EFFECTS OF A PROCEDURAL VARIATION ON MATERNAL BEHAVIOR IN A STANDARDIZED MOTHER-CHILD INTERACTION SITUATION

A Dissertation

Presented to

the Faculty of the Department of Psychology

University of Houston

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

By

Alfred J. Kahn

December, 1975

ACKNOWLEDGEMENTS

Recognition and gratitude are due to the many individuals whose help has been essential in the conception and execution of this research. Dr. Jeanne Deschner was primarily responsible for the development of the interaction procedures and the original approach to coding the observed behavior. Dr. Hazel Leler, Eliana Freire, and Rosa Davila contributed to the development of the set of ratings used in this study. Other members of the Parent-Child Development Center staff whose ideas and suggestions were helpful include Dr. Larry Brandt, Dr. Martha Frede, and Rebecca Pena Hines. Gilberto Rico ably administered the interaction procedure. Rosa Davila was responsible for the excellent supervision and training of the raters. Evangeline Vigil spent many laborious hours rating the videotapes used in this study. Committee members Dr. Sander Martin, Dr. Ida Stewart, and Dr. John Vincent, through their questions and comments, helped improve the clarity of the rationale, design, and interpretation of the research. To all of the above colleagues, teachers, and friends I am grateful.

I am especially indebted to my chairman and advisor, Dr. Dale Johnson, whose support, encouragement, suggestions, and patience have been of immeasurable help in the completion of this study.

This work was conducted under the support of Office of Economic Opportunity Grant N. CG 6901.

EFFECTS OF A PROCEDURAL VARIATION ON MATERNAL BEHAVIOR IN A STANDARDIZED MOTHER-CHILD INTERACTION SITUATION

An Abstract of a Dissertation

Presented to

the Faculty of the Department of Psychology

University of Houston

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

By

Alfred J. Kahn

December, 1975

ABSTRACT

Observational study of parent-child interaction is a developing area of methodology. Observational methods are becoming more elaborated and have enjoyed increasing use in research on socialization. Potential methodological artifacts, however, represent a threat to the interpretation of observational data, and likely artifactual factors must be eliminated or accounted for in future research. The present study was an experimental examination of one such potential factor, duration of the observation period in a set of structured mother-child interaction tasks.

It was hypothesized that increase in task duration would result in decreases in the level of interest, enjoyment, and verbalization of the child, decreases in the interest and involvement, positive affect, and the use of positive teaching techniques by the mother, and increases in the use of negative teaching techniques by the mother. It was further hypothesized that these effects would be of greater magnitude for non-program families than for families who had participated in a parent education program.

Subjects were 37 low income, Mexican-American, three-year-old children and their mothers. Seventeen families had been participants in an experimental two-year parent education program, the Houston Parent-Child Development Center. Twenty families were control group families from the same

research project. Families had been randomly assigned to groups at the inception of the program.

Three tasks were used, each with its own materials and instructions to the mother. The Book task used a large picture book, with instructions to help the child learn from the book. The Shape Sorter task used a shape-sorting box and blocks, with instructions to teach the child how to insert the blocks into the holes in the box. The Free Play task used a cabinet full of various toys, with instructions simply to do whatever they wanted with the toys.

Subjects were randomly assigned to either a Short or Long Task Duration condition. The Book, Shape Sorter, and Free Play tasks took five, five, and ten minutes, respectively, in the Short condition, and 10, 10, and 20 minutes, respectively, in the Long condition. The order of the tasks was randomly counterbalanced, with the two structured tasks preceding or succeeding the unstructured Free Play task. Sex of child was also randomly balanced across conditions.

Tasks were divided into 100 second segments. Each segment was rated on thirteen scales: Mother's Affectionateness, Mother's Use of Praise, Mother's Use of Reasoning, Mother's Encouragement of Child's Verbalization, Mother's Interest and Involvement in the Session, Level of Mother-Child Interaction, Mother's Use of Criticism, Mother's Control of Child's Behavior, Child's Verbal Communication, Child's Interest and Involvement in the Session, and Child's Enjoyment of the Situation, Typical, High, and Low Points.

Each scale was analyzed separately. Each task was divided into three equal time intervals. Mean ratings across segments were calculated for each interval of each task. These mean ratings for individual subjects were analyzed in a four way analysis of variance (Duration X Group X Interval X Task).

Support for the hypotheses was minimal. The hypothesized effect of task duration was found for mother's interest and involvement, level of mother-child interaction, mother's use of praise, and child's verbalization, all of which decreased across time more in the long condition than in the short condition. The hypothesized difference between program and control groups in the effect of task duration was found only for mother's use of criticism. Although not hypothesized, strong effects due to task were found. Differences among tasks were present for all rated behaviors, either as a main effect due to task alone or as an interaction between task and interval within task.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

TABLE PAGE

LIST OF FIGURES

FIGURE PAGE

CHAPTER I

STATEMENT OF THE PROBLEM AND REVIEW OF THE LITERATURE

Over the last two decades two trends have been evident in the study of socialization. One of these is the increasing inclusion of cognitive abilities in the domain of child characteristics subject to influences of socialization. This trend has moved from consideration of the relationship of gross social variables (race, social class) with cognitive skills to detailed examination of the effects of specific childrearing practices on a wide array of cognitive variables.

The second trend is toward increased use of observational data in the study of socialization. Questionnaire and interview methods have been supplemented or replaced by direct observation of the interaction between parents and children in both natural and laboratory settings.

The observational study of parent-child interaction and its effect on children's cognitive development has thus become an active area of both basic and applied research. Basic research has sought to discover the relationships that exist between parent behavior and child behavior in natural settings (e.g., White, Kaban, Marmor, and Shapiro, 1972) and in laboratory settings (e.g., Hess and Shipman, 1965). Applied research has sought to alter parent behavior as a means of optimizing child cognitive development. These attempts at parent education have been guided in large part

by results of the basic studies (e.g., Johnson, Leler, Rios, Brandt, Kahn, Mazeika, Frede, and Bisett, 1974). Such programs have focused directly on intervention into the socialization practices of parents of infants and toddlers. Mother-child interaction patterns in standardized situations are being used for evaluation of program success, as well as for nonevaluative research. For instance, individual mother behavior in standardized situations is videotaped and used for instructional purposes and for documentation of behavior changes. The data are also used to compare experimental and control groups as a test of program effectiveness.

The existence of methodological artifacts poses a threat to the validity of conclusions that can be drawn from observational data for both basic and applied questions. To the extent that situational effects are unknown or unaccounted for, the results of any study of socialization or program assessment will be that much less conclusive. Because so much more needs to be known about the effects of situational variables on interaction behavior, systematic study of these variables is essential.

This study examined one such situational variable--the duration of the interaction session. Two sorts of processes are related to interaction duration. The first is the process of adaptation. As both mother and child become more familiar with and feel more comfortable in a new situation, and become less aware of being observed, their behavior may

become less artificial. Thus initial behavior may not be typical or representative of behavior in more natural situations, while later behavior in the same session is much more representative. The second process is due to fatigue or boredom, of the mother or of the child. As fatigue or boredom increase over time, the interaction situation becomes less pleasant and may be more frustrating and even noxious. If such a process occurs, the behavior of mother and child can be expected to change during the session. The effect of both sorts of processes was hypothesized to be in the direction of fewer positive and more negative behaviors by both mother and child as the session gets longer. Therefore the length of the interaction session was varied in order to study the effect of session duration on mother-child interaction behavior in a standardized situation.

A related question of importance to program evaluation is the possible differential response of different groups in variations of a standardized situation. Group differences might appear in one situation but not in another. For instance, mothers who have been in a program designed to help them cope with their children's fatigue and boredom may be better able to handle difficult situations in the interaction session than mothers who have not been in the program. If these conditions arise only in longer sessions, then the difference between groups may not be detected during shorter sessions. Therefore the interaction between task duration

and treatment group in a parent education program was also examined.

Assumptions

Human behavior is a function of characteristics of the person and the situation in which he is. For many situations the relationship between the person and the immediate environment is interactive and dynamic, each responding to and influencing the other. This is especially true of social, interpersonal behavior. The study of parent-child interaction is of interest for two reasons. First, relationships between parents and children are common and of interest as an important subset of social interactions in general. The personal, social, and situational variables that are used to describe or predict interaction must account for intra-family interaction; and data from intra-family interaction may be a fruitful source of hypotheses regarding the more general case. Second, the study of early interaction is relevant for understanding later behavior of the person. Personal characteristics, as functional elements determining behavior in particular situations, have histories: they develop through a lifetime of continuous interaction between the organism and its environment. That developmental processes affect human behavior is a basic assumption, shared by widely disparate psychological theories. Special interest in early experience, during the first few years of life, is suggested by the rapid physical, intellectual, and social changes observed to take

place during childhood, and by theories of personality or cognition that emphasize early childhood experience (e.g., Erikson, 1950; Piaget, 1963). Parent-child interaction is assumed to be a major element in the socialization process, and has justifiably become the subject of a large body of research. Methodology, theory and empirical findings are in the process of development; continued refinement and elaboration of all these aspects of this area of research are necessary.

Methodological Issues

Two basic sorts of data have been used in the study of early socialization--self-report and direct observation. These will be described in turn.

Self-report methods, such as interviews and questionnaires, have been the basis for much of the research in this area. These methods vary along several dimensions--source, timing, content, and format.

Source of Data. The person from whom data is obtained may be the parent, the child, or some other family member. The subject is asked to report his perception of some aspect of family functioning. The most common informants seem to have been mothers, who are asked about their childrearing practices with their own children. But children, especially older children, are sometimes used as a source of information about the practices of their parents. Occasionally, mothers

or fathers are asked to report the behavior of their spouse in relation to their own children.

Timing of Data. Self-report data may be either current or retrospective. The informant may be asked about present practices, beliefs, or expectations, or may be asked to report on such data as it is remembered from some previous time, often a period of years. Both sorts of data have been used.

Content of Data. The content of self-report data varies widely, according to the concerns of each investigation. Many studies ask the informant for descriptive behavioral data, such as the mother's daily routine with her child or her usual response to a particular child behavior. Other studies explore the attitudes, beliefs, or values of parents and children, or ask the informant for a self-characterization of some sort. Reports of behavioral content are sometimes also used as a basis for inference about attitudes or characteristics of the informant.

Format of Data. The major dimension here is open vs. closed categories of response, with a range from the unstructured interview to the multiple choice questionnaire. Depending on the content to be elicited and the degree of psychological inference desired, investigators have placed varying restrictions on the informant's freedom of response.

Self-report data suffer from problems of reliability and validity. Yarrow (1963) has been quite critical of interview

methods, especially interviews of the mother. She enumerated the possible sources of selectivity and distortion of mother's reports on herself and her child, and cites evidence for the existence of such bias in interview data. She also challenges the reliability of retrospective data, again citing evidence. Yarrow concluded that research is needed which

> (a) will deal with the actual behavior of mother and child (or better, of parents and child); (b) will search for a broader substantive base of childrearing variables by considering additional variables; (c) will concern itself with the genotypic similarities and differences in parental behavior; (d) will deal with interactions; and (e) will be designed to permit more defensible causative inferences (p. 222).

Yarrow goes on to suggest that these goals may be better reached through observational methods than through extensions of the self-report techniques. In the ten years since Yarrow's article, observational techniques have in fact been used more frequently, decreasing somewhat the previous reliance on self-report. Such observational methods are not without methodological problems of their own.

Wright (1960) described six observational methods, as follows.

Diary Description. Actually a form of self-report, the diary description is the daily record of events as recorded by a participant-informant. The informant is likely to be the investigator himself, but this condition is not necessary. The written recording of events soon after they happen

justifies the classification of this method as observational, though the possible bias of self-report techniques remains. The special value of this method is that it provides relatively intensive data over a long time span.

Specimen Description. The specimen description is a comprehensive narration of events by an external observer for a continuous period ranging from a few minutes to a day or more (given sufficient resources, there is no necessary upper limit to the duration of observation). Most narratives are in "everyday" language, though more or less inference on the part of the observer may be appropriate to a particular study. Like diary description, specimen description is "open"--no preconceived limits are placed on the material to be observed. In practice, any human observer will impose some selectivity on his record. Generation of specimen record data is sometimes achieved mechanically through the use of audio or video recordings, or through a combination of mechanical and human recording techniques.

Time Sampling. This technique samples a relatively small part of the total behavior stream by observing short segments at regular intervals. Time sampling is usually, though not necessarily, "closed"--preselected behavior categories only are observed. Time sampling samples the behavior stream of an individual in a way that is not usually related to the natural timing of behavior. Thus it is a technique perhaps more suited to gathering data about prevalence of

behavior categories out of behavioral context for a number of subjects in an efficient manner.

Event Sampling. Event sampling is selective in the behavior to be observed. Though the observer's presence is continuous, recording of only certain categories of behavior is required, placed in behavioral context. Thus, event sampling is closed in its preselection of behavior categories. For both event sampling and time sampling, raw data may be in the form of narrative description or on-the-spot codes. If the nature of the data desired is well-specified, use of on-the-spot coding of relevant sampled material offers considerable gain in efficiency over specimen description.

Trait Rating. This technique is also closed in that the behavioral dimensions of interest are prespecified, but the range of behavior that the observer may use to make his rating is open. The rating represents the quantified judgment of the observer about characteristics of individuals and their interactions, and places the burden of inference or generalization on the observer rather than on a quantitative analysis of less inferential data.

Field Unit Analysis. Field unit analysis is an attempt to combine the advantages of specimen description and event sampling. The technique consists of structuring the observation of an extended continuous sequence of behavior into a relatively large number of behavioral categories. Selectivity and the efficiency of on-the-spot coding is attained in the

context of recording the behavior stream with regard for its complexity. The analytic scheme that one might apply to a specimen record is used in the coding of ongoing behavior and interaction. In studies with well-defined objectives, the economic gain is well worth the data loss.

Wright (1960) offers extensive discussion of each of these observational methods. Though he restricts his review to observation of behavior in natural settings, these same methods are applicable to observation in situations manipulated by the investigator. Methodological issues in the use of observational techniques were thoroughly reviewed by Lytton (1971). His discussion is summarized here following his conceptual scheme.

Control of Behavior and Stimuli. The degree of control imposed on the situation in which behavior is to be observed can range from none to a highly structured laboratory task. The advantage of the free situation at home or in the community is that such a setting is most "real," while the structured setting provides a desirable degree of standardization. Lytton felt that the laboratory situation is more appropriate to task-oriented behavior of child and adult, and less appropriate for study of the development of personality variables. A common compromise is the standardized setting in which the activities of the participants are left unspecified. It seems impossible to achieve maximum ecological validity and control over confounding variables at the same time.

Recording Behavior. Lytton covered essentially the same procedures as Wright (1960), reviewed above.

Conceptualization of Summary Variables. This is an inductive problem of interpretation or inference from the raw data, or the deductive operationalization of general psychological processes. In either case, it is a theoretical problem as well as technical, and depends on the hypotheses of interest to the investigator.

Range and Type of Behavior Sampled. Lytton found that unstructured situations have been used most to study simple behavior and caretaking of infants. Studies of preschoolers in the home have focused on social interchange, while in the laboratory there have been more studies of structured and free play interactions. For older children, naturalistic observation has been rare, but structured tasks have been used both in the laboratory and in the home. Lytton noted that privacy and subject restraint place limits on the range of natural behavior that can be observed.

Reliability of Data. Lytton distinguished between the reliability of the behavior being sampled and the reliability of the recorded data. Lytton and Wright both cited satisfactory levels of reliability for all methods of collecting data. However, reported stability of behavior has varied from low to high in different studies, leading to Lytton's suggestion of collecting large amounts of data whenever possible.

Validity of Data. Validity, according to Lytton, is

"the degree to which the data are representative of normal parent-child interaction." Observational data are in some ways susceptible to the same sort of bias as self-report data, due to the desire of the subject to look good. There has been, however, no means of collecting criterion normal data of assured validity, and Lytton felt that socialization theory and research have not advanced to the point that satisfactory construct validity can currently be achieved. Thus validity remains a continuing problem. Lytton suggested that methodological improvement of both observational and self-report data can be achieved, and that the convergence of complementary data from the two methods may strengthen conclusions to be drawn from either alone.

Acceptability to Parents of Observation in the Home. Lytton's last point was that despite a number of home observations accomplished, there are special difficulties in this area of research. He warned against both overt noncooperation and covert resistance to invasion of family privacy.

Empirical Studies of Interaction

The interaction variables that have been related to cognitive development fall into three general categories. The first of these is the emotional relationship between parent and child, both the general warmth of the parent and the responsiveness of the parent to the state or activity of the child. The second category is the disciplinary strategy of the parents, including distribution of power in the family,

restrictiveness of rules for the child, and parental response to child misbehavior. The third category is the quality of cognitive communication between parent and child. Each of these categories will be discussed separately. However, there are a number of cases where combinations of two or three categories are related to the child's development in an interactive way, so complete separation cannot be achieved. All findings reported are based primarily on observational data.

Emotional Relationship. It is the general pattern in these studies that positive relationships between parent and child, described variously as warmth, nurturance, responsiveness, or love, contribute positively to degree or rate of cognitive growth in young children.

The youngest children in these studies were the twelve-week-olds of Lewis and Goldberg (1969). Mothers who displayed greater stimulation behavior (touching, smiling, etc.) and greater responsiveness to their children's cries and vocalizations had babies who showed greater response decrement in an experimental stimulation situation assumed to be related to later intelligence.

Rubenstein (1967) observed mothers and five-month-old infants at home for one to three hours. Exploratory behavior of the infants at age six-and-one-half months in a structured task was positively related to maternal attentiveness in the home observation.

Leler (1971) observed a structured interaction of two- and three-year-old children and mothers, and obtained a language sample and Peabody Picture Vocabulary Test on the children. Peabody scores were positively related to maternal affectionateness, acceptance, and praise. Mean length of utterance was positively related to acceptance and praise.

Radin (1971, 1972) studied both fathers and mothers (in different samples) with their four-year-olds, and found that child IQ was positively related to maternal warmth (including reinforcement, consultation with the child, and sensitivity to the child) and to paternal nurturance. Interactions were observed in the home. In both samples, observation occurred during an interview with the parent with the child present.

Wiegerink and Weikart (1967) had parents teach a block-sorting task to their four-year-olds. The children who were more successful on the task had mothers who used more positive motivation and less negative reinforcement. Mothers of unsuccessful children showed the opposite pattern.

Baldwin, Kalhorn, and Breese (1945) used ratings of family interaction obtained longitudinally, as well as longitudinal test data on the children. Increase in IQ was positively related to parental warmth in the home.

Baumrind (1967) selected competent and other three- and four-year-old nursery school children and observed mother-child interaction at home and in a structured situation in the laboratory. Child competence was related to maternal

loving and understanding only in combination with firmness and a high degree of maturity demand. Baumrind calls this parental pattern "authoritative," as opposed to "permissive" parents who are loving but not firm and demanding.

Loewenstein (1971) observed six hours of interaction in the home. She grouped mothers on dimensions of involvement, kindness, intellectual stimulation, and control. No simple relationships with child IQ emerged, but mothers grouped low on all four dimensions tended to have children with low IQ and poor adjustment.

The only negative finding in this group is reported by Crandall, Preston, and Rabson (1960), who observed children in nursery school and at home and rated mother-child interaction at home. Child achievement behavior was not related to general affection of the mother, but was related to reward for achievement efforts.

Disciplinary Practices. These variables have usually been concerned with aspects of control exerted by parents over children's activities; the dimensions of such behavior have been labeled authoritarian-democratic, dependence-independence, and permissive-restrictive, among others. Freeberg and Payne (1967) reviewed the research in this area (mostly self-report data) and found no clear relationships between parent disciplinary practices and child cognitive development. They found considerable variability in the definitions of parental variables in the studies they covered;

a similar situation exists in the observational studies.

Baldwin, Kalhorn, and Breese (1945), in the longitudinal study cited above, found increase in child IQ was found in families whose interactions were classified as democratic and democratic-indulgent. In both homes the child had a voice in family affairs, but in the democratic home the child's independence was fostered while the child was protectively babied in the democratic-indulgent home. Though the relationship with IQ was the same for the two groups of families, the children from the democratic group were also superior on variables of originality, planfulness, patience, curiosity, and fancifulness, characteristics not found in the democratic-indulgent group children.

Baumrind (1967), as reported above, found a relationship between child competence and parental characteristics in mother-child interaction of control and demand when accompanied by warmth. Parents who were demanding and controlling but not warm and nurturant were labeled by Baumrind as authoritarian, as opposed to the authoritative parents of competent children. Children in authoritarian families tended to be dysphoric or alienated, and not as cognitively mature as children in the authoritative group.

Leler (1971) found Peabody and language scores to be positively related to maternal rewarding of independence. Language scores were negatively related to restriction of independence. Radin (1972) found four-year-old boys' IQ to

be negatively related to paternal restrictiveness. Hess and Shipman (1968) found higher child performance on intellectual and cognitive tasks positively related to maternal control techniques based on cognitive-rational or personal-subjective consequences of actions. Lower child performance was related to maternal control techniques based on norms for behavior associated with role, or status in the family.

It seems clear that emotional relationships and disciplinary practices have interactive effects on cognitive development. Also important is the distinction between high parental demand and parental restriction. As Baumrind's work has shown, these are separate dimensions and affect children differentially.

Communication. The quality of communication in parent-child interaction has recently been added to emotional and disciplinary variables as investigators have begun to look at cognitive stimulation more closely. The work of Hess and Shipman (1968) in this area is of great importance. They observed mothers' teaching behavior in a standard structured situation. Mothers were asked to teach their four-year-old children two block-sorting tasks and to copy a design with the mother on an Etch-A-Sketch toy. They included 163 mother-child pairs for observation and detailed analyses of verbal behavior and teaching style. Cognitive development of the child was positively related to greater verbal output and use of an elaborated language style by the mother, and to a

maternal teaching style characterized by a high level of specific verbalization, giving orientation to tasks, and reinforcing correct responses.

Wiegerink and Weikart (1967), using the same sorting task, found less success in children whose mothers used more specific information, contrary to the finding of Hess and Shipman. However, specific information is not defined identically in the two studies. Wiegerink and Weikart included nonverbal pointing, while Hess and Shipman excluded this behavior and found nonverbal teaching style related to poorer child performance.

Deschner (1972), observing two-year-olds and their mothers in a structured teaching situation, found that more specific cues from the mother facilitated child competence behaviors better than vague cues.

A few other studies have observed teaching and verbal interaction in mothers and young children but do not present data on the relationship of the interaction variables to cognitive variables in the children; these studies are concerned with comparison of groups rather than direct effects on children.

In these few studies examining communication variables, there seems to be some consistency. Explicit communication of cognitive information is positively related to cognitive development. Further elaboration is required to find what relationships exist between the communication dimension of

parental behavior and the dimensions of emotional relationship and discipline.

Empirical Studies of the Effect of Time on Mother-Child Interaction

Two types of empirical studies have examined time effects in interaction situations. The first type consists essentially of reliability assessment, with no concern for total duration or systematic changes across time within a session. A typical study is that of Hatfield, Ferguson, and Alpert (1967). Mothers and their four- to five-year-old children were observed for two separate half-hour sessions. Data consisted of ratings on several dozen rating scales, based on three-minute periods. Consistency of behavior was assessed both by the split half method within each session separately and by the intersession correlation based on total session scores. Reliability of behavior was high for most scales on each method. The split half method provides information about the reliability or variability of behavior among time periods, but unfortunately does not assess consistency or change across a sequence of time periods, since order is ignored in the calculations. Thus, although data bearing on duration effects are present in studies such as Hatfield et al., the method of analysis does not take advantage of it.

There are, however, two studies of the second type, in which changes in behavior during the interaction session were examined explicitly. The first of these was an investigation

by Smith (1958) in which she compared the data yielded by interview and observation methods. As a part of this study, Smith examined changes in mother behavior during the observation session. The subjects were mothers and their three- to four-year-old children. The 45 minute long interaction session took place in a playroom furnished with toys and both adult and play furniture. No specific instructions were given to the mother. After the first 30 minutes, the mother was given a lengthy form to fill out and this task seems to have occupied the mothers most of the last 15 minutes. Mother measures were counts of 11 behaviors theoretically related to child dependence-independence. The interaction session was divided into three 15 minute periods, and the mean frequency of each mother behavior was compared across the three periods. Since Smith changed the task considerably during the third period, changes from the first to the second period are of the most relevance to the present study. Significant changes were found for only two mother measures. There were decreases in the categories "give reward" and "structurize" (structurizing was a rather non-directive teaching technique). Smith speculates that these changes were "possibly as a result of the child's increasing ease in the situation or of the mother's decreasing feeling of any need to stimulate the child to new and better activities (p. 280)." However, no explanation is given for the lack of change in such mother behaviors as "teach" or "give positive directions."

A second study of time effects was done by Brooks and Lewis (1973b) as part of a series of studies on infant attachment (Brooks and Lewis, 1973a; Lewis, Weinraub, and Ban, 1972). One-year-old infants and their mothers were observed during a fifteen minute play period in a playroom with toys. Mothers were instructed not to initiate interaction, but were allowed to respond to the infant. Four infant behaviors were measured: 1) touching the mother; 2) looking at the mother; 3) vocalizing directed toward the mother; and 4) maintaining proximity to the mother. The session was divided into five three-minute periods, and mean number of seconds spent in each behavior were compared across intervals. Brooks and Lewis found significant increases across time for touching, maintaining proximity, and vocalizing, but not for looking.

These two studies provide sufficient evidence for time artifacts in interaction data to suggest continued investigation of this problem. Both mother and child behaviors across many ages and situations may be susceptible to such effects. The present study is a further exploration into the effects of session duration on interaction behavior.

Hypotheses

I. As session duration increases, there are decreases in:

Mother's Affectionateness

Mother's Use of Praise

Mother's Use of Reasoning

Mother's Encouragement of Child's Verbalization

Mother's Interest and Involvement in Session

Level of Mother-Child Interaction

Child's Verbal Communication

Child's Interest and Involvement in Session

Child's Enjoyment of the Situation

As session duration increases, there are increases in:

Mother's Use of Criticism

Mother's Control of Child's Behavior

II. The effects of duration as hypothesized in Hypothesis I are greater for the control group than for the educational program group.

CHAPTER II

METHOD

Experimental Design

The study was designed as an experiment with three crossed independent variables. The first was Duration of Interaction Session, with two conditions, Short and Long duration. The second was Educational Treatment Group, with two levels, Parent Education Program, and No Program. The third independent variable was Task, with three levels, Book task, Shape Sorter task, and Free Play task. Subjects were randomly assigned to one of the two Duration conditions and to one of the two Educational Groups. All subjects were administered all tasks. Thus, subjects were tested in the four Duration-Educational Group cells and crossed with task.

Two other variables were controlled by counterbalancing, the order of tasks and sex of child.

Thirteen dependent variables were used, eight ratings of mother behavior and five ratings of child behavior. Each dependent variable was analyzed separately.

Subjects

Subjects were 37 pairs of mothers and children enrolled in the University of Houston Parent-Child Development Center (PCDC). All participants were low income, Mexican-American families. Seventeen of the families were participants in the

experimental educational program of the PCDC, while the other 20 families were participants in the PCDC comprehensive services program. Both groups were eligible for medical services and referral to social services when needed, but only the experimental group participated in the educational program designed to help mothers develop their child-rearing skills. Full description of the PCDC program and research can be found in Johnson, Leler, Rios, Brandt, Kahn, Mazeika, Frede, and Bisett (1974). At the time of collection of the present data, the families had been PCDC participants for almost two years. These families were part of larger groups who had originally enrolled in the PCDC. Because of a steady attrition of the samples over time, many of the original families were unavailable for this study. Although the original groups had been assigned at random from a common pool, the high attrition rate had an unknown effect on the randomization. Characteristics of families included in this study are presented in Table 1.

At the time of this study, mother and child had already participated in three annual batteries of tests and interviews both at their homes and in the PCDC Center. All had participated the year before in a procedure similar to the one of this study.

Tasks

Each mother-child dyad was administered three tasks by a bilingual research assistant in the mother's preferred

Table 1

Selected Characteristics of Mothers and Children:
Numbers and Percentages or Means and Standard Deviations

Characteristic	Short				Long				Total	
	Experimental		Control		Experimental		Control			
Mothers										
Language Ability										
Bilingual	4	(44%)	9	(82)	4	(50)	7	(78)	24	(65)
Spanish Only	5	(56)	2	(18)	4	(50)	2	(22)	13	(35)
Marital Status										
Married	8	(89%)	9	(82%)	8	(100%)	9	(100%)	34	(92%)
Not Married	1	(11%)	2	(18%)	0	(0%)	0	(0%)	3	(8%)
Age	29.56	(6.65)	32.36	(5.48)	33.00	(8.49)	27.00	(7.28)	30.51	(7.05)
Years of School	7.56	(2.70)	8.82	(2.36)	8.29	(3.40)	7.89	(3.48)	8.17	(2.87)
Number of Children	3.67	(3.81)	4.00	(3.22)	5.12	(3.87)	4.22	(3.49)	4.22	(3.47)
Children										
Age	32.44	(1.67)	35.09	(1.45)	33.38	(1.92)	35.56	(1.74)	34.19	(2.05)
Binet IQ	104.11	(15.24)	100.09	(12.84)	94.88	(10.60)	93.56	(20.49)	98.35	(15.17)

language, English or Spanish. The Book task and the Shape Sorter task were structured teaching tasks; the Free Play task was relatively unstructured.

Book Task. The materials for the Book task were a low table and two small chairs, and The Great Big Car and Truck Book by Richard Scarry (undated). The mother and child were asked to sit next to each other at the table. The book was handed to the mother with the following instructions: "We'd like you to go through this book with your child, and see what he can learn from it. I'll be back in five /ten/ minutes."

Shape Sorter Task. At the end of the time allotted for the Book task, the administrator returned to administer the Shape Sorter task at the same table as the Book task. The material used was the Shape Sorting Box made by Creative Playthings. This toy consists of a small wooden box with a hinged lid. In the lid are five differently shaped holes, through which one can drop the shaped blocks provided. Two blocks of each shape come with the box. The structured teaching task used the box and one block of each shape, with the following instructions: "Please teach your child to put the blocks into the holes. I'll be back in five /ten/ minutes with some more blocks to see if he can do it by himself." After giving the instructions, the administrator left with the book. At the end of the allotted time, he returned with the five remaining blocks and asked the child to put them into the box.

Free Play Task. The Free Play task took place at one end of a long playroom in an area about twelve feet square. The area was furnished with a rug, a bookcase filled with toys, and two rocking chairs, adult and child size. On one wall were a small blackboard and small full length mirror. The following toys were in the bookcase: two toy telephones, a plastic tea set with cups and saucers, a set of colored spools and two shoelaces, a doll with a small bottle, a plastic dump truck, a wooden insert puzzle with three separate inserts, a seven-piece wooden Bambi jigsaw puzzle, a Fischer-Price lacing shoe with differently shaped insertable figures, and a long wooden block with ten graduated cylinders set in holes of graduated depth. The mother and child were led into the room and given the following instructions: "Just make yourselves at home in here; you can do whatever you like. Please don't let your child go past this line (a strip of tape on the floor defining the end of the play area), but he can play with any of the toys. I'll be back in about 10 /20/ minutes." The administrator returned after the allotted time.

Procedure

The order of tasks and the duration of tasks were varied. Two variations of order were used: Free Play first, Structured tasks second; and Structured tasks first, Free Play second. Two variations of task duration were used: Free Play 10 minutes, Book five minutes, and Shape Sorter five minutes, for a total of 20 minutes; and Free Play 20 minutes,

Book 10 minutes, and Shape Sorter 10 minutes, for a total of 40 minutes. These two sets of variations were crossed, yielding a total of four conditions:

a) Free Play first, 20 minutes total time;

b) Free Play first, 40 minutes total time;

c) Structured tasks first, 20 minutes total time;

d) Structured tasks first, 40 minutes total time.

Subject pairs were divided into groups according to sex of child and PCDC group. Within each group subjects were assigned randomly to conditions. Thus a total of four factors were completely crossed: Order of Tasks, Duration of Tasks, Sex of Child, and PCDC Group. Duration of Tasks and PCDC Group were independent variables of primary interest. Order of Tasks and Sex of Child were counterbalanced control variables.

All tasks were videotaped using SONY half-inch videotape equipment. A zoom lens was used to record as closely as possible while keeping both mother and child in the picture. The camera was behind a one way mirror during the Book and Shape Sorter tasks, and behind a curtain during the Free Play task.

The tasks were administered by a research assistant who was unfamiliar with the purpose of the experimental variation and who had had no previous contact with the mother or child. The administrator did, however, sometimes inadvertently learn the subjects' PCDC group.

Mother-child pairs were brought to the Center by PCDC personnel. They were greeted and given the following preliminary explanation.

> You may remember when you were here last year we observed you and your child doing some things together. We're going to do something similar again this time. We'd like to observe you together in several different situations and record your activities on videotape, like we did last time. I'll explain the different things as we go along. We'll start in this room in here.

The mother and child were taken into the room set up for the procedure and the first task was administered, either the Free Play or the Book task. After the completion of the Free Play or the Shape Sorter task (which always immediately followed the Book task), the pair were given a short break while the video equipment was rearranged. The remaining task (or tasks) was then administered. After completion of all tasks the mother and child were invited to view parts of the videotape that had just been made, usually to their great pleasure.

Measures

Each task was divided into 100-second segments, with three, six, and twelve segments for tasks lasting five, ten, and twenty minutes, respectively. Each segment was rated on each of thirteen rating scales, listed in Table 2. The full rating scales are found in Appendix A. Rating was done by one of two judges, who viewed each segment as often as necessary to make the ratings. Descriptions of training of the judges and interrater reliability are found in Appendix B.

Table 2

List of Rating Scales

Mother Ratings
Mother's Affectionateness
Mother's Use of Praise
Mother's Use of Criticism
Mother's Control of Child Behavior
Mother's Use of Reasoning
Mother's Encouragement of Child Verbalization
Mother's Interest and Involvement in the Session
Mother's Interaction with Child
Child Ratings
Child's Verbal Communication
Child's Interest and Involvement in the Session
Child's Enjoyment of the Situation - Typical
Child's Enjoyment of the Situation - High Point
Child's Enjoyment of the Situation - Low Point

CHAPTER III

RESULTS

Each scale was analyzed separately. Each task was divided into three equal time intervals. Mean ratings across segments were calculated for each interval of each task. These mean ratings for individual subjects were analyzed in a four way analysis of variance (Duration X Group X Interval X Task). All factors were treated as fixed. Duration and Group were Between Subject factors. Interval and Task were Within Subject factors. Each scale was analyzed separately. Hypothesis I was tested by the Duration X Interval interaction. Hypothesis II was tested by the Duration X Group X Interval interaction. Alpha was set at .10.

Descriptive results for each scale are presented in both tabular and graphic form, including all significant interactions.

Rating scales relevant to the involvement or mood of mother and child are considered first; then rating scales relevant to cognition and its socialization are considered.

Child's Interest and Involvement in the Session

Results for ratings of the child's interest and involvement are found in Tables 3 and 4 and Figures 1 and 2. Examination of the data reveals little support for the hypotheses. Only in the Book task is a decrease in the child's interest found in the Long Duration condition, and this for the

Table 3

Mean Ratings for
Child's Interest and Involvement in the Session

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	4.00	3.78	3.89	3.89	4.00	3.89	3.67	3.89	3.89	3.85	3.89	3.89
Long	3.94	3.94	3.88	4.00	4.00	3.81	3.88	4.00	4.00	3.94	3.98	3.90
Control												
Short	3.82	3.82	3.64	3.91	3.73	3.45	3.95	3.95	3.95	3.89	3.83	3.68
Long	3.83	3.33	3.28	4.00	3.83	3.72	3.97	3.97	3.97	3.94	3.71	3.66

Table 4

Mean Ratings for
Child's Interest and Involvement in the Session:
Significant Effects

4A. Group		4B. Task		4C. Interval	
Experimental	3.91	Book	3.76	1	3.90
Control	3.71	Shape Sorter	3.84	2	3.85
		Free Play	3.93	3	3.77

4D. Interval X Task

	1	2	3
Book	3.89	3.72	3.66
Shape Sorter	3.95	3.88	3.70
Free Play	3.87	3.95	3.95

4E. Interval X Group

	1	2	3
Experimental	3.89	3.93	3.89
Control	3.91	3.78	3.67

4F. Task X Group

	Book	Shape Sorter	Free Play
Experimental	3.90	3.93	3.88
Control	3.63	3.77	3.96

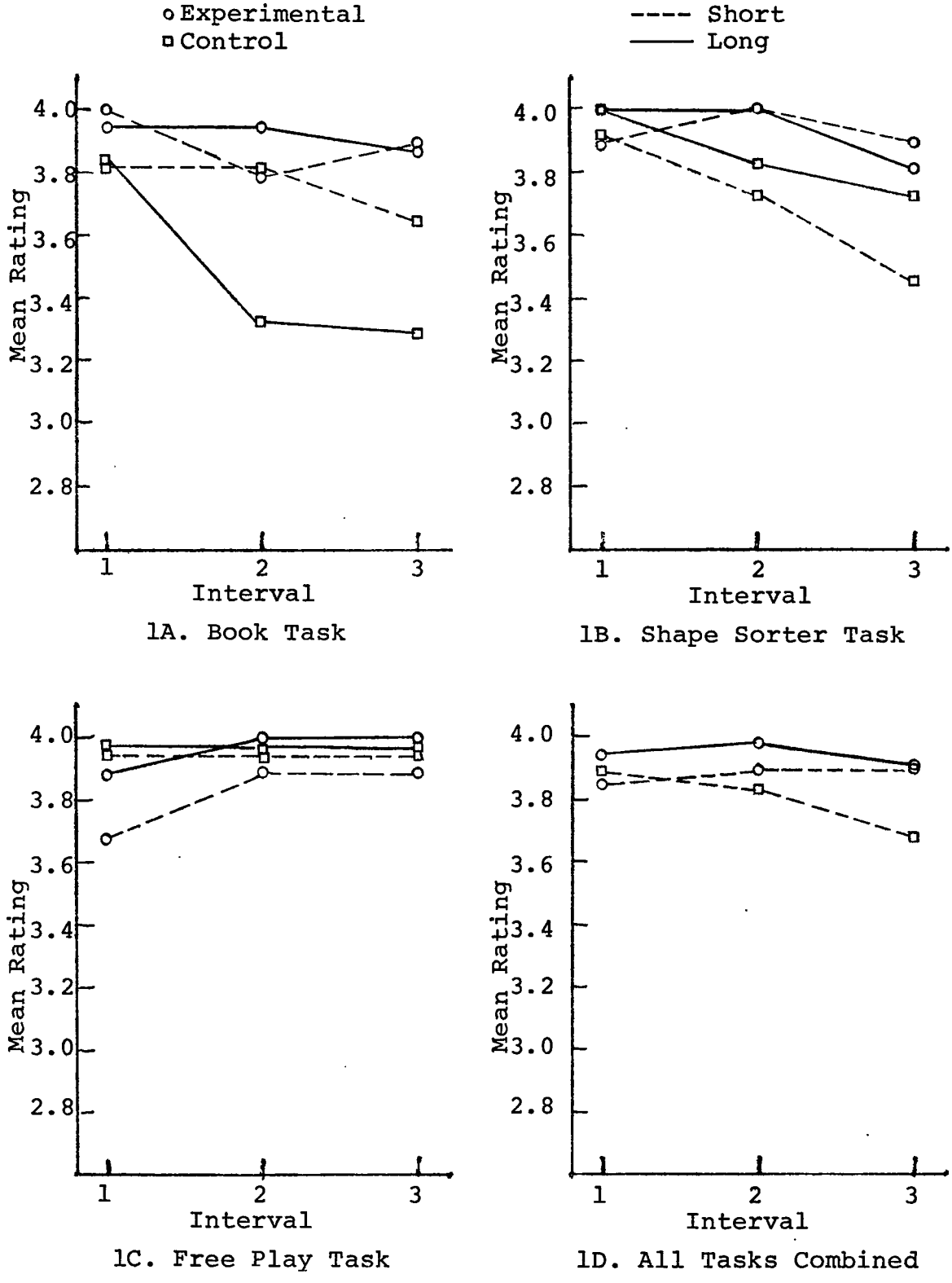


Figure 1

Mean Ratings for
Child's Interest and Involvement in the Session

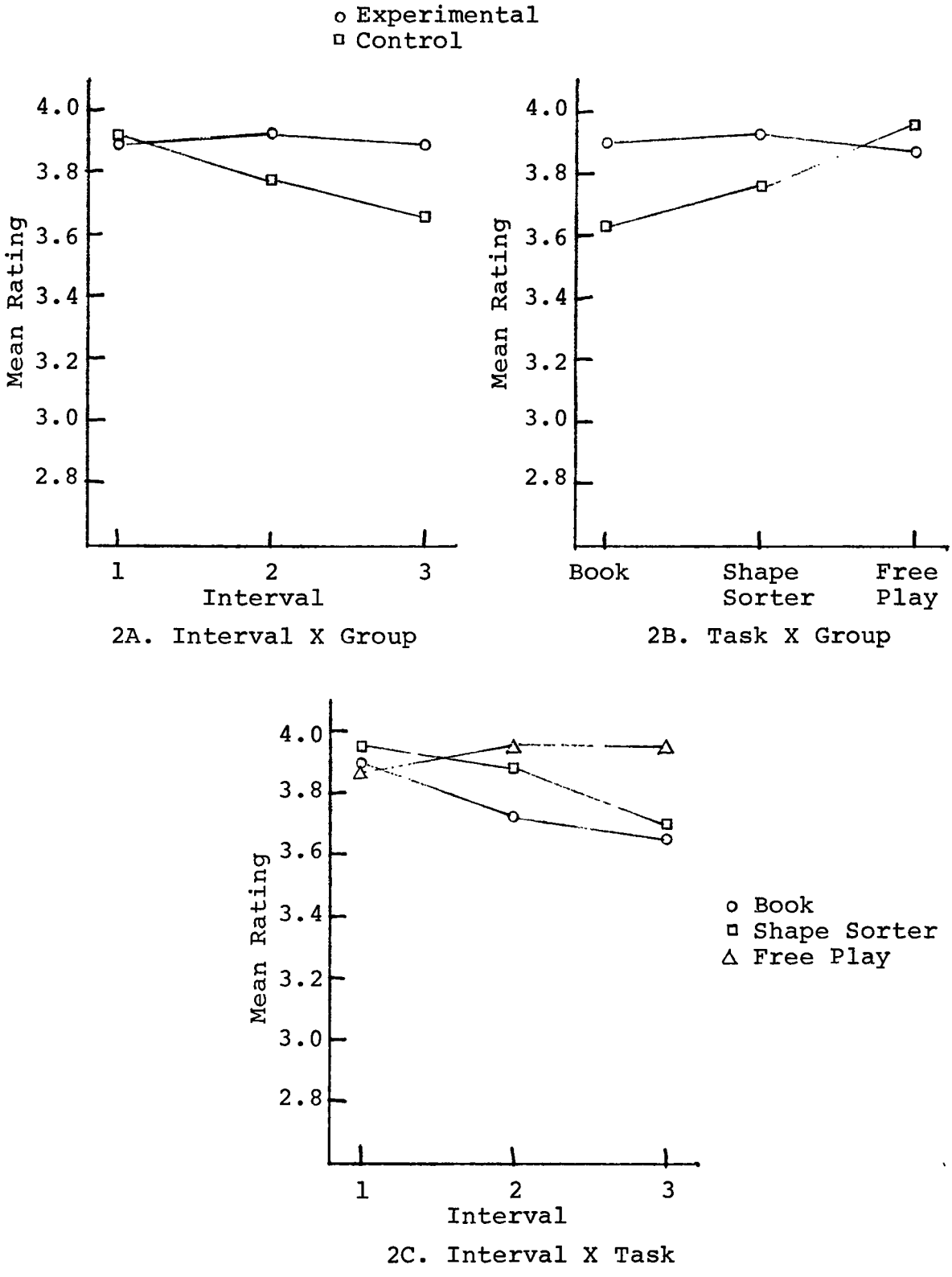


Figure 2

Mean Ratings for
Child's Interest and Involvement in the Session:
Significant Interactions

Control group only. The following significant effects were found in the analysis of variance:

1. Main effect for Group. The experimental group children were more interested and involved than the control group children.

2. Main effect for Task. The children showed the greatest level of interest during the Free Play task, next greatest during the Shape Sorter, and least during the Book.

3. Main effect for Interval. Under all conditions combined, children's level of interest declined across time.

4. Interval X Task interaction. When tasks are examined separately, children's interest and involvement declined during the Book and Shape Sorter, but not during the Free Play.

5. Interval X Group interaction. Interest of the children in the control group declined across time, but not the interest of the children in the experimental group.

6. Task X Group interaction. The interest of the experimental group children was approximately equal across all tasks, while the interest of the control children varied.

Child's Enjoyment of the Situation - Typical

Results for ratings of the child's typical level of enjoyment during the interaction are found in Tables 5 and 6 and Figures 3 and 4. No support for the hypotheses was found. The following significant effects were found in the analysis of variance:

1. Main effect for Interval. Under all conditions

Table 5

Mean Ratings for
Child's Enjoyment of the Situation - Typical

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	3.22	3.00	3.00	3.11	3.00	3.00	3.06	3.11	3.06	3.13	3.04	3.02
Long	3.00	3.00	3.00	3.12	3.12	2.94	3.06	3.00	3.03	3.06	3.04	2.99
Control												
Short	3.09	3.00	3.00	3.18	3.09	3.00	3.00	3.00	3.00	3.09	3.03	3.00
Long	3.22	3.00	3.06	3.17	3.06	3.11	3.00	3.03	3.00	3.13	3.03	3.06

Table 6

Mean Ratings for
Child's Enjoyment of the Situation - Typical:
Significant Effects

6A. Interval

1	3.10
2	3.03
3	3.02

6B. Interval X Task

	1	2	3
Book	3.14	3.00	3.01
Shape Sorter	3.15	3.07	3.01
Free Play	3.03	3.03	3.02

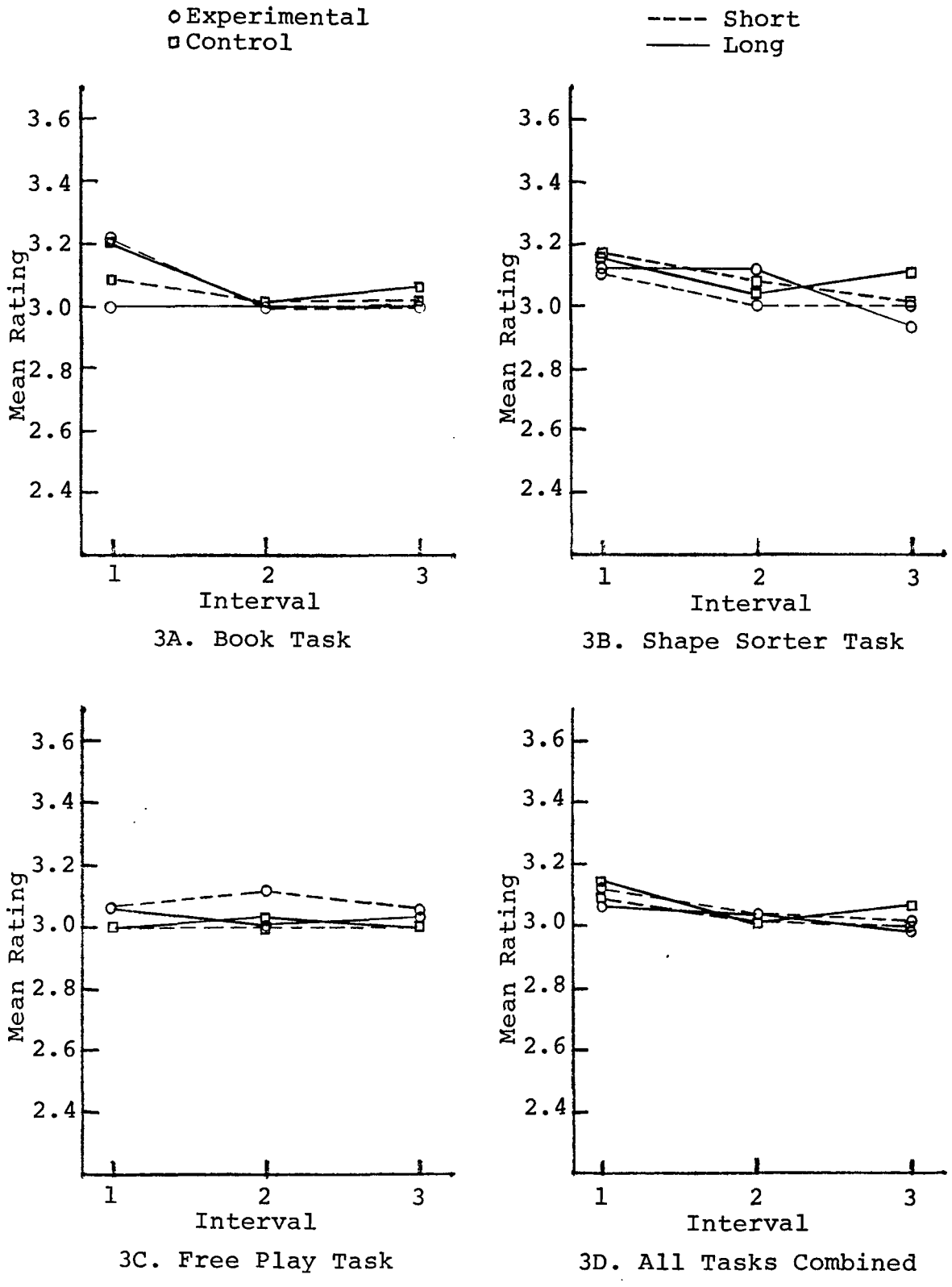


Figure 3

Mean Ratings for
Child's Enjoyment of the Situation - Typical

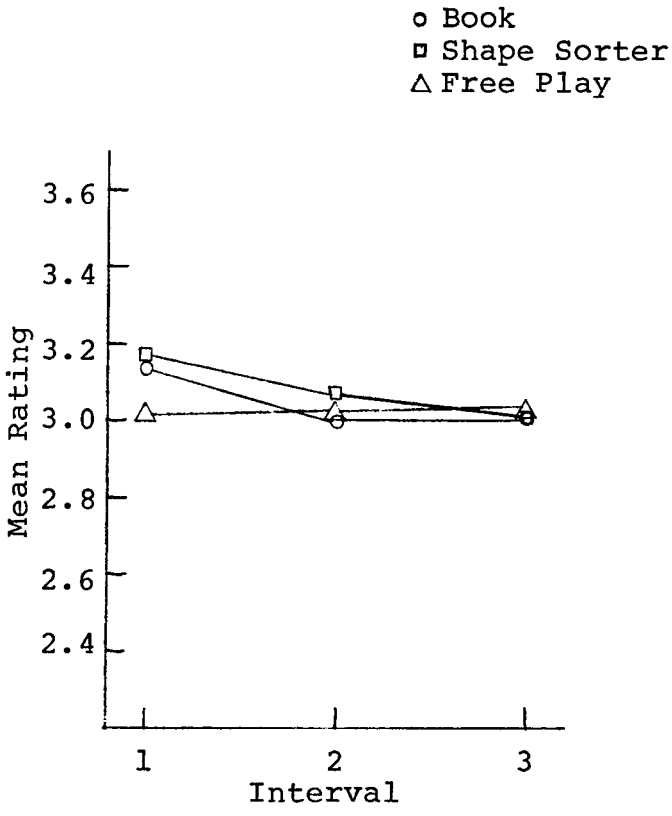


Figure 4

Mean Ratings for
Child's Enjoyment of the Situation - Typical:
Significant Interactions

combined, the second and third intervals were lower than the first.

2. Interval X Task interaction. Children's typical level of enjoyment declined during the Book and Shape Sorter tasks, but remained the same during the Free Play.

3. Interval X Task X Group X Duration interaction. This interaction was due to the greater differences between groups at the first interval of the Book task than at any other interval of any task.

Child's Enjoyment of the Situation - Low Point

Results for ratings of the child's lowest level of enjoyment during the interaction are found in Tables 7 and 8 and Figures 5 and 6. No support for the hypotheses was found. The following significant effects were found in the analysis of variance:

1. Main effect for Group. The low point of enjoyment was lower for the experimental group than for the control group.

2. Main effect for Task. Children's low point of enjoyment was lower in the Shape Sorter task than in the Book or Free Play.

3. Main effect for Interval. Under all conditions combined, children's low point of enjoyment declined across time.

4. Interval X Group X Duration interaction. With tasks combined, the pattern of change across time varied for the four groups (see Figure 6), but not in a way supportive of the hypotheses.

Table 7

Mean Ratings for
Child's Enjoyment of the Situation - Low Point

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	3.00	3.00	3.00	2.67	2.22	2.56	2.72	2.83	2.61	2.80	2.69	2.72
Long	2.88	2.75	2.69	2.69	2.81	2.44	3.00	2.88	2.78	2.85	2.81	2.64
Control												
Short	3.00	2.91	2.91	2.82	2.73	2.64	3.00	3.00	2.91	2.94	2.88	2.82
Long	3.00	3.00	3.00	2.89	2.89	2.94	2.97	2.97	2.97	2.95	2.95	2.97

Table 8

Mean Ratings for
Child's Enjoyment of the Situation - Low Point:
Significant Effects

8A. Group

Experimental	2.75
Control	2.92

8B. Task

Book	2.93
Shape Sorter	2.69
Free Play	2.89

8C. Interval

1	2.89
2	2.84
3	2.79

8D. Interval X Task X Duration

	Book			Shape Sorter			Free Play		
	1	2	3	1	2	3	1	2	3
Short	3.00	2.95	2.95	2.75	2.50	2.60	2.88	2.92	2.78
Long	2.94	2.88	2.85	2.79	2.85	2.71	2.99	2.93	2.88

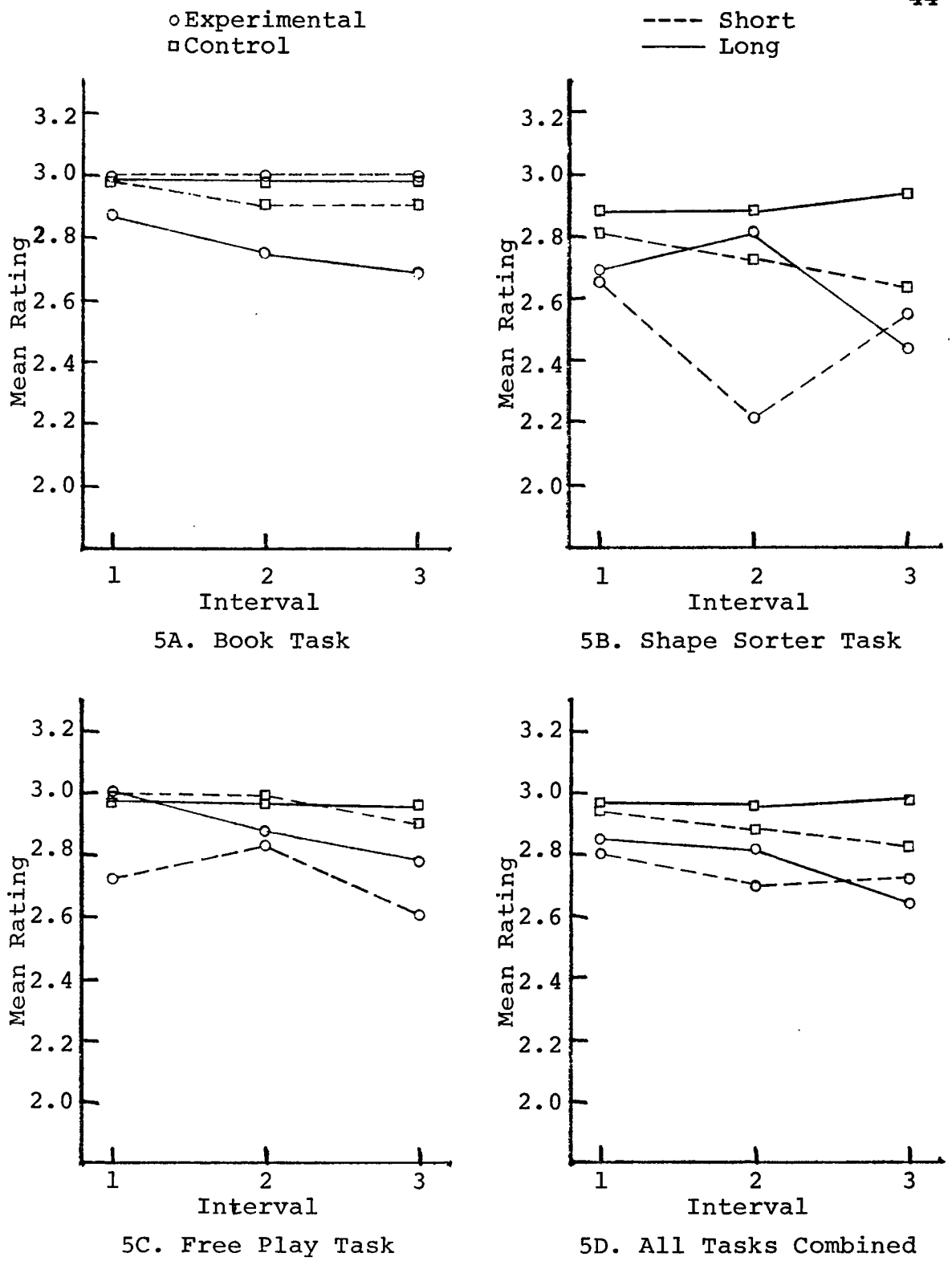
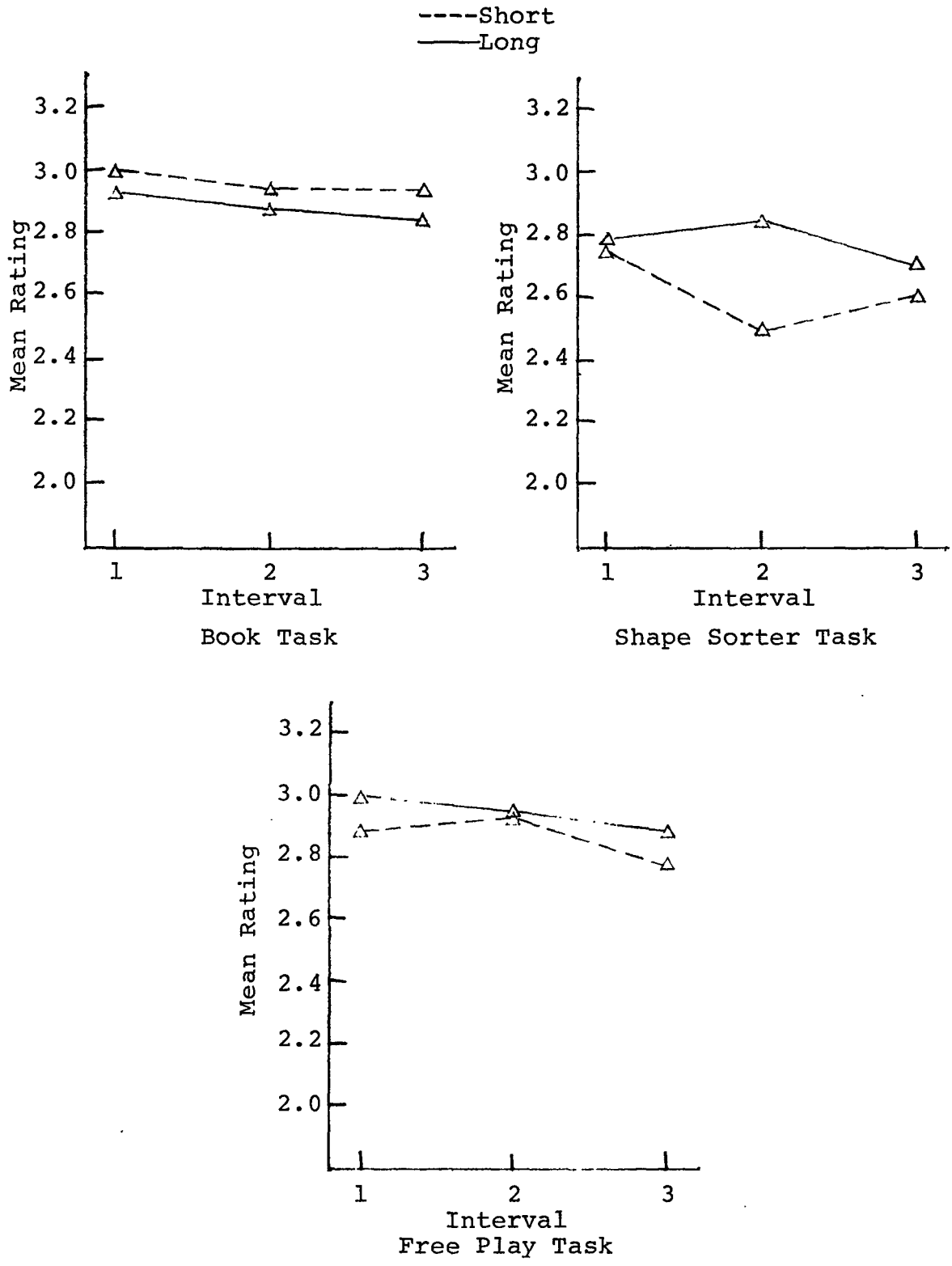


Figure 5

Mean Ratings for
Child's Enjoyment of the Situation - Low Point



Interval X Task X Duration

Figure 6

Mean Ratings for
Child's Enjoyment of the Situation - Low Point:
Significant Interactions

5. Interval X Task X Duration interaction. With groups combined, the change across time was similar for the short and long conditions in the Book and Free Play tasks, but was different in the Shape Sorter.

6. Interval X Task X Group X Duration interaction. This interaction is significant (see Figure 5), but not in a way supportive of the hypotheses.

Child's Enjoyment of the Situation - High Point

Results for ratings of the child's highest level of enjoyment during the interaction are found in Tables 9 and 10 and Figure 7. No support for the hypotheses was found. The following significant effects were found in the analysis of variance:

1. Main effect for Group. The high point of enjoyment was higher for the experimental group than for the control group.

2. Main effect for Task. Children's high point of enjoyment was greatest in the Shape Sorter, and least in the Free Play.

Mother's Interest and Involvement in the Session

Results for ratings of the mother's interest and involvement are found in Tables 11 and 12 and Figures 8 and 9. Some support of Hypothesis I was found. In both the Book and Shape Sorter tasks, there was a decrease in mothers' interest across time in the long duration condition but not in the

Table 9

Mean Ratings for
Child's Enjoyment of the Situation - High Point

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	3.89	4.00	3.78	4.11	4.00	4.11	3.61	3.94	3.89	3.87	3.98	3.93
Long	4.00	4.06	4.06	4.12	4.00	4.19	3.88	3.78	3.75	4.00	3.95	4.00
Control												
Short	3.82	3.45	3.55	3.82	3.82	4.00	3.18	3.23	3.32	3.61	3.50	3.62
Long	3.61	3.56	3.61	3.78	3.83	4.11	3.25	3.39	3.47	3.55	3.59	3.73

Table 10

Mean Ratings for
Child's Enjoyment of the Situation - High Point:
Significant Effects

10A. Group

Experimental	3.95
Control	3.60

10B. Task

Book	3.77
Shape Sorter	3.98
Free Play	3.53

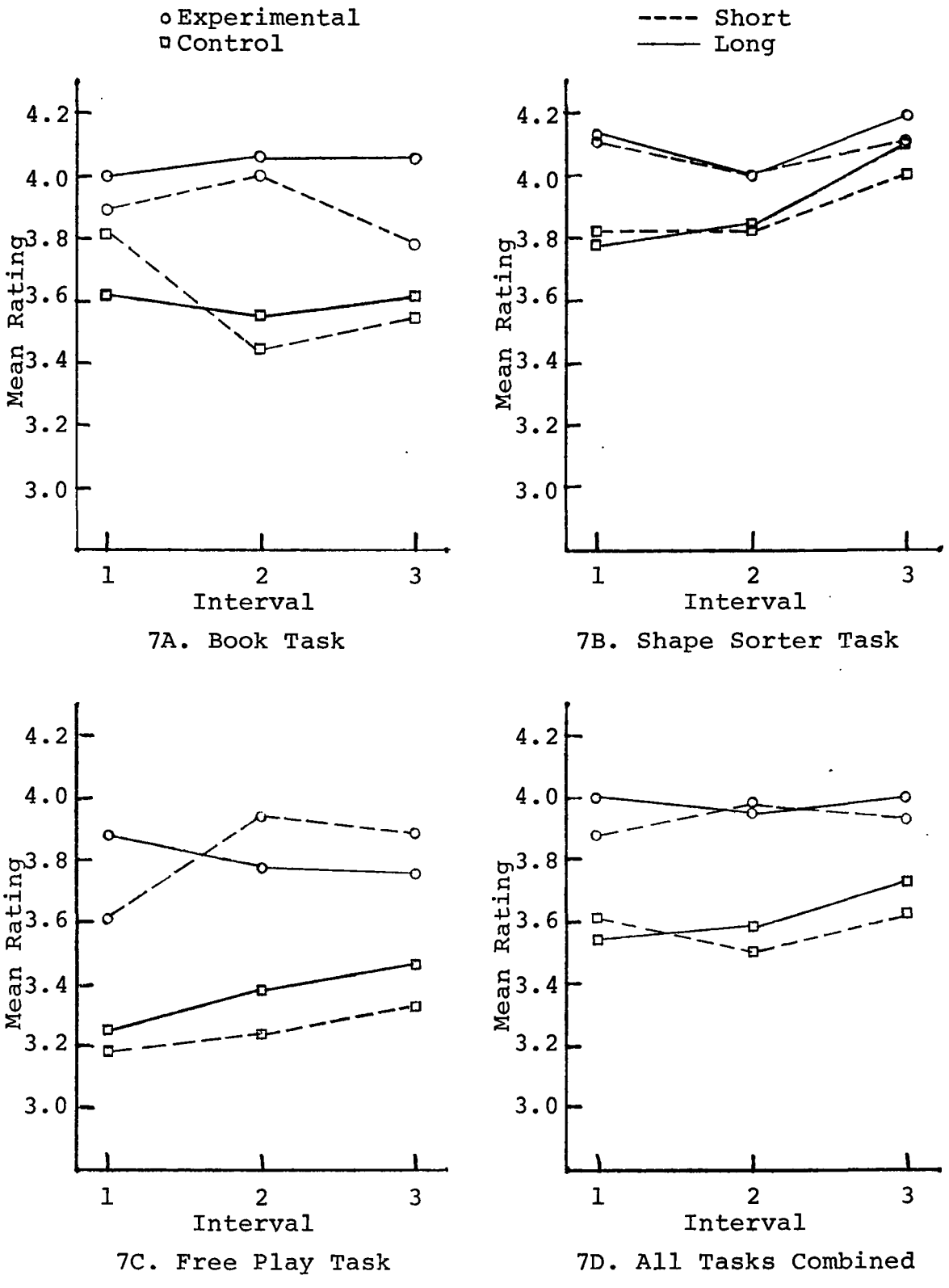


Figure 7

Mean Ratings for
Child's Enjoyment of the Situation - High Point

Table 11

Mean Ratings for
Mother's Interest and Involvement in the Session

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	4.00	3.89	4.00	4.00	4.00	3.89	3.94	3.94	3.94	3.98	3.94	3.94
Long	3.88	3.56	3.19	3.81	3.44	3.25	3.66	3.84	3.62	3.78	3.61	3.35
Control												
Short	4.00	3.73	3.64	3.91	3.91	3.82	3.82	3.82	3.82	3.91	3.82	3.76
Long	3.67	3.50	3.39	3.94	3.67	3.44	3.58	3.61	3.67	3.73	3.59	3.50

Table 12

Mean Ratings for
Mother's Interest and Involvement in the Session:
Significant Effects

12A. Duration

Short	3.89
Long	3.60

12B. Interval

1	3.86
2	3.75
3	3.65

12C. Interval X Task

	1	2	3
Book	3.89	3.68	3.57
Shape Sorter	3.92	3.77	3.62
Free Play	3.76	3.80	3.77

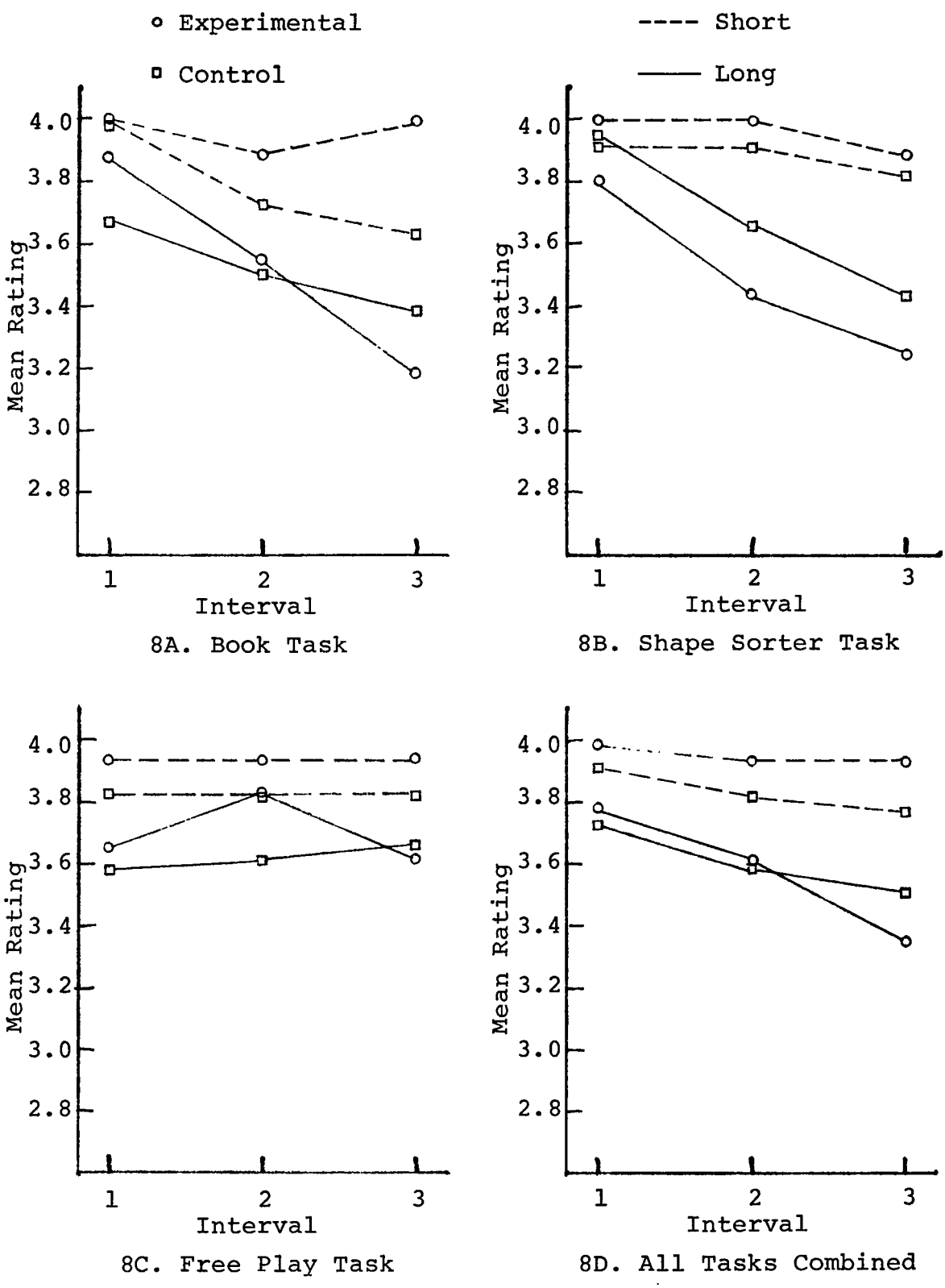


Figure 8

Mean Ratings for
Mother's Interest and Involvement in the Session

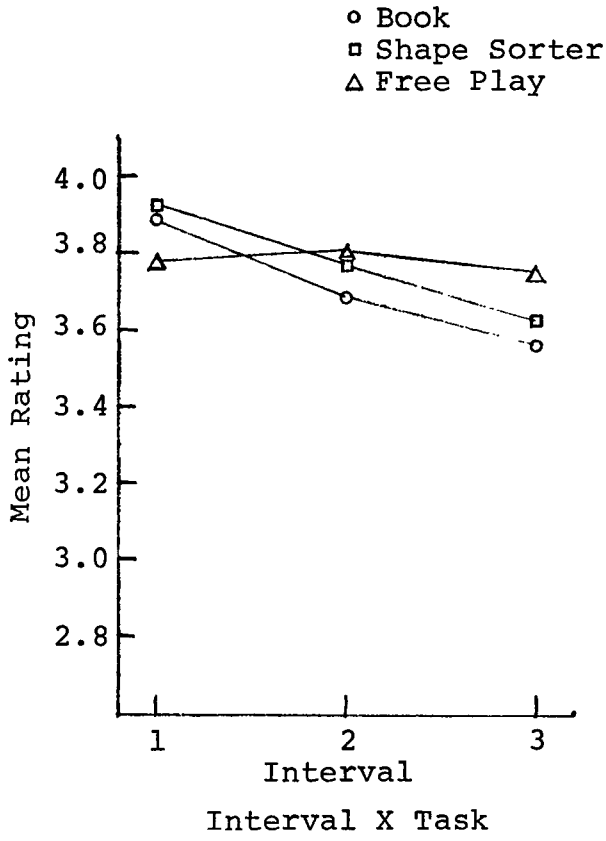


Figure 9

Mean Ratings for
Mother's Interest and Involvement in the Session:
Significant Interactions

short condition. This pattern was not present in the Free Play task. The following significant effects were found in the analysis of variance:

1. Main effect for Duration. The mothers' interest was greater in the short duration condition than in the long duration condition, supporting Hypothesis I.

2. Main effect for Interval. Across all conditions combined, mothers' interest decreased across time.

3. Interval X Task interaction. Mothers' interest decreased across time during the Book and Shape Sorter tasks, but not during the Free Play. The pattern of this interaction is quite similar to the pattern of the Interval X Task interaction for the child's interest and involvement (see Figures 2 and 9).

Mother's Interaction with Child

Results for ratings of the amount of interaction of the mother with the child are found in Tables 13 and 14 and Figures 10 and 11. Some support for both hypotheses was found. Hypothesis I was supported by the decline in interaction in the long duration condition and the absence of such a decline in the short duration condition. Partial support for Hypothesis II was found in the Book task, but not in the other tasks. The following significant effects were found in the analysis of variance:

1. Interval X Duration interaction. This is the interaction supportive of Hypothesis I, in which interaction

Table 13

Mean Ratings for
Mother's Interaction with Child

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	3.44	3.56	3.56	3.78	3.44	3.33	3.44	3.44	3.78	3.56	3.48	3.56
Long	3.81	3.88	3.75	3.75	3.50	3.25	3.47	3.53	3.22	3.68	3.64	3.41
Control												
Short	3.73	3.91	4.00	3.82	3.82	3.91	3.59	3.59	3.59	3.71	3.77	3.83
Long	3.56	3.50	3.28	3.50	3.56	3.33	3.33	3.31	3.50	3.46	3.45	3.37

Table 14

Mean Ratings for
Mother's Interaction with Child:
Significant Effects

14A. Interval X Duration

	1	2	3
Short	3.64	3.64	3.71
Long	3.56	3.54	3.39

14B. Interval X Task

	1	2	3
Book	3.64	3.72	3.66
Shape Sorter	3.72	3.59	3.49
Free Play	3.47	3.47	3.53

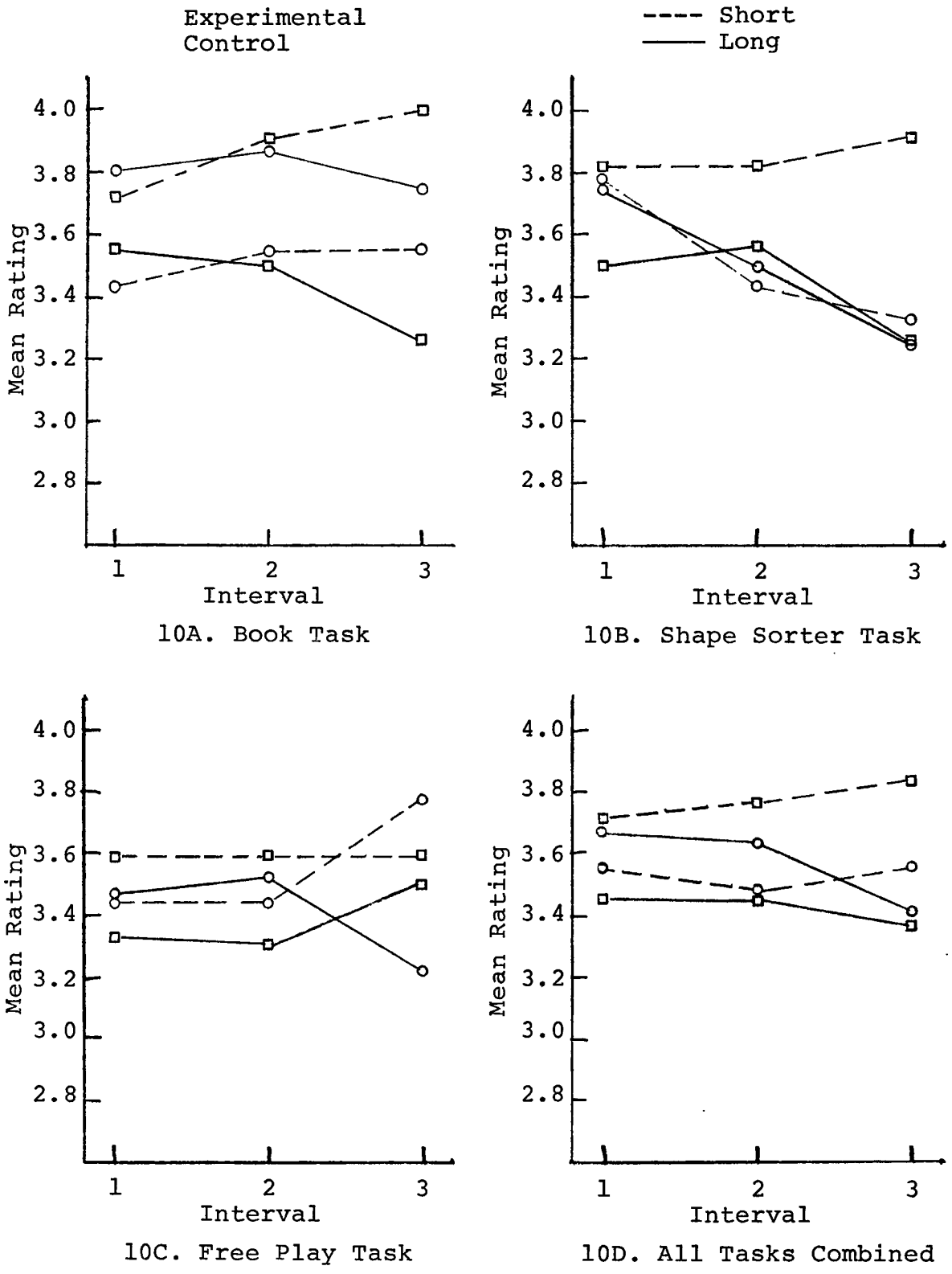
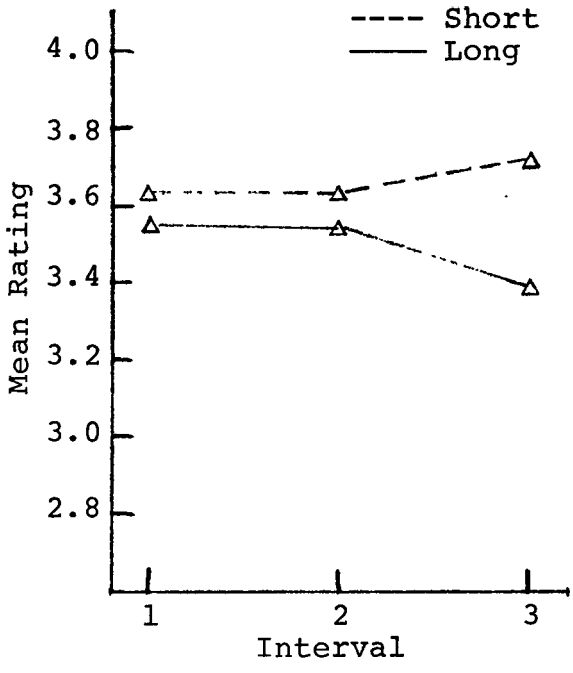
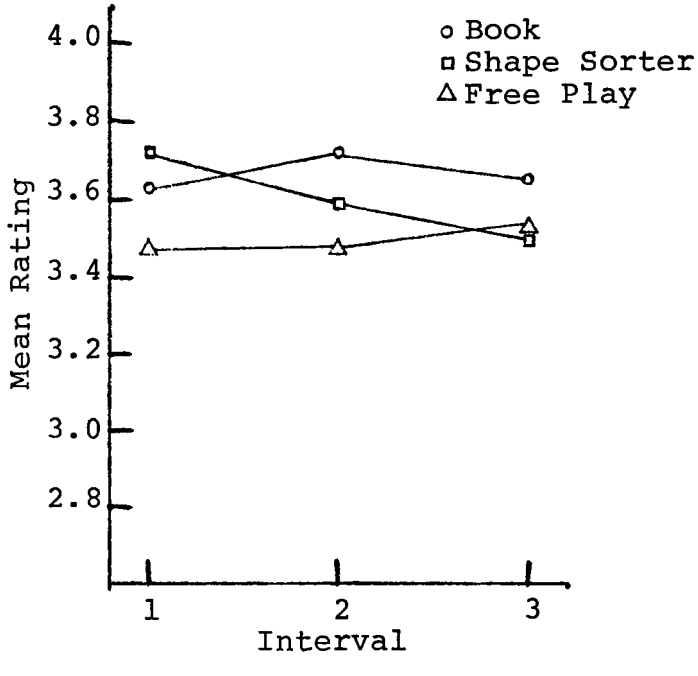


Figure 10

Mean Ratings for
Mother's Interaction with Child



11A. Interval X Duration



11B. Interval X Task

Figure 11
Mean Ratings for
Mother's Interaction with Child:
Significant Interactions

decreased in the long condition but not in the short condition.

2. Interval X Task interaction. The amount of interaction decreased across time in the Shape Sorter task, but remained the same across time in the Book and Free Play.

3. Interval X Task X Group X Duration interaction. This significant interaction reflects, among other things, the support for Hypothesis II in the Book task but not in the other tasks (see Figure 10).

Mother's Affectionateness

Results for ratings of the mother's expression of affection to the child are found in Tables 15 and 16 and Figures 12 and 13. No support for the hypotheses was found. The following significant effects were found in the analysis of variance:

1. Main effect for Group. The experimental mothers were more affectionate than the control mothers.

2. Main effect for Task. Mothers expressed most affection during the Shape Sorter task, and least during the Free Play.

3. Interval X Group interaction. Variation in mother's affectionateness across time is greater for the experimental group than for the control group (see Figure 13). The change across time for neither group is monotonically increasing or decreasing.

Table 15

Mean Ratings for
Mother's Affectionateness

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	5.67	5.22	5.44	5.67	5.67	5.67	5.33	5.17	5.50	5.56	5.35	5.54
Long	5.44	5.06	5.31	5.62	5.44	5.62	5.34	5.28	5.28	5.47	5.26	5.41
Control												
Short	5.18	5.45	5.18	5.36	5.55	5.09	4.91	4.86	4.95	5.15	5.29	5.08
Long	5.00	5.00	4.78	5.06	4.94	4.83	4.81	4.50	4.67	4.95	4.81	4.76

Table 16

Mean Ratings for
Mother's Affectionateness:
Significant Effects

16A. Group

Experimental	5.43
Control	5.02

16B. Task

Book	5.23
Shape Sorter	5.37
Free Play	5.04

16C. Interval X Group

	1	2	3
Experimental	5.51	5.31	5.48
Control	5.06	5.08	4.93

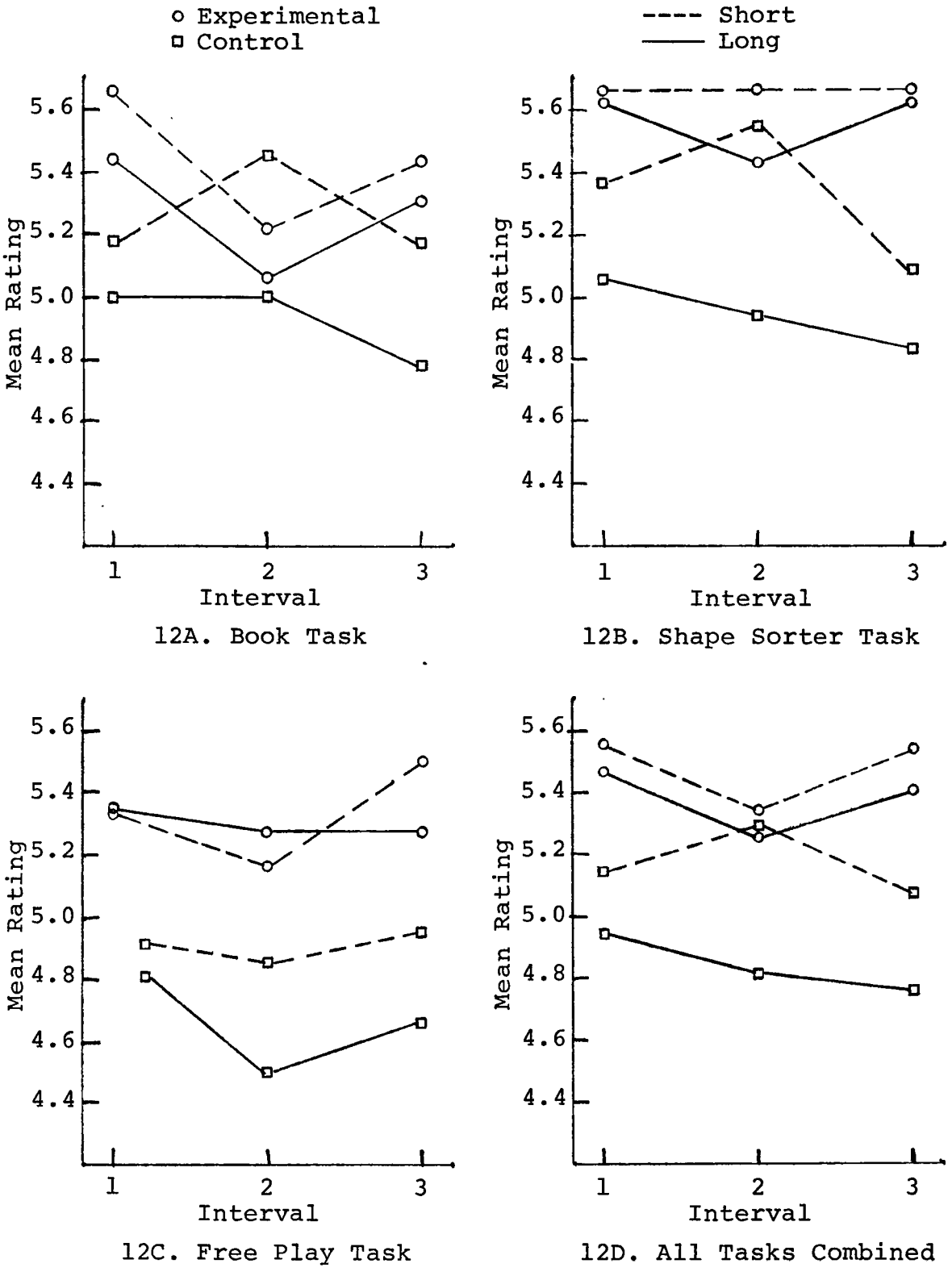
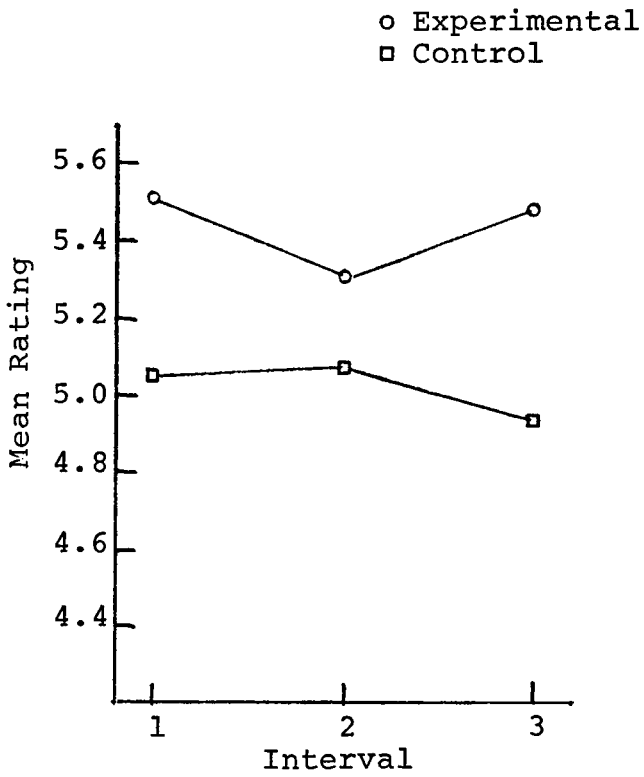


Figure 12

Mean Ratings for
Mother's Affectionateness



Interval X Group

Figure 13

Mean Ratings for
Mother's Affectionateness:
Significant Interactions

Mother's Use of Praise

Results for ratings of the mother's use of praise are found in Tables 17 and 18 and Figures 14 and 15. Hypothesis I was supported; use of praise declined in the long condition but not in the short condition. No support for Hypothesis II was found. The following significant effects were found in the analysis of variance:

1. Main effect for Task. The mother's use of praise was greater in the Shape Sorter task than in the other tasks.

2. Interval X Duration interaction. This is the interaction supportive of Hypothesis I, in which use of praise by the mother decreased across time in the long duration condition but not in the short duration condition.

Mother's Use of Criticism

Results for ratings of the mother's use of criticism are found in Tables 19 and 20 and Figures 16 and 17. Hypothesis II was supported; control mothers in the long duration condition increased their use of criticism while the use of criticism stayed the same for mothers in the other groups. The following significant effects were found in the analysis of variance:

1. Main effect for Interval. Across all conditions combined, mothers' use of criticism was greater in the second and third intervals than in the first.

2. Interval X Task interaction. Mothers' use of criticism increases and then decreases across time during the Shape Sorter task, while it remains the same or increases

Table 17

Mean Ratings for
Mother's Use of Praise

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	2.56	2.44	2.56	3.00	2.89	2.89	2.61	2.61	2.72	2.72	2.65	2.72
Long	2.56	2.38	2.50	3.12	2.88	2.75	2.59	2.66	2.19	2.76	2.64	2.48
Control												
Short	2.45	2.45	2.36	2.91	2.91	3.00	2.18	2.45	2.55	2.52	2.61	2.64
Long	2.28	2.22	2.22	2.78	2.39	2.67	2.33	2.28	2.25	2.46	2.30	2.38

Table 18

Mean Ratings for
Mother's Use of Praise:
Significant Effects

18A. Task

Book	2.41
Shape Sorter	2.85
Free Play	2.45

18B. Interval X Duration

Short	2.61	2.62	2.68
Long	2.60	2.46	2.43

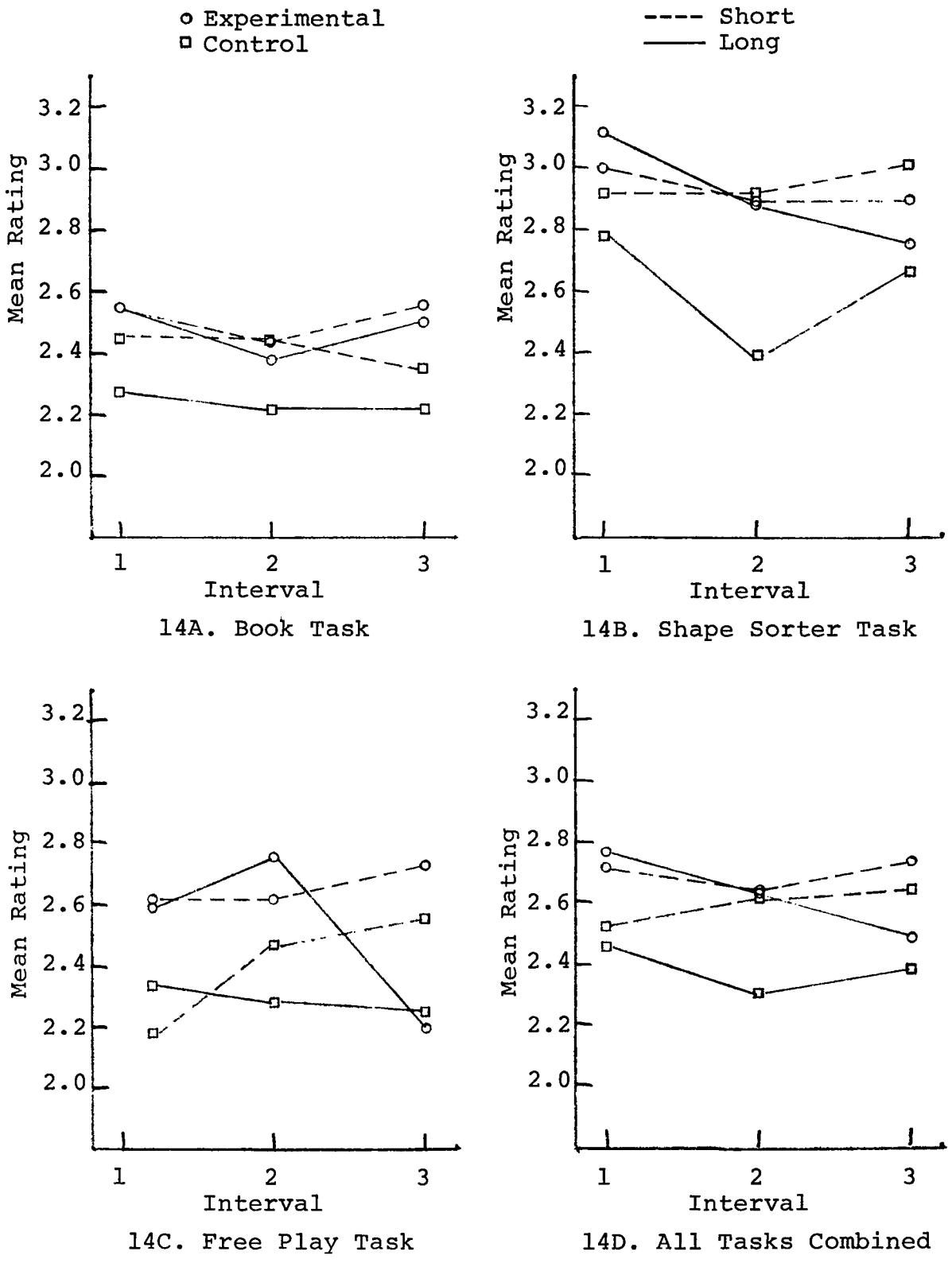
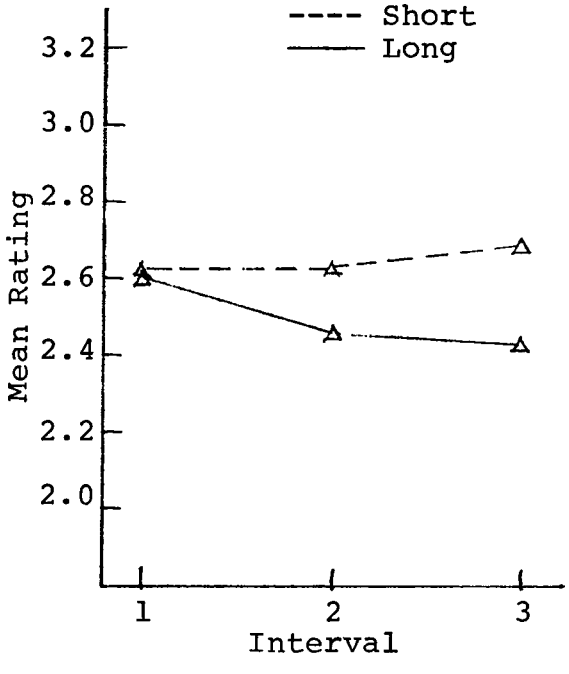


Figure 14

Mean Ratings for
Mother's Use of Praise



Interval X Duration

Figure 15

Mean Ratings for
Mother's Use of Praise:
Significant Interactions

Table 19

Mean Ratings for
Mother's Use of Criticism

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	1.00	1.11	1.22	1.00	1.22	1.11	1.11	1.11	1.17	1.04	1.15	1.17
Long	1.06	1.12	1.06	1.19	1.19	1.06	1.19	1.16	1.09	1.15	1.16	1.07
Control												
Short	1.18	1.00	1.18	1.00	1.36	1.18	1.18	1.18	1.18	1.12	1.18	1.18
Long	1.28	1.44	1.33	1.28	1.67	1.39	1.22	1.53	1.67	1.26	1.55	1.46

Table 20

Mean Ratings for
Mother's Use of Criticism:
Significant Effects

20A. Interval

1	1.14
2	1.26
3	1.22

20B. Interval X Task

	1	2	3
Book	1.14	1.16	1.20
Shape Sorter	1.11	1.36	1.19
Free Play	1.17	1.24	1.28

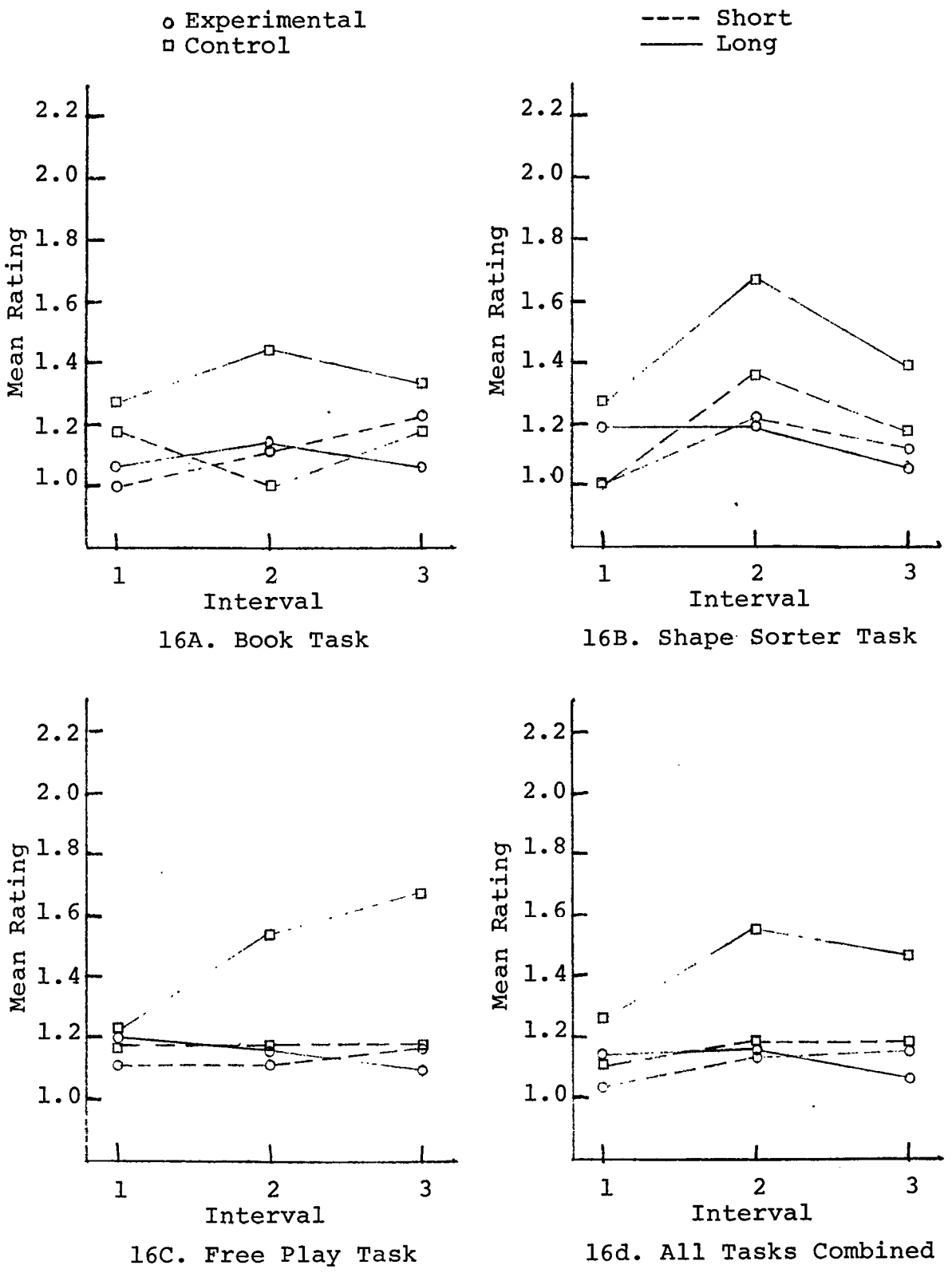


Figure 16

Mean Ratings for
Mother's Use of Criticism

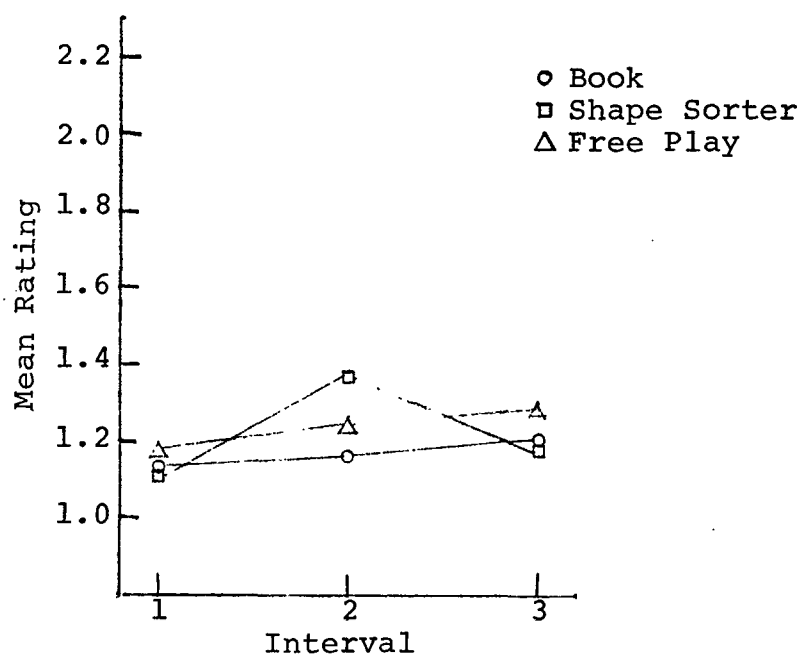


Figure 17

Mean Ratings for
Mother's Use of Criticism:
Significant Interactions

slightly across time in the other tasks.

3. Interval X Group X Duration interaction. This is the interaction supportive of Hypothesis II, in which an increase in criticism of the child by the mother was found for the control group in the long duration condition only.

Mother's Control of Child Behavior

Results for ratings of the mother's control of her child's behavior are found in Tables 21 and 22 and Figures 18 and 19. Behavior during the Book task was not rated on this scale. No support for the hypotheses was found. The following significant effects were found in the analysis of variance:

1. Interval X Task interaction. Mother's control increased during the Free Play task but decreased during the Shape Sorter.

2. Interval X Group X Duration interaction. The four groups varied in their patterns of change across time, but not in support of the hypotheses (see Figure 19).

Mother's Use of Reasoning

Results for ratings of the mother's use of reasoning with the child are found in Tables 23 and 24 and Figures 20, 21, and 22. No support for the hypotheses was found. The following significant effects were found in the analysis of variance:

1. Main effect for Task. The mothers used more reasoning with their children during the Shape Sorter task than during the Book or the Free Play.

Table 21

Mean Ratings for
Mother's Control of Child Behavior

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short				3.56	3.56	3.22	3.06	3.39	3.44	3.31	3.47	3.33
Long				3.12	3.00	2.94	3.19	3.12	3.19	3.16	3.06	3.06
Control												
Short				3.45	3.09	3.09	3.23	3.36	3.41	3.34	3.23	3.25
Long				3.22	3.17	3.06	3.17	3.39	3.53	3.19	3.28	3.29

Table 22

Mean Ratings for
Mother's Control of Child Behavior:
Significant Effects

22A. Interval X Task

	1	2	3
Book			
Shape Sorter	3.35	3.20	3.08
Free Play	3.16	3.32	3.40

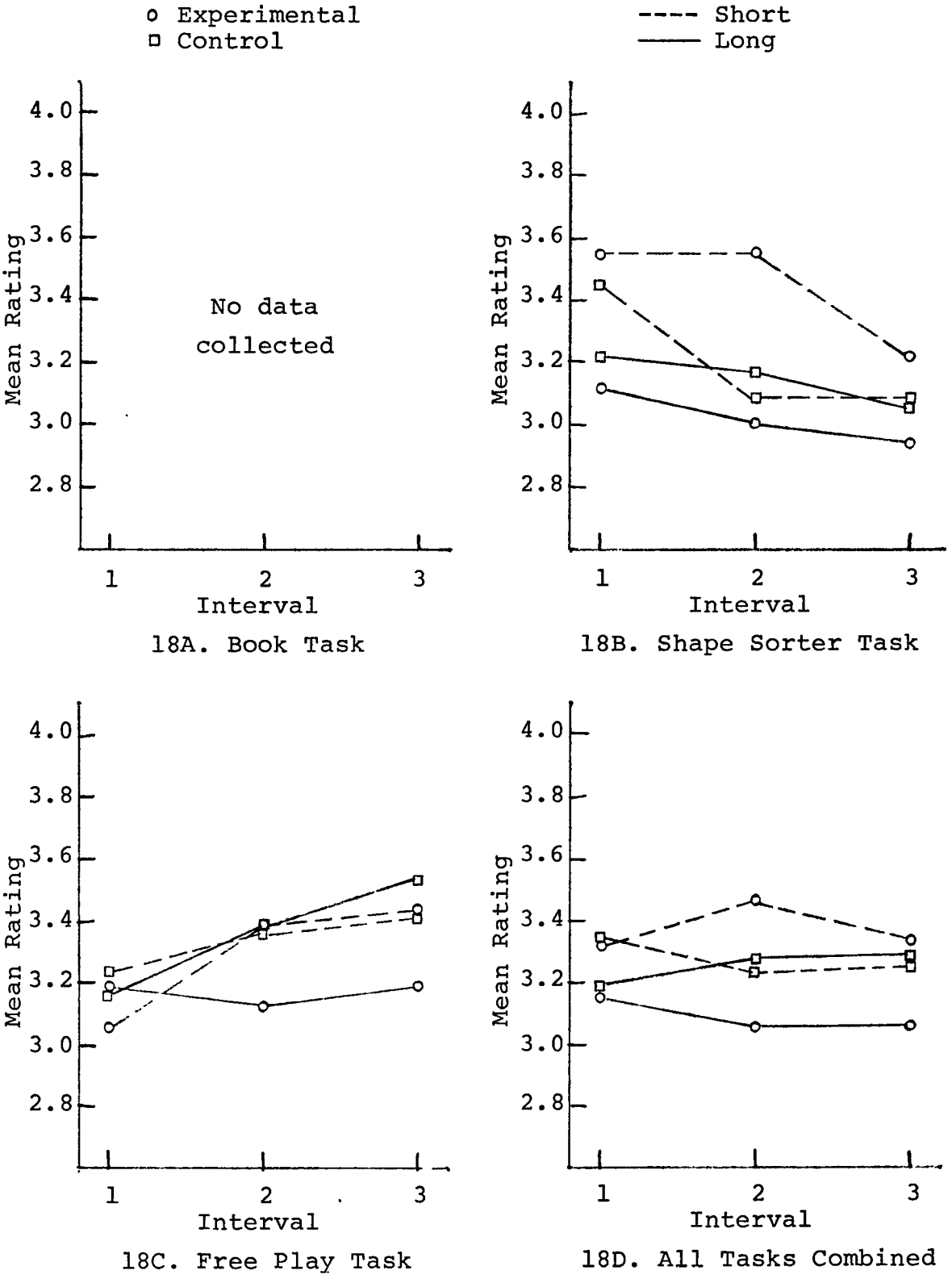
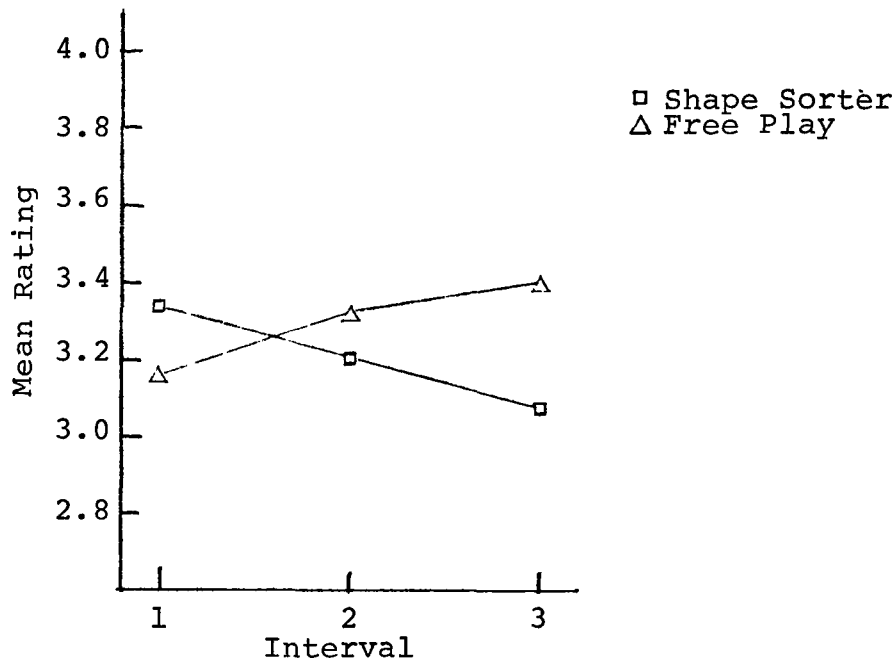


Figure 18

Mean Ratings for
Mother's Control of Child Behavior



Interval X Task

Figure 19

Mean Ratings for
Mother's Control of Child Behavior:
Significant Interactions

Table 23

Mean Ratings for
Mother's Use of Reasoning

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	1.56	1.44	1.78	2.22	1.89	2.22	1.78	1.72	1.83	1.85	1.69	1.94
Long	1.75	1.94	1.88	1.81	2.00	1.81	1.62	2.22	1.72	1.73	2.05	1.80
Control												
Short	1.64	1.91	1.64	1.91	2.64	2.55	1.50	1.36	1.59	1.68	1.97	1.92
Long	1.50	1.78	1.67	2.06	1.89	1.67	1.31	1.47	1.67	1.62	1.71	1.67

Table 24

Mean Ratings for
Mother's Use of Reasoning:
Significant Effects

24A. Task

Book	1.70
Shape Sorter	2.08
Free Play	1.64

24B. Task X Group

	Book	Shape Sorter	Free Play
Experimental	1.72	2.00	1.81
Control	1.69	2.14	1.48

24C. Task X Duration

	Book	Shape Sorter	Free Play
Short	1.67	2.25	1.62
Long	1.75	1.87	1.66

24D. Interval X Task X Group

	Book			Shape Sorter			Free Play		
	1	2	3	1	2	3	1	2	3
Experimental	1.65	1.68	1.82	2.03	1.94	2.03	1.71	1.96	1.78
Control	1.58	1.85	1.65	1.98	2.30	2.15	1.41	1.41	1.62

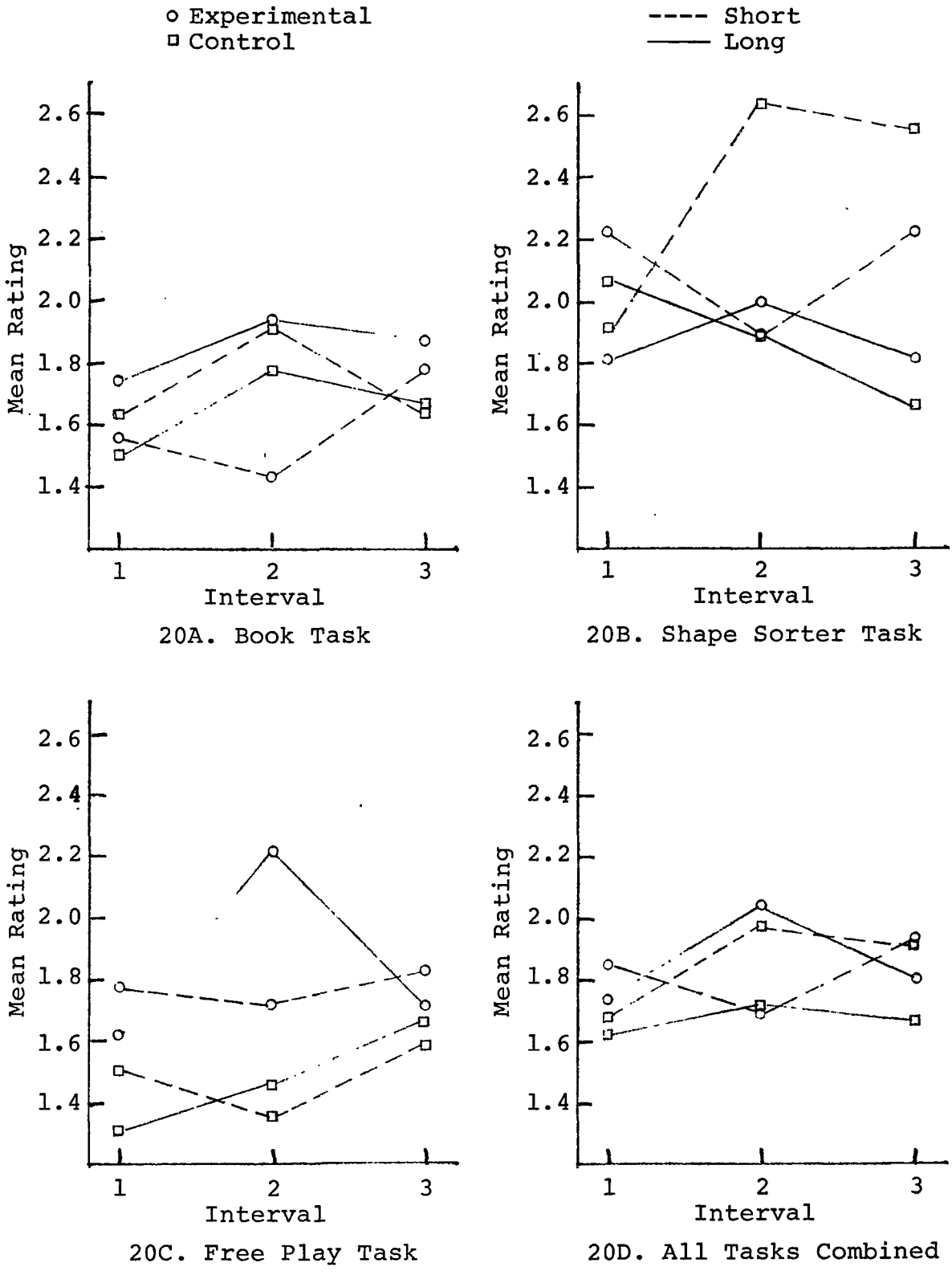
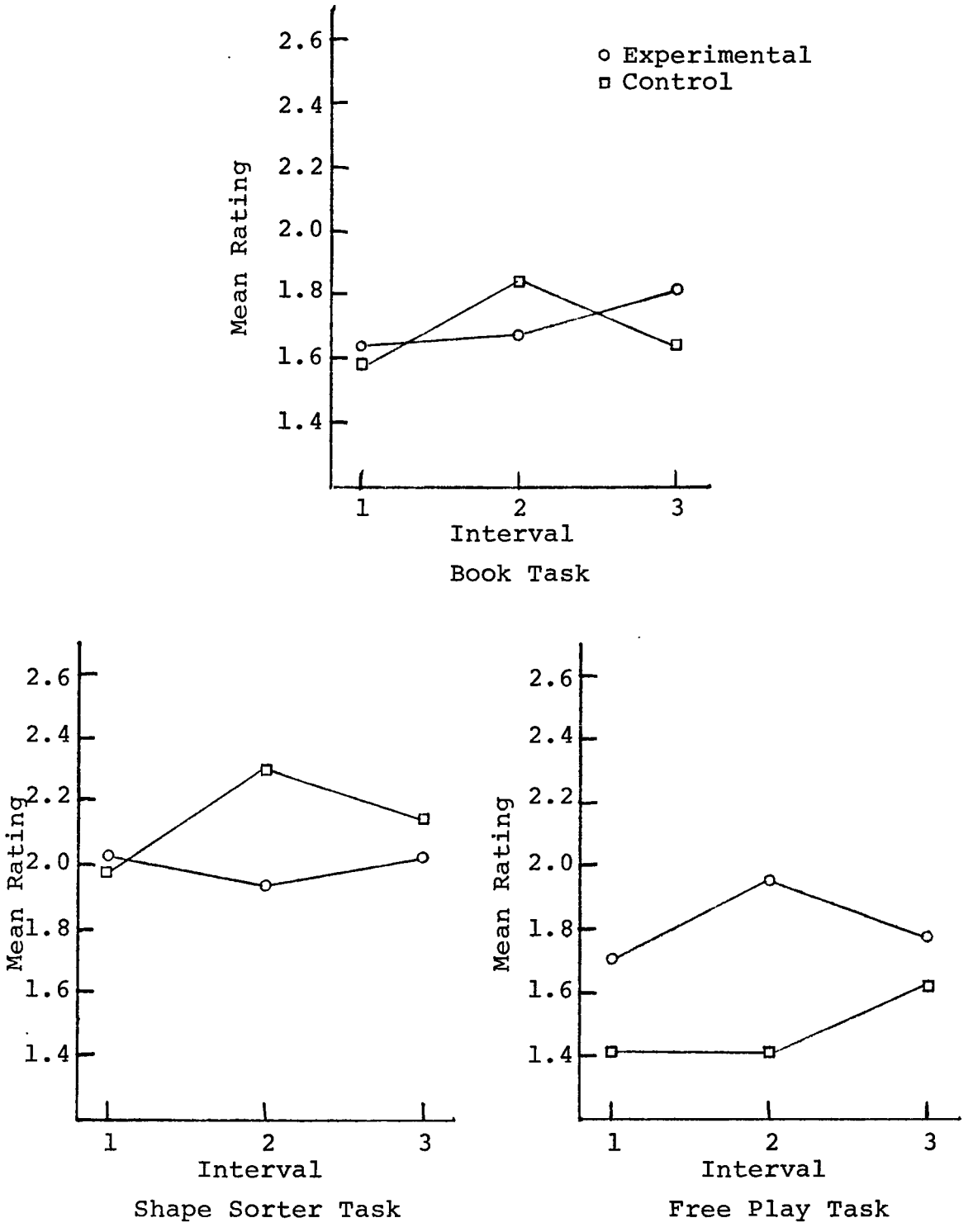


Figure 20

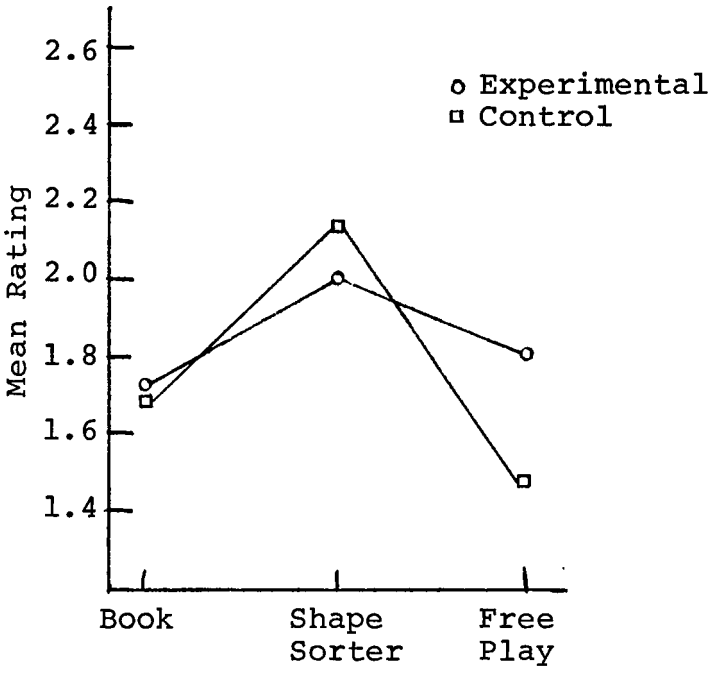
Mean Ratings for
Mother's Use of Reasoning



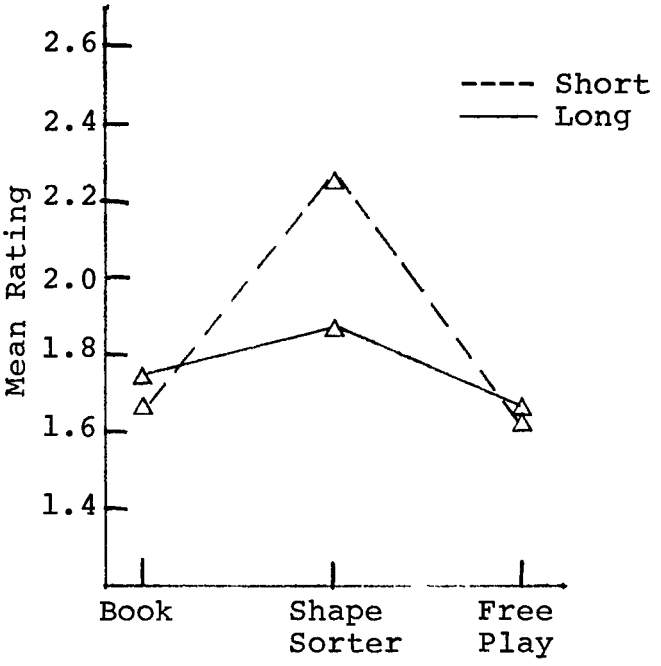
Interval X Task X Group

Figure 21

Mean Ratings for
Mother's Use of Reasoning:
Significant Interactions



22A. Task X Group



22B. Task X Duration

Figure 22

Mean Ratings for
Mother's Use of Reasoning:
Significant Interactions

2. Task X Group interaction. There was a bigger difference between the control and experimental groups in the Free Play than in the other tasks, with the control mothers using less reasoning than the control mothers during the Free Play.

3. Task X Duration interaction. There was a bigger difference between the short and long conditions in the Shape Sorter task than in the other two tasks, with the mothers in the short condition using more reasoning than the mothers in the long condition during the Shape Sorter.

4. Interval X Task X Group interaction. The patterns of change across time of the experimental and control groups were different for each task (see Figure 21).

5. Interval X Group X Duration interaction. The four groups varied in their patterns of change across time, but not in support of the hypotheses (see Figure 22).

Mother's Encouragement of Child's Verbalization

Results for ratings of the mother's encouragement of her child's verbalization are found in Tables 25 and 26 and Figures 23 and 24. No support for the hypotheses was found. The following significant effects were found in the analysis of variance:

1. Main effect for Task. The mothers encouraged verbalization most during the Book task and least during the Shape Sorter.

2. Interval X Task interaction. The mothers' encouragement of verbalization increased across time during the Shape

Table 25

Mean Ratings for
Mother's Encouragement of Child's Verbalization

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	3.11	3.11	2.89	2.22	2.33	2.33	2.83	2.78	2.50	2.72	2.74	2.57
Long	3.38	3.06	3.00	2.25	2.25	2.44	2.72	2.41	2.31	2.78	2.57	2.58
Control												
Short	3.18	3.09	3.00	2.27	2.36	2.55	2.41	2.64	2.55	2.62	2.70	2.70
Long	2.94	2.83	2.89	2.33	2.44	2.44	2.50	2.28	2.44	2.59	2.52	2.59

Table 26

Mean Ratings for
Mother's Encouragement of Child's Verbalization:
Significant Effects

26A. Task

Book	3.04
Shape Sorter	2.36
Free Play	2.53

26B. Interval X Task

	1	2	3
Book	3.15	3.03	2.95
Shape Sorter	2.27	2.35	2.45
Free Play	2.60	2.53	2.46

26C. Interval X Group

	1	2	3
Experimental	2.75	2.66	2.58
Control	2.61	2.62	2.65

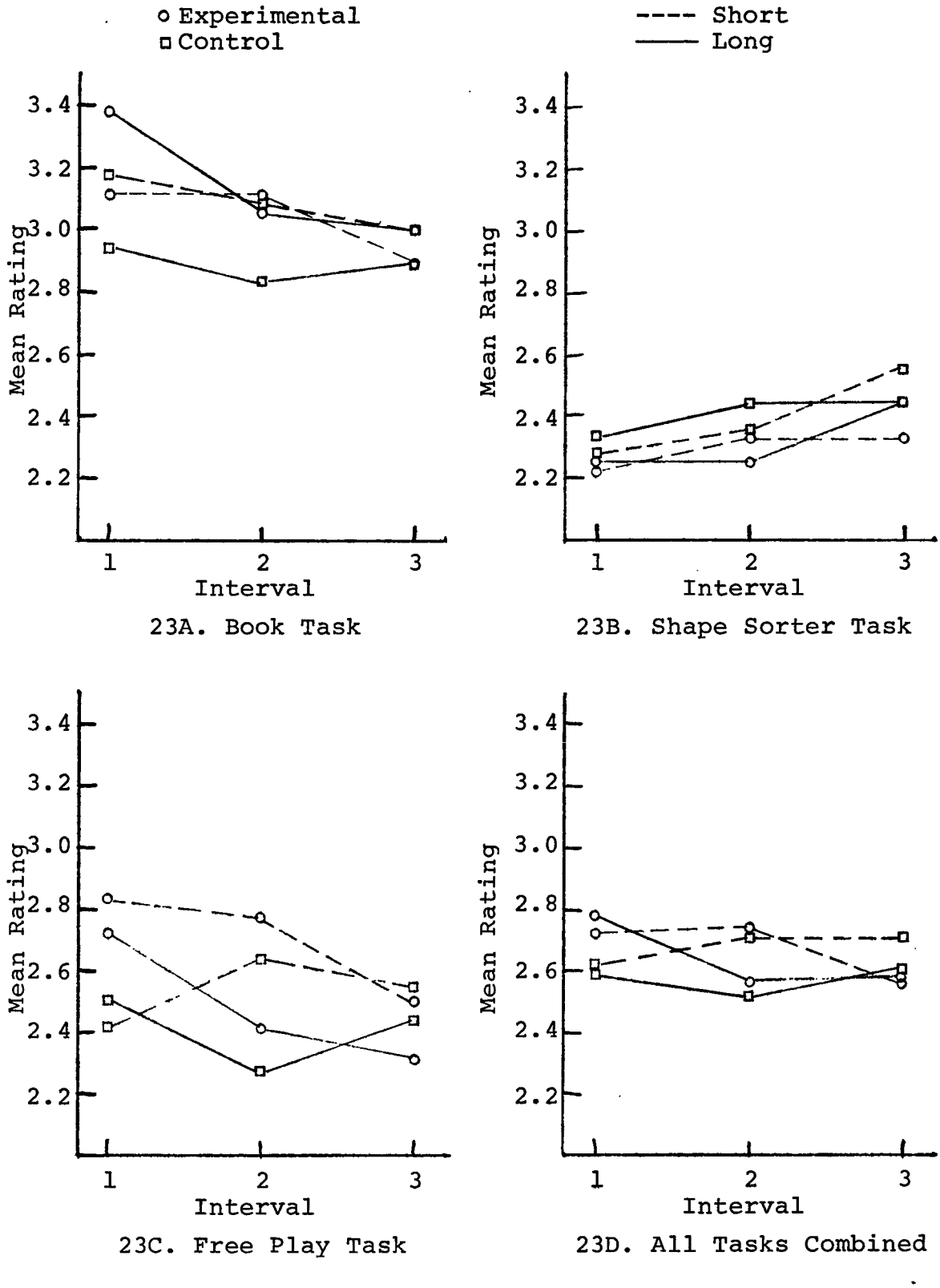
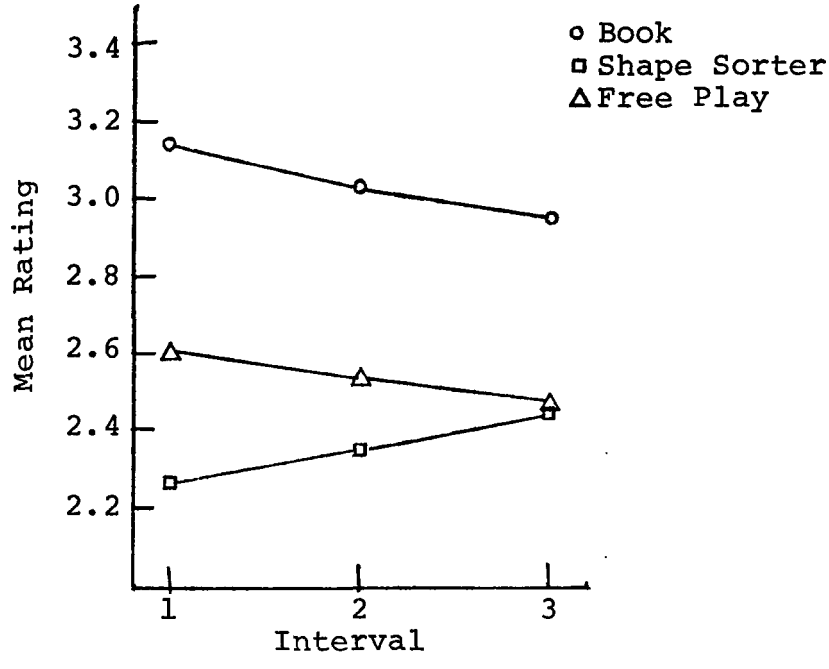
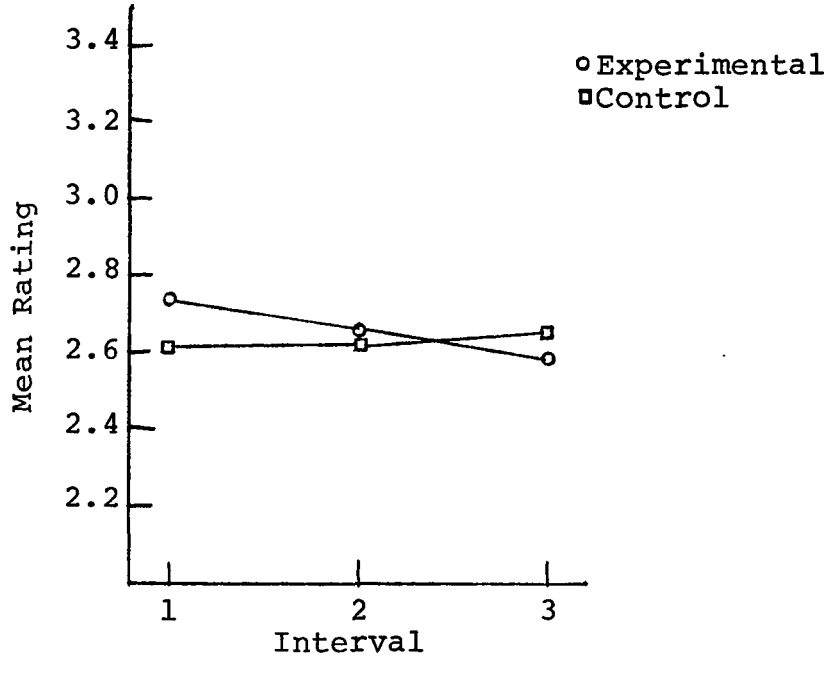


Figure 23

Mean Ratings for
Mother's Encouragement of Child's Verbalization



24A. Interval X Task



24B. Interval X Group

Figure 24

Mean Ratings for
Mother's Encouragement of Child's Verbalization:
Significant Interactions

Sorter task but decreased across time during the Book and Free Play.

3. Interval X Group interaction. The encouragement of verbalization by experimental group mothers decreased across time, but not that of the control group mothers.

Child's Verbal Communication

Results for ratings of the child's verbal communication are found in Tables 27 and 28 and Figures 25 and 26. Hypothesis I was supported; child verbalization declined in the long condition but not in the short condition. No support for Hypothesis II was found. The following significant effects were found in the analysis of variance:

1. Main effect for Task. The children's verbalization was greatest during the Book task and least during the Shape Sorter.

2. Interval X Duration interaction. This is the interaction supportive of Hypothesis I, in which child verbalization decreased across time in the long condition but not in the short condition.

3. Task X Group X Duration interaction. There was less variation in child verbalization across the four groups during the Shape Sorter task than during the other tasks (see Figure 26).

Summary

Support for the hypotheses of this study was found for only a few of the scales, sometimes in just one or two of the

Table 27

Mean Ratings for
Child's Verbal Communication

	Task and Interval											
	Book			Shape Sorter			Free Play			Combined		
Group	1	2	3	1	2	3	1	2	3	1	2	3
Experimental												
Short	2.89	3.11	2.89	2.33	2.33	2.67	2.67	3.17	2.78	2.63	2.87	2.78
Long	3.31	3.12	3.12	2.69	2.50	2.56	2.72	2.69	2.59	2.91	2.77	2.76
Control												
Short	3.09	3.18	3.09	2.36	2.73	2.55	2.27	2.73	2.91	2.58	2.88	2.85
Long	2.83	2.94	2.83	2.67	2.61	2.56	2.83	2.67	2.61	2.78	2.74	2.67

Table 28

Mean Ratings for
Child's Verbal Communication:
Significant Effects

28A. Task

Book	3.04
Shape Sorter	2.54
Free Play	2.72

28B. Interval X Duration

	1	2	3
Short	2.60	2.88	2.82
Long	3.02	2.60	2.69

28C. Task X Group X Duration

		Book	Shape Sorter	Free Play
Experimental				
	Short	2.96	2.44	2.87
	Long	3.19	2.58	2.67
Control				
	Short	3.12	2.55	2.64
	Long	2.87	2.61	2.70

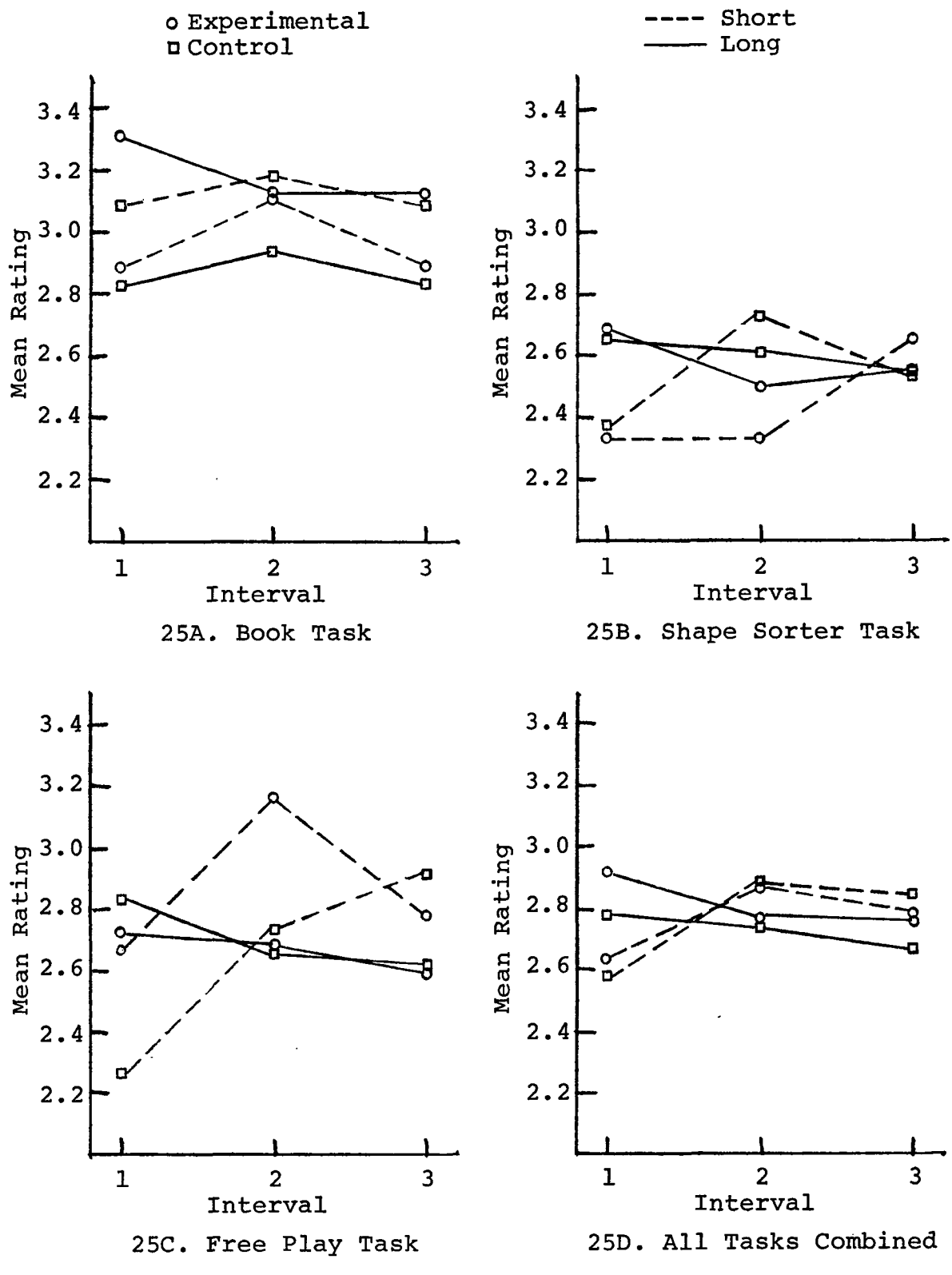
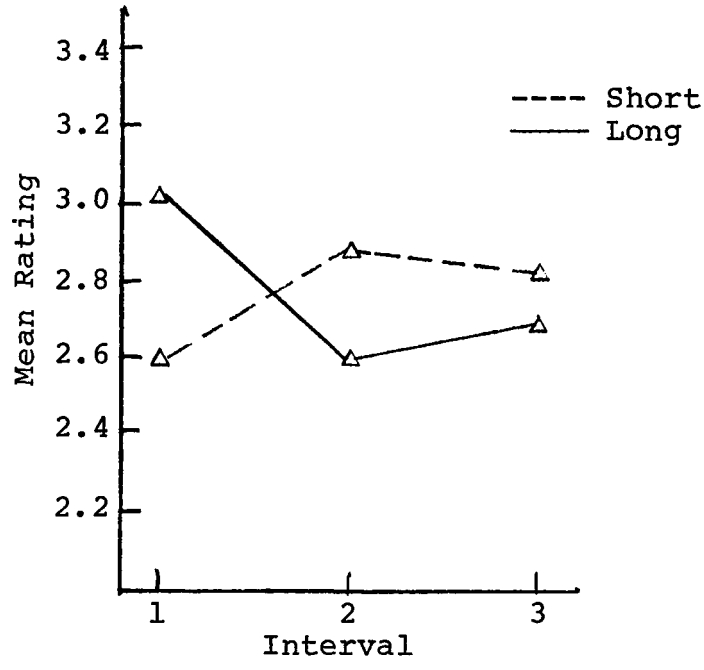
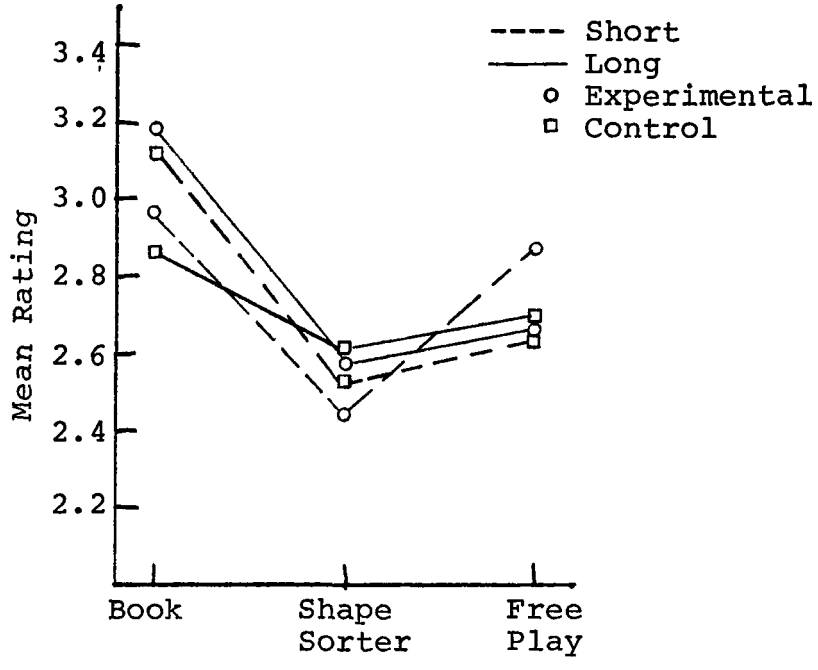


Figure 25

Mean Ratings for
Child's Verbal Communication



26A. Interval X Duration



26B. Task X Group X Duration

Figure 26

Mean Ratings for
Child's Verbal Communication:
Significant Interactions

tasks. These results are summarized in Table 29.

Considering first the child's interest and mood, in only one task on one rating scale was the hypothesized pattern found. The expected increase in the child's discomfiture and loss of involvement in the long duration condition did not consistently appear, nor were there consistent differences between groups in the long or short conditions.

There was positive evidence for the effect of task length on the child's verbal behavior. Hypothesis I was supported by the data; child verbal behavior did decrease in the long duration condition.

For mothers, both interest and level of interaction were affected by task duration. The expected decrease was found for these variables for both experimental and control groups, supporting Hypothesis I. However, only on the rating scale for level of interaction in the Book task did the data support Hypothesis II.

On the whole, mothers' teaching style was little affected by task duration. No support for either hypothesis was found for affection, control, reasoning, or encouragement of verbalization. Hypothesis I was supported for praise, and Hypothesis II for criticism.

Probability values of all significant effects from the analysis of variance are presented in Table 30. The significant effects which are in support of the hypotheses are marked by asterisks (not all the significant effects were in the predicted direction). The most consistent and strongest

Table 29

Support for Hypotheses

Scale	Hypothesis I	Hypothesis II
Child's Interest		Book
Child Enjoyment - Typical		
Child Enjoyment - Low		
Child Enjoyment - High		
Mother's Interest	Book, Shape Sorter	
Mother's Interaction	Across all tasks	Book
Mother's Affection		
Mother's Praise	Across all tasks	
Mother's Criticism		Across all tasks
Mother's Control		
Mother's Reasoning		
Mother's Encourage Verbal		
Child's Verbalization	Across all tasks	

Table 30

Analysis of Variance Results: Probabilities of Effects for Each Scale

Effect	Scale												
	Child Interest	Enjoyment	Enjoyment-Low	Enjoyment-High	Mother Interest	Interaction	Affection	Praise	Criticism	Control	Reasoning	Encourage Verbal	Child Verbal
Group (G)	.041		.043	.019			.007						
Duration (D)					.0002*								
G X D													
Interval (I)	.013	.022	.018		.001				.014				
I X G	.020						.038					.083	
I X D						.054*		.091*					.003*
I X G X D			.050						.059**	.063	.081		
Task (T)	.048		.000	.0000			.002	.0000			.0000	.0000	.0000
T X G	.034										.026		
T X D											.017		
T X G X D													.081
I X T	.008	.021			.009	.026			.068	.0001		.017	
I X T X G											.095		
I X T X D			.058										
I X T X G X D		.023	.022			.024**							

Note.- .000 represents $p<.001$; .0000 represents $p<.0001$; *support for Hypothesis I; **support for Hypothesis II.

result was the effect of the Task factor. Eight of thirteen scales showed a main effect for Task, and seven of thirteen scales showed a Task X Interval interaction. All thirteen scales showed either a Task or Task X Interval effect, ten of which were significant at the .01 level. In contrast, only two of thirteen scales showed a main effect for Duration or an effect for Duration in interaction with other factors significant at the .01 level. The Task factor seemed to account for more variance in more scales than any of the other experimental factors.

CHAPTER IV

DISCUSSION

The findings of this study have important implications for the study of mother-child interaction and perhaps also for interpersonal interaction in general. Task variables have been seen to influence the behavior of mothers and children in structured and semi-structured interaction sessions. The hypothesized effect of task duration was partially, though not strongly, confirmed. The effect of the specific task itself, though not hypothesized in this study, was in evidence with some consistency and strength. Each of these results merits some discussion; more general issues of understanding and predicting interpersonal behavior will also be considered.

The Effect of Task Duration

Task duration was expected to affect behavior because of two processes: adaptation and loss of energy and interest. The expected sequence of events was that behavior would become less artificial as mother and child adapted to the situation or lost interest, and that teaching behavior would deteriorate as a result of these processes.

The evidence suggests that the expected loss of interest did occur to some extent. Mothers' interest and level of interaction clearly decreased across time as a function of task duration. Though results for ratings of the children's

interest and enjoyment were negative, the presence of the expected effect of duration on level or rate of child verbalization may represent a manifestation of the fatigue process.

However, the expected deterioration of mother teaching behavior did not seem to result from the mothers' loss of interest. Hypothesis I was supported for only one of six rating scales used to assess mothers' teaching skills. This result is consistent with Smith's (1958) study, in which two of 11 mother measures changed over time.

A second area of interest was the possible differential effect of task duration on experimental and control groups in a program evaluation framework. In view of the quite limited support for Hypothesis II in this study, the evidence for such a differential effect is very weak.

These results for the effects of task duration have implications for the conduct of both basic and applied research. In the basic research area, concern with task duration is dependent on the sort of behavioral variable to be studied. Interest and motivation of mothers seem to be duration sensitive, while teaching behaviors seem not to be. It is unwise to extend this generalization too broadly, but the durations and mother variables of this study are typical of most studies in the area of mother-child interaction.

Similar conclusions may also hold for applied research. In the area of program evaluation, the behaviors to be evaluated determine the amount of attention paid to task duration.

For instance, evaluation of a program concentrating on maternal teaching skills would be relatively immune to effects of task duration. The absence of differential effects of the task duration on experimental and control mothers leads to the very practical decision to use shorter task lengths in the interest of research economy and reduction of the data collection burden on participating families.

While it is comforting to have data available for practical decision making, the issue of task duration is hardly exhausted. It is quite possible that variations of greater magnitude than those of this study, or much longer durations, may have greater effects. There are many other persons, tasks, and behaviors that may be time sensitive. As these are studied, it will be essential to generalize the results so as to be able to predict the presence of time artifacts in future research and to avoid or control for them in appropriate ways.

The Effect of Task

Task effects were not the primary focus of this study, because there is little doubt that task variables influence behavior. However, it is notable that such effects were the strongest to appear in the present study. These occurred as both main effects for Task and as Task X Interval interactions.

The influence of task as a main effect seemed to follow a pattern opposite to that of duration inasmuch as four of six mother teaching skills were sensitive to task, while

mother interest and level of interaction were not. High and low points of child enjoyment also were strongly task sensitive, but were not duration sensitive.

Task X Interval interactions are interesting because they represent an effect of time independent of total task duration itself. Changes over time occur during some tasks but not during others. These interactions were found in the present study for both interest and teaching skill variables.

Again there are implications for future research. In basic exploratory studies, sampling from a broad array of tasks may sometimes be appropriate. In evaluation research task selection should include consideration of known demand characteristics of various stimulus materials and instructions in order to provide some assurance of the presence of the behaviors of interest. In light of the present findings for both task and duration as influences on behavior, a practical strategy to use in evaluation research with broad goals is to sample behavior with a number of short tasks in preference to fewer, longer ones.

Issues for Continued Research

As psychologists conduct further investigations in the areas of interpersonal behavior, general methodological issues will continue to require attention. This concluding section addresses three general issues for the conduct of interaction research: psychometric considerations, choice of measurement procedure, and data analysis.

The first general issue concerns the reliability and validity of structured measures of interaction. In many areas of psychology, the use of a standardized situation in a controlled setting is used to assess individual behavior. The value and usefulness of these tests has been enhanced by the elaboration of psychometric technology. Laboratory measures of mother-child interaction can profitably be considered as tests of maternal childrearing skills.

This "test" approach to laboratory studies demands the same systematic attention to psychometric considerations as any other test procedure. Not only interrater reliability is required, but also reliability of performance, as measured by split-half and test-retest procedures. The present study of duration effects can be considered to lie in this general domain. The approach to behavioral tests should be as rigorous as for more traditional tests of human abilities. The implication for future research is systematic study of the technical as well as the substantive aspects of interaction measurement, with a possible goal of batteries of objective behavioral test procedures. Brooks and Lewis (1973) suggest several dimensions of situations used to assess infant attachment behavior that need to be examined. Among these are amount of time spent in the playroom, size and shape of the playroom, number and type of toys present, and absence or presence of a female adult stranger. Similar lists could be generated for other areas of interaction study. These

situational dimensions need to be studied for their effects on behavior in order to identify and eliminate situational artifacts in interaction studies.

The second general issue is that of measurement--the quantitative description of interpersonal behavior. Whether data are collected live or from written or electronic records, the alternatives are sequences of discrete behaviors, counts of discrete behavior without regard to order, and trait ratings (Wright, 1960). The primary choice is whether or not to preserve the order of behavior. Preservation of sequence in data collection seems inherently attractive, because simpler data, such as relative frequency counts of behavioral categories, can be easily calculated, whereas sequences cannot be reconstructed from the proportions. Ratings seem to be even further removed from the original form of the interaction, and order is irretrievable. However, sequential data are not always the most desirable.

Both economic and theoretical considerations determine the choice of measurement procedure. In general, sequential data require considerably greater time and effort than non-sequential data, especially trait ratings. Analysis of sequential data is likewise more complex and time consuming. There are many research questions which are questions about interaction sequences, and sequential data are necessary in such studies. But there are many other research questions which do not involve sequential data, and collection of such data is hardly worth the expense.

The above argument is a rather simple and obvious one. However, there remains an empirical question which deserves further study. That is, when is it worthwhile to ask the questions which require preservation of order? If one is interested, for instance, in the relationship of parent-child interaction with the characteristics of children, it may or may not be necessary to study the pattern of interaction in terms of sequence. Trait ratings may well be as good predictors of child development as sequential analyses. The appropriate research strategy is to compare the value of a variety of data derived from the same corpus of interaction behavior, with the aim of establishing a basis for making choices among types of measures. It may be that a combination of different kinds of measures of the same construct is superior to any one measure used singly. These are empirical questions which should be studied systematically.

The third general issue is that of data analysis. There are two sets of questions which need attention in this area. The first is the analysis of sequential interaction behavior; the second is the attempt to account for multiple simultaneous influences on behavior.

Most sequential analysis seems to focus on very short term sequences--strings of two, three, or perhaps four behaviors in a row. These short chains have been conceptualized as stimuli and responses, and contingency analysis has yielded interesting and important results (e.g., Bernal,

1969; Deschner, 1972; Minton, Kagan, and Levine, 1971; Patterson and Cobb, 1971). Much of this work has been applied behavior analysis in problem situations where the powerful utility of the stimulus-response conceptualization and analysis has been demonstrated.

Longer sequences have seldom been studied in the psychological literature. One important reason for this lack is technical. The number of possible sequences increases rapidly as sequence length increases only slightly. For instance, with eight behavior categories, there are over four thousand different possible four step sequences. The data base required for reliable contingency analysis of all these sequences is huge. Reduction in behavior categories reduces the number of possible sequences for a given number of steps, but much data are lost in the process and the problem quickly reappears with longer sequences. For instance, with only three categories of behavior there are over fifty-nine thousand possible ten-step sequences. The data base required for sequential analysis is again huge, and computational requirements are overwhelming with such an approach to analysis.

Even if technical problems were solved, interpretation of the results could be quite difficult. Classification of sequences into a limited number of categories would be necessary in order to test hypotheses of any generality. The classification process would require further sophisticated

computation. The relationships between the several steps of a sequence are potentially complex and may vary according to situational and individual variables, adding difficulty to both analysis and interpretation.

These difficulties pose a challenge to the full use of sequential behavioral data. Elaborate and sophisticated schemes for sequential data collection, such as Caldwell's APPROACH (1969), seem to have fallen into disuse because of lack of adequate analytic procedures. It is to be hoped that this issue receives the work it deserves.

The second analysis question is not unique to the area of interpersonal interaction, but is present throughout psychology. This is the question of handling multiple independent variables. The data of this study are a case in point. The analysis of variance yielded main effects and low order interactions that were simple to describe and relate to the research hypotheses. However, four way interactions were difficult even to describe, much less interpret. And in this or any study it is easy to generate many more factors than four which might plausibly have important effects on the dependent variable in question, singly and in interaction.

In addition, the magnitude of experimental effects is as important as their significance. There is a growing body of literature which presents the rationale and computational procedures for estimating the magnitude of effects (Dodd and Schultz, 1973; Dwyer, 1974; Fleiss, 1969; Hays, 1963; Vaughan

and Corballis, 1969) in various experimental designs. However, no computational algorithm could be found that was applicable to the design of the present study, and the generalized models recently presented by Dwyer (1974) and by Dodd and Schultz (1973) seem to be in some conflict. Resolution of these differences would be welcome, as would be the routine incorporation of magnitude of effect estimations into the computer programs widely used for analysis of experimental data.

Another approach to the problem of multiple independent variables is multiple regression analysis. Cohen (1968) and Kerlinger and Pedhazur (1973) point out that any analysis of variance design can be handled as a multiple regression problem, with the added advantage that both categorical and continuous independent variables can be analyzed simultaneously. Furthermore, multiple regression provides estimates of variance accounted for by independent variables singly or in combination, analogous to estimating magnitude of effect. Multiple regression does not require balanced designs, as it inherently accounts for correlated independent variables. However, correlation of independent measures complicates the calculation of interaction effects in multiple regression just as in the analysis of variance.

Any approach to data analysis requires prior conceptual analysis. Statistics are only a tool to be used in the service of understanding the nature and causes of behavior.

The same is true of the selection of settings and measures. The study of methodology in psychology is necessary in order to eliminate artifacts in research and thus come closer to true understanding. Future research into the substantive issues and the methodological issues of interpersonal interaction will be closely interdependent for some time to come.

BIBLIOGRAPHY

BIBLIOGRAPHY

Baldwin, A. L., Kalhorn, J., & Breese, F. H. Patterns of parent behavior. Psychological Monographs, 1945, 58 (No. 3, Whole No. 268).

Baumrind, D. Child care practices anteceding three patterns of pre-school behavior. Genetic Psychology Monographs, 1967, 75, 43-88.

Bell, R. Q. Stimulus control of parent or caretaker behavior by offspring. Developmental Psychology, 1971, 4, 63-72.

Bernal, M. Behavioral feedback in the modification of brat behaviors. Journal of Nervous and Mental Disease, 1969, 148, 375-385.

Bloom, B. S. Stability and change in human characteristics. New York: Wiley, 1964.

Brooks, J., & Lewis, M. Attachment behavior in thirteen-month-old opposite-sex twins. Paper presented at the Society for Research in Child Development meeting, Philadelphia, March, 1973. (a)

Brooks, J., & Lewis, M. The effect of time on attachment as measured in a free play situation. Research Bulletin 73-55. Princeton, N. J.: Educational Testing Service, 1973. (b)

Caldwell, B. M. A new "approach" to behavioral ecology. In J. P. Hill (Ed.), Minnesota symposia on child psychology. Vol. 2. Minneapolis: University of Minnesota Press, 1969.

Cohen, J. Multiple regression as a general data-analytic system. Psychological Bulletin, 1968, 70, 426-443.

Crandall, V. J., Preston, A., & Rabson, A. Maternal reactions and the development of independence and achievement behavior in young children. Child Development, 1960,

Deschner, J. P. The influence of mother-child interactions on early manifestations of competence. Doctoral dissertation, University of Houston, 1972.

Dodd, D. H., & Schultz, R. F., Jr. Computational procedures for estimating magnitude of effect for some analysis of variance designs. Psychological Bulletin, 1973, 79, 391-395.

Dwyer, J. H. Analysis of variance and the magnitude of effects: A general approach. Psychological Bulletin, 1974, 81, 731-737.

Erikson, E. H. Childhood and society. New York: Norton, 1950.

Fleiss, J. L. Estimating the magnitude of experimental effects. Psychological Bulletin, 1969, 72, 273-276.

Freeberg, N. E., & Payne, D. T. Parental influence on cognitive development in early childhood: A review. Child Development, 1967, 38, 65-87.

Hatfield, J. S., Ferguson, L. R., & Alpert, R. Mother-child interaction and the socialization process. Child Development, 1967, 38, 365-414.

Hays, W. L. Statistics for psychologists. New York: Holt, Rinehart and Winston, 1963.

Hess, R. D., & Shipman, V. C. Early experience and the socialization of cognitive modes in children. Child Development, 1965, 36, 869-886.

Hess, R. D., & Shipman, V. C. Maternal influences upon early learning: The cognitive environments of urban preschool children. In R. D. Hess & R. M. Bear (Eds.), Early education. Chicago: Aldine, 1968.

Johnson, D. L., Leler, H., Rios, L., Brandt, L., Kahn, A. J., Mazeika, E., Frede, M., & Bisett, B. The Houston Parent-Child Development Center: A parent education program for Mexican-American families. American Journal of Orthopsychiatry, 1974, 44, 121-128.

Kerlinger, F. N., & Pedhazur, E. J. Multiple regression in behavioral research. New York: Holt, Rinehart and Winston, 1973.

Leler, H. O. Mother-child interaction and language performance in young disadvantaged Negro children. Dissertation Abstracts International, 1971, 31(8), 4971-B.

Lewis, M., & Goldberg, S. Perceptual-cognitive development in infancy: A generalized expectancy model as a function of the mother-infant interaction. Merrill-Palmer Quarterly, 1969, 15, 81-100.

Lewis, M., Weinraub, M., & Ban, P. Mothers and fathers, girls and boys: Attachment behavior in the first two years of life. Research Bulletin 72-60. Princeton, N. J.: Educational Testing Service, 1972.

Loewenstein, S. F. An observational study of mothers and their children. Dissertation Abstracts International, 1971, 31(8), 4971-4972-B.

Lytton, H. Observation studies of parent-child interaction: A methodological review. Child Development, 1971, 42, 651-684.

Minton, C., Kagan, J., & Levine, J. A. Maternal control and obedience in the two-year-old. Child Development, 1971, 42, 1873-1894.

Patterson, G. R., & Cobb, J. A. Stimulus control for classes of noxious behaviors. Paper presented at the University of Iowa, May, 1971. Part of symposium, The control of aggression: Implications from basic research.

Piaget, J. The origins of intelligence in children. (Translation by M. Cook) New York: Norton, 1963.

Radin, N. Maternal warmth, achievement motivation, and cognitive functioning in lower-class preschool children. Child Development, 1971, 42, 1560-1565.

Radin, N. Father-child interaction and the intellectual functioning of four-year-old boys. Developmental Psychology, 1972, 6, 353-361.

Rubenstein, J. Maternal attentiveness and subsequent exploratory behavior in the infant. Child Development, 1967, 38, 1089-1100.

Smith, H. T. A comparison of interview and observation methods of maternal behavior. Journal of Abnormal and Social Psychology, 1958, 57, 278-282.

Vaughan, G. M., & Corballis, M. C. Beyond tests of significance: Estimating strength of effects in selected ANOVA designs. Psychological Bulletin, 1969, 72, 204-213.

White, B. L., Kaban, B., Marmor, J., & Shapiro, B. Preschool project: Child rearing practices and the development of competence. Final report, Grant No. CG-9909 A/2, Office of Economic Opportunity, Head Start Division. September, 1972.

Wiegerink, R., & Weikart, D. P. Measurement of mother teaching styles. Proceedings, 75th Annual Convention, APA. 1967, 333-334.

Wright, H. F. Observational child study. In P. H. Mussen (Ed.), Handbook of research methods in child development. New York: Wiley, 1960.

Yarrow, M. R. Problems of method in parent-child research. Child Development, 1963, 34, 215-226.

APPENDIX A

Rating Scales

1. Rating Scale for Mother's Affectionateness

Rate the mother's expression of affection to the child personally. Does she manifest an intense personal affection to the child; a warm, temperate emotion; or a cool aloof attitude? What is her most typical behavior?

1. Cool, aloof, distant.
2.
3. Objective, inhibited, neutral, matter-of-fact.
4.
5. Temperate, fond, attached, forgiving, kind.
6.
7. Affectionate, warm, fondling, loving, expressive.
8.
9. Passionate, consuming, intense, ardent, uncontrolled.

2. Rating Scale for Mother's Use of Praise

Rate the mother's tendency to praise the child's behavior during the tasks, conveyed both in words and tone. Does the mother lavish praise upon the child, or does she allow his successes to go unacknowledged? Rate independently of the mother's tendency to criticize the child.

1. Mother never praises the child nor shows approval, either in words or tone.
2. Mother praises very little and/or shows little approval in words or tone, providing mostly mere feedback.
3. Mother praises the child occasionally and/or shows moderate approval in words or tone. She tends to praise the child's more important accomplishments but responds to his minor actions with simple feedback.
4. Mother praises somewhat frequently and/or shows fairly enthusiastic approval, either in words or tone, rewarding the child when he concludes both important actions and significant subsections of the tasks.
5. Mother praises the child frequently and/or shows enthusiastic approval, rewarding even the most inconsequential successes.

3. Rating Scale for Mother's Use of Criticism

Rate the mother's tendency to criticize or to be critical of the child's actions. Is she critical of the child in word or tone for every error or inadequate performance, or does she simply help the child to correct his errors or perform without criticizing him? Rate independently of the mother's tendency to praise the child.

1. Mother never criticizes the child or is critical in words or tone; merely provides feedback.
2. Mother rarely criticizes, is rarely critical in words or tone, reacts to most errors with simple feedback.
3. Mother is somewhat critical in words or tone. She criticizes the child occasionally for poor performance.
4. Mother is fairly critical, in frequency and/or intensity expressing disapproval of the child for poor performance.
5. Mother is frequently and/or intensely critical of the child in word or in tone, punishing even the smallest errors or lacks in performance.

4. Rating Scale for Mother's Control of Child Behavior

Rate the extent to which the mother discourages the child's independence (child's self-help, making choices and decisions, taking initiative, evaluating own behavior, etc.) by giving unsolicited direction, help, and guidance to regulate child's behavior. This scale does not consider the mother's direction and help which are in response to child's solicitations, i.e., child's requests and behavioral solicitations (helplessness, difficulties, passivity, fatigue, etc.).

1. Gives no unsolicited help. Laissez-faire or permissive regarding child's independence.
2. Gives unsolicited help only rarely and with weak intensity.
3. Gives unsolicited help and guidance with moderate frequency. Help tends to be moderate in intensity, e.g., encouraging requests, reasoning, suggestions, hints and/or information, etc., rather than strong directive comments or physical help such as doing the puzzles.
4. Gives considerable unsolicited direction. Help is frequent and/or fairly intense.
5. Discourages child's independence and encourages dependency by giving frequent unsolicited direction, help, and guidance, help is strong in intensity, e.g., directive structuring of tasks and of child's behavior when used as guidance, demonstrating techniques, helping to do the puzzle, etc.

5. Rating Scale for Mother's Use of Reasoning with Child

Rate the extent to which the mother uses reasoning (explaining or describing positive or negative consequences of actions) to influence child's behavior or in response to child's questions, disobedience, or other behavior. Includes listening to child's views and trying to take them into account when presenting own reasoning. Examples of reasoning: describing a self-injury consequence to discourage defiant behavior, asking logical questions (asking whether a dog lives in a fish bowl).

1. No use of reasoning.
2. A little use of reasoning.
3. Moderate or occasional use of reasoning. Not necessarily emphasized.
4. Considerable use of reasoning. Fairly frequent and emphasized.
5. Constant use of reasoning. High in frequency and strongly emphasized.

6. Rating Scale for Mother's Encouragement of Child's Verbalizations

Rate the extent to which the mother encourages and responds to the child's statements and questions. This encouragement includes: responding to his verbalizations frequently; making full responses drawing him out with questions; listening attentively and with interest; showing approval of his communications and ideas.

1. No encouragement of child's verbalizations as evidenced by failure to respond to them and ignoring his questions.
2. A little encouragement of child's verbalizations: infrequent and weak.
3. Moderate encouragement of child's verbalizations: moderate frequency and strength.
4. Considerable encouragement of child's verbalizations: frequent and somewhat strong.
5. Constant and strong encouragement of child's verbalizations.

7. Rating Scale for Child's Verbal Communication

Rate the amount and quality of the child's verbal communications with the mother. Does he communicate actively and fully, does he respond briefly, or usually not at all?

1. Almost never communicates verbally with mother, never or almost never responds to her statements and questions, never or almost never initiates statements and questions, responds very briefly if at all.
2. Communicates verbally a little or occasionally, usually responds to her statements and questions briefly; rarely initiates statements and questions.
3. Communicates verbally with the mother to a moderate degree. Usually responds to her statements and questions adequately but not fully, sometimes initiates statements and questions.
4. Communicates verbally with the mother considerably. Usually responds to her statements and questions, fairly fully; somewhat frequently initiates statements and questions.
5. Communicates verbally with the mother constantly as evidenced by: active participation in responding to her statements and questions, frequent initiation of questions and statements, and responses which are comparatively full.

8. Rating Scale for Mother Interest

9. Rating Scale for Child Interest

1. Not involved, uninterested in task.
2. Little involvement, little interest.
3. Moderate involvement, moderate interest.
4. Great amount of involvement and interest.

10. Rating Scale for Mother-Child Interaction

1. No interaction
2. Very little interaction
3. Moderate or intermittent interaction
4. High interaction

11. Rating Scale for Child's Enjoyment of the Situation - Typical
12. Rating Scale for Child's Enjoyment of the Situation - Low Point
13. Rating Scale for Child's Enjoyment of the Situation - High Point

1. Child seems extremely frustrated--screaming or crying or hitting mother angrily, throwing toys, throwing tantrum.
2. Child seems somewhat frustrated--frowning, complaining, reluctant, non-compliant, rebellious and/or bored expression.
3. Child's expression neutral--passively complying, neither frustrated or happy expression--registers no obvious excitement but doesn't appear to be bored.
4. Child seems to be enjoying situation to some extent--occasionally smiling and/or seems slightly excited.
5. Child seems to be thoroughly enjoying situation--smiling quite a bit and/or laughing; appears to be very excited.

APPENDIX B

Videotape Rating Training Procedures and Reliability

VIDEOTAPE RATING TRAINING PROCEDURES AND RELIABILITY

Training of a videotape rater proceeds in several steps. First is general discussion with the supervisor and other raters about the general nature of the scales and the goals of the rating procedure. Then follows group viewing of videotapes, accompanied by discussion of the observed behavior and rationale for the ratings to be given that behavior. Next, the trainee works intensively with one other rater. They follow the standard rating procedure together, both independently rating behavior and then comparing and discussing their ratings. When the trainee has mastered the procedure and all scales, a formal reliability check is performed. Any discrepancies are subject to further training. When a reliability check indicates mastery of all scales, the rater is allowed to rate independently, but continues to be subject to regular random reliability checks. The entire training sequence takes two or three months.

Two measures of reliability are used. The first is the percentage of exact agreement between two raters on each scale. The second measure is gamma, an ordinal level statistic which estimates the degree to which the ratings of the two raters are correlated. Gamma ranges from 0.0 to 1.0, with high scores indicating low discrepancy between raters. Reliability data for the ratings of the tapes used in this study are found in Table 31. The two raters were the supervisor and a trained rater.

Table 31

Reliability of Rating Scales:
Percentage of Exact Agreement and Gamma

Scale	%	Gamma
Child's Interest	72.9	.86
Child Enjoyment - Typical	100.0	1.00
Child Enjoyment - Low	100.0	1.00
Child Enjoyment - High	100.0	1.00
Child's Verbalization	79.2	.99
Mother's Interest	87.5	.98
Mother's Interaction	83.3	.96
Mother's Affection	81.2	.97
Mother's Praise	79.2	.96
Mother's Criticism	87.5	.99
Mother's Control	72.1	.82
Mother's Reasoning	87.5	.99
Mother's Encourage Verbal	87.5	1.00

Note.-Number of segments rated = 48.