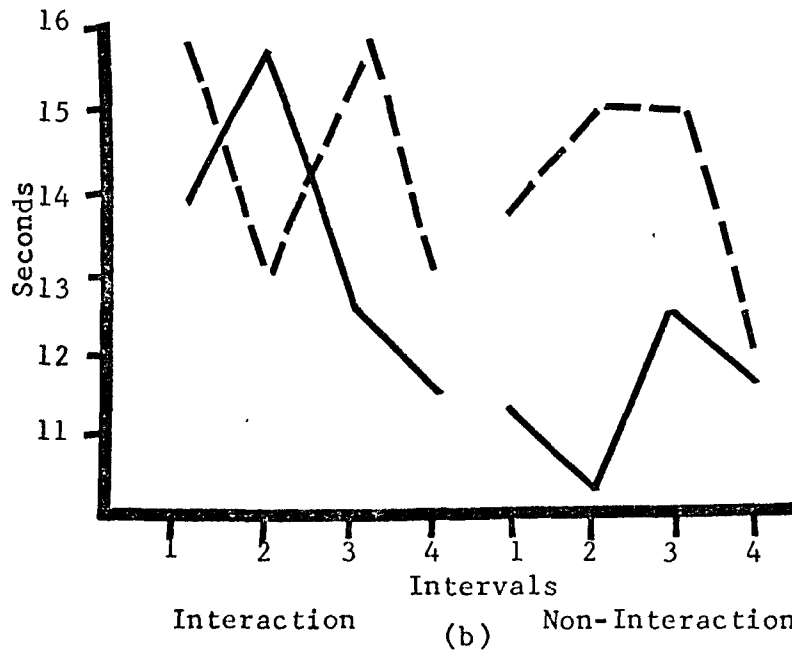
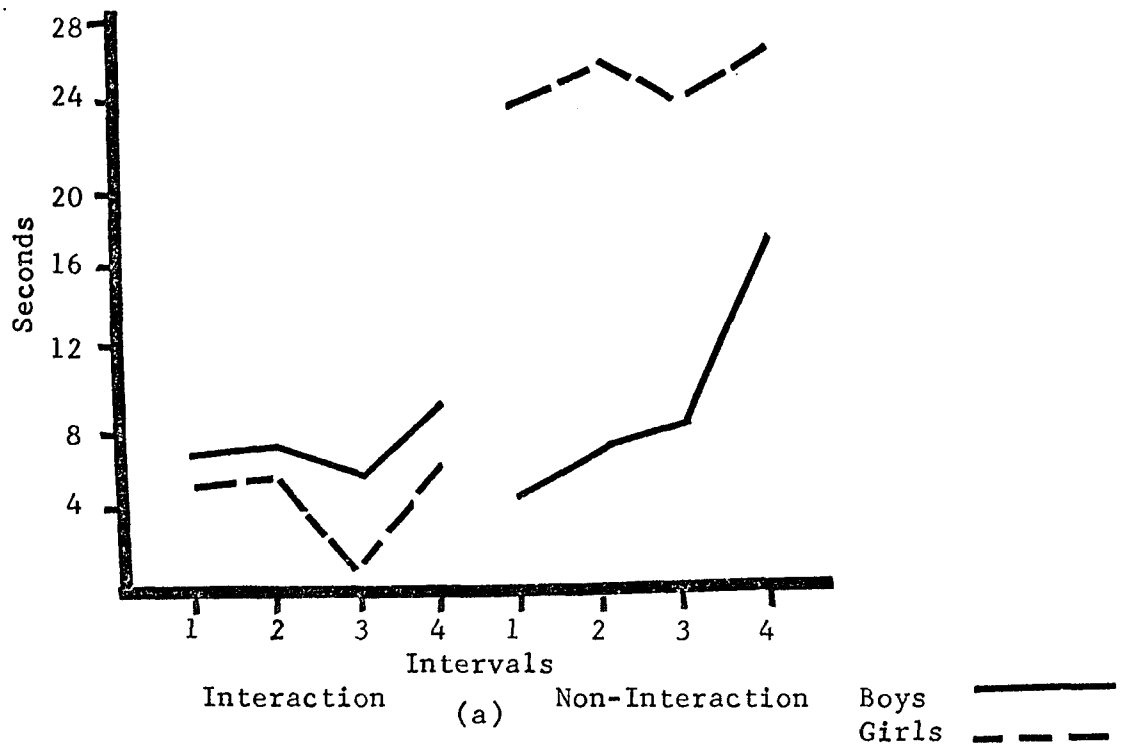


Fig. 12. Sex and Treatment Differences in Baby Touch (a) and Baby Look (b) over Intervals

to examine the data for Non-Interaction in the light of Brooks' and Lewis' (1974b) finding of sex differences which emerge only after the initial 3-minute time interval. As can be seen, sex differences in infant touching are present from the initial interval and, in fact, tend to decrease slightly over the entire time period sampled.

Vocalization. Infant vocalization also increased significantly [$F(3,168) = 3.529, p < .025$] with the passage of time during a session (Table 7). As was the case for touching, the lack of significant Treatment by Intervals (Figure 11c), Order by Intervals, or Order by Treatment by Intervals interactions in vocalization indicates that this increase is not dependent upon which condition is examined, whether it is the first or second session, or whether the level of interaction has increased or decreased. Increased vocalization over time was not a result of boredom across the entire 28 minutes of recording. There was less overall vocalization in the second session if the infant had the Non-Interaction condition first. Even infants having Interaction first failed to show a monotonically increasing level of vocalization over the entire session.

Figure 13a shows the vocalization data separately by sex and condition. The overall Sex by Intervals by Treatment interaction is not significant, although the figure indicates some tendency for sex differences to increase over time during Non-Interaction.

Look. Infant looking behavior does not show any time trends (Table 7), nor are there significant Treatment by Intervals (Figure 11d), Order by Intervals, or Order by Treatment by Intervals interactions. While the Sex by Treatment by Intervals interaction is not significant, Figure 12b indicates that sex differences during Non-Interaction were present in the initial intervals and tended to decrease slightly with the passage of time.

Proximity. As can be seen in Table 7 infant proximity-seeking shows no time trends, nor are there significant Treatment by Intervals (Figure 11b), Order by Intervals, or Order by Treatment by Intervals interactions. As Figure 13b shows, there were sex differences present during all of the Non-Interaction episodes: girls spent more time near the mother than did boys at all times, and both sexes showed the same U-shaped patterns over time.

Total Touch. As Table 7 shows, the combined touching measure reveals no time trends. The significant Treatment by Intervals interaction $[F(3,168) = 4.533, p < .005]$ for Frequency Total Touch indicates that touching became more frequent over the course of a Non-Interaction episode and less frequent over the course of an Interaction episode (Figure 11c). Total Touch does not show any other significant Intervals interactions.

Total Proximity. Table 7 indicates that the combined proximity score shows no significant time trends. The significant

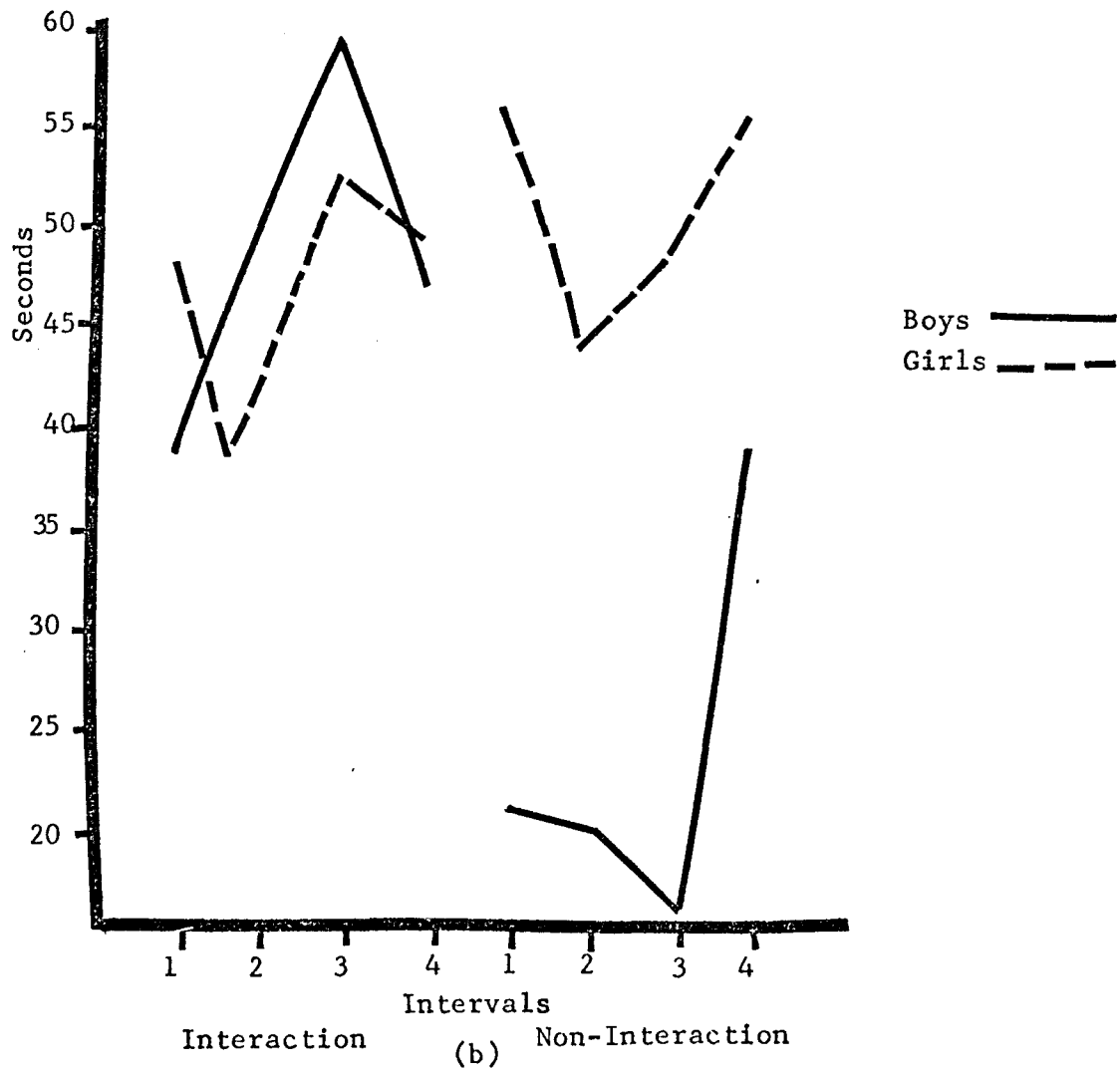
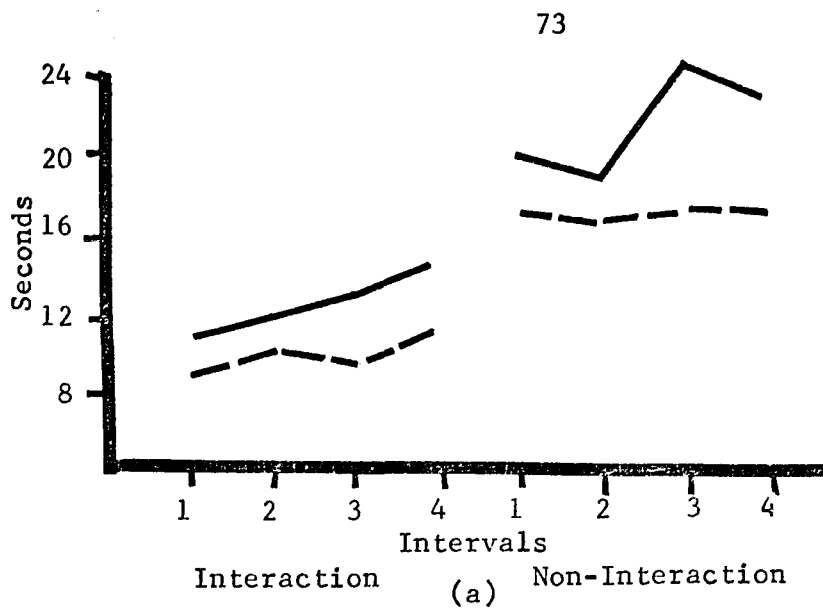


Fig. 13. Sex and Treatment Differences in Baby Vocalization (a) and Baby Proximity (b)

Sex by Order by Intervals interaction [$F(3,168) = 3.260, p < .025$] for Frequency is presented in Figure 14. Boys having Non-Interaction first and girls having Interaction first experienced a U-shaped pattern of proximity over time across conditions. On the other hand, boys who had Interaction first and girls who had Non-Interaction first experienced a down-up-down pattern of proximity over time across conditions.

The significant Sex by Order by Treatment by Intervals interaction for Frequency Total Proximity [$F(3,168) = 2.813, p < .05$] is presented in Figure 15. During Interaction, the same pattern as discussed in the Sex by Order by Intervals interaction can be seen: similarities between Non-Interaction-first boys and Interaction-first girls and between Interaction-first boys and Non-Interaction-first girls. During Non-Interaction, however, patterns of proximity effects over time appear sex-specific and there is little change over time. During Interaction there is a greater frequency of touching in addition to a greater degree of variability in Total Touch scores.

Summary. Within a session, infants tended to increase their touching and vocalizing over time, while there are no time patterns in looking or proximity-seeking. These time changes are not secondary to boredom. With the exception of the summed measures, these time-locked patterns are independent of the sex of the child, the treatment examined, as well as the order of treatments. Little evidence was found for the gradual emergence

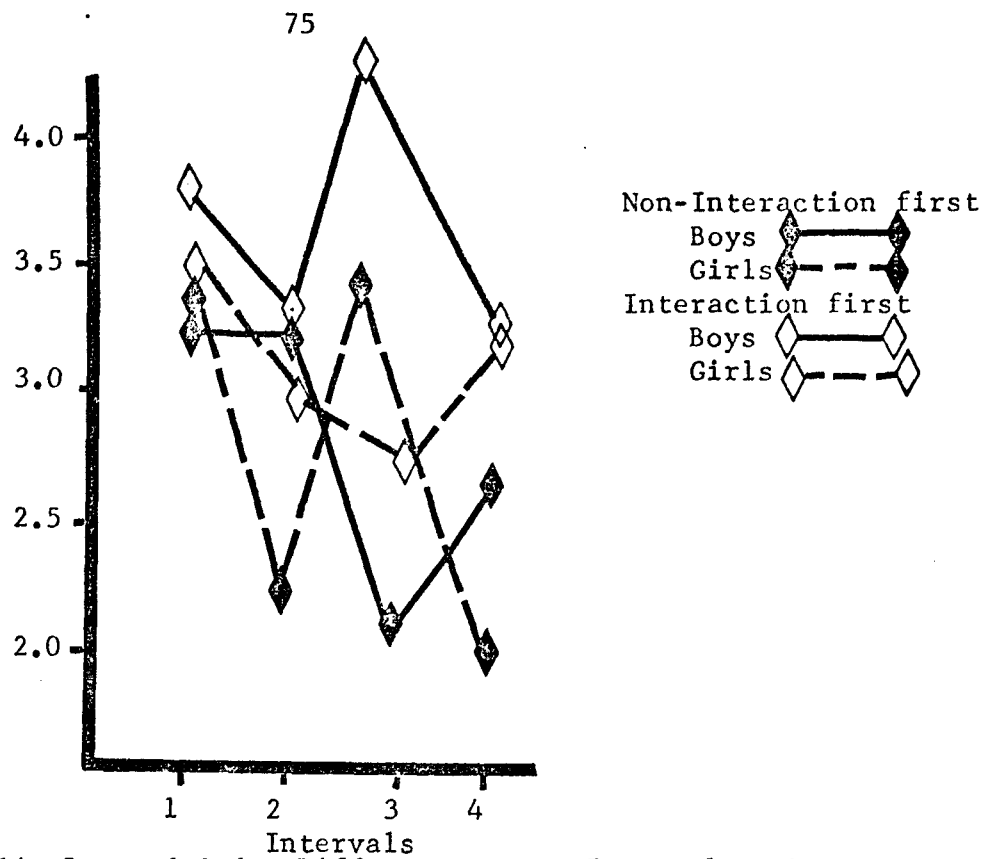


Fig. 14. Sex and Order Differences over Intervals: Frequency Total Proximity

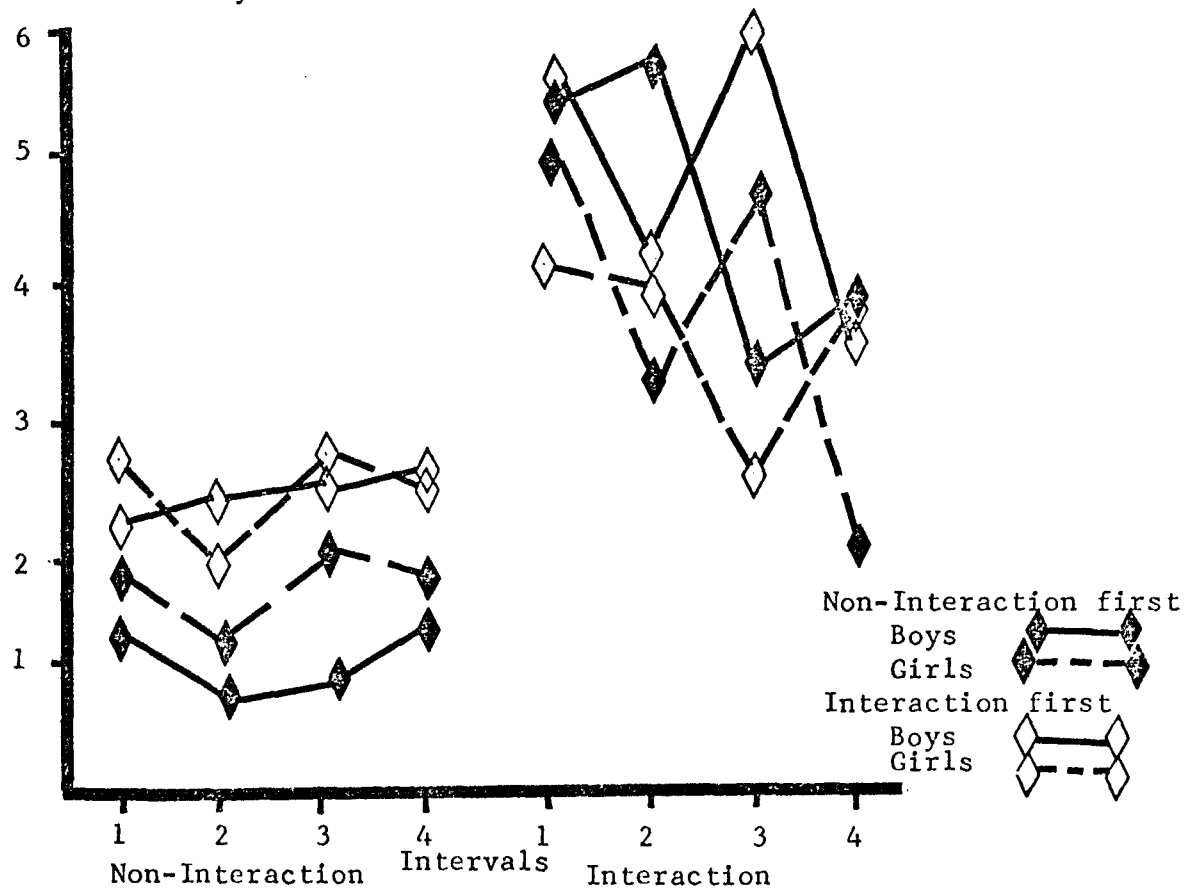


Fig. 15. Effects of Sex, Order and Treatment over Intervals: Frequency Total Proximity

of sex differences in behaviors directed toward a non-interacting mother over the course of a session: where sex differences existed they were present from the initial interval, with the possible exception of vocalization.

Intercorrelations of Behaviors

Frequency and Duration measures for maternal behaviors are all significantly positively correlated, with the exception of maternal looking, for which the measures are significantly negatively correlated. More frequent discrete looks goes with less total looking time. Frequency and Duration measures for all infant behaviors are also all positively and significantly correlated, with the exception of Total Proximity scores during Interaction (Table 8). For this reason, and because Duration measures have been most commonly used, further analyses will report data for the Duration measures only.

Non-Interaction

The first question to be examined is whether or not maternal and infant behaviors during Non-Interaction fall into the same proximal and distal clusters which have previously been reported for infant behavior (Ban & Lewis, 1971; Coates et al., 1972b). In addition, correlations between maternal and infant behaviors will be examined in order to define meaningful patterns.

Maternal correlations. As can be seen from Table 9, all maternal proximal measures are positively (and mostly significantly) correlated. Look (a distal measure) is negatively correlated with all proximal

TABLE 8

Correlations between Observation Measures in Interaction
and Those in Non-Interaction

Infant

Touch	-.02
Vocalization	.31*
Look	.40***
Proximity	.06
Total Proximity	.11
Total Touch	.02

Mother

Touch	.17
Vocalization	.21
Look	.13
Proximity	.19

NOTE: p values are based on two-tailed tests.

*p < .05

***p < .002

TABLE 9

Intercorrelations among Mother Observation Measures for Interaction^a and Non-Interaction^b

	<u>Touch</u>	<u>Vocalization</u>	<u>Look</u>	<u>Proximity</u>	<u>Total Proximity</u>	<u>Total Touch</u>
Touch	---	.13	-.11	-.19	.18	.83***
Vocalization	.36**	---	-.02	-.03	.31*	.04
Look	-.35**	.00	---	-.01	-.20	-.21
Proximity	.16	.03	-.21	---	.48***	-.19
Total Proximity	.32*	.32*	-.08	.14	---	.33**
Total Touch	.47***	.31*	-.14	.14	.78***	---

NOTE: p values are based on two-tailed tests. Reported correlations are for Duration measures.

^aAbove the diagonal

^bBelow the diagonal

*p < .05

**p < .01

***p < .002

measures, but unrelated to Vocalization (another distal measure). Vocalization appears positively related to the proximal behaviors. There is only little support for the predicted proximal-distal distinction.

Infant correlations. The pattern of infant correlations during Non-Interaction is presented in Table 10. Once again, correlations among proximal measures are positive (and significant). Vocalization is essentially unrelated to the proximal behaviors and is not significantly correlated with the other distal measure, Look. On the other hand, Look is positively correlated with proximal behaviors. There is no support for a proximal-distal distinction, then, in infant behavior during Non-Interaction.

Mother-infant correlations. Mother Touch and Infant Touch are positively and significantly correlated (Table 11). This is the only within-behavior correlation to reach significance. Maternal Vocalization is significantly positively correlated with Infant Touch, Infant Look and with Infant Proximity.

Interaction

Maternal correlations. There are fewer significant relationships among maternal behaviors in Interaction than was the case during Non-Interaction. As Table 9 shows, the only significant correlations involve the summed measures, Total Touch and Total Proximity. Total Touch is correlated positively and significantly with Mother Touch and with Total Proximity, while Total Proximity is correlated

TABLE 10

Intercorrelations among Infant Observation Measures for Interaction^a and Non-Interaction^b

	<u>Touch</u>	<u>Vocalization</u>	<u>Look</u>	<u>Proximity</u>	<u>Total Proximity</u>	<u>Total Touch</u>
Touch	---	.41***	.21	.53***	.36**	.77***
Vocalization	-.10	---	.09	.06	.06	.39***
Look	.38**	.23	---	.10	-.01	.18
Proximity	.78***	-.05	.22	---	.58***	.51***
Total Proximity	.79***	-.06	.21	.98***	---	.33**
Total Touch	.98***	.12	.38**	.77***	.78***	---

NOTE: p values are based on two-tailed tests. Reported correlations are for Duration measures.

^aAbove the diagonal

^bBelow the diagonal

**p < .01

***p < .002

TABLE 11

Correlations between Maternal Behavior and Infant Behavior during Non-Interaction

Mother Measures	Infant Measures			
	<u>Touch</u>	<u>Vocalization</u>	<u>Look</u>	<u>Proximity</u>
Touch	.30*	.19	.17	.22
Vocalization	.26*	.10	.38**	.32*
Look	.08	-.06	.04	-.04
Proximity	.12	-.05	-.03	-.04

Note: p values are based on two-tailed tests. Reported correlations are for Duration measures.

*p < .05

**p < .01

positively and significantly with Vocalization.

Infant correlations. As Table 10 shows, Touch is positively and significantly correlated with Vocalization and with Proximity. Touch and Proximity are significantly positively related to both summed measures, which are also significantly positively correlated with each other. Vocalization is correlated with Total Touch.

Mother-infant correlations. As was the case for Non-Interaction, Mother and Infant Touch are positively and significantly correlated during Interaction (Table 12). Maternal and Infant Proximity, on the other hand, are significantly negatively related. This indicates a complementary system for Proximity-seeking: if one member of the dyad initiates proximity, the other does not. Mother Touch and Infant Proximity are also significantly positively correlated. Almost all the significant mother-infant correlations, then, involve proximal measures.

Questionnaire Data

It will be remembered that the questionnaire consisted of two parts. The first part was an Attitude Scale, and here mothers were asked to indicate the degree of interaction which they experienced with their child on five separate subscales: Touch, Vocalization, Play, Proximity and Look. The final version of the questionnaire revealed levels for alpha, or internal consistency (Guilford, 1954), for the five subscales and for the Attitude instrument as a whole, as indicated in Table 13.

TABLE 12

Correlations between Maternal Behavior and Infant Behavior during Interaction

Mother Measures

Infant Measures

	<u>Touch</u>	<u>Vocalization</u>	<u>Look</u>	<u>Proximity</u>
Touch	.65***	.24	.06	.36**
Vocalization	-.01	-.06	-.03	.35**
Look	-.23	.08	.03	-.20
Proximity	-.17	.00	-.09	-.44***

NOTE: p values are based on two-tailed tests. Reported correlations are for Duration measures.

**p < .01

***p < .002

TABLE 13

Levels of Alpha for the Five Attitude Subscales

<u>Scale</u>	<u>Number of Items</u>	<u>Alpha</u>
Touch	4	.630
Vocalization	5	.588
Play	4	.249
Proximity	5	-.012
Look	9	.656

The second section of the questionnaire consisted of stereotyping items. Here, mothers were to indicate which behaviors were more true of girls and which were more true of boys. Choices here reflected sex-stereotyping and counter-stereotyping, and assessed the kinds of expectations which mothers have for sex-specific behavior in infants at this age. Other subscales reflect male- and female-response biases as well as the tendency to indicate that behaviors were not sex-specific.

Intercorrelations between these two scales are presented in Table 14. There is essentially no relationship between the Attitude and Sex-Stereotyping Scales: only one of 35 possible correlations is significant. This indicates that the two sections of the questionnaire reflect independent clusters of attitudes.

Sex Differences in Maternal Report

Item and scale means for the Attitude portion of the questionnaire are presented in Table 15. On only one item was there a significant sex difference: mothers reported that girls were more likely than boys to be responsive to the mother's "naming things" ($t = 2.263$, $p < .05$). Mothers indicated higher levels (although not significantly so) of interaction with daughters on 16 of the remaining 26 items, and this was especially the case within the Touch and Vocalization subscales.

Sex differences in the Stereotyping subscales are presented in Table 16. The only significant sex difference is for Female

TABLE 14

Intercorrelations between Stereotyping and Attitude Scales

	<u>Touch</u>	<u>Voc</u>	<u>Play</u>	<u>Prox</u>	<u>Look</u>
Male Ster	.00	.21	.03	.14	-.03
Male Cster	.12	-.10	-.18	.04	.32*
Other Male	-.14	-.15	-.14	.05	.07
Fem Ster	-.03	.01	-.03	.00	.09
Fem Cster	.02	-.13	-.06	.00	.05
Other Female	.08	-.10	-.19	-.09	.23
WishWash	.01	-.01	.10	-.05	-.14

NOTE: p values are based on two-tailed tests.

*p < .05

TABLE 15

Attitude Means by Item and Subscale

<u>Item</u>	<u>Total</u>	<u>Boys</u>	<u>Girls</u>	<u>t</u>	<u>p</u>
Touch					
1	3.617	3.600	3.633		
2	3.100	3.100	3.100		
3	4.133	4.067	4.200		
4	3.350	3.133	3.567		
Total	14.200	13.900	14.500		
Vocalization					
5	3.383	3.233	3.533		
6	3.250	3.033	3.467		
7	3.667	3.300	4.033	2.263	.05
8	3.883	3.667	4.100		
9	2.750	2.933	2.567		
Total	16.933	16.166	17.700		
Play					
10	2.300	2.167	2.433		
11	2.217	2.333	2.100		
12	3.317	3.500	3.133		
13	3.533	3.533	3.533		
Total	11.367	11.533	11.199		
Proximity					
14	3.050	2.700	3.400		
15	2.700	2.667	2.733		
16	3.717	3.733	3.700		
17	3.400	3.233	3.567		
18	2.500	2.633	2.367		
Total	15.367	14.966	15.767		
Look					
19	4.017	4.033	4.000		
20	3.583	3.567	3.600		
21	3.250	3.300	3.200		
22	3.200	3.233	3.167		
23	2.717	2.833	2.600		
24	3.767	3.667	3.867		
25	2.683	2.633	2.733		
26	3.067	3.033	3.100		
27	3.750	3.600	3.900		
Total	30.034	29.899	30.167		

NOTE: p values are based on two-tailed tests.

TABLE 16

Stereotyping Mean Frequencies by Sex and Subscale

<u>Scale</u>	<u>Total</u>	<u>Boys</u>	<u>Girls</u>	<u>t</u>	<u>p</u>
Male Ster	2.00	2.04	1.96		
Male Cster	0.44	0.39	0.48		
Other Male	1.05	1.09	1.00		
Fem Ster	3.07	3.17	2.96		
Fem Cster	0.31	0.09	0.52	2.377	.05
Other Female	0.85	0.96	0.74		
WishWash	22.31	22.26	22.35		
Total	30.03	30.00	30.01 ^a		

NOTE: p values are based on two-tailed tests.

^aTotals are greater than 30.00 because of rounding off.

Counterstereotyping ($p < .05$), indicating that mothers of girls are more likely to see girls as performing traditionally male behaviors than are mothers of boys. Mothers of sons and mothers of daughters do not respond significantly differently on any of the other Stereotyping subscales.

The lack of differences between mothers of sons and mothers of daughters on both the Attitude and Stereotyping Scales indicates that the sex of the child does not color the mother's report of either the amount of interaction she has with her infant or of the behaviors which infants of a given sex are expected to perform.

Factor Analysis

Results of the factor analysis of the five Attitude subscales and the separate factor analysis of the five Stereotyping subscales are presented in Table 17.

Attitude Factors

Factor Analysis of the Attitude subscales revealed, after varimax rotation, three factors, as presented in Table 17. Factor I, Vocalization, is made up almost entirely of Vocalization. Factor II, Passive Watching, includes Look and Proximity, but not Play. This factor reflects a mother's reported tendency to stay near and watch her infant without vocalizing, playing or touching. Factor III, Non-Verbal Interaction, is composed mainly of the Play subscale, with smaller contributions of Proximity and Touch, and is negatively related to the Vocalization subscale.

TABLE 17

Description of Factors

	Attitude I	Attitude II	Attitude III
<u>Subscale</u>	<u>"Vocalization"</u>	<u>"Passive Watching"</u>	<u>"Non-Verbal Interaction"</u>
Touch	-.005	.028	.391
Vocalization	.885	-.012	-.110
Play	-.131	.038	.627
Proximity	-.075	.395	.392
Look	.017	.756	.003

	Stereotyping I	Stereotyping II
<u>Subscale</u>	<u>"Stereotyping"</u>	<u>"Counterstereotyping"</u>
Male Stereotyping	.787	-.127
Male Counterstereotyping	.134	.700
Other Male Choices	.524	.412
Female Stereotyping	.666	.175
Female Counterstereotyping	-.094	.580
Other Female Choices	.364	.607

Stereotyping Factors

Factor analysis of the Stereotyping subscales revealed, after varimax rotation, the two factors presented in Table 17. Factor I, Stereotyping, is composed mainly of the Male Stereotyping and Female Stereotyping subscales, with smaller contributions of the male and female response subscales. Factor II, Counterstereotyping, consists mainly of Male and Female Counterstereotyping subscales, with some additional contributions of the male and female response scales.

In the next section, both the raw subscales and the factors will be compared to maternal and infant behavior during the observed periods of Interaction and Non-Interaction.

Relationship between Mothers' Report and Behavior and Between Mothers' Report and Infant Behavior

Maternal Attitude Scale

There are two questions to be considered when examining the relationships between (a) maternal attitudes and maternal behavior and (b) maternal attitudes and infant behavior. First, does a mother's report of the quality of her interaction with her child predict to either her observed behavior or to the observed behavior of her infant; second, are there sex differences in either the degree of that predictability or in the pattern which emerges.

Maternal Attitude Subscales

Maternal Behavior

If the mother's report of her behavior is a valid indicator of her actual behavior, significant correlations, within a given behavior or across behaviors, would be expected between her report and her observed behavior. Since mothers tended not to interact very much with their infants during the Non-Interaction condition, significant relationships would be more expected during the Interaction episode than during the Non-Interaction episode.

Non-Interaction. As Table 18 indicates, there is relatively little relationship between the Maternal Attitude subscales and maternal behavior for the sample as a whole. Reported Touch is correlated (although not significantly so) with observed touching, while there is essentially no relationship between reported Touch and other maternal behaviors. Reported Proximity-seeking is unrelated either to the distal behaviors or to observed touching, and is actually negatively correlated with observed proximity-seeking. Reported Vocalization is correlated (although not significantly so) with observed vocalization while there is essentially no relationship between reported Vocalization and other observed behaviors. Reported Look is negatively (but not significantly) correlated with observed touching and is essentially unrelated to other maternal behaviors. The Play subscale is positively and significantly correlated with observed vocalization and is unrelated to other maternal behaviors.

TABLE 18

Correlations between Questionnaire Subscales and Maternal Behavior during Non-Interaction

-Attitude Subscales-

						-Stereotyping Subscales-						
						Male Stereo	Male Counter Stereo	Other Male Choices	Female Stereo	Female Counter Stereo	Other Female Choices	Wish Wash
	Touch	Voc	Play	Prox	Look							
Overall Touch	.21	.07	.14	-.15	-.21	-.10	-.11	-.11	-.22	-.05	-.17	.21
Boys	.20	.34	.07	-.27	-.42*	-.17	-.22	-.18	-.20	.10	-.18	.24
Girls	.26	-.11	.21	.02	.01	-.02	-.01	-.04	-.24	-.10	-.14	.18
Overall Voc	.08	.20	.38**	.00	.04	.05	-.05	-.12	-.12	.14	-.07	.06
Boys	.08	.25	-.01	-.27	-.22	-.24	-.28	-.28	-.31	.05	-.23	.35*
Girls	.05	.12	.62**	.10	.17	.23	.03	.08	-.02	.10	-.03	-.12
Overall Look	-.06	.13	-.15	.07	.12	-.12	.17	.04	-.04	.01	-.02	.04
Boys	-.17	-.17	-.13	.12	.28	-.14	.09	.13	-.01	-.01	.03	.02
Girls	.05	.39*	-.16	-.12	-.10	-.08	.27	.03	-.07	-.14	-.15	.07
Overall Prox	.06	.14	.08	-.26*	.01	.01	-.05	.05	.24	-.07	.31*	-.16
Boys	.10	.30	.14	-.34	.01	.03	-.12	-.01	.32	-.06	.50**	-.21
Girls	.04	-.04	-.33	.02	.24	-.16	.40*	.42*	.17	-.10	.21	-.18

NOTE: p values are based on two-tailed tests.

*p < .05

**p < .01

When the correlations are examined separately by sex, the positive relationship between reported Play and observed vocalization holds true only for mothers of girls while the negative relationship between reported and observed proximity-seeking holds true only for mothers of boys.

With these exceptions, no further clarity is gained by examining correlations separately by sex. The lack of significant correlations for the sample as a whole does not appear to be a result, then, of vastly different patterns between mothers of boys and mothers of girls.

Aside, then, from the moderate correlations for Touch (for mothers of both boys and girls) and Vocalization (for mothers of girls), there is little relationship between what mothers say they do and what they are observed to do (within a given behavior), during the Non-Interaction condition. Mothers indicating that they play alot with their children actually do vocalize more (at least to their daughters), while mothers who report a higher level of proximity-seeking actually initiate less proximity (significantly so only for mothers of boys).

Interaction. Table 19 presents correlations between the Maternal Attitude Scale and maternal behavior during Interaction. For the sample as a whole, reported Touch is correlated (although not significantly so) with the other proximal measure, Proximity-seeking. Reported Proximity-seeking is unrelated to either of the observed proximal measures, but it is significantly negatively

TABLE 19

Correlations between Questionnaire Subscales and Maternal Behavior during Interaction

-Attitude Subscales-						-Stereotyping Subscales-						
	<u>Touch</u>	<u>Voc</u>	<u>Play</u>	<u>Prox</u>	<u>Look</u>	<u>Male Stereo</u>	<u>Male Counter Stereo</u>	<u>Other Male Choices</u>	<u>Female Stereo</u>	<u>Female Counter Stereo</u>	<u>Other Female Choices</u>	<u>Wish Wash</u>
Overall Touch	.11	-.12	.21	.01	.09	-.15	-.07	-.13	-.24	-.10	-.15	.24
Boys	-.04	-.15	.38*	.04	.16	-.26	-.19	-.25	-.23	.20	-.13	.30
Girls	.30	-.03	-.03	.02	.00	.00	.06	.02	-.30	-.01	-.16	.16
Overall Voc	.12	.32*	.24	.19	.04	-.19	-.08	-.12	-.20	-.10	-.25*	.26*
Boys	.18	.20	.27	.14	.24	-.41*	.02	.00	-.21	-.07	-.03	-.25
Girls	.02	.30	.27	.16	-.10	.03	-.16	-.14	-.19	-.25	-.46**	.30
Overall Look	-.12	.12	-.33**	-.38**	-.10	-.26*	.07	.10	-.21	.06	-.12	.12
Boys	-.07	.36*	-.44*	-.25	-.26	-.12	-.06	-.14	-.33	.30	-.20	.23
Girls	-.17	-.04	-.24	-.54**	.07	-.45**	.19	-.07	-.09	.02	-.02	.21
Overall Prox	.22	.04	.12	-.01	.13	.08	.13	-.06	.22	.29*	.31*	-.23
Boys	.33	-.28	.32	-.23	.01	-.22	-.03	-.06	.00	-.07	.16	.08
Girls	.15	.16	.03	.11	.20	.28	.20	-.05	.37*	.37*	.38*	-.47**

NOTE: p values are based on two-tailed tests.

*p < .05

**p < .01

correlated with observed looking. Reported Play is moderately (but not significantly) correlated with observed touching and vocalizing, and significantly negatively correlated with observed looking. As noted above, mothers who looked less at their infants during Interaction were usually engaged in more play; this may therefore account for the correlations between reported Play and Proximity and observed Look. Mothers who reported more vocalization did in fact show more observed vocalization during Interaction. Reported looking is not significantly related to any observed behavior.

When these correlations are examined separately for each sex, the negative correlation between reported Play and observed Look is significant only for mothers of boys. Similarly, mothers of boys who report more play are more likely to touch them (there is no significant relationship for mothers of girls). The Play subscale, then, seems to be a somewhat more valid predictor of behavior for mothers of boys than for mothers of girls. On the other hand, the negative correlation between reported Proximity and observed looking is significant only for mothers of girls. With these exceptions, examining correlations between maternal report and maternal behavior separately by sex does not clarify the quality of that relationship.

Maternal report of vocalization does seem to be a good predictor of her observed vocalization. Reported Play is positively related to vocalization and negatively related to looking (for mothers of boys and girls), while it is positively correlated with touching and proximity-seeking for mothers of boys only. Mothers who say they

play alot tend to use touching, vocalization and proximity-seeking in interacting with their sons, while they seem to make use only of vocalization in interacting with their daughters. As predicted, correlations between maternal behavior and Maternal Attitude subscales were more likely to appear during Interaction than was the case during Non-Interaction.

Infant Behavior

Non-Interaction. For the sample as a whole, infant behavior during Non-Interaction is not highly correlated with the Maternal Attitude Scale (Table 20). Mothers who report more proximity-seeking have infants who initiate more proximity (n.s.). Mothers who report more looking have infants who look at them and vocalize to them significantly more.

When the correlations are examined separately by sex, mothers who report more looking are likely to have sons who touch them less and daughters who touch them more (the difference between boys' and girls' correlations is significant; $z = 2.356$, $p < .025$). Conversely, mothers who report more touching are likely to have sons who look at them less and daughters who look at them more (the difference between boys' and girls' correlations is significant; $z = 2.606$, $p < .01$). This indicates a positive relationship for girls between mothers' reported Touch and Look and infant Look and Touch respectively, and a negative relationship for boys. There is a similar pattern for look and proximity. Mothers who report more looking are likely to have sons

TABLE 20

Correlations between Questionnaire Subscales and Infant Behavior during Non-Interaction

	-Attitude Subscales-					-Stereotyping Subscales-						
	<u>Touch</u>	<u>Voc</u>	<u>Play</u>	<u>Prox</u>	<u>Look</u>	<u>Male Stereo</u>	<u>Male Counter Stereo</u>	<u>Other Male Choices</u>	<u>Female Stereo</u>	<u>Female Counter Stereo</u>	<u>Other Female Choices</u>	<u>Wish Wash</u>
Overall Touch	.13	.13	.03	.13	.14	-.07	.10	-.15	.11	.00	.06	-.02
Boys	.05	.34	.00	-.18	-.31	-.15	-.21	-.17	-.06	.11	.12	.12
Girls	.13	-.03	.08	.21	.31	-.03	.18	-.06	.23	-.14	-.01	-.09
Overall Voc	.30*	-.12	.04	-.03	.28*	-.14	.16	-.01	-.10	-.03	.13	-.12
Boys	.42*	.09	.14	.10	-.02	-.19	-.14	-.26	-.26	-.08	-.04	.26
Girls	.24	-.18	-.07	-.09	.56**	-.09	.38*	.25	.03	.08	.33	-.17
Overall Look	.03	-.08	.16	-.07	.25*	.14	-.03	-.15	.00	-.01	.07	-.04
Boys	-.37*	.03	.04	-.24	.13	.10	-.24	-.21	-.08	.03	-.11	.08
Girls	.31	-.20	.26	.00	.32	.19	.05	-.04	.08	-.09	.14	-.14
Overall Prox	.11	.12	.11	.21	.06	-.06	.11	-.18	.05	.13	-.01	-.01
Boys	-.06	.21	-.06	-.04	-.37*	-.18	-.20	-.15	-.21	.10	-.05	.21
Girls	.13	-.03	.25	.26	.21	-.02	.18	-.11	.20	.00	-.07	-.08

NOTE: p values are based on two-tailed tests.

*p < .05

**p < .01

who stay further away from them and daughters who stay closer (the difference between boys' and girls' correlations is significant; $z = 2.212$, $p < .05$). Conversely, mothers reporting more proximity-seeking have sons who are less likely to look at them, while there is no relationship for daughters. This indicates a generally positive relationship for girls between mothers' reported Look and Proximity and infant observed proximity and looking, respectively, and a negative relationship for boys. Girls' behavior, then, shows a rather globally positive relationship to maternal report: reported looking (a distal behavior) is related to both infant proximal and distal behaviors; reported proximal behaviors are also related to both proximal and distal behaviors. For boys, the pattern is rather more negative: reported looking (a distal behavior) is related to less infant proximal behavior; reported proximal behaviors are related to less infant looking.

In sum, there is only minimal consistency between maternal report and infant behavior during Non-Interaction. Mothers who indicate a higher degree of looking at their infants have infants who direct more looking and vocalizing to them. Reported proximity-seeking is correlated (n.s.) with observed proximity-seeking. In general, the behavior of daughters is globally positively related to maternal report, while the behavior of sons shows a more globally negative pattern.

Interaction. Table 21 presents correlations between maternal report and infant behavior during Interaction, for the sample as a

TABLE 21

Correlations between Questionnaire Subscales and Infant Behavior during Interaction

	-Attitude Subscales-					-Stereotyping Subscales-						
	<u>Touch</u>	<u>Voc</u>	<u>Play</u>	<u>Prox</u>	<u>Look</u>	<u>Male Stereo</u>	<u>Male Counter Stereo</u>	<u>Other Male Choices</u>	<u>Female Stereo</u>	<u>Female Counter Stereo</u>	<u>Other Female Choices</u>	<u>Wish Wash</u>
Overall Touch	.10	-.06	.22	.05	.14	.08	-.11	-.12	-.03	-.13	-.10	.06
Boys	-.10	-.19	.23	.06	.06	-.06	-.12	-.15	.09	-.14	.04	.03
Girls	.35*	.07	.20	.08	-.07	.21	-.11	-.17	-.15	-.10	-.19	.09
Overall Voc	.08	-.22	.00	-.18	.03	.03	.01	.14	.06	-.17	.07	-.06
Boys	.09	-.18	.09	-.25	-.19	-.01	-.03	-.04	.05	-.16	.17	-.02
Girls	.15	-.18	-.12	-.02	.14	.07	.07	.33	.04	-.11	.05	-.11
Overall Look	-.11	-.09	-.13	-.12	-.11	.17	.08	-.04	.09	-.04	.11	-.13
Boys	-.50**	.01	-.35*	-.07	.00	.10	-.01	-.10	.29	.15	.07	-.15
Girls	.30	-.18	.06	-.19	-.04	.23	.14	.09	-.10	-.14	.14	-.10
Overall Prox	.04	.09	.21	.18	-.06	-.10	.00	-.10	-.19	-.05	-.34**	.21
Boys	-.14	.04	.12	.21	.22	-.08	.12	-.10	-.01	-.01	-.24	.09
Girls	.27	.15	.30	.16	-.33	-.12	-.09	-.10	-.39*	-.08	-.45**	.38*
Sex	-.13	-.24	.08	-.17	-.03	.02	-.05	.23	.04	-.30*	-.11	-.01

NOTE: p values are based on two-tailed tests.

*p < .05

**p < .01

whole. Since maternal vocalization during Interaction was positively correlated with maternal report of vocalization and negatively correlated with infant vocalization, it would be expected that maternal report of vocalization would be negatively correlated with infant vocalization. As can be seen, this is the case (although not significantly so). Reported proximity-seeking is negatively related (n.s.) to both distal measures and positively related (n.s.) to infant proximity-seeking. The Play subscale is positively (n.s.) correlated with both proximal measures, and essentially unrelated to the distal measures.

When correlations are examined separately by sex, reported maternal touching is significantly related to girls' touching. This is the only significant within-behavior correlation for either sex. The pattern which emerged from the Non-Interaction situation (girls' behavior being more globally positively related to maternal report and boys' behavior being rather more negatively related) again appears; however, it is significant only in the case of the correlation between reported touching and observed infant looking. This correlation is significantly negative for boys, positive for girls, and the difference between boys' and girls' correlations is significant ($z = 3.157$, $p < .005$). Significant correlations are more likely to appear during Non-Interaction than during Interaction; this is the reverse of the pattern observed for mothers.

In sum, then, mothers who report more vocalization have infants who vocalize less during Interaction. Mothers who report more touching

have daughters who touch more. Further support is provided for the pattern suggested from the Non-Interaction correlations: namely, globally positive correlations between maternal report and girls' behavior and more globally negative patterns for boys. More significant correlations between maternal report and infant behavior appear for the Non-Interaction condition than was the case for Interaction.

Maternal Attitude Factors

Since the univariate analysis showed relatively little relationship between what mothers reported and either their own or their infants' behavior, correlations between factor scores of the three Attitude factors (Vocalization, Passive Watching, and Non-Verbal Interaction) and maternal and infant behavior were obtained. This analysis sheds little additional light on the relationship between maternal report and either maternal or infant behavior.

Maternal Behavior

Non-Interaction. Since the Non-Interaction condition was not one which allowed free expression of maternal behavior, few correlations between the three Attitude factors and maternal behavior would be expected. However, if such correlations did emerge, it might be expected, on the basis of factor loadings (Table 17) that Factor I, Vocalization, would bear some positive relationship to observed vocalization. In fact, they are positively correlated (Table 22) although the relationship only approaches significance. Factor II,

TABLE 22

Correlations between Factor Scores and Maternal Behavior

	Factors				
	<u>Vocali- zation</u>	<u>Passive Watching</u>	<u>Non- Verbal Inter- action</u>	<u>Stereo- typing</u>	<u>Counter stereo- typing</u>
<u>Non-Interaction</u>					
Overall Touch	.11	-.27*	.19	-.17	-.11
Boys	.39*	-.48**	.18	-.22	-.17
Girls	-.07	-.04	.23	-.12	-.08
Overall Voc	.24	-.03	.30*	-.09	-.01
Boys	.27	-.29	.01	-.32	-.25
Girls	.17	.08	.44*	.11	.01
Overall Look	.12	.15	-.11	-.09	.11
Boys	-.22	.32	-.21	-.05	.18
Girls	.38*	-.11	-.05	-.08	.03
Overall Prox	.14	-.10	.01	.16	.05
Boys	.33	-.16	.06	.18	.13
Girls	-.06	.26	-.26	.08	.24
<u>Interaction</u>					
Overall Touch	-.09	.04	.16	-.20	-.09
Boys	-.12	.09	.24	-.27	-.20
Girls	.01	-.01	.10	-.15	-.01
Overall Voc	.36**	.04	.30*	-.21	-.13
Boys	.27	.19	.29	-.29	.17
Girls	.32	-.09	.30	-.10	-.30
Overall Look	.07	-.15	-.36**	-.28*	.08
Boys	.33	-.24	-.31	-.25	-.02
Girls	-.09	-.05	-.40*	-.35*	.16
Overall Prox	.08	.07	.15	.08	.24
Boys	-.22	-.15	.26	-.11	.12
Girls	.18	.19	.09	.25	.27

NOTE: p values are based on 2-tailed tests.

*p < .05

**p < .01

Passive Watching, might be expected, on the basis of factor loadings, to show correlations with observed looking and proximity-seeking; however, this factor is negatively and significantly correlated with observed maternal touching, and is essentially unrelated to other maternal behavior. Factor III, Non-Verbal Interaction, might be expected, on the basis of factor loadings, to show correlations with observed touching and proximity-seeking, while it appears significantly positively correlated with maternal vocalization.

When correlations are examined separately by sex, Vocalization is significantly positively correlated, for girls, with maternal looking, another distal behavior. On the other hand, for mothers of boys, it is negatively correlated with maternal looking. The negative correlation between Passive Watching and touching is significant only for mothers of boys, while the positive correlation between this factor and maternal looking approaches significance only for mothers of boys. On the other hand, the positive correlation between Non-Verbal Interaction and maternal vocalization is significant only for mothers of girls.

In summary, during Non-Interaction, the Vocalization factor bears some relationship to observed maternal vocalization, at least with boys. Passive Watching is positively related to maternal looking, and negatively related to maternal touching for mothers of boys. Non-Verbal Interaction is significantly related only to maternal vocalization to girls (and that correlation is not in the predicted

direction). On this basis, it would appear that these factors are only moderately valid predictors of maternal behavior with sons, and that they are even less helpful in predicting behavior with daughters.

Interaction. It is in the Interaction condition that one would expect a higher degree of consistency between what mothers say they do and what they are observed to do, since under this condition, mothers were free to interact with their infants in ways of their own choosing. During Interaction, Vocalization is again related (now significantly) to observed vocalization. Passive Watching is unrelated to maternal behavior, while Non-Verbal Interaction is related again to observed maternal vocalization (although not in the expected direction) and is negatively related to maternal looking. This last finding might be expected, since Non-Verbal Interaction loads heavily on the Play subscale, and mothers who were observed to play more with their infants during Interaction actually looked at them less.

For mothers of boys, Vocalization seems positively related (although not significantly so) to the other observed distal behavior, looking, while it is negatively related to the proximal behaviors (not significantly). This pattern does not emerge for mothers of girls. Mothers of boys high in Non-Verbal Interaction were observed to do more playing of all sorts: more touching, proximity and vocalization, and less looking (although none of these correlations was significant); while for mothers of girls, this factor predicts to a pattern defined

only by more vocalization (n.s.) and less looking.

In sum, then, during Interaction, Vocalization seems moderately related to maternal behavior, especially for mothers of boys. Non-Verbal Interaction is related to an interactive pattern involving all four observed behaviors for mothers of sons, but only vocalization and looking for mothers of daughters. Contrary to predictions, Non-Verbal Interaction is positively related to maternal vocalization. Contrary to predictions, the number of significant correlations between maternal report and maternal behavior is greater for the Non-Interaction condition than was the case for Interaction. The reverse was true for the subscales.

Infant Behavior

Non-Interaction. During Non-Interaction, infant behavior in the sample as a whole is unrelated to any of the three Maternal Attitude factors (Table 23). When correlations are examined separately by sex, Vocalization is significantly positively correlated with boys' touching (this was also the case for mothers of boys during Non-Interaction), and is also positively (although not significantly) related to the other proximal measure, proximity-seeking, for boys. These correlations are essentially zero for girls. Passive Watching is negatively correlated with both proximal measures for boys, and positively correlated for girls. While these correlations are not significant, the difference between boys' and girls' correlations is significant (in the case of touching, $z = 2.439$, $p < .025$; for proximity-seeking,

TABLE 23

Zero-Order and Partial Correlation

Matrices for Non-Interaction^a

ZERO-ORDER			PARTIAL				
<u>TOUCH</u>							
	<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>		<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>
Baby				Baby			
Mother	.300*			Mother	.281*		
Attitude	.127	.213		Attitude	.068	.184	
<u>VOCALIZATION</u>							
	<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>		<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>
Baby				Baby			
Mother	.104			Mother	.131		
Attitude	-.120	.198		Attitude	-.148	.213	
<u>LOOK</u>							
	<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>		<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>
Baby				Baby			
Mother	.041			Mother	.012		
Attitude	.246	.119		Attitude	.243	.112	
<u>PROXIMITY</u>							
	<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>		<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>
Baby				Baby			
Mother	-.041			Mother	.015		
Attitude	.210	-.261*		Attitude	.206	-.258*	

NOTE: p values are based on two-tailed tests.

^aMatrices are presented for Duration measures only: Frequency measures show substantially the same pattern.

*p < .05

$z = 1.962$, $p < .05$). Similarly, this factor is positively correlated with the distal measures for girls (significantly so for vocalization, and the difference between boys' and girls' correlations approaches significance) and is unrelated to these measures for boys. Once again, the pattern that emerges indicates globally positive correlations for girls and a more negative pattern for boys, at least when this factor is considered. Non-Verbal Interaction shows a moderate but (not significant) relationship to proximity-seeking in both sexes, which would be expected on the basis of factor loadings.

Interaction. During Interaction, there are again no significant correlations for the group as a whole, although the relationship between both observed proximity and observed touching and Non-Verbal Interaction is positive, indicating again a moderate relationship between this factor and proximal behavior. The same was true during Non-Interaction, as noted above.

When the correlations are examined separately by sex, the positive relationship between both infant proximity and infant touching and Non-Verbal Interaction holds up only for girls. Mothers high on this factor are likely to have sons who look at them less and daughters who look at them more (this difference is significant, $z = 2.351$, $p < .025$). The number of significant correlations between maternal report and infant behavior is greater for the Non-Interaction condition than was the case for Interaction. This is the same pattern found for maternal behavior.

Partial Correlations

In examining the correlations of three variables with each other, the contribution which Variable A makes to Variables B and C might in some way alter the relationship between Variables B and C. In order to investigate this possibility in the data, partial correlations were computed for each cluster of variables (infant behavior, maternal behavior, and maternal report as measured by the Attitude subscales) in order to partial out the effect of one variable upon the correlation between the other two.

Partial correlation and zero-order correlation matrices for all such clusters are presented in Tables 24 and 25. Use of partial correlations does not improve upon the zero-order correlations; in almost every case, partial correlations are slightly lower than the zero-order correlations. Thus, it seems that the presence of any one variable is not having an undue influence upon the relationship between the other two.

Summary

Regardless of whether subscales or factors are examined, only moderate consistency is found between maternal report and either maternal or infant behavior. During Non-Interaction, only the Touch and Vocalization subscales show even slight value in predicting maternal behavior, although strong correlations would not be expected here because of situational constraints on maternal behavior. During Interaction, mothers who reported more vocalization were observed to

TABLE 24

Zero-Order and Partial Correlation

Matrices for Interaction^a

<u>ZERO-ORDER</u>			<u>PARTIAL</u>				
<u>TOUCH</u>							
	<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>		<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>
Baby				Baby			
Mother	.652**			Mother	.648**		
Attitude	.103	.113		Attitude	.040	.061	
<u>VOCALIZATION</u>							
	<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>		<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>
Baby				Baby			
Mother	-.058			Mother	.012		
Attitude	-.220	.315*		Attitude	-.213	.310*	
<u>LOOK</u>							
	<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>		<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>
Baby				Baby			
Mother	.034			Mother	.033		
Attitude	-.017	-.095		Attitude	-.014	-.084	
<u>PROXIMITY</u>							
	<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>		<u>Baby</u>	<u>Mother</u>	<u>Attitude</u>
Baby				Baby			
Mother	-.438**			Mother	-.443**		
Attitude	.180	-.013		Attitude	.194	.074	

NOTE: p values are based on two-tailed tests.

^aMatrices are presented for Duration measures only: Frequency measures show substantially the same pattern.

*p < .05

**p < .002

TABLE 25

Correlations between Factor Scores and Infant Behavior

	Factors				
	<u>Vocali- zation</u>	<u>Passive Watching</u>	<u>Non- Verbal Inter- action</u>	<u>Stereo- typing</u>	<u>Counter stereo- typing</u>
<u>Non-Interaction</u>					
Overall Touch	.15	.14	.10	-.03	.05
Boys	.36*	-.33	.07	-.13	-.02
Girls	-.01	.31	.09	.10	.01
Overall Voc	-.08	.19	.07	-.11	.14
Boys	.19	-.05	.35*	-.25	-.12
Girls	-.17	.45**	-.12	-.01	.32
Overall Look	-.07	.16	.04	.05	-.06
Boys	-.05	.06	-.26	-.03	-.31
Girls	-.15	.21	.20	.18	-.02
Overall Prox	.15	.09	.19	-.09	.08
Boys	.21	-.31	.24	-.21	-.07
Girls	.01	.21	.24	.03	.04
<u>Interaction</u>					
Overall Touch	-.03	-.04	.20	.02	-.17
Boys	-.20	.05	.08	-.02	-.13
Girls	.13	-.10	.32	.04	-.19
Overall Voc	-.22	-.09	-.04	.11	-.03
Boys	-.17	-.27	.04	.03	.00
Girls	-.17	.12	-.08	.16	.01
Overall Look	-.11	-.02	-.18	.13	.00
Boys	-.12	.08	-.50**	.13	-.02
Girls	-.15	-.12	.09	.15	.00
Overall Prox	.12	-.03	.24	-.18	-.12
Boys	.03	.25	.04	-.10	-.05
Girls	.20	-.31	.44*	-.29	-.17
Sex	-.26*	-.08	-.09	.13	-.15

NOTE: p values are based on 2-tailed tests.

*p < .05

**p < .01

vocalize more to both sex children, and those reporting more Play vocalized more and looked less at both sex children; they also touched and initiated proximity more with sons. In short, they did in fact "play" more with their children, although the components of "playing" seemed to be sex-specific.

As for infant behavior, the subscales show some sex-differential relation during Non-Interaction: girls' behavior is positively related to maternal report, while boys show a more negative pattern. This relationship did not hold up very strongly during Interaction.

As for the Maternal Attitude factors, only Vocalization showed the predicted correlation with observed maternal behavior during either Non-Interaction or Interaction. During Interaction, mothers who were high on the Non-Verbal Interaction factor were observed to do more playing with their infants, making use of a cluster of behaviors which involved more touching, more proximity-seeking, less looking, and more vocalization. For mothers of girls, this factor predicted to a pattern defined only by more vocalization and less looking. A similar organization was apparent, as noted above, in the sex-differential correlations between the Play subscale and maternal behavior during Interaction. This factor, then, seems to be tapping into a cluster of behaviors which can loosely be called "play", the exact definition of which is sex-specific.

When correlations between the Maternal Attitude factors and infant behavior during Non-Interaction are examined, a generally positive pattern is found for girls and a more negative pattern is found for boys,

for the Passive Watching factor. This is similar to the pattern reported for the Maternal Attitude subscales, as noted above. Correlations during Interaction, for the sample as a whole, or for the sexes separately, are not strong.

For both subscales and factors, correlations between maternal report of the quality of her interaction with her infant and her observed behavior are stronger during the Interaction condition when the subscales are considered, as would be expected, since maternal behavior was sharply curtailed during the Non-Interaction condition. However, correlations between maternal report and infant behavior are stronger during the Non-Interaction condition. Further, a comparison of partial and zero-order correlations reveals the relative independence of the relationship between any two variables from the influence of the third.

Maternal Stereotyping Scale

Since the Stereotyping Scale presumably taps into a mother's sex-differential expectations for infant behavior, it would be expected that the several subscales (or factors) should be associated with sex-specific behavior on the part of the mother and the infant. To be precise, it would be expected that mothers high in Stereotyping (1) should show more proximal behaviors toward daughters and more distal behaviors toward sons, except that mothers should vocalize more to daughters, and (2) should have "feminine" girls (more proximal behavior) and "masculine" boys (more distal behavior).

The reverse might be true of mothers high in Counterstereotyping, while mothers high on the WishWash scale should not show sex-differential behavior, nor should their children show such behavior.

Maternal Stereotyping Subscales

Maternal Behavior

Non-Interaction. Few correlations would be expected during the Non-Interaction condition, since the mother was under instructions to keep her interaction to a minimum. For the group as a whole, during Non-Interaction (Table 22), maternal behavior was largely unrelated to the stereotyping subscales, although there was a tendency for mothers high on the Female Stereotyping and Other Female Choices subscales to spend more time in proximity with their infants (the correlation is significant for Other Female Choices).

It is of special interest to examine these correlations separately by sex, since it is anticipated that a given subscale would have sex-specific correlates. However, there are no significant sex differences in correlations between either Stereotyping subscale, nor are there reversals when sex differences in correlations between Counterstereotyping subscales and maternal behavior are examined. The WishWash correlations do appear to differ less by sex than do the other subscale correlations.

Interaction. Mothers high in either Male or Female Stereotyping tended to interact less with their infants; for the sample as a whole, correlations between both Stereotyping subscales and maternal behavior

were negative for vocalization, touching and looking. Mothers high in WishWash tended to do more interacting with their infants; for the sample as a whole, correlations with maternal vocalization, touching and looking were positive. The sole exception to this pattern involved proximity-seeking. Mothers high on the WishWash subscale tended to initiate less proximity-seeking while mothers high in Female Stereotyping initiated more (maternal proximity-seeking is unrelated to Male Stereotyping).

For the sexes separately, mothers high in Male Stereotyping were significantly less likely to vocalize to sons, as would be expected. In fact, this subscale is correlated negatively with all maternal behavior toward sons, thus providing partial support for the prediction that mothers high in this subscale would show less vocalizing, less touching, less proximity-seeking, and more looking. Mothers high in Female Stereotyping were less likely to engage in each behavior with sons or with daughters, with the exception of proximity-seeking, which was negatively correlated with this factor. Thus, the prediction that stereotyping mothers would be more likely to touch, vocalize to, and initiate proximity with their daughters, and less likely to look at them, is only partially supported. Mothers high in Female Counterstereotyping and in Other Female Choices were also more likely to initiate proximity with their daughters, and again, the former finding is contrary to predictions. Mothers high on WishWash were less likely to initiate proximity with daughters, and, in fact, do not show fewer sex-specific correlations (contrary to

expectations). For this subscale, the difference between correlations for sons and daughters is significant in the case of proximity ($z = 2.170$, $p < .05$) and vocalization ($z = 2.077$, $p < .05$); these mothers vocalized less to sons and initiated proximity less with daughters. As was the case for the Attitude subscales, correlations with maternal behavior were more likely to occur during Interaction.

In short, the predictions that stereotyping mothers would act in sex-specific ways, that counterstereotyping mothers would act in sex-specific ways, and that non-stereotyping mothers would not act in sex-specific ways is supported most clearly in the case of stereotyping mothers' behavior toward sons. Most other correlations were not as expected.

Infant Behavior

Non-Interaction. Contrary to predictions, the Stereotyping subscales are unrelated to the behavior of the sample as a whole (none of the 28 possible correlations is significant), or separately by sex (only one of 56 possible correlations is significant), as can be seen in Table 20.

Interaction. In general, the Stereotyping subscales are unrelated to infant behavior during Interaction for the sample as a whole. When the correlations are examined separately by sex, mothers high in Female Stereotyping were those whose daughters initiated less proximity (it will be remembered that these mothers initiated more proximity). The same is true of daughters and their mothers for

Other Female Choices. Mothers high in WishWash had daughters who initiated more proximity (the mothers did less). This indicates, once again, that the mother and infant proximity systems are reciprocal (at least for girls), if one member of the dyad initiates proximity, the other does not. That the amounts of mother-infant proximity are reciprocal is further supported by the finding that the summed measure for mother proximity plus infant proximity (Total Proximity) is uncorrelated with any of the Stereotyping subscales. It is not the amount of overall proximity that changes as a function of maternal stereotyping attitudes, but who is the initiator of that proximity. Maternal initiation of proximity toward daughters during Interaction seems moderately consistent with maternal attitudes about stereotyping, and infant proximity seems consistent with the actual amount of maternal proximity-seeking. Correlations between maternal stereotyping subscales and infant behavior were more likely to appear during Interaction; this was not the case for the Attitude subscales, as noted above.

Maternal Stereotyping Factors

Maternal Behavior

Non-Interaction. For the sample as a whole, and for the sexes separately, maternal behavior is unrelated (Table 22) to either of the two stereotyping factors (Stereotyping and Counterstereotyping) during Non-Interaction.

Interaction. For the entire sample, correlations during

Interaction are also low. As would be predicted from the subscale correlations presented above, Stereotyping correlates negatively with every maternal behavior except proximity-seeking. The negative correlation is significant in the case of looking. Mothers high in Counterstereotyping are somewhat more likely to initiate proximity, although this latter finding only approaches significance.

For the sexes separately, Stereotyping does not seem any more related to sex-differential maternal behavior than does Counterstereotyping. Sex differences in correlations with either factor are not particularly high, contrary to predictions. As was the case for the sample as a whole, correlations between Stereotyping and maternal behavior toward either sons or daughters are negative except for proximity-seeking.

The number of significant correlations between maternal behavior and the stereotyping factors is greater during Interaction than was the case during Non-Interaction. This pattern was also found for the stereotyping subscales, as noted above. The factors themselves do not seem to differentiate well between stereotyping and non-stereotyping mothers in the degree to which they perform sex-specific behavior with their infants.

Infant Behavior

Non-Interaction. Contrary to predictions, as Table 23 indicates, Stereotyping factors are not highly correlated with infant behavior during Non-Interaction. This is true for the sample as a whole and for

the sexes separately.

Significant correlations between these factors and infant behavior did not appear, then, under either condition. Contrary to expectations, the Stereotyping factors were not predictive of sex-specific behavior for either sex.

Summary

There is little relationship between the Maternal Stereotyping subscales and maternal behavior when the sample as a whole is examined; this is to be expected since predicted correlations would be sex-differential. Sex differences in maternal behavior, during Interaction at least, are moderately correlated with Stereotyping subscales. Mothers high in either Male Stereotyping or Female Stereotyping showed less overall interactive behavior with their children, except that mothers high in Female Stereotyping were more likely to initiate proximity-seeking with their daughters. Mothers high on the WishWash subscale initiated less proximity-seeking toward daughters. Mothers high in Male Stereotyping vocalized less to sons.

The Stereotyping subscales are unrelated to infant behavior for the entire sample or for the sexes separately during Non-Interaction. During Interaction, the subscales are unrelated to infant behavior for the sample as a whole, while stereotyping correlations with proximity in female infants appear which correspond to the above mentioned correlations for maternal proximity with daughters. Mothers high in Female Stereotyping have daughters who initiate less proximity

(the mothers initiate more), while mothers high in WishWash have daughters who initiate more proximity (the mothers initiate less). In other words, the reciprocal relationship noted between observed maternal and observed infant proximity-seeking seems to form a cluster with maternal stereotyping attitudes, at least for daughters. Mothers who were observed to initiate more proximity-seeking had infants who initiated less. Mothers high in Female Stereotyping initiated more proximity and had daughters who initiated less; the reverse is true of the WishWash subscale. Maternal initiation of proximity toward daughters seems consistent with maternal attitudes about stereotyping, and daughters' proximity-seeking seems consistent with the actual amount of maternal proximity-seeking.

Maternal Stereotyping factors are unrelated to maternal behavior for the sample as a whole, or for the sexes separately during Non-Interaction. During Interaction, mothers high in Stereotyping showed less of all interactive behaviors, except for proximity-seeking, with their infants; this was also the case for the Male Stereotyping and Female Stereotyping subscales, as noted above. The tendency of Stereotyping mothers to interact less with their infants is true of mothers of both daughters and sons. Stereotyping does not seem any more predictive of sex-differential maternal behavior than does Counterstereotyping. Neither factor is even moderately correlated with infant behavior during either condition, for the sample as a whole or for the sexes separately.

The Maternal Stereotyping subscales seem predictive of sex

differences in maternal and infant behavior primarily during Interaction rather than during Non-Interaction. There is practically no support for the hypotheses with which this section opened: that Stereotyping (subscales or factors) would be related to more proximal behavior and more vocalizing toward and by daughters, as well as more looking at and by sons; that Counterstereotyping (subscales and factors) would be related to reversals in that pattern; and that WishWash would be less predictive of sex-differential behavior than the other scales. While Stereotyping and WishWash mothers did less with their infants of either sex, with the exception of proximity-seeking, WishWash mothers tended to interact more with their infants.

IV. DISCUSSION

This section will cover, in the main, the following four topics: (1) sex differences in infant and maternal behavior during Non-Interaction, (2) the effects on infant and maternal behavior of asking the mother to interact or not to interact, (3) the effects on infant and maternal behavior of increasing or decreasing the level of interaction, and (4) the Maternal Questionnaire and its relation to infant and maternal behavior.

Sex Differences

The Non-Interaction condition has been the situation most frequently employed in the investigation of sex differences in the behavior which infants direct toward their mothers.¹ In the present study, during Non-Interaction, girls were found to touch and to initiate proximity toward their mothers more than boys did. This is consistent with other investigations using this situation and age group (Goldberg & Lewis, 1969; Lewis & Ban, 1971; Brooks & Lewis, 1974a; Maccoby & Jacklin, 1973).

In the present study, girls were found to vocalize less than boys, while there were no sex differences in looking behavior. Other

¹ Infant and maternal sex differences during the Interaction episode will be discussed below when considering Treatment effects.

investigations usually report that girls vocalize more than boys (Goldberg & Lewis, 1969; Lewis & Ban, 1971), but distal behaviors in general are less consistently associated with sex differences than are proximal behaviors.

Studies which have examined (and found) sex differences in the behavior which infants direct toward their mothers have operated on a more or less unstated assumption. That assumption, perhaps common to all investigations of socially meaningful infant behavior, is that differences in that behavior can largely be accounted for by differences in maternal behavior. The infant's behavior is presumably affected both by the mother's earlier behavior and by her present behavior. According to one explanation of sex differences in infant behavior, whether intentionally or not, mothers are presumed to act upon their infants in such a way as to promote the emergence of these differences. However, although it is assumed that maternal behavior (both past and present) facilitates such infant differences, laboratory investigations of infant-to-mother behavior have not systematically examined concurrent mother-to-infant behavior in order to test these assumptions.

The present investigation, which has examined the relationship between contemporaneous infant and maternal behavior, finds few sex-of-infant differences in maternal behavior during the Non-Interaction condition. Mothers showed no sex-differential touching or proximity-seeking, both behaviors for which there were large infant sex differences. Because mothers were instructed, during Non-Interaction

to keep their interactions to a minimum, and because they did interact less with their infants during this situation, it might be argued that diminishing the level of their behavior wiped out any sex differences in that behavior. However, sex-of-infant differences in maternal behavior did not appear during the Interaction condition either. Mothers looked longer at and vocalized more to girls than to boys during Non-Interaction.

The generally low correlations between maternal and infant behavior during Non-Interaction further support the idea that concurrent, sex-differential maternal behavior, at least in the behaviors studied here, is not directly related to the sex differences in observed infant behavior. Several possible alternatives still remain.

Sex differences in maternal behavior at an earlier age may be one such explanation, especially since socialization would be expected to change as a function of the changing status of the child. Several studies have documented such differences (e.g. Moss, 1967; Goldberg & Lewis, 1969). Second, it is possible that examining a greater range of maternal behaviors would pinpoint some which would be more associated with infant sex differences. Third, maternal report of her behavior and of the degree to which she expects sex differences in infant behavior may play a role in the establishment of such differences. As noted above, maternal report is not strongly predictive of infant sex differences. The relationship between maternal report and infant and maternal behavior will be discussed in greater detail below.

Finally, the possibility remains that these observed sex differences are independent of maternal behavior, and are rooted in sex-related temperamental differences.

Treatment Effects

Because the presence of sex differences in infant behavior was found to be highly dependent upon which treatment condition was examined, it is difficult to discuss treatment effects without discussing the Sex by Treatment interaction. Both effects will be considered below.

Behavior, like every other real event, occurs in a particular situation. Further, behavior can be presumed to change from one situation to another. Examination of events within one particular context presents only a partial picture of the true nature of such events. In order to fully grasp the nature of any cluster of behaviors, such as the relationship between a mother and her child, it is necessary to study that behavioral cluster in more than one situation; hopefully it is then possible to explore the ecological relationship between the situation and the behaviors measured.

Because this is so, the picture presented above of sex differences in the infant's and mother's behavior is only an incomplete one. It is important to examine the behaviors measured in the light of the surround in which they take place.

Most of the infant sex differences appearing in the Non-Interaction condition disappeared during Interaction: the only sex

difference to remain was that boys vocalized more than girls, regardless of the situation. Maternal sex differences, while few during Non-Interaction, were rarer still during Interaction: the only difference was that mothers vocalized more to daughters than to sons.

Sex differences in infant behavior thus seem to be situation-specific: they appear when mothers are not interacting and disappear when mothers are interacting. This finding may shed some light on the often inconsistent results of investigations of such differences in year-old infants. Generally speaking, investigations of infant behavior employing a "free play" situation with a non-interacting mother (Goldberg & Lewis, 1969; the current Non-Interaction condition) report more proximal behavior among female infants. On the other hand, studies employing the "strange situation" (frequent short episodes in which the mother's behavior conforms to a rather rigid set of rules which also precludes interaction) do not report such differences (e.g. Ainsworth & Bell, 1970). Finally, in the current Interaction condition (a freely interacting mother), few sex differences are found. In sum, when mothers have been instructed not to interact with their infants, girls, more than boys, are found to approach and touch their mothers. When mothers interact in a more natural fashion, or when they follow a pattern of frequent entrances and exits (the strange situation), such sex differences do not appear. Although these last two situations may be somewhat similar in that they both involve (usually) frequent movements of a

large stimulus (the mother, the stranger) their differences seem to outweigh this similarity. The most likely conclusion is that different situations facilitate different sets of behaviors.

While differences across situations, as indicated above, may be one explanation for changes in the degree to which sex differences (or any other individual differences) appear, it is also the case that individual differences in maternal behavior within a situation may account for infant differences. There was a considerable variation in the amount of interaction in which mothers engaged during Interaction, and there was even variability in the degree to which mothers ceased infant-directed behavior during Non-Interaction. Nevertheless, changes across situations were greater and presumably more powerful than variations within a given situation.

Any explanation of the lack of sex differences under one condition, and their presence under another condition, requires a discussion of contextual differences between these situation. Examination of treatment effects in themselves, apart from the sex differences in those effects, should clarify some dimensions of situational change. Sex differences in response to those situational changes can then be considered.

Mothers show increases in every behavior during Interaction as compared to Non-Interaction, except amount of looking time, which is greater during Non-Interaction. During Non-Interaction, mothers are non-responsive yet attentive (there is little else to do but look at the infant). This is most likely a situation rarely if ever before

encountered by the infant. The mother responds only minimally to the infant's overtures: she will not come to him, and her vocalization and touching are also diminished relative to the Interaction condition. However, she is visually attentive, more so than during Interaction. The presence of a non-responsive, staring mother has been found to induce distress in three month olds (Brazelton et al., 1975), and it may have the same effect on 12 month olds. When mothers, in response to instructions, behave in this non-responsive yet attentive manner, infants show more vocalization and touching (perhaps in an effort to engage the mother) and fewer discrete looks than they do during the Interaction situation.

Looking at the behavior of the dyad as a system, touching appears generally complementary for girls but not for boys. Infants in general touch more during Non-Interaction, when mothers touch less. Although maternal touching is not sex-specific in either situation, girls touch their mothers more than boys during periods of Non-Interaction. Girls, although not boys, increase their touching (by 83 seconds out of 14 minutes) in response to maternal non-availability, even though mothers show only a small (10 seconds out of 14 minutes) but significant decrease in touching. The increase in girls' touching is not, therefore, a response to a corresponding large decrease in maternal touching itself, but rather a response to a decreased level of general maternal availability and interaction, with touching being only one aspect of that system. Boys, on the other hand, show only a slight increase (9 seconds out of 14 minutes)

in their touching when their mothers decrease their general interaction.

Vocalization, too, appears to be a generally complementary system. Infants vocalize far more during Non-Interaction, and mothers vocalize far more during Interaction. Twelve-month-old infants have been found to inhibit the level of their vocalization when tape recordings of adult voices were played (Barnett-Goldfarb & Whitehurst, 1973) and similar results have been reported for the ratio of consonants to vowels when hearing consonants, and the reverse suppression, in six-month-olds (Webster, 1969). While infants in general appear to vocalize less when others are vocalizing to them in the present investigation, under both situations, boys vocalized more than girls did, while mothers of girls vocalized more than mothers of boys. Here can be seen the operation of the complementary vocalization system along sex-differentiating lines. Mothers of girls vocalized more, and perhaps because of this, their daughters vocalized less. This was not merely a scaling problem: mothers of girls did not monopolize all the available time during Interaction. They only vocalized for 132 of the possible 840 seconds (and their daughters vocalized for less than 40 of those seconds). The reciprocity in the amount of mother and infant vocalization seems to be a response to a "conversational rule": if A and B are having a conversation, when A talks, B listens; when B talks, A listens.

In general, proximity-seeking appears to be less coordinated. Both mother and infant initiate more proximity-seeking during

Interaction. Maternal proximity-seeking is not sex-specific: mothers of both boys and girls refrain from initiating proximity when told not to interact. As with infant touching, girls spend more time in proximity with their mothers than boys do during Non-Interaction, while there are no sex differences during Interaction. A truly complementary system would be one in which infants initiated less proximity when the mother was free to (and did) initiate more, during Interaction, and infants initiated more proximity during Non-Interaction. In fact, however, neither sex child operates within such a feedback system. Girls remain at almost the same high level even when their mothers interact and begin to initiate proximity on their own. Boys respond to increases in maternal interaction (and in maternal proximity-seeking) by increased proximity-seeking of their own. Clearly, this must be because the mother is not only initiating proximity during Interaction: she is also likely to be doing things to actively engage her infant, and this succeeds in bringing the male infant to her. Female infants stay near their mothers whatever she is doing.

During Interaction, there are no sex differences in infant looking. During Non-Interaction, boys decrease their looking, presumably because the mother is less interesting, while girls show only slight changes (decreases) in their level. As was the case with proximity-seeking, then, the looking behavior of girls is relatively independent of changes in maternal behavior, while that of boys is responsive to such maternal transformations. The result is that in

Non-Interaction, girls look at their mothers more than boys do. In a parallel fashion, there are no sex differences in maternal looking during Interaction. Under Non-Interaction, when the trend is for mothers to spend more time looking, they look more at daughters than they do at sons, and girls show more looking at their mothers than boys do.

If girls show more proximal behavior than boys during Non-Interaction, and there are no such sex differences during Interaction, what specific attributes of the Non-Interaction condition promote the emergence of such sex differences? Stress in the Non-Interaction condition is the first such attribute to come to mind, since Ss were far more likely to be eliminated for crying during the Non-Interaction situation than during the Interaction situation.

Male infants have been found to seek proximity following entry of a stranger in the "strange situation" (Feldman & Ingham, 1975) more than female infants do, and the authors interpret this as a sex-differential response to stress. Male infants have been reported to show more "freezing" behavior following onset of a loud auditory stimulus (Maccoby & Jacklin, 1973) which these authors suggest is a sex-differential response to stress. Brooks and Lewis (1974a) report that male infants initiate more proximal behavior with a non-interacting mother following 15 minutes of separation than do male infants observed prior to separation. Female infants' proximal behavior is not affected by whether or not they have first had the separation experience: girls show more proximal behavior than boys

do when seen prior to separation, while there are no sex differences when infants are seen following separation. The present investigation finds sex differences during Non-Interaction (a situation similar to Brooks' and Lewis' (1974a) pre-separation condition, and behavior similar to that which they report in this situation) and no sex differences during Interaction (behavior similar to that reported for Brooks' and Lewis' (1974a) post-separation situation).

Clearly, "stress" can be defined in many ways, and there is no a priori reason why loud noises, approaching strangers and prior separation from the mother should all be responded to in similar ways. It is also unclear why the present study generates results in the Interaction condition ("no stress") which parallel those of Brooks' and Lewis' post-separation condition (where infants had a double dose of "stress": the previous separation and a non-interacting mother). If individual differences appear under conditions of "moderate stress" yet do not appear under conditions of either "no stress" or "high stress", the validity of such situation-linked behaviors must be questioned.

While this possibility remains that maternal behavior during Interaction may mask "true infant behavior" so that sex differences can not emerge, this again points out the highly situational nature of such behavior. If "true infant behavior" can only be observed without concomitant maternal behavior, it seems that we must question the value of such a concept as "true infant behavior", along with its assumption that situational changes are irrelevant to or merely

interfere with the expression of some underlying constant state of behavior. As Parke (1976) has suggested, the relationship between various contextual dimensions and associated infant behavior needs to be studied more systematically before these questions can be answered.

Treatment Transitions

The situation or context in which the mother-infant dyad appears certainly accounts in large measure for the behavior which they demonstrate. The same may be said of changes in that situation. The mother, in response to experimental instructions, changes both the level of her overall interaction as well as the pattern of interrelationships among her various behaviors. The actual behavior which she emits bears some relationship to her own internal standard of what those instructions mean and to the level and quality of behavior coming from the infant. The infant's differential behavior from one condition to another is a response to situational change (that is, changes in maternal behavior). Both maternal and infant behavior are influenced not only by the current situation, but also by the nature of the preceding situation, as well as by their past history. In other words, maternal and infant behavior are determined both by which condition they find themselves in, and also by whether that constitutes an increase or decrease in comparison to the previous level of interaction.

When the transition is from a condition of Interaction to one of Non-Interaction, maternal touching remains about the same, while

infant touching increases. With the opposite transition, from Non-Interaction to Interaction, maternal touching increases while infant touching remains the same. Touching, then, appears to be an interactive dyadic system: it has a level to be maintained, but it is also tied in to changes in the overall level of interaction. If the mother increases her touching, infants in general do not change their level of touching (actually girls decrease their level while boys show no change), while if mothers decrease their overall level of interaction (though not necessarily their touching), both male and female infants increase the amount of touching which they perform. Touching is not then a system with an absolute level, since the amount of overall touching can be made to increase even if the mother's touching does not decrease.

As noted above, mother and infant vocalization seem to be highly co-ordinated. Regardless of treatment transitions, infants vocalize far more during Non-Interaction, and mothers vocalize far more during Interaction.

Proximity appears to be less complementary. Whether the mother increases or decreases her proximity-seeking, the infant increases his. The mother responds to experimental instructions, and the infant, who cannot respond directly to those instructions, appears to respond to a change in the rules of the interaction. In some sense, going from Interaction to Non-Interaction is similar to a separation episode, a situation in which increased infant proximity-seeking might be expected. In fact, Young and Lewis (1975) find that infants show increased

proximity-seeking toward their mothers when their mothers simply move away from them, after having been standing close by. In the present investigation, infants increased proximity-seeking to both the withdrawal of and the stepping up of maternal interaction. Interestingly, the increase in infant proximity-seeking was much greater following an increment in maternal interaction. It would seem, then, from this evidence, that a change in the rules of an interaction is potentially distressful for the infant, regardless of its content or direction. Before the infant is able to figure what the new rules are, he moves toward the mother for comfort or protection. Alternatively, two processes may be at work, so that the infant moves toward the mother when she increases the level of her interaction because she is doing interesting things, and also moves toward her when she decreases the level of her interaction because he is in distress.

Looking does not appear to be co-ordinated. When mothers decrease their level of overall interaction (but increase their looking time), infants increase their looking. When mother increase their interaction (but decrease their looking), infants increase their looking. Both increased maternal looking (which occurred during Non-Interaction) and increased maternal interaction (during the Interaction condition) are associated with increases in infant looking. This was also the case for proximity, as noted above. However the mother changes the level of her behavior, the infant responds with increased proximity-seeking and looking.

It seems then that two systems can be presented which may function as descriptive models for the ways in which changes in the behavior of one member of a dyad are related to changes in the behavior of the other. The first is a reciprocal system, and it can appear in one of two varieties. Considering only co-ordination within a single behavior, a behaviorally reciprocal system would be one in which increases in the level of behavior of one partner, for example, the mother, are met by decreases in the level of that behavior from the other partner, and vice versa. This kind of system seems to be operating in case of vocalization for both boys and girls. It also appears for girls and their mothers, to some degree, for touching, but only when the transition is from Non-Interaction to Interaction (mothers' touching increases while girls' touching decreases). A situationally reciprocal system involves an expansion beyond the single-behavior co-ordination suggested above. This is the case for changes in infant touching which accompany a transition from Interaction to Non-Interaction. Maternal touching does not change appreciably when the mother moves from Interaction to Non-Interaction, but infant touching increases nevertheless. This is most likely a response to a decrease, relative to Interaction, in the general level of interactive behavior coming from the mother, specifically, maternal initiation of proximity-seeking and vocalization.

The final pattern again involves co-ordination within a single behavior. In this system either increases or decreases in the

behavior of one partner (again, the mother) would be met by increases in the behavior of the other partner. This pattern appears for proximity-seeking and looking, and occurs for infants of both sexes. This type of system can be labeled an incremental system and might be characterized by the rule, "the more you do, the more I do, and the less you do, the more I do."

While other possible models could be devised, these two fairly well cover the patterns observed in the present study. The only behavioral event not accounted for by the above explanatory systems is that of boys' touching in response to increased maternal touching (following a change from Non-Interaction to Interaction). Specifically, there is no change in boys' touching following this transition. In this case, boys' touching does not appear to be related to changes in either maternal touching or in the overall level of interaction.

In summary, mother and infant vocalization appear to operate on the basis of a behaviorally reciprocal system. When mothers are told to decrease the level of their interaction, the amount of vocalization which they produce drops off and the amount of infant vocalization increases. When mothers are told to increase the level of their interaction, the amount of vocalization which they produce increases and the amount of vocalization which the infant produces decreases. Such a system also operates for the touching of girls and their mothers: when mothers are told to increase the level of their interaction, they do in fact increase the amount of touching which they perform, and their daughters' touching decreases. This

type of co-ordination is not found for boys' touching.

When mothers are asked to decrease the level of their interaction, the level of their touching does not change. Following this transition, infant touching increases. This is not a response to changes in maternal touching (there are no changes) but more likely a reaction to decreases in the overall level of interaction (namely, vocalization and proximity-seeking). For transitions in this direction, then, touching operates within what has been called here a situationally reciprocal system.

When mothers are told to decrease the level of their interaction, they initiate less proximity-seeking; when told to increase the level of their interaction, they initiate more proximity. Either transition, in the direction of increased or decreased maternal proximity-seeking, lead to increases in infant proximity-seeking. An incremental system appears at work here: regardless of how much proximity-seeking the mother initiates, changes in that level spark increases in infant proximity-seeking. A similar pattern appears for looking. When mothers are told to decrease the level of their interaction, they actually increase the amount of looking which is directed to their infants. Conversely, when asked to increase the level of their interaction, they direct less looking at their infants. Either transition, whether toward increased or decreased maternal looking, leads to increased infant looking.

The pattern of behavioral change which constitutes a transition effect is complex and multidimensional. Changes in infant

behavior are tied in not just to corresponding maternal changes, but also to variations in both the level of interaction as a whole and to contextual patterning of maternal behavior as well.

The Questionnaire and its Relationship to Maternal and Infant Behavior

Maternal Behavior and Maternal Report

Neither the mother's account of the level of interaction which she typically has with her infant nor the degree to which she expects sex differences in infant behavior was found to be sex-specific. The infant's sex does not appear to be an overwhelmingly important dimension around which these attitudes, as measured, are organized. Even on the Stereotyping Scale, where sex-specific attitudes were directly solicited, for each item, the majority of mothers believed there to be no sex differences. Further, the sex of her infant did not influence which behaviors a mother labeled masculine and which she labeled feminine, when she did make such a choice.

This lack of sex-differential maternal attitudes is in keeping with the general absence of sex-differential maternal behavior. Aside from more looking at daughters during Non-Interaction, and more vocalization to daughters in both conditions, there were no sex-of-infant differences under either condition.

The absence of sex differences in maternal report is consistent, then, with the absence of such differences in maternal behavior. While the possibility remains that the lack of sex-of-infant differences

in both maternal behavior and maternal report results from mothers' attempting to make their Questionnaire responses consistent with their behavior, this seems unlikely. The Questionnaire was presented to mothers after their behavior had been observed, and mothers were unaware of the primary purpose of the investigation until after they had completed the Questionnaire. While the Stereotyping portion of the Questionnaire did bring up the idea of sex differences in infant behavior, most mothers assumed that they were responding with factual information, not their "expectations". They were often quite surprised, even after having responded to the Questionnaire items, that sex-differential maternal behavior was being investigated. The more likely explanation for these results is that neither maternal behavior nor maternal report is sex-specific.

On a finer level, what can be said of the degree of coherence between the several subscales, or factors, and maternal and infant behavior?

Because of the constraints on maternal behavior during Non-Interaction, few relationships between either the Attitude or the Stereotyping portion of the questionnaire and maternal behavior were expected for the Non-Interaction condition, and, in fact, few were found. This was the case, regardless of whether subscales or factors were employed, and regardless of whether the group was examined as a whole, or separately by sex of infant.

Looking at the Attitude portion of the questionnaire, reported vocalization (both subscale and factor) is positively correlated

with observed maternal vocalization during Interaction to both daughters and sons. The subscale, Play, is related to an interactive pattern involving more proximity-seeking, more touching, more vocalization and less looking for mothers of boys; for mothers of girls, Play predicts only to more vocalization and less looking. A similar pattern of sex-differential correlations appears for the Non-Verbal Interaction factor.

As for the Stereotyping portion of the Questionnaire, mothers high in either Male or Female Stereotyping showed less interactive behavior during Interaction with their infants, while mothers who expected fewer sex differences showed more overall behavior directed toward their infants. While some support is found for the tendency of stereotyping mothers to act in stereotypical ways toward sons (they show less vocalization, less touching, and less proximity-seeking) and toward daughters (they show more proximity-seeking), even here correlations are scattered, and are not always in the expected direction. General behavioral suppression appears to be the rule with these mothers, rather than performance of a pattern of behavior consistent with their stereotypic attitudes. The same is true for the relationship between the Stereotyping factor and maternal behavior. Mothers high in Male or Female Stereotyping might be expected to view their infants in a more rigid, simplified manner; perhaps these mothers were either inhibited by the experimental situation, or, because of a lack of cognitive complexity, they were less able to relate to their infants in a truly interactive style.

Both theoretical (Lewin, 1935) and experimental (Luchings & Luchins, 1959) evidence suggests that rigidity in terms of either attitudes or personal style may be related to behavioral rigidity. Finally, parents high in sex-role-stereotyping are less likely to be reported as being affectionate by their adolescent children (Papanek, 1969); if "being less affectionate" means less touching, less talking to, and less being close to one's child, perhaps such inclinations can be detected in stereotyping mothers very early in the life of their children.

With the exception of vocalization, then, observed specific maternal behaviors are not well predicted by a mother's report of her behavior nor by the degree to which she expects infant behavior to be sex-specific. This is in keeping with earlier reports of the absence of such predictability in mothers of preschoolers (Zunich, 1962; Brody, 1965) and in mothers of infants (Clarke-Stewart, 1973). In other words, with few exceptions, aside from such pervasively powerful determinants as social class (which seems to affect both a mother's behavior and her verbal report: Tulkin & Kagan, 1972), consistency between maternal attitudes and behavior does not seem to appear. This is true whether the instrument used assesses such variables as "maternal control" (the PARI: Brody, 1965), such affective dimensions as a "positive attitude" toward the child (Clarke-Stewart, 1973), or even whether it is concerned with the identical specific behaviors which are observed (the present study). This study does, however, provide some support for the presence

of more global relationships between maternal report and maternal behavior. Namely, mothers who report that they "play" with their infants do show a pattern of interactive behavior which is also sex-specific; further, mothers who expect the behavior of their infant to be sex-specific actually interact less with their infants than do mothers who do not expect such differences.

Maternal Report and Infant Behavior

Maternal behavior and maternal report have been found, as noted above, to have some relationship to each other, although that relationship appears to be rather limited. Similarly, maternal behavior and infant behavior have been found to be related to each other in an organized fashion. The relationship between maternal and infant behavior has been characterized as dyadic and two basic models have been presented to describe the ways in which changes in the behavior of one member of the dyad affect changes in the behavior of the other member: incremental and reciprocal systems. Given this relationship between maternal and infant behavior, how can the relationship between maternal report and infant behavior be characterized?

For both the Stereotyping and Attitude portions of the Questionnaire, little relationship is found between a stereotyping or attitude scale (or factor) and any direct counterpart in infant behavior. However, because of the complex, often reciprocal, manner in which specific maternal and infant behaviors are related, it is probably not reasonable to expect direct correspondence between maternal

report and infant behavior. Instead, given a slight relationship between maternal report and maternal behavior, and given the reciprocal way in which certain maternal and infant behaviors (looking and proximity-seeking) are related, it might be expected that maternal report of a given behavior would be more related to infant performance of other behaviors than to infant performance of the particular behavior in question. In fact, this seems to be the case. A relationship between maternal report and infant behavior emerges when the correlations between specific maternal subscales and other infant behaviors are examined, even when the contribution of the mother's behavior is partialled out of the correlations. For girls, maternal report is positively related to infant behavior, while for boys, the relationship is negative.

A similar pattern appears for stereotyping. Stereotyping factors are unrelated to infant behavior, while there is some relationship between the subscales and infant behavior. If the maternal stereotyping subscales truly reflect maternal stereotyping behavior, it would be expected that both Male and Female Stereotyping should be positively correlated with maternal touching, vocalizing, and proximity-seeking for mothers of girls, and negatively correlated with these behaviors for mothers of boys. Similarly, correlations with maternal looking should be negative for mothers of girls and positive for mothers of boys. There is some support for these predictions for vocalization and proximity-seeking.

Further, while it was suggested above that infants of stereotyping

mothers should behave in sex-stereotypic ways, (more touching, vocalizing, and proximity-seeking among girls, more looking among boys), alternatively the complementary nature both of observed maternal and infant touching, and of maternal and infant vocalization, might indicate a different pattern. Correlations between Male and Female Stereotyping subscales and both infant touching and infant vocalization might then be negative for girls and positive for boys. While neither alternative is well supported by the data, the evidence for the first prediction (more touching and vocalization in daughters of stereotyping mothers) seems somewhat stronger.

For proximity-seeking, a consistent interrelationship appears between maternal stereotyping attitudes, maternal behavior, and infant behavior. Mothers high in Female Stereotyping initiate more proximity with their daughters, consistent with their stereotypic attitudes. Because of the complementary nature of the proximity system (correlations between maternal and infant proximity are significantly negative during Interaction), these daughters do not themselves initiate as much proximity as other girls. Conversely, mothers high in WishWash (those whose attitudes are not sex-stereotypic) tend to initiate less proximity with their daughters than do other mothers, and perhaps because of this, their daughters initiate more. Boys, once again, do not show a lawful pattern. For girls, at least with regard to proximity-seeking, maternal report is related to infant behavior, although this relationship is complicated by the often complementary nature of the relationship between maternal and

infant behavior.

It would appear then, that infant behavior is somewhat related to maternal report, especially for girls. Mothers high on any one subscale of the Attitude portion of the Questionnaire tend to have daughters who interact using other behaviors, while this is not the case for sons. Mothers who report more touching have daughters who show more touching during Interaction. Maternal proximity-seeking seems to be consistent with maternal stereotyping for girls, and the observed proximity-seeking of daughters appears reciprocally related to such dimensions. The often complementary relationship between infant and maternal behavior renders the relationship between maternal report and infant behavior rather complex, at least in the case of girls. The behavior of sons does not fit even this complicated pattern.

One possible explanation for the lack of a strong relationship between infant behavior and maternal behavior is that infant behavior is more related to earlier maternal behavior (and earlier maternal report) than it is to current maternal behavior (and report). Since the socialization demands of mothers change with the age of the child, there could very well be a time lag which would account for the apparent lack of co-ordination between the mother and the infant. Mothers may orient their behavior and their report of their behavior toward some future vision of appropriate infant behavior. Over time, as the infant changes his behavior, in keeping with the mother's demands, the mother would change those demands, in keeping with some

newer standard of how her infant should behave.

However, this explanation for the inconsistency between maternal behavior and infant behavior and between maternal report and infant behavior still assumes some co-ordination between maternal behavior and maternal report. Such co-ordination has been found only weakly when either her report of the quality of her interaction with her infant or her report of the degree to which she expects sex differences in infant behavior is considered. If the mother can not present a verbal picture of her behavior which mirrors her observed behavior under either Interaction or Non-Interaction, the situational nature of her behavior may again be the cause. Either her behavior varies so completely from situation to situation that the mother is virtually unable to come up with a generalized statement of her behavior, or else she has in mind a prototypic situation unlike those tapped into by the present investigation. While either is possible, it is certainly true that being in an observation room and being closely watched by an observer is unlikely to be the type of situation the mother envisions when she tries to assess and comment upon her "usual" behavior.

Alternatively, the lack of strong mother-infant co-ordination might truly reflect the independence of infant interactive behavior from any influence of the mother's observed or reported behavior, as well as maternal independence from infant behavior. While such a model seems unlikely, this possibility can not be dismissed at this time. Further longitudinal and cross-situational examination of the

interweaving of maternal and infant behavior is necessary before the nature of the connections (if there should be any connections) between maternal behavior, maternal report, and infant behavior can be determined.

What is clear from the hints provided by the present study, is that the nature of those interweavings is likely to be exceedingly complicated, and perhaps not terribly powerful. The interrelationships among the components of the three subsets investigated here (maternal report, maternal behavior, infant behavior) as well as the complex effect which each subset may have upon the other two, means that simple statements describing these patterns will not be adequate.

V. CONCLUSIONS

Several points must be stressed. First, this study finds support for the presence of sex differences in the behavior which year-old infants direct towards their mothers. When mothers refrain from interacting, girls touch mothers more and initiate proximity with their mothers more than boys do; boys vocalize more than girls do.

Second, these differences can not be accounted for by corresponding concurrent sex-differential maternal behavior. They can not be accounted for by sex-of-infant differences in mothers' reports of the quality of their interactions with their infants. They can not be accounted for by sex-stereotyping in mothers. Mothers did not show behavior which was highly sex-specific; they did not report sex-differential behavior; they generally did not expect the behavior of year-old infants to be sex-specific.

Third, the nature of maternal behavior and of infant behavior, and specifically the presence of sex differences in infant behavior, is highly dependent upon the situation examined. Contextual changes provoke large behavioral changes such that sex differences which appear in one situation (Non-Interaction) are largely non-existent in another situation (Interaction).

Fourth, maternal and infant behavior are related not just to

the current situation, but also to how that situation compares to the previous one. To be specific, changes in the level of interaction, as well as the direction of those changes (treatment transitions) have been found to influence the behavior of both mother and infant. Two models have been presented which describe the way in which changes in the behavior of one member of a dyad are related to changes in the behavior of the other. A reciprocal system is one in which increases, by one member of the dyad, in either a given behavior (behaviorally reciprocal system) or in the overall level of interaction (situationally reciprocal system) are related to decreases by a given behavior by the other member of the dyad, and vice versa. An incremental system is one in which increases, by one member of the dyad, in a given behavior, are related to increases, by the other member of the dyad, in that behavior. Similarly, decreases by one member are met with increases by the other.

Finally, neither maternal behavior nor infant behavior is very well predicted by maternal report. With few exceptions, the relationship between maternal behavior and infant behavior is also rather weak. Mothers who report that they "play" with their infants do show a pattern of interactive behavior which is sex-specific; mothers who expect the behavior of their infants to be sex-specific interact less with their infants than do mothers who do not expect such differences. Girls' behavior is globally positively related to maternal report; boys' behavior is globally negatively related to maternal report. Three possible explanations for the lack of consistency are presented: (1) maternal behavior, infant behavior, and maternal report constitute

three rather independent systems; (2) there is a time lag, as a result of changing socialization demands, between maternal report and maternal behavior on the one hand, and infant behavior on the other hand; (3) mothers are unable to indicate verbally what their "usual" behavior is because that behavior is situationally determined. While these explanations are not mutually exclusive, further longitudinal and cross-situational investigations are needed to clarify these relationships. The complexity of the interrelationships among maternal report, maternal behavior and infant behavior make predictions in this area extremely difficult.

APPENDIX

INSTRUCTIONS

Hello! While you and your baby are in this playroom, we will be in the next room. We are observing how babies at this age play with toys. There is no right or wrong way for your baby to act; we just want to look at the many different ways in which children can play. Try to be as natural as possible; we're sure your baby will be! The observation will take $\frac{1}{2}$ hour. When it is time to begin, please go into the playroom, have a seat on the chair with your baby on your lap. When I knock on the wall, please put your baby on the floor beside you. For the first 15 minutes, please remain seated and do not initiate any interaction with the baby. If your baby directs any action toward you, you may respond briefly. After 15 minutes, I will knock on the wall a second time. At this time, please pick up your baby, and return to the chair, holding the baby in your lap. After a few moments, I will knock a third time and you should now put the baby down again on the floor beside you. This time, however, you may, if you wish, interact in any way with your child and sit or move about the room as you choose. At the end of the second 15 minute period, I will signal to you that we are done.

I have read the above information, understand what will happen in the study, and give my permission to the persons involved to record the necessary observations.

Signed _____ Date _____

INSTRUCTIONS

Hello! While you and your baby are in this playroom, we will be in the next room. We are observing how babies at this age play with toys. There is no right or wrong way for your baby to act; we just want to look at the many different ways in which children can play. Try to be as natural as possible; we're sure your baby will be! The observation will take $\frac{1}{2}$ hour. When it is time to begin, please go into the playroom, have a seat on the chair with your baby on your lap. When I knock on the wall, please put your baby on the floor beside you. For the first 15 minutes, you may, if you wish, interact in any way with your child and sit or move about the room as you choose. After 15 minutes, I will knock on the wall a second time. At this time, please pick up your baby and return to the chair, holding the baby in your lap. After a few moments, I will knock a third time, and you should now put the baby down on the floor beside you. This time however, please remain seated and do not initiate any interaction with your baby. If your baby directs any action toward you, you may respond briefly. At the end of the second 15 minute period, I will signal to you that we are done.

I have read the above information, understand what will happen in the study, and give my permission to the persons involved to record the necessary observations.

Signed _____ Date _____

MATERNAL QUESTIONNAIRE

Maternal Attitude Scale

1. Relative to other mothers, how much touching of your child do you think you do?
2. Some children seem to be cuddlers, while others don't like too much of that sort of thing. How would you characterize your child?
3. How much do you like to cuddle your child?
4. How many times in a day do you kiss your baby?
5. Compared to other babies, how much vocalization do you think your baby directs to you?
6. How many questions do you ask the baby in a day?
7. How responsive is the baby to your naming things?
8. How often in a day do you name things to the baby?
9. How often in a day do you explain things to him/her, such as how things work, etc.?
10. Is s/he content to play by her/himself, or does s/he always want you to join in?
11. How often in a day do you join in with his/her play?
12. If you have some free time are you more likely to play with the baby or to do something on your own?
13. How much of the day do you spend playing with her/him, not including that in the course of eating, diapering, bathing, etc.?
14. If you are sitting in your living room, occupied with reading or something, what is the distance from you which the baby usuallys stays to play?
15. In a strange place, do you prefer that s/he investigate or stay closer to you?
16. Under what conditions do you feel it is important to be near your baby?
17. When is it important to stay somewhat further away?

MATERNAL QUESTIONNAIRE - Continued

18. When do you prefer that s/he be further away from you (some-time when the baby wants to be near, but you don't want it)?
19. If you are sitting in your living room and the child is playing in the same room, how often do you look up at her/him?
20. How many times in five minutes do you think that is?
21. Is that more, less or the same as most mothers?
22. Under these circumstances, how much does s/he look up at you?
23. How many times in five minutes?
24. If you are in a strange place which is not "baby-proofed", how many times in five minutes do you look up at the baby?
25. Under these circumstances, how often does s/he look up at you?
26. How many times is that in five minutes?
27. When is it alright not to check up on a child at this age?

Maternal Stereotyping Scale

Do you think the following behaviors are more likely to be true of a boy, of a girl, or whether they are equally likely to be true of either sex child at about a year?

Reacts comfortably to strangers	Talks alot
Does not do what mother says to do	Cries easily
Acts afraid in the doctor's office	Plays rough
Expresses interest in new clothes	Is more active
Plays alone when mother is busy	Likes to be clean
Is interested in father's activities	Likes cuddly dolls
Likes to have other children around	Hits other children
Has a longer attention span	Is affectionate with father
Wants to do things by him/herself	Is affectionate with mother
Feeds him/herself with fork or spoon	Is happy and full of laughter
Stays near mother when in a strange place	
Is easily quieted by being held	
Goes into the street when walking with mother	

TABLE 26

Means for Baby Frequency Touch

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	1.083	0.650	0.933	1.183	3.849
Boys	1.033	0.833	1.333	1.667	4.866
I first	0.667	0.667	0.533	1.000	2.867
NI first	1.400	1.000	2.133	2.333	6.866
Girls	1.133	0.467	0.533	0.700	2.833
I first	0.933	0.067	0.533	0.667	2.200
NI first	1.333	0.867	0.533	0.733	3.466
Non-Interaction	1.267	1.283	1.633	2.233	6.416
Boys	0.767	1.300	1.300	1.700	5.067
I first	1.267	2.267	2.067	2.533	8.134
NI first	0.267	0.333	0.533	0.867	2.000
Girls	1.767	1.267	1.967	2.767	7.768
I first	2.200	1.000	2.000	3.133	8.333
NI first	1.333	1.533	1.933	2.400	7.199
Overall Mean	1.175	0.967	1.283	1.708	5.133

TABLE 27

Means for Baby Duration Touch

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	6.058	6.325	3.650	7.750	23.783
Boys	6.750	7.250	6.267	9.300	29.567
I first	6.733	2.800	1.800	2.333	13.666
NI first	6.767	11.700	10.733	16.267	45.467
Girls	5.367	5.400	1.033	6.200	18.000
I first	4.667	0.067	0.267	0.900	5.901
NI first	6.067	10.733	1.800	11.500	30.100
Non-Interaction	14.500	16.925	16.092	21.950	69.467
Boys	4.900	7.617	8.283	17.217	38.017
I first	7.933	13.400	15.000	28.233	64.566
NI first	1.867	1.833	1.567	6.200	11.467
Girls	24.100	26.233	23.900	26.683	100.916
I first	21.800	27.967	25.000	32.033	106.800
NI first	26.400	24.500	22.800	21.333	95.033
Overall Mean	10.279	11.625	9.871	14.850	46.625

TABLE 28

Means for Baby Frequency Vocalization

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	13.000	15.350	15.367	16.350	60.067
Boys	12.800	17.133	16.967	17.633	64.533
I first	12.400	16.533	18.000	17.200	64.133
NI first	13.200	17.733	15.933	18.067	64.933
Girls	13.200	13.567	13.767	15.067	55.601
I first	14.800	14.733	15.067	17.333	61.933
NI first	11.600	12.400	12.467	12.800	49.267
Non-Interaction	21.900	22.033	23.400	24.983	92.316
Boys	21.800	22.633	26.267	28.100	98.800
I first	26.400	23.800	29.400	28.600	108.200
NI first	17.200	21.467	23.133	27.600	89.400
Girls	22.000	21.433	20.533	21.867	85.833
I first	27.000	23.333	23.133	23.200	96.666
NI first	17.000	19.533	17.933	20.533	74.999
Overall Mean	17.450	18.692	19.383	20.667	76.192

TABLE 29

Means for Baby Duration Vocalization

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	9.758	10.900	11.183	12.600	44.441
Boys	10.650	11.883	13.050	14.250	49.833
I first	8.033	10.600	14.467	12.333	45.433
NI first	13.267	13.167	11.633	16.167	54.234
Girls	8.867	9.917	9.317	10.950	39.051
I first	9.567	10.567	10.867	12.067	43.068
NI first	8.167	9.267	7.767	9.833	35.034
Non-Interaction	17.700	16.658	20.400	19.825	74.583
Boys	19.200	17.300	23.900	22.800	83.200
I first	20.433	17.767	25.000	22.533	85.733
NI first	17.967	16.833	22.800	23.067	80.667
Girls	16.200	16.017	16.900	16.850	65.967
I first	21.033	17.600	19.733	19.433	77.799
NI first	11.367	14.433	14.067	14.267	54.134
Overall Mean	13.729	13.779	15.792	16.212	59.512

TABLE 30

Means for Baby Frequency Look

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	7.383	7.183	7.083	7.000	28.649
Boys	6.667	6.967	6.133	6.633	26.400
I first	7.733	7.733	7.267	8.667	31.400
NI first	5.600	6.200	5.000	4.600	21.400
Girls	8.100	7.400	8.033	7.367	30.900
I first	7.400	7.400	6.533	6.867	28.200
NI first	8.800	7.400	9.533	7.867	33.600
Non-Interaction	6.250	6.050	5.633	5.517	23.450
Boys	5.200	5.400	5.500	5.133	21.233
I first	5.533	5.267	6.400	5.800	23.000
NI first	4.867	5.533	4.600	4.467	19.467
Girls	7.300	6.700	5.767	5.900	25.667
I first	8.333	7.133	6.333	6.133	27.932
NI first	6.267	6.267	5.200	5.667	23.401
Overall Mean	6.817	6.617	6.358	6.258	26.050

TABLE 31
Means for Baby Duration Look

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	14.808	14.300	14.133	12.217	55.458
Boys	13.767	15.667	12.483	11.533	53.450
I first	14.067	13.933	12.533	13.200	53.733
NI first	13.467	17.400	12.433	9.867	53.167
Girls	15.850	12.933	15.783	12.900	57.466
I first	14.033	13.400	12.133	10.533	50.099
NI first	17.667	12.467	19.433	15.267	64.834
Non-Interaction	12.458	12.583	13.758	11.642	50.441
Boys	11.267	10.267	12.767	11.500	45.800
I first	11.633	10.633	13.800	10.967	47.033
NI first	10.900	9.900	11.733	12.033	44.566
Girls	13.650	14.900	14.750	11.783	55.083
I first	16.133	17.533	16.167	11.933	61.766
NI first	11.167	12.267	13.333	11.633	48.400
Overall Mean	13.633	13.442	13.946	11.929	52.950

TABLE 32

Means for Baby Frequency Proximity

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	1.983	2.067	2.317	1.750	8.117
Boys	1.967	2.300	2.733	1.533	8.533
I first	2.067	2.533	3.467	1.400	9.467
NI first	1.867	2.067	2.000	2.067	8.000
Girls	2.000	1.833	1.900	1.767	7.500
I first	1.467	1.800	0.667	1.800	5.734
NI first	2.533	1.867	3.133	1.733	9.266
Non-Interaction	1.867	1.450	1.817	2.017	7.151
Boys	1.533	1.467	1.300	1.900	6.200
I first	1.867	2.200	1.933	2.533	8.533
NI first	1.200	0.733	0.667	1.267	3.867
Girls	2.200	1.433	2.333	2.133	8.099
I first	2.667	1.667	2.733	2.467	9.534
NI first	1.733	1.200	1.933	1.800	6.666
Overall Mean	1.925	1.758	2.067	1.883	7.633

TABLE 33

Means for Baby Duration Proximity

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	43.517	42.967	56.225	47.917	190.626
Boys	38.733	47.500	59.600	46.650	192.483
I first	27.367	58.367	55.867	24.067	165.668
NI first	50.100	36.633	63.333	69.233	219.299
Girls	48.300	38.433	52.850	49.183	188.766
I first	36.700	28.567	37.333	48.567	151.167
NI first	59.900	48.300	68.367	49.800	226.367
Non-Interaction	38.475	31.475	32.267	47.050	149.267
Boys	20.983	19.483	15.950	38.583	94.999
I first	18.367	30.633	23.633	55.667	128.300
NI first	23.600	8.333	8.267	21.500	61.700
Girls	55.967	43.467	48.583	55.517	203.534
I first	60.100	46.333	49.200	71.033	226.666
NI first	51.833	40.600	47.967	40.000	180.400
Overall Mean	40.996	37.221	44.246	47.483	169.946

TABLE 34

Means for Mother Frequency Touch

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	2.317	2.100	2.133	1.250	7.800
Boys	2.400	2.367	2.533	1.633	8.933
I first	2.400	1.533	1.800	1.600	7.333
NI first	2.400	3.200	3.267	1.667	10.534
Girls	2.233	1.833	1.733	0.867	6.666
I first	1.933	0.600	0.933	0.867	4.333
NI first	2.533	3.067	2.533	0.867	9.000
Non-Interaction	0.650	0.850	0.850	2.317	4.667
Boys	0.333	0.967	0.967	2.300	4.567
I first	0.533	1.933	1.800	3.600	7.866
NI first	0.133	0.000	0.133	1.000	1.266
Girls	0.967	0.733	0.733	2.333	4.766
I first	1.467	1.133	0.533	1.600	4.733
NI first	0.467	0.333	0.933	3.067	4.800
Overall Mean	1.483	1.475	1.492	1.783	6.233

TABLE 35

Means for Mother Duration Touch

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	6.875	5.850	5.500	3.492	21.717
Boys	6.767	6.767	6.300	5.783	25.617
I first	6.533	4.533	3.600	3.333	17.999
NI first	7.000	9.000	9.000	8.233	33.233
Girls	6.983	4.933	4.700	1.200	17.816
I first	7.367	1.433	2.400	0.967	12.167
NI first	6.600	8.433	7.000	1.433	23.466
Non-Interaction	1.675	2.058	2.817	5.333	11.883
Boys	1.267	2.783	2.750	6.250	13.050
I first	2.400	5.567	5.333	9.867	23.167
NI first	0.133	0.000	0.167	2.633	2.933
Girls	2.083	1.333	2.883	4.417	10.716
I first	3.233	2.367	2.333	3.267	11.200
NI first	0.933	0.300	3.433	5.567	10.233
Overall Mean	4.275	3.954	4.158	4.412	16.799

TABLE 36

Means for Mother Frequency Vocalization

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	34.050	30.317	32.350	28.100	124.817
Boys	28.633	27.167	28.800	24.767	109.367
I first	28.600	24.600	27.867	24.467	105.534
NI first	28.667	29.733	29.733	25.067	113.200
Girls	39.467	33.467	35.900	31.433	140.267
I first	39.867	29.733	33.000	31.267	133.867
NI first	39.067	37.200	38.800	31.600	146.667
Non-Interaction	3.783	3.717	4.450	5.567	17.517
Boys	3.233	2.767	3.400	4.500	13.900
I first	3.800	2.800	3.667	5.933	16.200
NI first	2.667	2.733	3.133	3.067	11.600
Girls	4.333	4.667	5.500	6.633	21.133
I first	5.267	5.333	7.000	7.733	25.333
NI first	3.400	4.000	4.000	5.533	16.933
Overall Mean	18.917	17.017	18.400	16.833	71.167

TABLE 37

Means for Mother Duration Vocalization

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	30.967	28.800	30.967	27.475	118.209
Boys	26.667	25.250	27.217	23.650	102.784
I first	29.067	23.967	27.400	23.600	104.034
NI first	27.267	26.533	27.033	23.700	104.533
Girls	35.267	32.350	34.717	31.300	133.634
I first	35.333	30.833	35.067	32.967	134.200
NI first	35.200	33.867	34.367	29.633	133.067
Non-Interaction	3.325	3.058	3.758	4.733	14.874
Boys	2.500	1.917	2.567	3.783	10.767
I first	3.167	2.200	3.000	5.267	13.634
NI first	1.833	1.633	2.133	2.300	7.899
Girls	4.150	4.200	4.950	5.683	18.983
I first	5.333	4.967	6.467	6.300	23.067
NI first	2.967	3.433	3.433	5.067	14.900
Overall Mean	17.146	15.929	17.362	16.104	66.541

TABLE 38

Means for Mother Frequency Look

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	13.933	13.633	15.400	16.467	59.433
Boys	13.433	14.200	13.867	15.067	56.567
I first	9.600	9.733	11.933	11.267	42.533
NI first	17.267	18.667	15.800	18.867	70.601
Girls	14.433	13.067	16.933	17.867	62.300
I first	12.200	11.133	14.400	15.467	53.200
NI first	16.667	15.000	19.467	20.267	71.401
Non-Interaction	10.150	9.800	10.583	11.350	41.883
Boys	10.367	11.900	12.400	12.767	47.434
I first	11.467	17.267	14.667	15.400	58.801
NI first	9.267	6.533	10.133	10.133	36.066
Girls	9.933	7.700	8.767	9.933	36.333
I first	11.333	10.467	10.467	9.067	41.937
NI first	8.533	4.933	7.067	10.800	31.333
Overall Mean	12.042	11.717	12.992	13.908	50.659

TABLE 39

Means for Mother Duration Look

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	144.217	148.808	141.000	146.292	580.317
Boys	142.650	152.000	147.917	148.900	591.467
I first	158.967	173.867	164.600	175.800	673.234
NI first	126.333	130.133	131.233	122.000	509.699
Girls	145.783	145.617	134.083	143.683	569.166
I first	157.500	166.467	154.633	147.200	625.800
NI first	134.067	124.767	173.533	140.167	572.534
Non-Interaction	182.625	185.267	180.542	179.008	727.442
Boys	181.000	179.050	171.383	170.983	702.416
I first	173.933	162.300	152.300	154.333	642.866
NI first	188.067	195.800	190.467	187.633	761.967
Girls	184.250	191.483	189.700	187.033	752.466
I first	180.300	182.533	186.267	186.667	735.767
NI first	188.200	200.433	193.133	187.400	769.166
Overall Mean	163.421	167.037	160.771	162.650	653.879

TABLE 40

Means for Mother Frequency Proximity

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	3.100	2.300	1.967	1.650	9.017
Boys	3.567	2.800	2.033	2.100	10.500
I first	3.533	1.800	2.667	2.333	10.333
NI first	3.600	3.800	1.400	1.867	10.667
Girls	2.633	1.800	1.900	1.200	7.533
I first	2.733	2.267	2.000	2.133	9.133
NI first	2.533	1.333	1.800	0.267	5.933
Non-Interaction	0.050	0.067	0.150	0.017	0.284
Boys	0.067	0.033	0.300	0.033	0.433
I first	0.133	0.067	0.600	0.067	0.867
NI first	0.000	0.000	0.000	0.000	0.000
Girls	0.033	0.100	0.000	0.000	0.133
I first	0.067	0.200	0.000	0.000	0.267
NI first	0.000	0.000	0.000	0.000	0.000
Overall Mean	1.575	1.183	1.058	0.833	4.649

TABLE 41

Means for Mother Duration Proximity

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	49.008	35.142	37.875	28.483	150.508
Boys	59.000	29.650	26.917	22.083	137.650
I first	61.167	17.367	24.433	25.833	128.800
NI first	56.833	41.933	29.400	18.333	146.499
Girls	39.017	40.633	48.833	34.833	163.316
I first	36.800	48.433	65.867	45.100	196.200
NI first	41.233	32.833	31.800	24.667	130.533
Non-Interaction	0.367	0.525	2.942	0.017	3.851
Boys	0.650	0.583	5.883	0.033	7.149
I first	1.300	1.167	11.767	0.067	14.301
NI first	0.000	0.000	0.000	0.000	0.000
Girls	0.083	0.467	0.000	0.000	0.550
I first	0.167	0.933	0.000	0.000	1.100
NI first	0.000	0.000	0.000	0.000	0.000
Overall Mean	24.687	17.833	20.408	14.250	77.178

TABLE 42

Means for Total Frequency Touch

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	3.400	2.750	3.067	2.433	11.650
Boys	3.433	3.200	3.866	3.300	13.799
I first	3.067	2.200	2.333	2.600	10.200
NI first	3.800	4.200	5.400	4.000	17.400
Girls	3.367	2.300	2.266	1.567	9.500
I first	2.867	0.667	1.467	1.533	6.534
NI first	3.867	3.933	3.067	1.600	12.467
Non-Interaction	1.917	2.133	2.483	4.550	11.083
Boys	1.100	2.267	2.267	4.000	9.634
I first	1.800	4.200	3.867	6.133	16.000
NI first	0.400	0.333	0.667	1.867	3.267
Girls	2.733	2.000	2.700	5.100	12.533
I first	3.667	2.133	2.533	4.733	13.066
NI first	1.800	1.867	2.867	5.467	12.001
Overall Mean	2.658	2.442	2.775	3.492	11.367

TABLE 43

Means for Total Duration Touch

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	12.933	12.175	9.150	11.242	45.500
Boys	13.517	14.017	12.567	15.083	55.184
I first	13.267	7.333	5.400	5.667	26.667
NI first	13.767	20.700	19.733	24.500	78.700
Girls	12.350	10.333	5.733	7.400	35.816
I first	12.033	1.500	2.667	1.867	18.067
NI first	12.667	19.167	8.800	12.933	53.567
Non-Interaction	16.175	18.983	18.908	27.283	81.349
Boys	6.167	10.400	11.033	23.467	51.067
I first	10.333	18.967	20.333	38.100	87.733
NI first	2.000	1.833	1.733	8.833	14.399
Girls	26.183	27.567	26.783	31.100	111.633
I first	25.033	30.333	27.333	35.300	117.999
NI first	27.333	24.800	26.233	26.900	105.266
Overall Mean	14.554	15.579	14.029	19.262	63.424

TABLE 44

Means for Total Frequency Proximity

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	5.083	4.367	4.283	3.400	17.133
Boys	5.533	5.100	4.767	3.833	19.233
I first	5.600	4.333	6.133	3.733	19.799
NI first	5.467	5.867	3.400	3.933	18.667
Girls	4.633	3.633	3.800	2.967	15.033
I first	4.200	4.067	2.667	3.933	14.867
NI first	5.067	3.200	4.933	2.000	15.200
Non-Interaction	1.917	1.517	1.967	2.033	7.434
Boys	1.600	1.500	1.600	1.933	6.633
I first	2.000	2.267	2.533	2.600	9.400
NI first	1.200	0.733	0.667	1.267	3.867
Girls	2.233	1.533	2.333	2.133	8.232
I first	2.733	1.867	2.733	2.467	9.800
NI first	1.733	1.200	1.933	1.800	6.666
Overall Mean	3.500	2.942	3.125	2.717	12.284

TABLE 45

Means for Total Duration Proximity

	<u>Interval 1</u>	<u>Interval 2</u>	<u>Interval 3</u>	<u>Interval 4</u>	<u>Total</u>
Interaction	92.525	78.108	94.100	76.400	341.133
Boys	97.733	77.150	86.517	68.733	330.133
I first	88.533	75.733	80.300	49.900	294.466
NI first	106.933	78.567	92.733	87.567	365.800
Girls	87.317	79.067	101.683	84.067	352.134
I first	73.500	77.000	103.200	93.667	347.367
NI first	101.133	81.133	100.167	74.467	266.900
Non-Interaction	38.842	32.000	35.208	47.067	153.117
Boys	21.633	20.067	21.833	38.617	102.150
I first	19.667	31.800	35.400	55.733	142.600
NI first	23.600	8.333	8.267	21.500	61.700
Girls	56.050	43.933	48.583	55.517	204.083
I first	60.267	47.267	49.200	71.033	227.767
NI first	51.833	40.600	47.967	40.000	180.400
Overall Mean	65.583	55.054	64.654	61.733	247.024

TABLE 46

Analysis of Variance for Baby Frequency Touching

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	0.833	0.109	
Order (O)	1	1.875	0.245	
S x O	1	2.408	0.315	
Error	56	7.649		
Treatment (T)	1	49.408	8.022	.010
S x T	1	42.008	6.820	.025
O x T	1	73.633	11.955	.002
S x O x T	1	28.033	4.551	.050
Error	56	6.159		
Intervals (I)	3	11.706	3.582	.025
S x I	3	3.217	0.984	
O x I	3	0.381	0.116	
S x O x I	3	4.681	1.432	
Error	168	3.268		
T x I	3	3.803	1.142	
S x T x I	3	4.014	1.205	
O x T x I	3	0.517	0.155	
S x O x T x I	3	2.194	0.659	
Error	168	3.330		

TABLE 47

Analysis of Variance for Baby Duration Touching

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	4940.824	3.159	
Order (O)	1	36.851	0.024	
S x O	1	533.407	0.341	
Error	56	1564.155		
Treatment (T)	1	15652.180	11.224	.002
S x T	1	10397.387	7.456	.010
O x T	1	6847.844	4.910	.050
S x O x T	1	1122.407	0.805	
Error	56	1394.580		
Intervals (I)	3	611.401	1.074	
S x I	3	220.312	0.387	
O x I	3	59.270	0.104	
S x O x I	3	22.726	0.040	
Error	168	569.141		
T x I	3	183.150	0.295	
S x T x I	3	122.201	0.197	
O x T x I	3	946.287	1.522	
S x O x T x I	3	56.434	0.091	
Error	168	621.880		

TABLE 48

Analysis of Variance for Baby Frequency Vocalization

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	899.280	2.025	
Order (O)	1	1283.810	2.891	
S x O	1	125.052	0.282	
Error	56	443.995		
Treatment (T)	1	7800.449	38.753	.001
S x T	1	30.503	0.152	
O x T	1	383.418	1.905	
S x O x T	1	52.668	0.262	
Error	56	201.287		
Intervals (I)	3	216.525	2.786	.050
S x I	3	151.058	1.944	
O x I	3	92.957	1.196	
S x O x I	3	19.730	0.254	
Error	168	77.709		
T x I	3	29.302	0.293	
S x T x I	3	53.591	0.535	
O x T x I	3	93.118	0.930	
S x O x T x I	3	1.824	0.018	
Error	168	100.106		

TABLE 49

Analysis of Variance for Baby Duration Vocalization

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	1471.743	4.833	.050
Order (O)	1	366.622	1.204	
S x O	1	588.526	1.933	
Error	56	304.490		
Treatment (T)	1	6813.879	35.449	.001
S x T	1	78.004	0.406	
O x T	1	407.928	2.122	
S x O x T	1	1.463	0.008	
Error	56	192.215		
Intervals (I)	3	205.716	3.529	.025
S x I	3	94.941	1.504	
O x I	3	50.641	0.802	
S x O x I	3	41.927	0.664	
Error	168	63.116		
T x I	3	62.461	0.825	
S x T x I	3	23.100	0.305	
O x T x I	3	67.978	0.898	
S x O x T x I	3	7.864	0.104	
Error	168	75.674		

TABLE 50

Analysis of Variance for Baby Frequency Looking

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	149.633	3.065	
Order (O)	1	75.208	1.541	
S x O	1	97.200	1.991	
Error	56	48.815		
Treatment (T)	1	202.799	9.467	.005
S x T	1	0.008	0.000	
O x T	1	5.633	0.268	
S x O x T	1	126.075	5.997	.025
Error	56	21.022		
Intervals (I)	3	7.669	0.745	
S x I	3	6.206	0.603	
O x I	3	3.114	0.302	
S x O x I	3	14.550	1.413	
Error	168	10.295		
T x I	3	1.117	0.097	
S x T x I	3	9.658	0.839	
O x T x I	3	10.572	0.918	
S x O x T x I	3	1.881	0.163	
Error	168	11.515		

TABLE 51
Analysis of Variance for Baby Duration Looking

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	331.668	0.831	
Order (O)	1	1.302	0.003	
S x O	1	9.075	0.023	
Error	56	399.113		
Treatment (T)	1	188.752	1.126	
S x T	1	52.008	0.310	
O x T	1	421.873	2.516	
S x O x T	1	321.767	1.919	
Error	56	167.652		
Intervals (I)	3	96.473	0.930	
S x I	3	24.937	0.240	
O x I	3	17.762	0.171	
S x O x I	3	102.409	0.987	
Error	168	103.785		
T x I	3	26.489	0.245	
S x T x I	3	125.826	1.163	
O x T x I	3	44.312	0.409	
S x O x T x I	3	34.859	0.322	
Error	168	108.227		

TABLE 52

Analysis of Variance for Baby Frequency Proximity

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	0.833	0.053	
Order (O)	1	14.008	0.897	
S x O	1	21.675	1.388	
Error	56	15.611		
Treatment (T)	1	7.008	0.620	
S x T	1	18.408	1.628	
O x T	1	43.200	3.820	
S x O x T	1	4.800	0.424	
Error	56	11.310		
Intervals (I)	3	1.939	0.453	
S x I	3	1.850	0.433	
O x I	3	0.892	0.209	
S x O x I	3	6.981	1.633	
Error	168	4.275		
T x I	3	4.814	1.039	
S x T x I	3	4.147	0.895	
O x T x I	3	0.761	0.164	
S x O x T x I	3	8.628	0.138	
Error	168	4.632		

TABLE 53

Analysis of Variance for Baby Duration Proximity

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	20599.738	3.248	
Order (O)	1	119.499	0.019	
S x O	1	822.938	0.130	
Error	56	6342.961		
Treatment (T)	1	12828.836	2.544	
S x T	1	23625.117	4.685	.050
O x T	1	27383.840	5.431	.025
S x O x T	1	0.713	0.000	
Error	56	5042.207		
Intervals (I)	3	2320.521	1.147	
S x I	3	1273.683	0.629	
O x I	3	2194.831	1.084	
S x O x I	3	3865.469	1.910	
Error	168	2023.938		
T x I	3	3046.014	1.676	
S x T x I	3	866.750	0.477	
O x T x I	3	2475.818	1.362	
S x O x T x I	3	1949.341	1.073	
Error	168	1817.276		

TABLE 54

Analysis of Variance for Mother Frequency Touching

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	8.008	0.393	
Order (O)	1	0.833	0.041	
S x O	1	31.008	1.521	
Error	56	20.393		
Treatment (T)	1	73.633	6.555	.025
S x T	1	11.408	1.016	
O x T	1	97.200	8.653	.005
S x O x T	1	12.675	1.128	
Error	56	11.234		
Intervals (I)	3	2.706	0.406	
S x I	3	3.358	0.504	
O x I	3	4.083	0.613	
S x O x I	3	5.025	0.754	
Error	168	6.661		
T x I	3	46.705	4.635	.005
S x T x I	3	0.425	0.042	
O x T x I	3	12.206	1.211	
S x O x T x I	3	9.758	0.968	
Error	168	10.076		

TABLE 55

Analysis of Variance for Mother Duration Touching

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	192.533	1.182	
Order (O)	1	13.333	0.082	
S x O	1	110.208	0.677	
Error	56	162.883		
Treatment (T)	1	725.207	7.414	.010
S x T	1	56.033	0.573	
O x T	1	1068.032	10.919	.002
S x O x T	1	252.300	2.579	
Error	56	97.817		
Intervals (I)	3	4.518	0.081	
S x I	3	73.754	1.320	
O x I	3	41.662	0.746	
S x O x I	3	21.951	0.393	
Error	168	55.855		
T x I	3	278.351	3.448	.025
S x T x I	3	9.007	0.112	
O x T x I	3	73.348	0.909	
S x O x T x I	3	70.512	0.873	
Error	168	80.735		

TABLE 56

Analysis of Variance for Mother Frequency Vocalization

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	2726.537	5.595	.025
Order (O)	1	26.133	0.054	
S x O	1	0.833	0.002	
Error	56	487.343		
Treatment (T)	1	86349.500	249.385	.001
S x T	1	1050.211	3.033	
O x T	1	525.008	1.516	
S x O x T	1	37.408	0.108	
Error	56	346.250		
Intervals (I)	3	126.188	2.647	.050
S x I	3	20.467	0.429	
O x I	3	99.755	2.092	
S x O x I	3	3.478	0.073	
Error	168	47.673		
T x I	3	314.697	7.138	.001
S x T x I	3	49.053	1.113	
O x T x I	3	51.608	1.171	
S x O x T x I	3	21.786	0.494	
Error	168	44.085		

TABLE 57

Analysis of Variance for Duration Mother Vocalization

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	2861.640	6.169	.025
Order (O)	1	62.353	0.134	
S x O	1	23.409	0.050	
Error	56	463.838		
Treatment (T)	1	80083.125	216.600	.001
S x T	1	960.500	2.598	
O x T	1	124.034	0.335	
S x O x T	1	2.269	0.006	
Error	56	369.729		
Intervals (I)	3	62.808	1.207	.050
S x I	3	1.103	0.021	
O x I	3	41.157	0.791	
S x O x I	3	1.567	0.030	
Error	168	52.025		
T x I	3	147.275	2.928	
S x T x I	3	6.697	0.133	.050
O x T x I	3	15.514	0.308	
S x O x T x I	3	19.369	0.385	
Error	168	50.304		

TABLE 58

Analysis of Variance for Mother Frequency Looking

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	54.001	0.162	
Order (O)	1	85.852	0.257	
S x O	1	3.852	0.012	
Error	56	334.353		
Treatment (T)	1	2310.007	18.472	.001
S x T	1	531.302	4.248	.050
O x T	1	2925.458	23.393	.001
S x O x T	1	239.417	1.914	
Error	56	125.057		
Intervals (I)	3	117.619	2.320	
S x I	3	54.719	1.079	
O x I	3	60.457	1.193	
S x O x I	3	22.180	0.437	
Error	168	50.698		
T x I	3	13.880	0.289	
S x T x I	3	43.107	0.899	
O x T x I	3	72.830	1.518	
S x O x T x I	3	50.324	1.049	
Error	168	47.962		

TABLE 59

Analysis of Variance for Mother Duration Looking

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	1443.867	0.306	
Order (O)	1	7242.277	1.534	
S x O	1	588.534	0.125	
Error	56	4721.480		
Treatment (T)	1	162343.188	82.895	.001
S x T	1	9814.883	5.012	.050
O x T	1	86390.000	44.112	.001
S x O x T	1	8665.703	4.425	.050
Error	56	1958.431		
Intervals (I)	3	827.477	0.967	
S x I	3	55.735	0.065	
O x I	3	24.046	0.028	
S x O x I	3	1002.645	1.171	
Error	168	855.961		
T x I	3	268.917	0.407	
S x T x I	3	1328.368	2.009	
O x T x I	3	1267.661	1.917	
S x O x T x I	3	1735.338	2.624	
Error	168	661.277		

TABLE 60

Analysis of Variance for Mother Frequency Proximity

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	20.008	1.863	
Order (O)	1	7.500	0.698	
S x O	1	4.033	0.376	
Error	56	10.737		
Treatment (T)	1	572.032	52.712	.001
S x T	1	13.333	1.229	
O x T	1	1.408	0.130	
S x O x T	1	8.008	0.738	
Error	56	10.852		
Intervals (I)	3	11.592	2.734	.050
S x I	3	0.492	0.116	
O x I	3	4.239	1.000	
S x O x I	3	7.406	1.747	
Error	168	4.240		
T x I	3	11.906	2.662	.050
S x T x I	3	2.372	0.530	
O x T x I	3	4.325	0.967	
S x O x T x I	3	3.781	0.845	
Error	168	4.472		

TABLE 61

Analysis of Variance for Mother Duration Proximity

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	685.215	0.188	
Order (O)	1	1882.189	0.516	
S x O	1	2307.830	0.633	
Error	56	3644.266		
Treatment (T)	1	161314.625	50.262	.001
S x T	1	1958.185	0.610	
O x T	1	497.150	0.155	
S x O x T	1	4371.148	1.362	
Error	56	3209.502		
Intervals (I)	3	2316.282	3.588	.025
S x I	3	2172.697	3.366	.025
O x I	3	937.041	1.452	
S x O x I	3	856.788	1.327	
Error	168	645.553		
T x I	3	2178.475	2.918	.050
S x T x I	3	2941.645	3.941	.010
O x T x I	3	585.483	0.784	
S x O x T x I	3	1317.990	1.766	
Error	168	746.505		

TABLE 62

Analysis of Variance for Total Frequency Touching

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	3.675	0.103	
Order (O)	1	0.208	0.006	
S x O	1	50.700	1.427	
Error	56	35.520		
Treatment (T)	1	2.408	0.113	
S x T	1	97.200	4.568	.050
O x T	1	340.033	15.979	.001
S x O x T	1	78.408	3.685	
Error	56	21.280		
Intervals (I)	3	24.822	2.091	
S x I	3	12.719	1.072	
O x I	3	6.897	0.581	
S x O x I	3	9.000	0.758	
Error	168	11.869		
T x I	3	73.208	4.533	.005
S x T x I	3	6.233	0.386	
O x T x I	3	8.600	0.533	
S x O x T x I	3	18.297	1.133	
Error	168	16.150		

TABLE 63

Analysis of Variance for Total Duration Touching

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	3182.692	1.426	
Order (O)	1	5.852	0.003	
S x O	1	1128.530	0.506	
Error	56	2231.378		
Treatment (T)	1	9639.152	5.640	.025
S x T	1	11979.993	7.010	.010
O x T	1	13324.629	7.796	.010
S x O x T	1	2439.002	1.427	
Error	56	1709.083		
Intervals (I)	3	668.517	0.919	
S x I	3	480.678	0.661	
O x I	3	94.873	0.130	
S x O x I	3	15.592	0.021	
Error	168	727.515		
T x I	3	881.163	1.016	
S x T x I	3	76.822	0.089	
O x T x I	3	1254.484	1.446	
S x O x T x I	3	214.432	0.247	
Error	168	867.504		

TABLE 64

Analysis of Variance for Total Frequency Proximity

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	12.675	0.697	
Order (O)	1	42.008	2.311	
S x O	1	7.008	0.385	
Error	56	18.181		
Treatment (T)	1	705.674	35.202	.001
S x T	1	63.075	3.146	
O x T	1	29.008	1.447	
S x O x T	1	0.408	0.020	
Error	56	20.046		
Intervals (I)	3	13.169	1.798	
S x I	3	2.336	0.319	
O x I	3	3.025	0.413	
S x O x I	3	23.881	3.260	.025
Error	168	7.324		
T x I	3	18.625	2.381	
S x T x I	3	0.547	0.070	
O x T x I	3	2.547	0.326	
S x O x T x I	3	22.003	2.813	.050
Error	168	7.822		

TABLE 65

Analysis of Variance for Total Duration Proximity

<u>SOURCE</u>	<u>DF</u>	<u>MEAN SQUARE</u>	<u>F-TEST</u>	<u>P</u>
Sex (S)	1	28798.953	4.291	.050
Order (O)	1	1053.175	0.157	
S x O	1	374.538	0.056	
Error	56	6711.520		
Treatment (T)	1	265126.563	50.344	.001
S x T	1	11980.047	2.275	
O x T	1	20501.543	3.893	.050
S x O x T	1	4260.199	0.809	
Error	56	5266.281		
Intervals (I)	3	2749.430	1.385	
S x I	3	492.267	0.248	
O x I	3	2656.245	1.338	
S x O x I	3	1954.148	0.984	
Error	168	1985.509		
T x I	3	4989.844	2.575	
S x T x I	3	2577.805	1.330	
O x T x I	3	895.893	0.462	
S x O x T x I	3	2346.178	1.211	
Error	168	1938.027		

REFERENCES

- Ainsworth, M.D. Patterns of attachment behavior shown by the infant in interaction with his mother. Merrill-Palmer Quarterly, 1964, 10, 51-58.
- Ainsworth, M.D. The development of infant-mother attachment. In B.M. Caldwell & H.N. Ricciuti (Eds.), Review of child development research, Volume III. Chicago: University of Chicago Press, 1973.
- Ainsworth, M.D. & Bell, S.M. Attachment, exploration, and separation: Illustrated by the behavior of one-year-olds in a strange situation. Child Development, 1970, 41, 49-67.
- Ainsworth, M.D., Bell, S.M., & Stayton, D.J. Individual differences in strange-situation behavior of one-year-olds. In H.R. Schaffer (Ed.), The origins of human social relations. London: Academic Press, 1971. Pp. 17-57.
- Ainsworth, M.D. & Wittig, B.A. Attachment and exploratory behavior of one-year-olds in a strange situation. In B.M. Foss (Ed.), Determinants of infant behavior IV. London: Methuen, 1969. Pp. 111-136.
- Ban, P.L. & Lewis, M. Mothers and fathers, girls and boys: Attachment behavior in the one-year-old. Merrill-Palmer Quarterly, 1974, 20, 195-204.
- Barnett-Goldfarb, M.S. & Whitehurst, G.J. Infant vocalizations as a function of parental voice selection. Developmental Psychology, 1973, 8, 273-276.
- Baumrind, D. An exploratory study of socialization effects on black children: Some black-white comparisons. Child Development, 1972, 43, 261-267.
- Beckwith, L. Relationships between infants' social behavior and their mothers' behavior. Child Development, 1972, 43, 397-411.
- Bowlby, J. Attachment and loss, Volume I, Attachment. New York: Basic Books, 1969.
- Brazelton, T.B., Tronick, E., Adamson, L., Als, H., & Wise, S. Early mother-infant reciprocity. In M.A. Hofer (Ed.), Parent-infant interaction. Amsterdam: Elsevier, 1975.

- Brody, G. Relationship between maternal attitudes and behavior. Journal of Personality and Social Psychology, 1965, 2, 317-323.
- Bronson, W.C. Development in behavior with age-mates during the second year of life. In M. Lewis & L. Rosenblum (Eds.), Friendship and peer relations. New York: Wiley, 1975. Pp. 131-152.
- Brooks, J. & Lewis, M. Attachment behavior in thirteen-month-old, opposite-sex twins. Child Development, 1974(a), 45, 243-247.
- Brooks, J. & Lewis, M. The effect of time on attachment as measured in a free-play situation. Child Development, 1974(b), 45, 243-247.
- Charlesworth, W.R. & Kreutzer, M.A. Facial expressions of infants and children. In P. Ekman (Ed.), Darwin and facial expression. New York: Academic Press, 1973.
- Clarke-Stewart, K.A. Interactions between mothers and their young children: Characteristics and consequences. Monographs of the Society for Research in Child Development, 1973, 38, (Serial No. 153).
- Coates, B., Anderson, E., & Hartup, W. The stability of attachment behaviors in the human infant. Developmental Psychology, 1972(a), 6, 231-247.
- Coates, B., Anderson, E., & Hartup, W. Interrelations in the attachment behavior of human infants. Developmental Psychology, 1972(b), 6, 218-231.
- Cohler, B., Weiss, J., & Grunebaum, H. Child-care attitudes and emotional disturbance among mothers of young children. Genetic Psychology Monographs, 1970, 82, 3-47.
- Corter, C.M. A comparison of the mother's and a stranger's control over the behavior of infants. Child Development, 1973, 44, 705-713.
- Corter, C.M., Rheingold, H., & Eckerman, C. Toys delay the infant's following of his mother. Developmental Psychology, 1972, 6, 138-145.
- Feldman, S. & Ingham, M. Attachment behavior: A validation study in two age groups. Child Development, 1975, 46, 319-330.
- Goldberg, S. & Lewis, M. Play behavior in the year-old infant: Early sex differences. Child Development, 1969, 40, 21-31.

- Guilford, J.P. Psychometric Methods. New York: McGraw-Hill, 1954.
- Jacobs, B.S. & Moss, H.A. Birth order and sex of sibling as determinants of mother-infant interaction. Child Development, 1976, 47, 315-322.
- Judd, E. The effects of birth order and spacing on mother-infant relationships. Paper presented at the 1976 meeting of the Eastern Psychological Association, New York.
- Lewin, K. A dynamic theory of personality. New York: McGraw-Hill, 1935.
- Lewis, M. State as an infant-environment interaction: An analysis of mother-infant behavior as a function of sex. Merrill-Palmer Quarterly, 1972, 18, 95-121.
- Lewis, M. & Ban, P. Stability of attachment behavior: A transformational analysis. Paper presented at the 1971 meeting of the Society for Research in Child Development, Minneapolis.
- Lewis, M. & Ban, P. Variance and invariance in the mother-infant interaction: A cross-cultural study. Paper presented at the Burg Wartenstein Symposium No. 57, Cultural and Social Influences in Infancy and Childhood, Burg Wartenstein, Austria, June 1973.
- Lewis, M., Weinraub, M., & Ban, P. Mothers and fathers, girls and boys: Attachment behavior in the first two years of life. Paper presented at the 1973 meeting of the Society for Research in Child Development, Philadelphia.
- Luchins, A. & Luchins, E. Rigidity of behavior. Eugene, Oregon: University of Oregon Books, 1959.
- Maccoby, E.E. & Feldman, S.S. Mother-attachment and stranger-reactions in the third year of life. Monographs of the Society for Research in Child Development, 1972, 37.
- Maccoby, E.E. & Jacklin, C.N. Stress, activity, and proximity seeking: Sex differences in the year-old child. Child Development, 1973, 44, 34-42.
- Messer, S.B. & Lewis, M. Social class and sex differences in the attachment and play behavior of the one-year-old infant. Merrill-Palmer Quarterly, 1972, 18, 295-306.
- Moss, H.A. Sex, age, and state as determinants of mother-infant interaction. Merrill-Palmer Quarterly, 1967, 13, 19-35.

- Osofsky, J. Neonatal characteristics and mother-infant interaction in two observational situations. Child Development, 1976, 47, 1138-1147.
- Osofsky, J. & Danzger, B. Relationships between neonatal characteristics and mother-infant interaction. Developmental Psychology, 1974, 10, 124-130.
- Papanek, M.L. Authority and sex roles in the family. Journal of Marriage and the Family, 1969, 31, 88-96.
- Parke, R.D. On the myth of the field-lab distinction. Newsletter of the Society for Research in Child Development, Winter, 1976.
- Rheingold, H. & Eckerman, C. The infant separates himself from his mother. Science, 1970, 168, 78-83.
- Ross, H.S., Rheingold, H., & Eckerman, C. Approach and exploration of a novel alternative by 12-month-old infants. Journal of Experimental Child Psychology, 1972, 13, 85-93.
- Schaffer, H.R. & Emerson, P.E. The development of social attachments in infancy. Monographs of the Society for Research in Child Development, 1964, 29.
- Stern, D.N. Mother and infant at play: The dyadic interaction involving facial, vocal and gaze behaviors. In M. Lewis & L. Rosenblum (Eds.), The effect of the infant on its caregiver. New York: Wiley, 1974. Pp. 187-214.
- Thoman, E. How a rejecting baby affects mother-infant synchrony. In Parent-infant interaction. New York: Associated Scientific Publishers, 1975.
- Thoman, E., Leiderman, P., & Olson, J. Neonate-mother interaction during breast feeding. Developmental Psychology, 1972, 6, 110-118.
- Tulkin, S.R. & Cohler, B.J. Childrearing attitudes and mother-child interaction in the first year of life. Merrill-Palmer Quarterly, 1973, 19, 95-106.
- Tulkin, S.R. & Kagan, J. Mother-child interaction in the first year of life. Child Development, 1972, 43, 31-41.
- Webster, R. Suppression of infants' vocal responses by classes of phonemic stimulation. Developmental Psychology, 1969, 1, 410-414.
- Weinraub, M. & Lewis, M. Dependency and separation. Monographs of the Society for Research in Child Development, in press.

- Yarrow, M., Campbell, J., & Burton, R. Recollections of childhood: A study of the retrospective method. Monographs of the Society for Research in Child Development, 1970, 35.
- Young, G. & Lewis, M. Friends and strangers: Peer relations in infancy. Paper presented at the Human Ethology Session, Animal Behavior Society Meeting. Wilmington, North Carolina, 1975.
- Zunich, M. Relationship between maternal behavior and attitudes toward children. The Journal of Genetic Psychology, 1962, 100, 155-165.