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**Differences in maternal verbalizations and involvement during
Hawaiian mother-child interactions**

Dick-Barnes, Margaret Lilja, Ph.D.

The University of North Carolina at Greensboro, 1986

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DIFFERENCES IN MATERNAL VERBALIZATIONS AND INVOLVEMENT
DURING HAWAIIAN MOTHER-CHILD INTERACTIONS

by

Margaret Lilja Dick-Barnes

A Dissertation Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
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APPROVAL PAGE

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This dissertation examined differences in the behavior of middle and low socioeconomic status (SES) mothers during interactions with their preschool age children while engaged in free-play and task-oriented sessions. The maternal variables of interest were complexity of maternal speech and the degree of involvement during interactions with their children. The relationship between these variables and children's performance on cognitive and language tasks was also examined.

Forty Hawaiian/part Hawaiian mother-child dyads were recruited to participate in this study (20 middle- and 20 low-SES). Dyads made two visits. During the first visit, mothers and their children were videotaped together for 20 minutes in a free-play session and 10 minutes in a task-oriented session. At the end of the videotaping session the children were administered the Peabody Picture Vocabulary Test-Revised (PPVT-R). During the second visit the children were administered the Wechsler Preschool and Primary Scale of Intelligence (WPPSI).

Videotapes were coded for complexity of maternal verbalizations and for the frequency and duration of maternal involvement. A modified version of Sigel, McGillicuddy-DeLisi and Johnson's (1980) coding system designed to code verbalizations according to the cognitive

demands placed on the listener (low, intermediate or high levels of distancing and task-management statements) was used. Tapes were also coded for maternal degree of involvement (mutual activity, passive participation, independent play and no clear activity) according to a modified version of Farran and Haskins (1980) Reciprocal Control Categories.

In short, the results indicated that there were no differences according to SES in how involved mothers were with their children. In addition, when collapsed across sessions, middle- and low-SES mothers engaged in comparable amounts of verbalizations with their children. However, mothers did differ in the complexity of the verbal interactions with their children. Middle-SES mothers engaged their children using more high level and intermediate level distancing strategies than did low-SES mothers. Low-SES mothers engaged their children by using more task-management statements than did middle-SES mothers. There were significant correlations between maternal complexity of speech and children's performance on the PPVT-R and WPPSI.

These findings are examined in detail and interpretations discussed.

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CHAPTER 1

INTRODUCTION

The present study was concerned with an examination of the effects of environmental variables on children's performance. More specifically, the emphasis of this study was on the influence of maternal verbalizations and degree of maternal involvement on children's cognitive and language development. Differences exhibited according to socioeconomic status in maternal verbalizations and degree of maternal involvement during maternal-child interactions were examined. In addition, maternal behaviors were observed in two separate conditions in order to examine issues concerning skills suppression as opposed to skills deficits.

The chapter begins with a discussion of studies which preceded and prompted examinations of environmental influences in relation to childrens' later academic, language and cognitive performance. Theoretical perspectives that have driven much of the research in early education and there implications are discussed. The varied outcomes of the first early education programs are examined. The relationship of language to cognitive development and there relationship to cognitive and academic achievement is also examined. A detailed examination of the relationship of

mother-child interactional styles to childrens' language and cognitive performance proceeds from that point, including descriptions of the various ways that dyadic interactions have been assessed. Finally, the present study is introduced and outlined, including a statement of the experimental hypotheses.

Early Experience and Performance

The role of poverty in the prediction of early school failure has been the focus of considerable concern since at least the early 1960's (Tough, 1982). A large body of research has demonstrated the effects of social class differences on intelligence tests, achievement tests, school grades, and a variety of other measures (Coleman et al., 1966; Deutsch, 1973; and Hess, 1970). Relatedly, it has been observed that not only do lower-class children begin school at a less academically advanced level than middle-class children, but their performance continues to deteriorate, widening the gap over time (Ausubel, 1964; Lazar & Darlington, 1982).

Early education intervention programs became a popular means of attempting to counteract the detrimental effects of poverty on young, at-risk children during the late 1960's

(Lazar & Darlington, 1982). The theoretical foundations of early intervention programs can be traced in part to the works of Hebb (1949), Hunt (1961), and Harlow (1962). Hebb (1949) empirically demonstrated the effects of early experience and environment on performance by manipulating the quality of the rearing environment of laboratory rats. One group of rats was home-reared, which provided an enriched environment, while the other group was laboratory-reared, which provided a deprived environment. On a maze learning task, Hebb found that the animals raised as pets performed better initially and improved more over time than did the laboratory-reared animals. This led Hebb to conclude "that the richer experience of the pet group during development made them better able to profit by new experience at maturity - one of the characteristics of the 'intelligent' human being" (pp.298-299). Harlow (1962) in a series of studies concerned with the social and maternal deprivation of infant rhesus monkeys, demonstrated that early maternal deprivation resulted in the development of socially abnormal adults. These maternally deprived monkeys developed into socially isolated and socially inept adults. Their overall ability to adapt to changing environments was impaired. This research suggested that early deprivation resulted in a permanent deficit in later social and problem-solving ability (Zigler & Berman, 1983).

Analogue studies of the effects of early deprivation on laboratory animals were important. They allowed for the systematic manipulation and observation of the effects of early deprivation (manipulations that were neither morally nor ethically acceptable with humans) and contributed to the growing emphasis on children's early environments. Early education programs were established in the hopes that the detrimental effects of being reared in poverty could be offset by these programs. Early education programs were expected to provide immediate and long-term benefits that would result in the elimination of class differences upon school entry and would endure through later years (Zigler & Berman, 1983).

Based on the animal literature, Hunt (1961) theorized the possibility of promoting greater intellectual development by "governing the encounters that children have with their environment, especially during the early years of their development" (p.363). He argued that intelligence is neither fixed nor predetermined by heredity. By incorporating Piaget's concepts of assimilation and accommodation into this theory, Hunt proposed that an individual's cognitive development was dependent on the match between the child's internal level of intellectual development and the stimuli available in the child's environment. Further, Bloom (1964) indicated that 50 percent of an individual's intellectual development had occurred by

age four. Based on these studies (and others) the consensus grew that environmental intervention would have the greatest effects if implemented in the early years of high intellectual growth.

The Cultural Deficit vs Cultural Difference Model

Different theoretical perspectives have affected the orientation of early education programs. The cultural deficit model, which was popular in the 1960's, proposed that the performance differences noted in lower-class children as opposed to their middle-class peers were due to skill deficits that were a result of their deprived and culturally disadvantaged environments (Moore, 1982; and Ogbu, 1982). This model posited that low-socioeconomic status (SES) children arrived at school with skills which were inadequate for successful academic performance (Ogbu, 1982). Thus, early intervention programs were designed to provide poverty children with experiences that were not readily available in their impoverished home environments (Zigler & Berman, 1983). The implication of this model was that the culture of the lower-class was inferior to that which was required in the schools (typically a white middle-class culture). Thus, the goal became to shape lower-class children into a white middle-class mold.

In contrast to the cultural bias implicit in the deficit model (that a white middle-class culture is superior to other cultures) a perspective which emphasized the cultural differences between children's skills developed (Moore, 1982). The difference model, as it is known, conceptualized lower-class environments as culturally different rather than deficient. These differences resulted in children acquiring different skills, different strengths and weaknesses as compared to their middle-class peers (Lazar, 1981). The difference model posited that one's natal culture shapes the skills required for adaptation and for maximal reinforcement within that culture. This would account for findings such as those reported by Yando, Seitz and Zigler (1979) in which lower-class children performed better on tasks requiring creative thinking while middle-class children performed better on tasks requiring more traditional academic skills. These respective skills may have more (or less) salience in the respective cultures, contributing to the differences in scores. The authors conclude that many of the differences between SES groups reflect "stylistic patterns rather than capacity differences" (p.107).

The difference model encouraged a more productive approach to intervention by trying to build on the strengths that children brought to programs rather than attempting to change the children themselves. By adopting a difference

rather than a deficit model, optimal development was no longer sought by inculcating middle-class values but rather, by promoting techniques which allowed personal potential to flourish in other than a middle-class setting (Zigler & Berman, 1983).

The controversy continues over the applicability of the deficit or difference model. The issues surrounding the controversy include the observation that when the skills learned in middle-SES families are favored (reinforced) in academic settings over the skills learned in lower-SES families the lower-SES skills are frequently viewed as unfavorable, undesirable or merely irrelevant (a deficit). Thus, cultural differences can easily be reduced to skills deficits when the testing environment is one which favors a particular culture. This is frequently the case within the classroom where a white, middle-class culture is often in place.

It is important to take into account the context in which skills are assessed. For instance, the verbal skills of black children are adaptive for survival in their culture, but their verbal skills are not appropriate for effective performance in a white, middle-class school environment (Ogbu, 1982). The most common means of remediating these so called skills deficits exhibited by low-SES children within a school environment is to concentrate on the individual child in the hopes that the

extra attention while in school will improve the child's skills. However, this is often unsuccessful since it requires a great deal of individual time by teachers and is often not carried over into the child's home and social environment. As a result, many children who exhibit difficulties in school continue to do so throughout their school careers continuing the myth that low-SES children are less capable of learning (Ogbu, 1982).

An alternative to the above approach is to develop a school program that is compatible with the natal culture of the children being served. Such a program is presently in place in Hawaii, at the Kamehameha Elementary Education Program (KEEP). The KEEP classrooms have been designed to compliment the native Hawaiian culture of the children who attend the program. Children who have been in the KEEP program have exhibited significant increases in their scores on standardized tests as compared to children in control groups (Tharp, Jordan, Speidel, Au, Klein, Calkins, Sloat and Gallimore, 1984). It appears that by developing programs that are compatible with children's home environment significant educational gains can be produced.

Unfortunately, the distinctions between the deficit model and the difference model, while important, are not always clear. The confusing nature of the issues within the deficit-difference controversy can be seen in interpretations of the theoretical base of early education

programs. For instance, Stipek, Valentine, and Zigler (1979) describe the Head Start Program as being theoretically grounded in the cultural deficit model. Yet, Zigler (the same author as cited just previously) and Berman (1983) describe the Head Start Program as being able to avoid the deficit model and adopt rather a "cultural relativistic" model (difference model). The differences in interpretations illustrate the difficulties involved in clearly defining a program as stemming from a deficit or difference model. Although it is sometimes difficult to make and keep a clear distinction between the two models, it is important to do so since the emphases brought to an intervention program are dependent on the theoretical perspective.

It is important to keep in mind that while programs such as the KEEP program are feasible when servicing large, isolated cultural groups such as the Hawaiians, they are not as feasible when trying to service groups of children from varied cultural backgrounds. For the most part it appears that schools will continue to be white, middle-class in their orientation. Therefore, children who are not reared in that environment are more likely to have difficulties within the school system. The alternative is to concentrate on the child's early environment in order to teach the skills that will be needed in order to function within the context of the school system. These concerns contributed to the development of early education programs.

Effectiveness of Early Education Programs

Project Head Start, one of the earliest and best known of the early education programs, was an outgrowth of the War on Poverty in the early 1960's. Optimism was high and the belief was strong that such early education programs would significantly improve the cognitive and social functioning of children reared in poverty, and that these changes would endure through adulthood (Lazar & Darlington, 1982). However, the first evaluations of Head Start and other early education programs were less than optimistic.

For example, the Westinghouse Study (Cicirelle et al., 1969) concluded that the gains of Head Start children were initially pronounced but short-lived, resulting in no significant long-term gains in either cognitive or social development. Other findings, such as those in Bronfenbrenner's review (1974) also noted the temporary nature of gains made in early education programs. However, on reanalysis of the Westinghouse Study, critics maintained that there were considerable methodological problems with the study (Campbell & Erlebacher, 1975; White, 1970). These problems included an inadequate research design, weak measures, and a failure to follow-up children far enough into their school careers (Lazar & Darlington, 1982).

Critics also noted that parental behavior, attitudes and observations were not assessed in the first evaluations

of preschool programs (Robinson & Choper, 1979). By including parental information in their evaluation of Head Start, Robinson and Choper (1979) concluded that parental participation in Head Start led to greater community participation both during their child's enrollment in Head Start and after. They also concluded that parents' attitudes and beliefs about their children were positively affected by participation. These changes included increases in positive mother-child interactions and parental involvement in later school programs.

More recent findings, particularly findings reported by the Consortium for Longitudinal Studies (Darlington et al., 1980; Lazar & Darlington, 1982), have renewed the optimism that once surrounded early education programs. The Consortium of Longitudinal Studies refers to the collaborative effort of a group of investigators who independently designed and conducted preschool programs for at-risk children from low-income families during the 1960's. These researchers pooled their original data and jointly conducted a follow-up study in order to investigate both the short and long-term gains of their programs. The Consortium has presented evidence of gains that span over a decade after the children's preschool experience. These gains were not revealed as IQ gains but rather as gains in the children's "social competence" (Zigler & Berman, 1983). Children from the early education programs were less likely

than their control peers to be placed in special education classes and were more likely to remain in the appropriate grade for their age. These findings and others (i.e., Wilson & Herbert, 1978; Zigler & Trickett, 1978), suggest that the measures related to early intervention success need not be narrowly defined as IQ gains but should be expanded to include measures of both academic as well as social competence.

In an attempt to further the educational gains obtained from early education programs it has been argued that intervention needs to begin earlier, during the infancy years. The Abecedarian Project is one of the programs developed that emphasizes the need to begin intervention early. Components of this project include; prenatal care; maternal and infant nutritional supplementation; parent education; and infant daycare (Ramey & Haskins, 1981). The Abecedarian Project, which began in the mid-1970's, continues to this date and is involved in the collection and evaluation of longitudinal data on the children who are and have been in the program. Thus far, the data suggest that educational intervention beginning in infancy can prevent declines in measured intelligence during early childhood. The magnitude of the effects of daycare on IQ appears to be approximately one standard deviation, suggesting that early intervention may have a profound effect on intelligence in low-income children (Ramey & Farran, 1983).

In sum, evaluations of early education programs conclude that these programs are successful in the short-term by raising IQ and in the long-term by improving the adaptability and sociability of children from low-SES backgrounds. Efforts continue in order to find ways to improve the long-term gains of early intervention programs. By keeping in mind the context of school evaluations and by attending to the cultural differences that may be contributing to children's difficulties in academic settings, programs can be developed that teach children the skills that are not emphasized in the home but are needed in order to succeed in school. Ways proposed to remediate these differences vary. As suggested earlier, some feel that intervention needs to begin sooner while children are still in their infancy (Ramey & Haskins, 1981). Others argue that the age of intervention is relatively unimportant, citing that children are flexible enough to withstand early deprivation and that consistency of intervention over a long period of time is what is needed (Clarke & Clarke, 1976). Still others emphasize the need to study cognitive development within the home environment rather than within the school environment in an attempt to better understand familial influences and to increase the likelihood that permanent gains will be maintained (Laosa, 1982). A final group argues the need to study the types of cognitive demands placed on children in order to promote optimal

cognitive development (Sigel, 1982). All, however, emphasize the need to understand the predominant environment (often the home) in order to effectively intervene academically.

Language and Cognitive Development

Understanding the skills taught within a child's home environment would yield valuable information about that child's ability to perform within a school environment. The cognitive skills emphasized within the home are likely to form the nucleus of skills that the child will exhibit within an academic environment. Children who are not exposed to the types of environments which produce cognitive skills that are frequently required in school are more likely to have difficulty with those cognitive skills than children who have been exposed to them. By examining the types of cognitive skills that are emphasized in the home, important differences (i.e., according to culture or SES), might be revealed.

One avenue to explore differences in cognitive abilities is through an examination of the language skills that are exhibited by children from differing SES backgrounds (Feagans & Farran, 1982). It has been repeatedly noted that the core of many of the cognitive performance differences on intelligence and achievement tests is

differences in language skills (Ramey, Sparling & Wasik, 1981). Item analyses of children's performance on intelligence test have been conducted to identify the areas most closely associated with SES. From an early item analysis conducted by Ellis et al. (1951), Hess (1970) concluded that "mean SES differences were largest for verbal items and smallest for picture, geometric design, and stylized drawing items" (p.57). More recently, Ramey and Campbell (1977) compared an experimental preschool group of low-SES children to a control group of low-SES children. The authors have concluded that the differences between the experimental group and the control group on the Bayley Mental Development Index at 18 months and on the Stanford-Binet at 24 and 36 months were due to the control group's higher rate of failure on language items. At 30 months, the control group's below average performance on the Verbal Scale of the McCarthy Scales of Children's Abilities also supported the hypothesis that poor language skills were contributing to the lower intellectual performance of the low-SES control children. More and more researchers have begun to concentrate on children's verbal skills as being predictive of their cognitive abilities (Ramey et al., 1981).

Theories of Language and Cognitive Development

The evidence that verbal abilities are closely related to measures of cognitive abilities is central to theories

such as those developed by Piaget; the soviet researchers, Vygotsky and Luria; and Staats's social-behavioral model. The views on this relationship differ considerably between these theorists.

Piaget argued that language develops after or behind cognition (Bronchart & Ventouras-Spycher, 1979). As Piaget stated in 1968 "...intelligence precedes language, not only ontogenetically...but phylogenetically, as numerous experiments dealing with intelligence in the higher orders of monkeys have proven." (p.79). According to Piaget, language is conceptualized as a tool for individual representation of some object or concept. Language can be utilized to represent events or objects in the individual's experience. Other representational tools available to individuals include physical gestures and art (i.e., painting, music, sculpture, and sign language). According to Piaget, language development follows cognitive development and serves functionally as a representational tool. Given this, language development is dependent on cognitive development, therefore deficits in language skills are reflective of cognitive deficits.

Piaget concentrated on the functional aspects of language by defining it as a representational tool, deemphasizing its social and communicative properties. Meanwhile, Soviets such as Vygotsky, emphasized the social and communicative properties of language and made these

characteristics the focus of their investigations.

Vygotsky's basic premise was that language was a social tool for communication as well as a tool for representation (Vygotsky, 1962). Vygotsky argued against the Piagetian notions regarding the relationship between cognition and language. He conceptualized language as developing from two distinct sources; an intellectual source and a vocal-social source (Bronchart & Ventouras-Spycher, 1979). Vygotsky posited that during the first year of life a child possessed intelligent but non-verbal behavior and socially based, non-intellectual vocalizations (similar to the intellectual and vocal capacities of higher-order apes). Later, as the child progressed and developed, the two processes of vocalizations and intellect merged resulting in thought that was verbal and language that was intellectual (Vygotsky, 1962; Bronchart & Ventouras-Spycher, 1979). Unlike Piaget, Vygotsky suggested that language does not follow cognition but develops in parallel and merges during development. When the vocal-social aspects and the intellectual-representational aspects of language merged, a "revolution" of verbal-cognitive capacity resulted. Thus, Vygotsky viewed language and cognitive development as being dependent on the other, each influencing the others development.

The differences between Piaget and Vygotsky become even more apparent when discussing the role of language in an individual's later development. Since Piaget has argued that

language is neither necessary nor sufficient for cognitive development (Bronchart & Ventouras-Spycher, 1979) he saw no reason to talk about the interactions between language and behavior in general. In his view language cannot influence development or behavior in any way, but "simply happen(s) to be particularly good for representing the highly elaborate operations of formal thought" (Bronchart & Ventouras-Spycher, 1979, p.11). Vygotsky, on the other hand, has argued that language plays a crucial role in later development, taking control of an individual's behavior over a period of time. Vygotsky (1962) has described this process as occurring in three phases. First, the child merely imitates the verbal productions of adults with no understanding. Then as the child matures he/she begins to verbalize in conjunction with their motor behavior (this he called egocentric speech), the child talks him/herself through the task he/she is engaged in. In the final stage, language becomes internalized or goes "underground". Vygotsky (1962) has referred to this final stage as "inner, soundless speech" (p.47), or verbal-thought. He has defined verbal-thought schematically as being the intersecting portion of two overlapping circles of thought and language. At this stage, internal speech takes on a regulatory or organizational role over behavior.

Luria (1961, 1963) has illustrated and expanded Vygotsky's position by experimentally demonstrating the

regulatory powers of language on motor behavior. He has demonstrated that the motor behavior of young children is first exclusively under the control of adult speech. As the child matures, his or her motor behavior becomes self-regulated, but only by the "impulsive" or rhythmic qualities of speech. Then, finally, the semantic quality of a child's speech takes over and exerts control over the child's motor behavior.

Luria emphasized the cultural-social influences on language and cognitive development (Oleron, 1977). He felt that language allowed an individual to go beyond his or her own personal experience, permitting the ability to participate in social and historical experiences. He speculated that the ability of language to allow comprehension beyond personal experience "permitted cognitive abilities of a much more complex and profound nature" (Luria & Yudovich, 1959, p.11). By cognitive abilities Luria meant skills such as planning along with the various stages and operations of planning such as classification.

The views on the relationship between thought and language presented by Piaget and the Soviets differ considerably from the views held by many behaviorists. Skinner has frequently noted the "The variables of which human behavior is a function lie in the environment." (Skinner, 1978, p.97). Historically, Skinner has argued that

mentalistic terms such as "thought" refer to internal constructs which add little to the analysis or understanding of human behavior. Internal constructs such as "thought", "mind", and "cognition" are merely inventions of processes that are said to initiate behavior. Inventions such as these are unnecessary. The behavioral view emphasizes that one needs to speak of "thoughtful behavior" not "thought". For instance, thoughtful behaviors that are frequently referred to in academic settings include sequences of verbal and motoric behavior that allow for complex problem-solving, i.e. verbally labeling the problem, verbal sequences that are cued by the labeling process, and mechanical sequences that are cued by the labeling process.

Along the same lines, Staats (1975) argues that what is frequently referred to as cognitive development or ability is often, under close analysis, revealed to be examples of language repertoires that have been learned by the individual. He speculates that one of the reasons that intelligence and language measures correlate is because they are in good part measures of the same thing (p. 146). Therefore, measures of intelligence are merely measures of behavior (both verbal and motoric) which are elicited by the individual due to the stimulus properties of the test materials and the past learning history of the individual. One need not infer some internal quality known as "intelligence", "cognition" or "thought" to explain how a

person came to emit a certain behavior, rather one need only observe the emitted behavior and the environmental contingencies supporting that behavior.

Staats (1968c, 1971a, 1971b, 1975) discusses a model of language learning based on basic learning principles. He proposes that children learn to speak largely from their parents (some learning does occur from other adults, siblings and peers). He argues that parents, from the time of their child's birth, modify their own speech in a way that gradually shapes children into competent users of language. Parents begin gradually by responding to and reinforcing the infant's early vocalizations. Parents also begin to engage their infants by imitating the sounds made by the infant's and by reinforcing the infant's imitation of the parent's vocalizations. Gradually children are shaped to one-word sentences, then two-word sentences on up to more complex sentences.

Staats discusses the importance of parents being sensitive to cues which indicate how rapidly to advance the language training. Staats speculates that some parents are better teachers of language, being more sensitive to the behavioral cues given by the child (i.e., the child mastering one-word sentences). He further speculates that parents who are better trainers of language produce children who exhibit better language skills themselves and who

therefore score better on tests which measure those types of skills (Staats, 1971a. p.296).

Both Staats and the Soviets agree that language develops within a social milieu and as a result of social pressure to engage in verbal behavior. Thus, differences that are observed between individuals' language skills are attributable to differences in the social environment. These beliefs have led researchers to examine the social environments in which children develop in order to better understand the learning of specific language skills (Ramey, Sparling & Wasik, 1981).

Since most children's early environment consists primarily of interacting with their parents (especially their mothers) (Rebelsky & Hanks, 1977), environmental studies have begun to focus on the mother-child interactions as an important source of information regarding childrens' language and cognitive development. Generally, researchers hope to gain a better understanding of children's development by studying mother-child interactions. Specifically they hope to gain an understanding of how differences in language and cognitive development relate to linguistic practices in the home (Ramey et al., 1981).

Mother-Child Interactional Studies

It has become increasingly apparent that certain aspects of the mother-child relationship can affect the later competence of the child (Olson, Bates & Bayley, 1984). For instance, research suggests that an infant's ability to learn is enhanced when the infant's behavior is followed immediately by positive feedback (Finkelstein & Ramey, 1977). Other research indicates that mothers who provide relatively high amounts of verbal and motor stimulation during times of interaction with their infants tend to have infants who are developmentally advanced (Carew, 1980; Clarke-Stewart, 1973; Elardo, Bradley & Caldwell, 1975, 1977). However, critics have argued that genetic variability can account for the correlational associations between mother-child interactional styles and a child's cognitive competence (Olson et al., 1984).

It is undoubtedly true that genetic factors account for some of the individual differences noted in children's intellectual competence, but not all (Olson et al., 1984). For instance, adoption studies have reported significant relationships between adoptive mothers' behaviors and children's intellectual development. Beckwith (1971) has reported a study which examined the effects of environmental variables on the intellectual development of 24 infants who

were adopted at the age of 5-10 days old and then tested at approximately 8 and 10 months of age. The results revealed that the infants' Cattell IQ scores did correlate significantly with their biological mothers' socioeconomic class ($r = .29$). However, environmental variables also correlated significantly with the infants' IQ scores. Adoptive maternal behaviors such as the amount of physical and verbal contact correlated $r = .37$ with the infants' Cattell scores. Other behaviors such as "the missed amount of opportunity given to the baby to explore", "how much mother ignored the baby", and "the amount of experience with other people than mother" also significantly correlated with the infants' IQ scores. While the results indicated that the natural mother's socioeconomic class affected her infant's performance on the Cattell, they also indicated that the adoptive mother's caretaking behavior played at least an equally important role in predicting the infant's performance.

Another study reported by Hardy-Brown, Plomin and De Fries (1981) investigated the genetic and environmental influences on the rate of communication development with adopted one-year-old children. The investigators assessed the cognitive skills of both the adoptive mothers and the biological mothers along a battery of cognitive tests. They also measured aspects of the infant's home environments (adoptive homes) which included measures of socioeconomic

status as well as measures of maternal interactions such as maternal socializations and imitation of the infant. Measures of communicative development were collected and included measures of vocalizations, gesturing and imitation. The results indicated that genetic influences accounted for some part of the variance in rate of communicative development ($r = .19$) but that environmental variables played an equally important role. Significant relationships were found between the child's communicative development and the adoptive mothers vocal imitation of the child and the vocal responsivity to the child ($r = .17$).

Additionally, Ramey and Haskins (1981) conducted a study in which 52 high-risk infants were randomly assigned to an experimental or a control group. The experimental group participated in an educational daycare program between the ages of 3 and 36 months, while the control group received appropriate physical-nutritional care and social work services between those ages. The results indicated that the experimental group "maintained normal intellectual growth" ($p.5$) while the control group exhibited declines in IQ between 12 and 18 months and remained significantly lower than experimental children through 36 months of age. Perhaps more importantly, the correlation between mother's and child's IQ's for the control dyads was $r = .43$. This is approximately what is expected if it is assumed that the child shares half of the mother's genetic material. However,

the experimental dyads exhibited a correlation of $r = -.05$. The authors concluded that "these two types of evidence are interpreted as support for the importance of early environments in the development of intelligence" (p. 5).

Given the results of these studies it seems important to continue conducting investigations of environmental influences on children's development. As demonstrated, maternal variables are often the focus of these environmental investigations. Farran (1982) has proposed several reasons why mothers are frequently designated as the primary agent of investigation. One obvious reason is the assumption that the mother is the primary socializing agent of the child and therefore the transmitter of social and cultural norms (Schlossman, 1978). Another argument assumes that even if the mother is not the primary socializing agent of the child, she still represents a model or sample of the types of adult interactional styles that are available to the child. Farran (1982) has cautioned, however, that the assumptions made to justify the study of mothers may be especially inappropriate when studying homes in which extended families are prevalent and in which child-rearing responsibilities may be shared by a number of adults or older-siblings. She has emphasized the need to carefully examine the family context before assuming that any one individual is crucial to the child's development.

Evidence of the importance of maternal interactional style in the second year of life (and up) has been demonstrated by a number of longitudinal studies. One such study was presented by Clarke-Stewart (1973) on the investigation of 36 lower-class mothers and their children, age 9 to 18 months. She examined the behavioral and verbal interactional styles of the mothers with their children and concluded that "(T)he amount of verbal stimulation directed toward the child significantly influenced the child's intellectual development, particularly the ability to comprehend and express language" (p.92-93). Clarke-Stewart also concluded that "(T)he child's cognitive development and the complexity of his play with objects was apparently influenced by the amount of time his mother spent with him playing with materials" (p.93).

Elardo, Bradley and Caldwell (1975; 1976) conducted a longitudinal study to examine the relationship between variables in a child's home environment and the child's language development. The child's home environment was assessed when the child was 6 and 24-months old using the Home Observation for Measurement of the Environment (HOME: Caldwell, Heider & Kaplan, 1968). Each child was then tested at three years on the Illinois Test of Psycholinguistic Abilities. The results demonstrated a strong relationship between language development and the HOME subscales of Emotional and Verbal Responsivity of Mother; Provision of

Appropriate Play Materials; and Maternal Involvement with Child.

More recently, a longitudinal study conducted by Olson et al. (1984) attempted to identify the mother-child variables that were most strongly associated with variations in children's cognitive and verbal performance. One-hundred and twenty-one mother-infant dyads, of varying socioeconomic status, were observed and assessed at 6, 13, and 24 months. The authors concluded that the frequency of maternal verbalizations and positive physical contact were most predictive of later cognitive and language competence at every age.

These longitudinal studies indicate that the degree of both verbal and physical stimulation (responsivity) supplied by the mother throughout the child's development is predictive of the child's later cognitive and language competence. However, maternal responsivity is not predictive of cognitive competence of the child before the age of one. These studies also indicate that differences in the amount of maternal responsivity are associated with the families' socioeconomic status (SES). Tough (1982) and Blank (1982) have argued that the principle social-class difference in maternal speech is the responsivity of mothers to their child's speech. Schachter (1979) has conducted the most extensive study of maternal speech across different socioeconomic and ethnic groups of mother-child dyads. She

concluded that the major differences between low- and middle-income dyads had to do with how responsive the mother was to the child and whether the mothers were talking with the child or talking to the child. Based on Tough's (1977a) position, Farran (1982) has concluded that "participation in dialogues with an adult where several turns are taken on the same topic is crucial to the development of both cognitive and linguistic abilities" (p.33).

Farran and Haskins (1980) reviewed studies which examined mother-child dyadic differences according to SES. They concluded "Summarizing across these results would seem to indicate that middle-income mothers are more involved, less commanding, more indirectly controlling, and more positively reinforcing of their children's behavior." (p.781). However, they also argued that the studies from which these conclusions were drawn did not attempt to evaluate the reciprocal effects of mothers and children. By reciprocal effects, the investigators referred to the child's effects on their mother's behavior, as well as the mother's effects on the child. They emphasized that it is important to conceptualize the mother-child interaction as a two way street, not merely composed of mothers' influence on their children but the reverse as well. By neglecting the reciprocal effects of these interactions, Farran and Haskins (1980) argued that important differences between low-SES dyads and middle-SES dyads may be overlooked.

Thus, Farran and Haskins (1980) examined mother-child interaction patterns of low- and middle-class dyads by utilizing a coding system that focused on the initiation of interactions as well as the responses to those interactions by each member of the dyad. The investigators also examined the frequency and duration of maternal interactions with their children by examining how mothers and their children spent their time (i.e., in mutual play, independent play, passive participation or no clear activity) when together in a relatively unstructured situation. In general, the researchers concluded that the patterns of mother-child interactions did not differ according to SES, that is, mothers and children from both SES groups responded to each other's behavior in similar ways. However, the frequency and duration of mutual play was significantly greater for middle-income dyads than for low-income dyads, while the frequency and duration of independent play and no clear activity was significantly greater for low-income dyads. Thus, middle-income dyads were more involved with each other than were low-income dyads.

The findings of Farran and Haskins (1980) imply that the differences found between social classes in interactional styles are of a quantitative nature. That is, that middle-class mothers interact more with their children than lower-class mothers and it is these differences in the degree of involvement that account for the cognitive

differences in their children. It appears that mothers of each social class have the full range of potential behaviors in their repertoire but don't engage in those behaviors at the same rate.

While Farran and Haskins did examine the reciprocal and quantitative nature of dyadic interactions they did not attempt to examine the nature or quality of the verbal interactions within the dyads. By quality of the verbal interactions what is meant is the complexity of verbal interactions and the types of verbal teaching and language skills employed by the mothers with their children. These variables are felt by some (i.e., Blank, 1980 and Sigel, 1979) to be extremely important in the assessment of mother-child interactions as well as being revealing of important social class differences.

Qualitative Differences in Maternal Verbal Interactions

Concerns about the language development in children has primarily focused on the early acquisition of language rather than on the quality of language skills being learned (Farran, 1982). As a result the language skills used within particular environments were relatively neglected until recently. One of the early efforts to study the ways in which language was used in different environments was conducted by Bernstein (1960). Bernstein argued that the

language utilized by lower-class English parents differed from the language used by middle-class parents. He distinguished the class differences by noting that lower-class parents engaged in what he termed "restricted codes" when communicating with their children. By restricted codes, Bernstein meant language that regulated or limited the contexts in which the child could experience the meaning of the communication, while also limiting the child to only learning about the objective nature of objects. Meanwhile, middle-class parents engaged in "elaborated codes" of communication, or language that was more flexible and in which imagination and innovation were encouraged via the communication from parent to child (Bernstein, 1972).

Influenced by Bernstein's early observations, Hess and Shipman (1965; 1968) examined the talk of mothers from different social backgrounds as they carried out a simple teaching task with their child. The results indicated that middle-class mothers used more efficient teaching strategies than their lower-class peers and that these differences resulted in the children being socialized into different cognitive modes (Tough, 1982). A study conducted by Bee, Van Egeren, Streissguth, Nyman and Leckie (1969) looked more specifically at the parameters of language differences according to SES. They found that "middle-class mothers used longer and more complex sentences, more adjectives, and

fewer personal referents than lower-class mothers" (c.f. Ramey et al., 1981, p.452).

More recently, Blank and her associates (1974; 1975; 1978a; 1978b; 1980) have developed a system to study the complexity of children's speech. Blank has noted that as children develop, their ability to comprehend ideas which are more complex and conceptual also develops. Her interests lay in studying the ways in which children use language to represent and understand complex ideas (Blank & Franklin, 1980). Blank and Franklin (1980) defined complexity of utterances as "the level of conceptualization of the ideas conveyed through one's verbal system" (p.128).

Blank has also addressed the interactions between the complexity of the child's speech and that of the parent. For example, parents frequently speak in full sentences even if their child is only at the state of one word production (Blank & Franklin, 1980). Snow and Ferguson (1977) have speculated that it is important for parents to function at a "higher level" of verbal complexity than may be appropriate for their children's level of complexity since it aids in the ability of the child to attain more complex language skills. However, Blank and Franklin (1980) feel that continued exposure to levels of communication beyond one's understanding may lead to confusion and communication difficulties on the child's part.

These two views can be reconciled by evoking a concept developed by Vygotsky (1978). Vygotsky speculated that an important aspect of teaching within adult-child interactions had to do with the adult's ability to operate at a level somewhat advanced of the child in order to guide the child through the task. However, the adult can not be operating at such an advanced level as to lose the child due to the child's lack of ability. Vygotsky (1978) has labeled this notion as the "zone of proximal development". The zone of proximal development has been defined as "...the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." (Vygotsky, 1978, pp. 85-86). Thus, Vygotsky made a distinction between a child's "actual" level of development and the child's "potential" level of development (Brown & French, 1979). Another way of stating this is that Vygotsky made a distinction between the child's unaided performance on some task and the child's performance given appropriate cues and feedback from some other person who has already mastered the task.

If a child performs a desired behavior with the aid of a parent it can be said that the parent is operating within that child's zone of proximal development but this would be known only because the child is able to perform the desired

behavior. Therefore, it may be more accurate to explain the behavioral process by saying that the parent provides the child with the appropriate cues needed to perform the task. Roberts and Dick (1982) have conceptualized this process as lying along a continuum on which varying degrees of external environmental support are required to initiate and maintain the behaviors of interest (p.276). Thus, behaviors that are under the control of the child (having been mastered) would require less environmental support as compared to behaviors that are not under the child's control. By being sensitive to the child and the amounts of external support needed, parents can successfully teach their children the desired behavior. Therefore, a parent's ability to enrich a child's language skills by engaging in increasingly more diverse and complex speech is important in determining the types of language skills and repertoires learned by the child. Blank, Rose & Berlin (1978a) concluded, in a study concerning parents use of complex language, that children needed facility with more complex language in order to perform adequately in school.

Blank and Franklin (1980) have developed a coding system for assessing the complexity of speech and its effects on communication with young children. Working within a cognitive-mentalistic framework, Blank and Franklin have defined their coding system as being based on a "hierarchy of space-time abstractions " developed by Moffett (1968).

From a behavioral perspective a "hierarchy of space-time abstractions" can be defined as language skills which allow people to speak about events and behavior in the present, past and future. These language skills can be arranged hierarchically from less complex or simple speech about concrete objects in the present observable environment to more complex speech about predicted events and behavior in the future.

Blank and Franklin (1980) have developed this coding system based on a four level scale of language from less to more complex speech. Level I is termed "matching experience" and refers to language that describes what is presently occurring or observable within the individual's environment; Level II is termed "selective analysis of experience" and refers to language that combines objects and/or actions in the environment; Level III is termed "reordering experience" and refers to language which no longer merely describes events and actions, but language which starts to take on organizing properties; and Level IV is termed "reasoning about experience" and refers to language which is utilized for problem-solving and which refers to causal relationships. In addition to coding the levels of language complexity, Blank and Franklin also code whether an utterance comes in statement or question form and whether responses given in an interchange are appropriate or not.

Blank and Franklin (1980) have utilized this coding system in a study involving six, three-year-old girls and their mothers. All the children were from white, middle-class families. The dyads were audio taped in the home and the tapes were coded and analyzed according to the system just described. The results indicated that both mothers and their children used questions more frequently than comments at every level of complexity. The child most often used Level I utterances while mothers more frequently used Level II and III utterances. As the level of utterances used by the mother became more complex, less appropriate (or adequate) responses were made by the children. Thus, children were more likely to respond to initiations that corresponded to the language skills they had already mastered (Level I and II). It was also noted that mothers frequently engaged their children at language levels one or two steps above the language levels most frequently emitted by their children. This observation is consistent with the Vygotskian notion of adults operating within the child's zone of proximal development and with the hypothesis that more complex language skills are gradually introduced and reinforced by the parent.

However, the investigators did not examine the relationship between the quality of the language skills being presented by the mothers and the children's ability to perform competently on measures of cognitive development and

academic success. It does not necessarily follow that because mothers engage in more complex speech that their children will perform well on cognitive measures. If mothers are not sensitive to their children's language skills (if they are unable to employ appropriate cues) the maternal language skills may not be learned by the children.

Therefore, the mother's ability to engage in more complex speech may be necessary but not sufficient for learning to occur in the child. Longitudinal studies that examine the language complexity and environmental influences of mothers from different SES backgrounds might begin to address some of these issues. These types of information seem crucial in the investigation of language and cognitive differences found between low- and middle-SES children. The work of Sigel and his associates has addressed some of these issues (Sigel, 1968; 1970; 1979; 1982; Sigel & Saunders, 1979; McGillicuddy-DeLisi, Sigel & Johnson, 1979).

Sigel's model of language complexity and quality is theoretically founded in the Piagetian notion of language as a representational tool. As discussed earlier in this paper, Piaget believed that language functions merely as a tool to represent thought. Sigel has defined representational thought as the "ability to transcend the immediate, evoke the past, as well as anticipate the future." (Sigel, 1981, p.206). Sigel argues that the verbal strategies that parents and others employ in a child's environment are crucial to

the development of representational thinking. Sigel terms these verbal strategies "distancing strategies" and refers to them as "events and interactions which 'demand' the child to separate himself/herself mentally (via representation) in space or time from the ongoing observable field." (Sigel, 1981, p.206).

In discussing distancing strategies, it is unnecessary to discuss the "representational" qualities of the speech since what is under discussion is behavior. Distancing strategies refer to specific types of verbal behavior which are designed to communicate about events and behaviors that have occurred at different times and places from the present. Again, these verbal behaviors range from simple to complex. The idea that the child must "separate himself/herself mentally (via representation) in space or time..." (Sigel, 1981, p.206) adds little to the understanding of the verbal behavior which is learned by the child nor the ways in which that learning effects measures of verbal, cognitive and academic success. It is assumed that the more the child is reinforced for using more complex distancing strategies, the more proficient the child will be on tests which measure that ability.

Sigel has proposed a hierarchical model of language complexity based on his theory of representational quality. However, as just previously stated, it is unnecessary to infer some inherent cognitive structure in order to discuss

language within a hierarchical structure of complexity. Like all behavior, language begins at a very basic and simple level. As Watson (1930) has stated "Language as we ordinarily understand it, in spite of its complexities, is in the beginning a very simple type of behavior, ... namely the unlearned vocal sounds the infant makes at birth and afterwords." (p. 225-226). Staats (1975) has expounded on this behavioral view of language by comparing it with most other human behavioral repertoires. He argues that higher-level or more "abstract" verbalizations are comprised from earlier learned and more elementary verbalizations. Staats has elaborated with the following example:

Thus, the child told to 'Judge the matter well' may indicate that he does not know what that 'means'. At this point the adult may say, 'Look into the matter thoroughly. Get everyones point of view. Do not take either side. Then decide who is right.' Through experience of this type words that will control complex sequences of behaviors can be learned. The child learns to respond to the word **judge** as a higher unit, based upon already acquired responses to other words. (p. 125).

When talking about the complexity of language we are, in fact, discussing a hierarchy of learning and experience that requires greater and greater discriminations of word meaning and usage. The use of greater levels of discriminations are needed in order to engage in more complex speech. This requires that an individual have repeated trials within his or her environment where complex language skills are utilized and reinforced. Therefore, when

talking about the representational quality of the verbalization we are referring to language skills that require finer discriminations of word meaning. These discriminations are based on earlier learned language. For instance, according to Sigel's three level coding system, a low level distancing statement would be "This is a truck", an intermediate level distancing statement would be "This looks like the truck you have at home" and a high level distancing statement would be "This truck, like the big trucks that we see on the highway, can be used to haul many different things". Each statement requires finer discriminations and elaborations built onto the original verbal ability to label an object (in this case, truck).

The more a child is exposed to higher levels of language complexity, the greater the probability that they will engage in those language repertoires. Sigel (1981) has proposed that these more complex language repertoires are predictive of children's ability to perform well on measures of cognitive ability. This makes intuitive sense given the extremely verbal nature of many traditional measures of cognitive skills. Therefore, children who are exposed to greater diversity and complexity within their verbal community are likely to do well on measures of those skills.

Distancing strategies can be broken down into three levels; high, intermediate and low and can occur in both statement and questions form. Low level distancing

strategies refer to demands for the individual to observe, label, produce information, describe, and demonstrate. Intermediate level distancing strategies refer to demands for the individual to sequence events, reproduce events, compare (describe similarities, describe differences, infer similarities, and infer differences), and combine information. Lastly, high level distancing strategies refer to demands for the individual to propose alternatives, resolve conflicts, evaluate outcome, infer, generalize, transform or change, plan, and conclude . Sigel also included what he termed task-management statements in his coding system, while not making any cognitive demands on the listener, task-management statements do demand that the listener follow the speaker's command (Sigel et al., 1980, p. C21-C34).

Sigel is interested in how the distancing strategies employed by adults (especially mothers) in the child's environment influence the abilities of the child, and how that correlates with tests of their cognitive development. He speculates that parents who engage in more complex level distancing will have children who are cognitively advanced as compared to children of parents who use less complex level distancing strategies. In several studies Sigel and his associates (Sigel & Olmstead, 1970; Olmstead and Sigel, 1970; McGillicuddy-DeLisi, Sigel & Johnson, 1979; Sigel, 1982) have concluded that low-income mothers, in general,

interact with their children by utilizing predominately low level and occasionally intermediate level distancing strategies. Meanwhile, middle-income mothers, in general, are more apt to employ predominately high level and occasionally intermediate level distancing strategies. It appears then, that middle-class mothers employ distancing strategies that are slightly advanced of their children, encouraging the children to engage in more and more complex speech. On the other hand it appears that lower-class mothers do not encourage their children as vigorously as middle-class mothers. Rather they continue to engage their children at levels which they have already mastered. This results in less opportunity to learn more complex language skills. Sigel argues that it is these differences in maternal distancing strategies that has such a significant effect on the children's problem-solving abilities and which accounts for the differences frequently noted between children from middle and low-SES backgrounds. In general, then, Sigel argues that the important issue in mother-child interactional studies does not concern the quantity of maternal verbalizations but rather the quality of those verbalizations.

In an attempt to manipulate the distancing strategies employed by mothers, Slater (1983) developed a program for training high-risk mothers in the use of different distancing strategies. Sixty, white, low-SES mother-child

dyads were matched and randomly assigned to one of three conditions; a control condition, a low level distancing condition and a high level distancing condition. The children ranged in age from 36 to 72 months. Mothers and children were pretested on measures of intellectual and home performance (WAIS, Stanford-Binet, McCarthy and HOME). A six session intervention program was then implemented over seven weeks. All 60 dyads were taken on six field trips (one prior to training, five after training) to different places in the city (i.e., farm, circus, toy store, etc...). Mothers were instructed to tell their children a story about the field trip, these story sessions were videotaped. Following the story telling, the videotapes were reviewed with the mothers and training was given according to the group that the mother was assigned to. Control mothers were told that they were doing fine and to continue with the same type of story telling. Low level distancing mothers were encouraged to increase three behaviors; 1) asking questions; 2) talking more; and 3) talking with. Modeling and feedback were provided by the trainer. High level distancing mothers were encouraged to; 1) ask "what" and "why" questions; 2) talk more by identifying functions and classes of items; 3) talk with; and 4) talk about "things in general" and their general functions and classifications. All mothers were encouraged to use what they learned at home.

At the end of the sixth training session, the children were readministered the McCarthy. Both experimental groups scored significantly better on all three subscale scores (Verbal, Quantitative and Memory) as compared to the control group. However, the scaled scores indicated that the high level distancing group was more successful in enhancing their children's ability to score well on the tests of Numerical Memory, Verbal Memory II, and Opposite Analogies than either the low level distancing or the control group. These data support the hypothesis that high level distancing strategies are successful in effecting children's performance on intellectual tasks.

The author (Slater, 1983) pointed out, however, that the high level distancing group verbally interacted significantly more frequently than the control group. The question of whether the amount of interactions was important, not just the verbal skills utilized, remains unanswered. Caution should be exercised in interpreting these results until the influence of the quantity of interactions, as well as the quality of verbal interactions can be further defined.

Conclusions

From this review of the mother-child dyadic literature it appears that there are two lines of research which can

account for the language and performance differences observed between low- and middle-SES children. One line of research proposes that the cognitive differences noted between low- and middle-SES dyads are the result of quantitative differences in maternal-child interactions, with lower-class mothers interacting less with their children than middle-class mothers (Farran & Haskins, 1980). It appears that, even though both sets of mothers have the same interactive skills available in their repertoires, middle-SES mothers use their interactive skills more frequently than low-SES mothers. These data suggest that mothers who engage their children more in mutual activities and who actively interact with their children when an opportunity to do so arises tend to have children who perform better on measures of cognitive abilities.

The second line of research is based on the hypothesis that qualitative differences in mother-child verbal interactions are predictive of cognitive performance differences, with lower-class mothers engaging in less complex speech with their children than middle-class mothers. Therefore, mothers who engage in more complex speech with their children will have children who perform better on measures of cognitive abilities. Both hypotheses are based on the assumption that mothers teach their children to be better problem-solvers either through interacting with them more, or through interacting with them verbally at a

higher qualitative level. Although the two dimensions of quality and quantity of maternal interactions are related to each other, they are not necessarily dependent on one another. At a very basic level a mother must have some interaction (quantity) with her child for a quality interaction to occur. However, it is certainly the case that a mother could interact with her child without improving the quality of those interactions (i.e., the controlling mother who constantly tells her child to be quiet, be still and behave). It is also the case that a mother could interact relatively little with her child and yet the quality of those interactions could be very high (i.e., the mother that allows her child to explore his or her environment and who, on occasion, asks or answers probing questions of the child).

At present it is unclear whether degree of involvement, quality of the verbal interactions or some combination of both is most important within dyadic interactions. Which is more predictive of a child's cognitive competence and how are they related to each other? Is there some optimal combination of maternal involvement and talk? How do middle-class dyads differ from lower-class dyads along both of these dimensions? It is also unclear whether the differences noted between middle- and low-SES mothers are due to differences in the skills available to them or differences in the skills that they choose to use.

Present Study

The purpose of the present study was to further clarify the relationships that existed between the quality of maternal-child verbal interactions and the quantity of maternal involvement, along with the relationship that might exist between these variables and a child's cognitive performance. While it has been argued that definitive answers to the questions concerning the determinants of children's cognitive competence cannot be answered with descriptive, correlational studies, it has also been argued that correlational studies can be designed in such a way as to clarify questions, to investigate degrees of association, and to lay the groundwork for experimental research (Olson et al., 1984).

A methodology similar to that used by Farran and Haskins (1980) was used. In the present case, forty Hawaiian and part-Hawaiian dyads from low- and middle-SES backgrounds participated. These dyads were videotaped in a semi-naturalistic (free-play) setting for 20 minutes. Unlike the original study these dyads were also videotaped in a task-oriented (teaching) setting for 10 minutes. The inclusion of the task-oriented session allowed an examination of maternal behavior across both an unstructured and structured task. In previous work, the maternal behaviors in question had only been examined in one

situation or the other. For instance, Farran and Haskins (1980) only observed their dyads in a free-play setting, while Sigel (1980) only observed dyads while engaged in task-oriented settings.

By observing the maternal behaviors of interest in two different settings it was felt that additional information would be available regarding the similarity and/or dissimilarity of maternal skills between mothers from differing SES backgrounds. The free-play and task-oriented sessions were not counter-balanced in this study. The reader is referred to the final chapter for a discussion of the reasoning behind the decision not to counter-balance along with the implications for interpretation of the results.

The dyadic interactions were coded according to measures of the quantity of mother-child involvement during interactions (frequency and duration of the interactional styles of mutual activity; passive participation; independent play; and no clear activity, as per Farran and Haskins, 1980), along with measures of the quality (language complexity) of verbal interactions (task management statements, low, intermediate, and high level distancing strategies, as per Sigel, 1980). Dependent measures of children's problem-solving and verbal skills were gathered by administration of the Peabody Picture Vocabulary Test-Revised (Dunn, 1979) and the Wechsler Preschool and Primary Scale of Intelligence (Wechsler, 1967).

Group comparisons, according to SES were made on all independent and dependent measures. Correlational analyses were also performed to determine the relationship between all independent measures. It was felt that a study that examined the relationship between the quality and quantity of mother-child interactions across different SES groups within different settings would not only contribute to the continuing efforts to specify and understand the effects of different environmental conditions on language and cognitive development, but might also contribute to the educational efforts being made to remediate the language and cognitive differences that are presumed to be central to the poverty child's poor academic performance.

Hypotheses Tested

General Maternal Interactions

Verbal Interactions

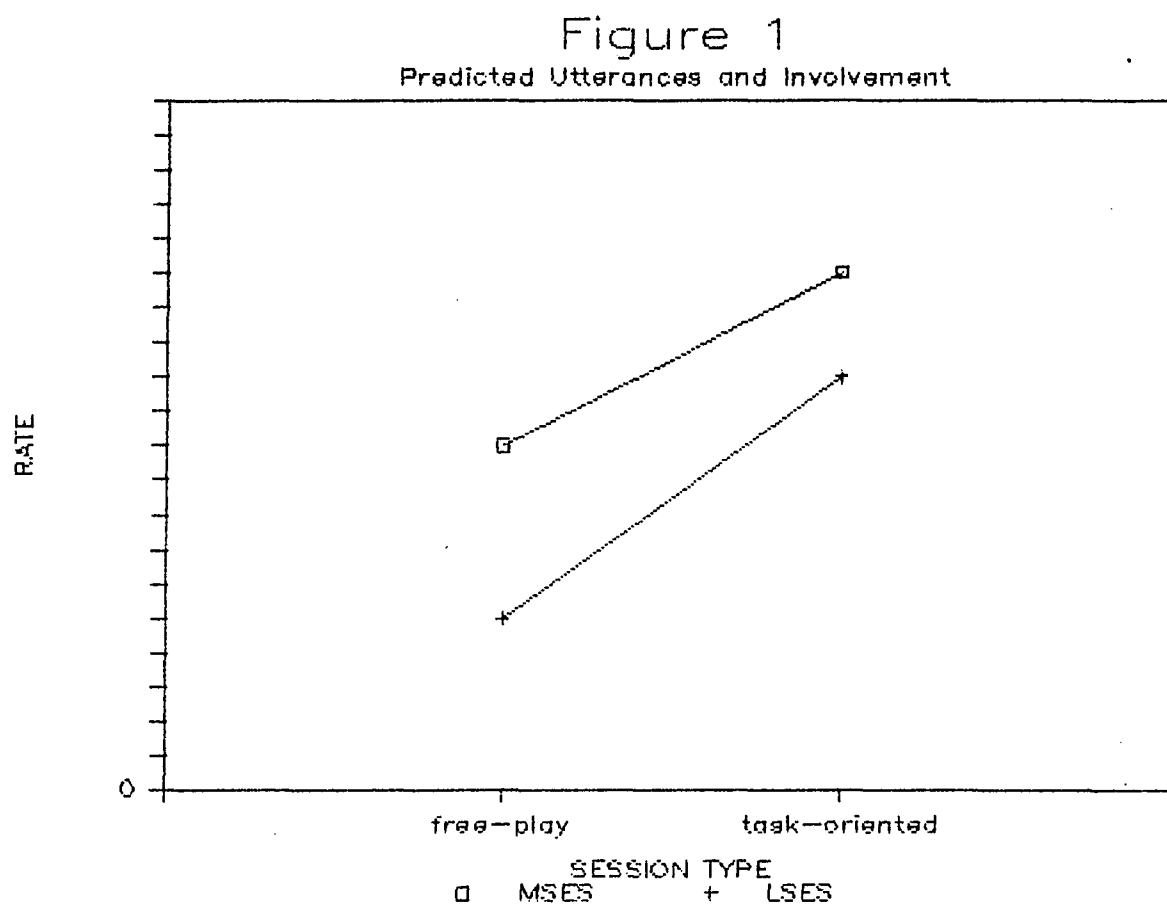
With respect to the mothers' verbal interactions the following predictions were made : a) both middle- and low-SES mothers would significantly increase the rate of verbal interactions (frequency corrected for differences in length of sessions) from free-play to the task-oriented session; b) middle-SES mothers would engage in significantly more verbal interactions than low-SES mothers during free-play session but not during

task-oriented sessions. These predictions were made on the basis of a large body of data which suggested that one of the differences between middle- and low-SES mothers behavior with their children was how much they talked to their children, with middle-income mothers talking considerable more to their children than low-income mothers (i.e., Hess & Shipman, 1968; Tough, 1977a; Schachter, 1979). (See Figure 1 for predicted outcome of above hypotheses)

Degree of Involvement

With respect to maternal involvement, it was hypothesized that: a) middle-SES mothers would engage in more mutual activity and passive participation than low-SES mothers, while low-SES mothers would engage in more independent play and no clear activity during free-play but not during task-oriented sessions; b) that both middle- and low-SES mothers would significantly increase the frequency and duration of mutual activity and passive participation with their children from free-play to task-oriented sessions (see Figure 1).

These hypotheses were based on reports which indicated that low-SES mothers had the skills to engage their children in mutual activity and passive participation, but didn't use those skills as



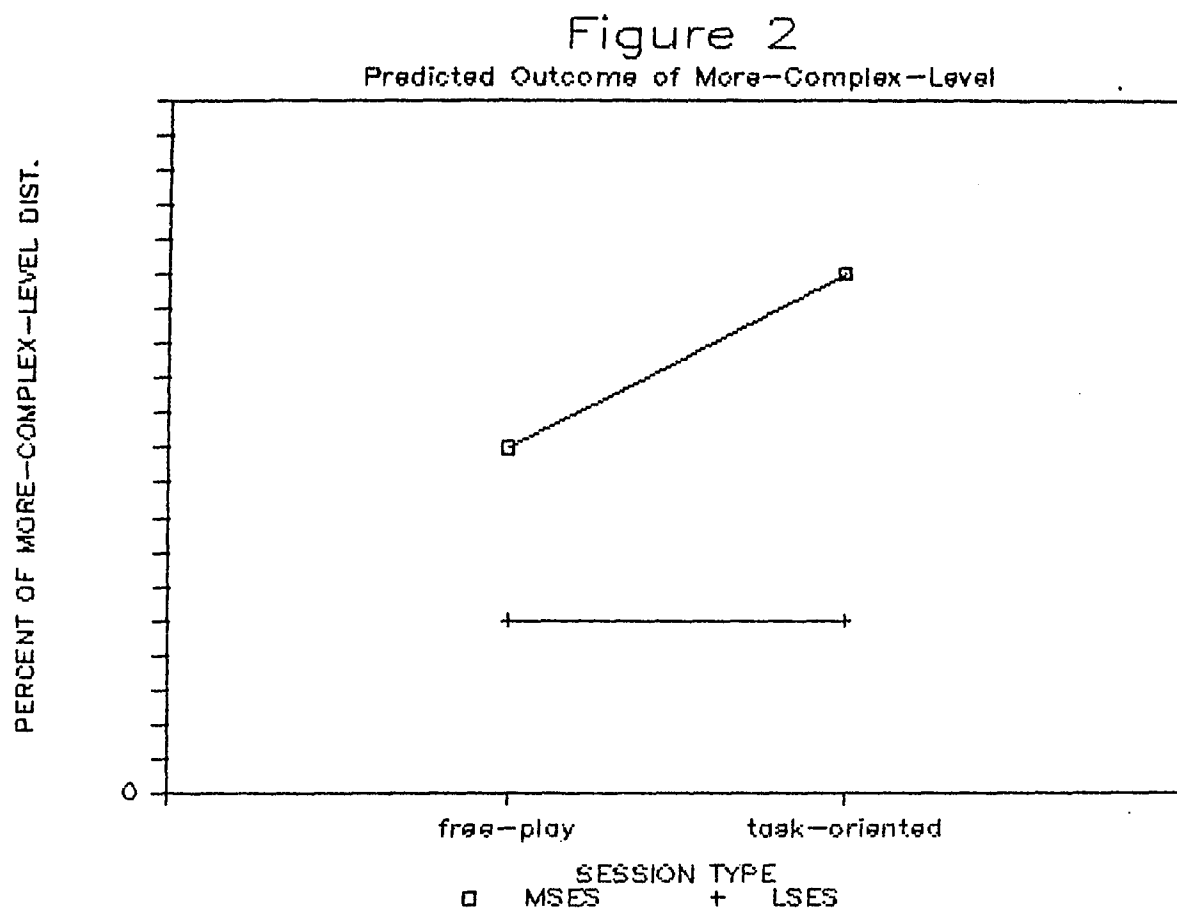
Caption Figure 1. Predicted Outcome of Maternal Rate of Utterances and Maternal Degree of Involvement According to SES and Session Type.

frequently as middle-SES mothers (Farran & Haskins, 1980). By placing mothers in a situation that "demanded" that they be involved with their child (task-oriented session) it was expected that both low- and middle-SES mothers would show higher rates and longer durations of engaged interactions. Low-SES mothers would engage their children at a low rate during free-play sessions and a high rate during task-oriented sessions. Middle-SES mothers would engage their children at a moderate rate during free-play sessions and a high rate during task-oriented sessions.

Maternal Level of Distancing

More-Complex-Level Distancing

With respect to maternal more-complex-level distancing, it was hypothesized that middle-SES mothers would employ a significantly higher percentage of more-complex-level distancing strategies (intermediate and high level distancing strategies) than low-SES mothers with their children during both free-play and task-oriented session, and that the percentage of more-complex-level distancing strategies would be significantly greater in the task-oriented session for middle-SES mothers but not for low-SES mothers (see Figure 2 for predicted outcome of this hypothesis).

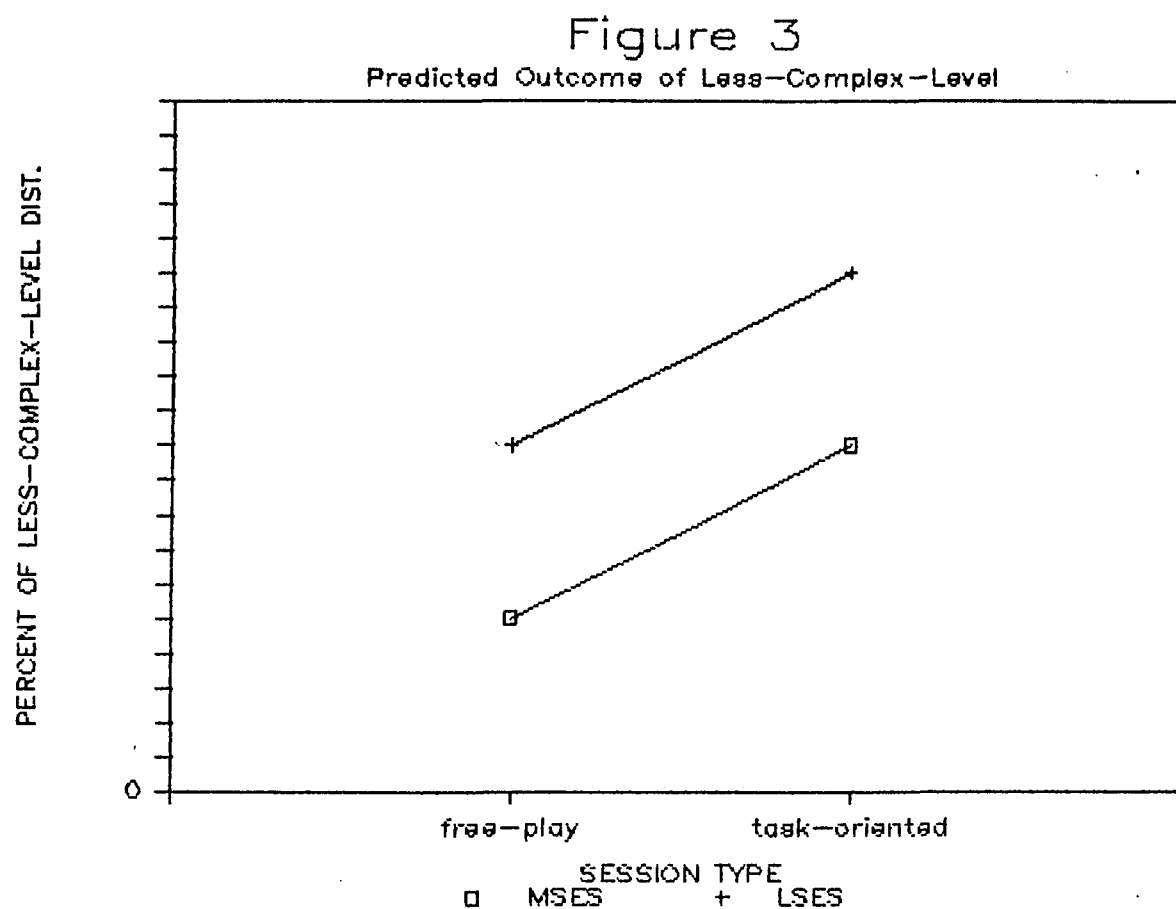


Caption Figure 2. Predicted Outcome of Maternal More-Complex-Level Distancing according to SES and Session Type.

This hypothesis was based on reports which indicated that low-SES mothers did not engage in more-complex-level distancing strategies with their children during structured tasks, as compared to middle-SES mothers (Sigel, 1972, 1975, 1977, 1981, 1982, and more).

Less-Complex-Level Distancing

With respect to less-complex-level distancing, it was hypothesized that low-SES mothers would employ a significantly higher percentage of less-complex-level distancing strategies (task-management statements and low level distancing strategies) than middle-SES mothers with their children during both free-play and task-oriented session, and that the percentage of less-complex-level distancing strategies would be significantly greater in the task-oriented sessions than in the free-play session for both middle- and low-SES mothers (see Figure 3 for predicted outcome of this hypothesis). Again, reports indicate that low-SES mothers engage in greater amounts of less-complex-level distancing strategies than middle-SES mothers. This was expected in both the free-play and task-oriented sessions. It was also expected that middle-SES mothers would increase their use of less-complex-level distancing strategies (as well as more-complex-level strategies as predicted previously), while low-SES



Caption Figure 3. Predicted Outcome of Maternal Less-Complex-Level Distancing according to SES and Session Type.

mothers would increase their use of less-complex-level distancing strategies only. It was assumed that low-SES mothers have acquired less-complex-level distancing strategies in their language repertoires but not more-complex-level distancing strategies. Thus, when placed in a situation where they were asked to teach their children (task-oriented session) the distancing strategies that they used were expected to be less-complex-level distancing strategies.

Relationship of Maternal Levels of Distancing, Maternal Degree of Involvement, and Children's Performance Scores

With respect to the relationship of maternal variables to children's performance and to each other, it was hypothesized that: a) measures of maternal distancing and childrens' scores on the Peabody Picture Vocabulary Test-Revised (PPVT-R) and Wechsler Preschool and Primary Scale of Intelligence (WPPSI) would be moderately correlated. It has been demonstrated that the amount of maternal high level distancing is positively correlated to measures of childrens' cognitive and language performance (i.e., Sigel, 1970; 1979; 1981; 1982; Slater, 1983); b) that the measures of maternal involvement and childrens' scores on the PPVT-R and the WPPSI would be moderately correlated. It has been repeatedly demonstrated

that the amount of maternal interactions is positively correlated to measures of childrens' cognitive and language performance (i.e., Clarke-Stewart, 1973; Elardo et al., 1975, 1977; Olson et al., 1984); c) that the percentage of more-complex-level distancing would be moderately correlated with the degree of involvement (both active and passive) exhibited by mothers. It has been demonstrated that middle-SES are more involved with their children as well as exhibiting higher percentages of more-complex-level distancing strategies. It was inferred that measures of distancing strategies were not completely independent of measure of involvement, in that the maternal variables that controlled the amount of maternal interaction were assumed to be related to the variables that controlled the level of distancing emitted. These variables were thought to be captured in the SES group distinctions; d) that the correlations between maternal distancing behavior and childrens' PPVT-R and WPPSI scores would be significantly greater than the correlations between measures of maternal involvement and childrens' PPVT-R and WPPSI scores. This prediction was based on several lines of research previously reviewed which indicated that the important difference between mothers of low- and middle-SES was the language skills that mothers used to interact with their children (distancing strategies), with low-SES

mothers generally exhibiting an inability to engage their children using complex language skills and with middle-SES mothers generally being able to engage their children using complex language skills. Children exposed to complex language skills are more likely to engage in those skills when required to do so. Therefore, tasks that measure childrens' language skills, as many language and cognitive measures do (Staats, 1975), will reflect differences in childrens' performance based on their language abilities. Thus, intuitively, it follows that children exposed to more-complex-level distancing strategies will perform better on measures of language and cognitive skills as compared to children who aren't exposed to these same types of strategies. Based on this reasoning, it was felt that measures of maternal distancing would be more highly associated with childrens' performance on language and cognitive measures than measures of maternal involvement.

In addition to these hypotheses it was also of interest to examine the conditional probability relationships between maternal verbalizations and maternal involvement. Which verbalizations were more likely to occur within each involvement condition? Were these relationships dependent on

SES? These questions were exploratory in nature with no specific predictions made a priori.

CHAPTER 2

METHOD

Subjects:

Forty, 46 mo. to 59 mo.-old ($x = 53$ mos.) children and their mothers participated in this study. Half of the mother-child dyads were drawn from twenty families who had children enrolled in the Pre-Kindergarten Educational Program (PREP), a laboratory preschool offered by Kamehameha Schools/Bishop Estate (Kamehameha Schools/Bishop Estate is a privately funded educational institution for Hawaiian/part-Hawaiian children). The remainder of the mother-child dyads were drawn from Hawaiian/part-Hawaiian families who had older children currently enrolled in Kamehameha Elementary School (KES) at the time of the study. The mother and the younger, four year old sibling of the KES enrollee were invited to become the subject. A total of 20 middle-SES dyads and 20 low-SES dyads participated in the study (see Appendix A for criteria for SES determinations). Gender of the preschool children was counterbalanced such that each SES group had approximately the same number of males and females (low-SES = 8 males and 12 females, middle-SES = 11 males and 9 females; a total of 19 males and 21 females).

Other demographic variables used to describe the population included: number of single parent families, maternal education, maternal employment status (whether they were employed or not employed), paternal education, and paternal employment status (see Table 1).

Marked differences between the two groups were discovered in the number of single parent families. Of the 20 middle-SES dyads only 2 were composed of single parents families, while of the 20 low-SES families 10 were single parent families, $F(1)=8.91$, $p \leq .005$. Of the mothers who indicated they were single parents all refused or were unable to give complete information about the child's father. As a result there were data missing on the educational level and employment status of 12 fathers. This severely restricted any statistical comparisons that could be made between middle- and low-SES fathers on those variables, therefore no statistical comparisons were made. Despite this, it was still deemed important to emphasize the large number of single parent families in the low-SES group and to note the likelihood that in those families, fathers were either minimally or completely uninvolved in their children's upbringing.

All of the data on maternal employment and education were available. The breakdown of maternal employment was as follows: Of the 20 middle-SES mothers, 9 were employed and 11 were unemployed; of the 20 low-SES mothers 6 were

Table 1

Subject Table

No.	SES	Age	Sex	BO	MMS	MA	MEM	MED	FA	FEM	FED	Source
01	Low	53	F	4	Mar	29	Emp	12	31	Emp	11	PREP
06	Low	57	F	2	Mar	25	Une	12	30	Une	12	KES
08	Low	58	F	2	Div	33	Emp	09	.	Emp	.	PREP
09	Low	57	F	1	Div	28	Emp	12	.	.	.	PREP
10	Low	55	M	4	Div	32	Une	12	.	.	.	PREP
11	Low	50	F	2	Sep	27	Emp	12	.	.	.	PREP
13	Low	50	M	1	Sep	26	Une	12	.	.	.	PREP
15	Low	55	F	4	Sig	26	Une	10	.	.	.	PREP
16	Low	55	M	1	Sig	26	Une	12	.	.	.	PREP
17	Low	55	M	2	Sig	24	Une	12	.	.	.	PREP
18	Low	56	M	1	Sep	23	Une	10	.	.	12	PREP
19	Low	48	F	1	Sig	20	Une	12	.	.	12	PREP
20	Low	55	F	1	Mar	22	Une	12	24	Une	.	PREP
24	Low	52	M	2	Sig	30	Une	12	.	.	.	PREP
26	Low	56	F	3	Mar	26	Une	12	32	Emp	14	KES
29	Low	48	M	4	Mar	42	Une	11	42	Emp	11	KES
34	Low	56	F	4	Mar	38	Une	07	45	Emp	12	PREP
36	Low	46	M	2	Mar	28	Emp	12	30	Emp	11	KES
37	Low	52	F	3	Mar	29	Une	12	32	Emp	09	KES
38	Low	47	F	3	Mar	32	Emp	12	33	Emp	12	KES
02	Mid	59	M	3	Mar	33	Emp	12	34	Emp	14	KES
03	Mid	50	F	1	Mar	29	Emp	17	30	Emp	14	PREP
04	Mid	48	M	4	Mar	43	Emp	16	44	Emp	12	PREP
05	Mid	50	F	4	Mar	37	Emp	18	44	Emp	12	KES
07	Mid	52	M	2	Mar	30	Une	13	34	Emp	16	KES
12	Mid	59	M	3	Mar	33	Une	12	31	Emp	13	KES
14	Mid	50	M	2	Div	32	Emp	14	.	.	.	PREP
21	Mid	57	M	3	Mar	41	Emp	14	41	Une	09	PREP
22	Mid	52	M	3	Mar	29	Une	12	31	Emp	14	KES
23	Mid	49	F	1	Sep	26	Emp	14	.	.	.	PREP
25	Mid	54	F	8	Mar	40	Une	12	39	Emp	19	KES
27	Mid	50	M	2	Mar	29	Une	12	31	Emp	17	KES
28	Mid	56	F	2	Mar	33	Emp	12	37	Emp	13	KES
30	Mid	56	F	2	Mar	34	Une	16	34	Emp	12	KES
31	Mid	58	M	2	Mar	30	Une	13	30	Emp	19	PREP
32	Mid	46	F	2	Mar	37	Une	12	36	Emp	14	KES
33	Mid	51	M	3	Mar	32	Une	14	34	Emp	16	KES
35	Mid	55	M	3	Mar	27	Une	12	29	Emp	14	KES
39	Mid	55	F	2	Mar	32	Emp	16	34	Emp	16	KES
40	Mid	54	F	2	Mar	32	Une	13	33	Emp	17	KES

No. = Order of mother-child dyad videotaping
 SES = Family socioeconomic status (Low = low-SES, Mid = middle-SES)
 Age = Child's age in months
 Sex = Child's gender (M = male, F = female)
 BO = Child's birth order
 MMS = Mother's marital status (Mar = married, Div = divorced, Sep = separated, Sig = single)
 MA = Mother's age in years
 MEM = Mother's employment status (Emp = employed, Une = unemployed)
 MED = Mother's education in years
 FA = Father's age in years
 FEM = Father's employment status (Emp = employed, Une = unemployed)
 FED = Father's education in years
 Source = Source from which subject was enlisted for study
 (PREP = Laboratory preschool at Kamehameha Schools,
 KES = Siblings of children enrolled in Kamehameha Elementary School)
 . = Missing data

Caption Table 1. Table of Children's and Parent's
 Descriptive Variables.

employed and 14 were unemployed. A chi-square analysis was performed on mother's SES by employment status. The analysis revealed no significant differences between the SES group on maternal employment status.

An analysis of variance (ANOVA) was performed on maternal education in years according to SES groupings. The ANOVA revealed a significant main effect for SES, $F(1)=20.03$, $p \leq .000$ with middle-SES mothers having more education in years ($\bar{x}=13.70$) than low-SES mothers ($\bar{x}=11.35$).

In summary, it appears that there were some real differences between these two groups of subjects beyond their Hollingshead ratings and income levels (as per Appendix A). In particular there appeared to be some real differences in the number of single parent homes according to SES groupings with almost half of the low-SES homes being composed of single parents. This was not the case with the middle-SES homes where only one-tenth of those homes consisted of a single parent. As a result considerable data were missing from fathers in low-SES homes which made statistical interpretation of paternal data speculative at best. However, these missing data suggest a low degree of paternal involvement in the low-SES single parent family. Finally, there was a significant difference in maternal education between SES groups, while there was no significant difference in their employment status. All of these differences were consistent with the dichotomy set up

according to SES. Low-SES mothers were more likely to have less education, be single, and to be from lower income households.

Subjects Selection:

The laboratory preschool (PREP) is part of a longitudinal research project at Kamehameha Schools dedicated to improving the quality of education for Hawaiian/part-Hawaiian children. All of the children are of Hawaiian/part-Hawaiian ancestry, and are residents of the preschool catchment area. Seventy percent of the families fall within the low socioeconomic level, while 30% fall within the middle socioeconomic level as defined by Appendix A.

At the time of application to the preschool all parents were required to complete a questionnaire which provided demographic information including parental occupation, parental education, income, family size, primary caretaker of the preschool child, and more (see Appendix B). Prior to agreeing to enroll their children in the laboratory preschool parents were thoroughly briefed on the experimental nature of the preschool. Parents were informed that they and their children would be asked to participate in various research projects slated for the school year as a condition of acceptance into the preschool (see Appendix C).

Parents who were willing to agree to the terms of enrollment had their children placed into a pool of applicants. Final selection of students was then randomly determined with the exception that the class was to be evenly divided by gender. At the time of this study mothers were contacted (see Appendix D), all 20 mothers agreed willingly to participate with their children.

In addition to the 20 laboratory preschoolers in the study, 20 additional children were selected using the following procedure. A general mailing went out to all parents who had children enrolled as students in grades 1 through 6 at Kamehameha Elementary School (KES), inviting them to participate if they had children 3 years 10 months to 4 years 11 months old who were of Hawaiian/part-Hawaiian ancestry (see Appendix D). Follow-up telephone calls were made to assess those mothers who were interested in participating in the study and who had children who were qualified. To qualify, mothers were asked the age of their child, gender of their child, parental occupation, and parental education level (see Appendix E).

Of the 49 mothers contacted, 18 (36.7%) were ineligible either due to age, health or ethnicity of child, or due to the families socioeconomic status (since we were interested in having equal n's for both SES groups). Of the 31 eligible, 8 declined (25.8%) and 23 agreed (74.2%) to participate. Out of the 23 who agreed to participate, one

was later found to be ineligible (child was adopted and not Hawaiian/part-Hawaiian) and two were unable to participate once scheduling began. Thus, 20 mother-child dyads from the KES subject pool agreed to participate in the study (a 66.6% participation rate out of those eligible).

Seventy percent of these mother-child dyads fell within the middle socioeconomic level while 30% fell within the low socioeconomic level. Informed consent was obtained from each mother who was enrolled in this manner (see Appendix F).

Procedure:

Once identified as subjects for the study, mothers were asked to schedule a 1 1/2-hour block of time with the experimenter at the laboratory preschool. This time was spent orienting mothers to the nature of the study and completing any demographic information that was missing, after which videotaping of mothers with their children began in a small room adjacent to the classroom which had been equipped with remote controlled videotaping and microphone equipment.

Each videotaping session lasted approximately 30 minutes. Of the 30 minutes, the first 20 minutes were spent with the mother and child engaged in the free-play session and the remaining 10 minutes were spent with the mother and child engaged in the task-oriented session.

Prior to the videotaping session, the experimenter accompanied the mother and child into the videotaping room and pointed out all of the videotape equipment. The experimenter also explained to the mother that she was interested in seeing how children play with toys and their mothers (free-play). The experimenter instructed the mothers to act as they normally would with their children at home (see Appendix G for complete instructions). At the end of the free-play session (20 min.) the experimenter implemented the task-oriented session by asking mothers and children to be seated at the children's work table in the videotaping room. The experimenter then gave each mother the same set of 3-dimensionsal building blocks and the same picture cards, each with a model of a specific block design on it (Playskool 646 Blocks and Wooden Block Building Pattern Cards 7044, patterns number 10, 14, and 16; Playskool, Inc. 1980). The experimenter instructed the mother to help their child to build the model (see Appendix G). After 10 minutes in the task-oriented session videotaping stopped, however, mothers and children were usually allowed to complete the block-building design they were working on before the experimenter came in the room to terminate the session.

After the videotaping sessions were completed, mothers were permitted to view the videotape while their children were administered the Peabody Picture Vocabulary Test-Revised (PPVT-R). Laboratory preschoolers were then

returned to their classrooms and their mothers thanked for participating and told that they would be contacted at a later date to be debriefed about the study. Non-laboratory preschoolers and their mothers were scheduled for a second visit in order to administer the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) to the children.

Videotaping Room: Videotaping sessions were conducted in a small, well lit, well ventilated, carpeted, and comfortably furnished room. The room contained a comfortable couch, an end table, a lamp, a small child's work table and two small children's chairs. Magazines were provided for the mothers (Family Circle and Parents magazines) and coloring materials (a coloring book and crayola markers), three books (The Three Little Pigs, Farm Animals, and Scuppers the Sailor Dog) and a box of toys (Tonka truck, tea and cooking set, a wood jigsaw puzzle, and wood number and alphabet blocks) were provided for the child. The room also contained a video camera and an unobtrusively positioned microphone.

PPVT-R Testing

All the children were administered the PPVT-R on the day that they were videotaped. All children received the same test administered by the same examiner. The laboratory preschoolers were returned to their classroom after the

testing, while the non-laboratory preschoolers were returned to their mothers who waited in a separate room while their children were tested.

PPVT-R Testing Room: PPVT-R test administration was conducted in the same room as the videotaping (see description above). The testing took place while seated at the small child's work table with the child and examiner seated on the small children's chairs.

WPPSI Testing

All the children were administered the WPPSI on a day separate from the videotaping. Laboratory preschoolers were tested as part of the preschool program. They were accompanied from their classroom to the testing room by a teacher. The non-laboratory preschool children were accompanied by their mothers to the testing room. All children received the same test by the same examiner.

WPPSI Testing Room: WPPSI test administration was conducted in a small, well lit and well ventilated room. The room was furnished with a small child's table for placement of testing materials and two children's chairs, one for the examiner and one for the child.

Debriefing

At the end of the study mothers (and interested fathers) were individually debriefed regarding their children's performance on the PPVT-R and WPPSI. A large group meeting was then held for mothers and interested fathers in order to elaborate on the nature of the study and to answer any questions parents might have had.

Measures Taken:

Cognitive measures; Child - Each child was administered the Wechsler Primary and Preschool Scale of Intelligence (WPPSI) and the Peabody Picture Vocabulary Test-Revised (PPVT-R).

Coded behaviors: Levels of Distancing - Measures of the frequency of maternal verbal behaviors termed high level, intermediate level, low level distancing strategies, and task-management statements were taken. In addition each utterance was coded for the form of the utterance (statement, question or fragment) and emotional support of the utterance (approval, disapproval, information feedback, correction or reflection). See Appendix H for a complete description of the coding manual.

Coded behaviors: Degree of Involvement - Measures of the frequency and the duration of maternal involvement were taken including mutual activity, passive participation, independent play and no clear activity. These measures were subsets from the coding of the reciprocal interactions of the mothers and their children as coding according to the system describe in Appendix I.

SES and Familial Measures - Data were collected on familial income, parental education, parental occupation, family size, birth order of the subject child, primary caretaker of the child and more (see Appendix B). This information was used to determine socioeconomic status using both Hollingsheads Two Factor Index of Social Position (1957) and the Native Hawaiian Profile (1979) (see Appendix A).

Coding Procedures:

Apparatus - The mothers' levels of distancing and the mothers' degree of involvement were recorded from the videotapes with the aid of two Sony Betamax and monitors connected to IBM PC-XT's which were used as event recorders. Computer programs were written (Crocker, 1980) that allowed

the PC-XT's to lay down a time base (in tenths of seconds) which could be read by the computer while also recording the numerical code from each coding system. Tapes were coded for maternal levels of distancing first and then for maternal degrees of involvement. These two sets of data were then merged together on the basis of time.

Coding of Levels of Distancing - Two observers were trained to code levels of distancing as described in Appendix H, each maternal utterance was coded. Delays in the development of the software programs required that the majority of this coding be done by hand with a time base (to tenths of seconds) laid down by a date-time generator. Once the software was operational the codes were then entered using the PC-XT so that they could be later merged with the codes for the degree of involvement.

Observer Training and Reliability Assessment for Coding of Levels of Distancing - Individual coders were required to reach 90% agreement prior to separate coding of the experimental tapes. Once 90% agreement was reached through independent coding, one observer was designated the primary coder and coded each tape. The second observer was designated the checker and coded approximately 25% of the tapes. After the primary observer had coded four tapes, one tape was randomly selected for the second observer to code independently. Reliability was computed by dividing the

number of agreements by the number of agreements plus disagreements. Reliability measures per tape ranged from 89.9% to 94.2% with a mean of 90.25%.

Coding of Degree of Involvement - Three observers were trained to code maternal involvement (Farran, 1986) as described in Appendix I. The coding was done directly onto the PC-XT using a software program that was developed by Crocker (1980) at the University of North Carolina at Chapel Hill that allowed these codes to be later merged with the codes for maternal levels of distancing.

Observer Training and Reliability Assessment for Coding of Maternal Involvement - Of the 40 mother-child tapes, 11 were coded during an extensive training phase among the three coders. The codes from those tapes were determined by consensus. Of the remaining 29 tapes, 24 were coded by two observers at separate times as a continuation of training. Only 5 tapes were coded independently by one observer only. Codes were determined to be in agreement if they fell within a 2 sec. window on either side of the actual coded time. Therefore, codes of less than 4 sec. were eliminated from the analyses since the window for reliability exceeded the actual duration (Farran, 1986). Reliability was computed by dividing the number of agreements by the number of agreements plus disagreements. For the codes of maternal involvement (mutual activity, passive participation,

independent play and no clear activity) the reliability measures ranged from 75.15% to 95.29% with a mean of 82.59%.

CHAPTER 3

RESULTS

One methodological concern that bears on the results is the fact that all subjects experienced the free-play session and the task-oriented sessions in the same order session . This lack of counter-balancing is a confound to this study. Any conclusions drawn about effects across the two sessions must take into account that free-play always preceded task-oriented. This is an important concern that will be more fully discussed in the final chapter. With respect to the present chapter it is important to note that analyses across tasks have been reported. This has been done while keeping in mind that any interpretation of the results takes into account the confound inherent in the study's methodology.

Sex Differences

Before reporting the results of the specific hypotheses tested, several analyses concerning differences in performance due to child's gender will be presented. Separate analyses of variance were performed to examine sex differences on the measures of maternal involvement, maternal rate of utterances, maternal levels of distancing

and children's performance on the PPVT-R and WPPSI. There were no differences due to children's gender along any of these measures. Mothers of both males and females were involved with their children an equal amount, talked with their children an equal amount and engaged in equal amounts of the various levels of distancing. Males and females also scored similarly on the Peabody Picture Vocabulary Test-Revised and Wechsler Preschool and Primary Scale of Intelligence.

General Maternal Interactions

Verbal Interactions

The first set of hypotheses examined the effects of SES and type of session on the total amount of speech emitted by the mothers. First, a main effect for session was predicted with both middle- and low-SES mothers increasing their speech from free-play to task-oriented sessions (see Figure 1). Secondly, it was predicted that middle-SES mothers would engage in significantly more speech than low-SES mothers during the free-play session but not during the task-oriented session.

A 2(SES) x 2(session) multivariate analysis of variance (MANOVA) with repeated measures on session was performed (Table 2 summarizes the results). Rate of speech was the dependent variable and was computed by dividing the total

Table 2

<u>Source of Variance</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
SES (A)	1	.075	.009	N.S.
Session (B)	1	202.407	66.295	<.000
SES x Session (AxB)	1	12.443	4.075	<.051
Error	38	3.053		

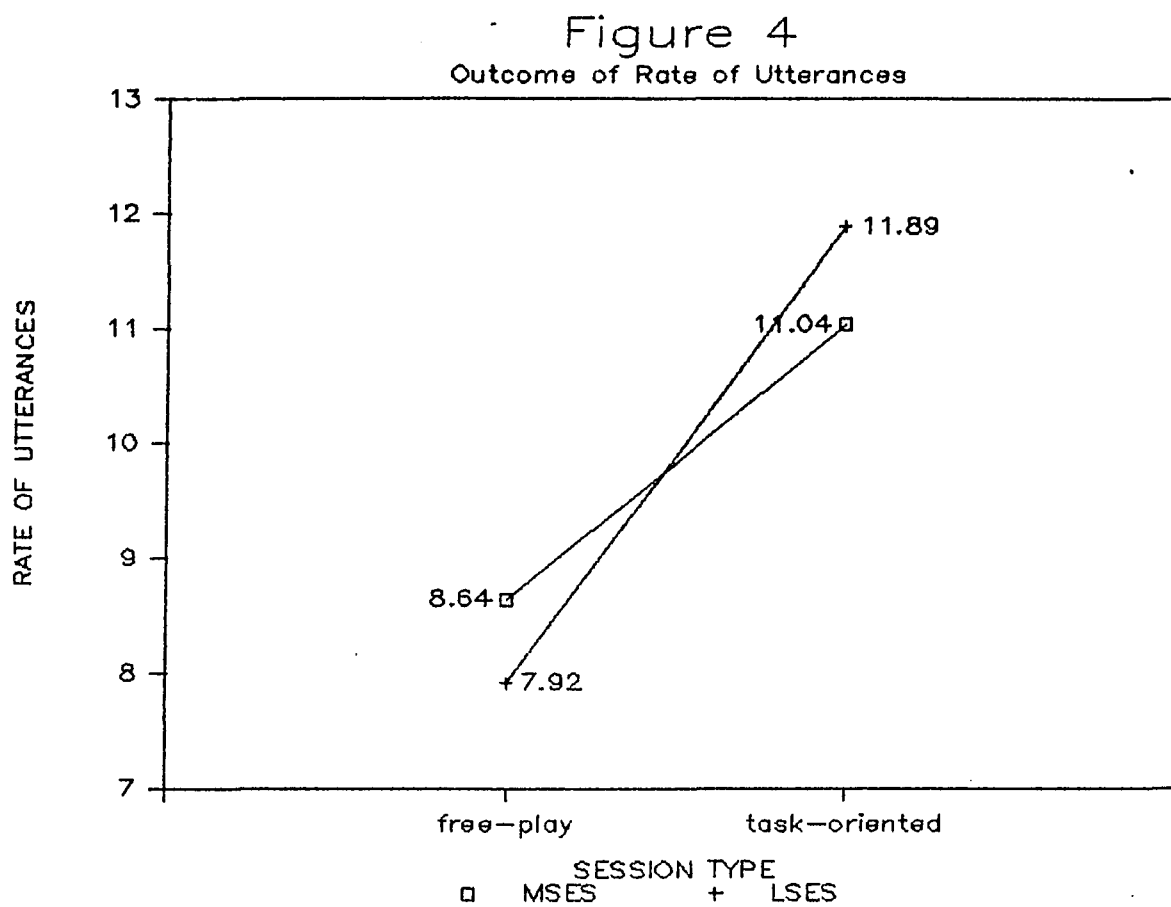
Caption 2. Results of Multivariate Analysis of Variance
 Conducted on Rate of Total Utterances of Middle- and Low-SES
 Mothers During Free-Play and Task-Oriented Sessions.

amount of speech during each session by the amount of time in each session. Results indicated that there was no main effect for SES. There was a highly significant main effect for session $F(1)=66.3$, $p \leq .000$, with mothers talking at a much higher rate during the task-oriented session than during the free-play session. Finally, there was a SES x session interaction $F(1)=4.08$, $p \leq .05$ with low-SES mothers increasing their rate of speech from free-play to task-oriented sessions significantly more than middle-SES mothers (see Figure 4).

The results of the analysis supported the first prediction, both middle- and low-SES mothers increased their rate of speech from the free-play to the task-oriented session. However, the results did not entirely support the second prediction. SES did not affect rate of speech across the board. Rather, it appeared that the effects of SES were mediated by session type. Rather than middle-SES mothers engaging in more verbalizations during the free-play session it appeared that low-SES mothers increased their rate of speech significantly more than middle-SES mothers from free-play to task-oriented sessions.

Maternal Degree of Involvement

The second set of hypotheses predicted that middle-SES mothers would be involved (in mutual activity and passive participation) more often and for longer durations with



Caption Figure 4. Rate per Minute of Utterances
Emitted by Middle-SES and Low-SES Mothers
During Free-Play and Task-Oriented Sessions

their children than low-SES mothers during free-play but not task-oriented sessions. In addition, a main effect for session was predicted with both middle- and low-SES mothers significantly increasing the amount and duration of their involvements with their children from free-play to task-oriented sessions (see Figure 1).

In the course of coding the interactions it became evident that all mothers during the task-oriented session were fully engaged in the task with their child. Therefore, the coding system became uninformative since there was little or no variation in the mothers' degree of involvement with their children. They were all almost exclusively involved in mutual activity throughout the session. As a result, coding of interactions during the task-oriented session was not performed since it was felt that no additional information would be gained by doing so. It was clear that all the mothers (both middle- and low-SES) were continuously involved with their children throughout the task-oriented session. In addition, during the free-play session only one dyad exhibited an episode of no clear activity therefore this involvement category was eliminated from the analyses. Finally, it was decided that involvement episodes during the free-play session that lasted less than 4 seconds would be eliminated from the analyses. This decision was based on careful consideration of the way in which reliability was obtained. Reliability was obtained by

scoring a correct match if the same code was coded within a 2 second frame on both sides of that code (see description in method section). Therefore, it was felt that episodes of less than 4 seconds were not adequately reliable.

Thus, two 2(SSES) x 3 (degree of involvement) ANOVA's were performed in order to investigate the remaining predictions. The first ANOVA was performed with frequency of interactional episodes (mutual activity, passive participation and independent play) as the dependent measure. Frequency of episodes was determined by summing the number of times mothers were in each involvement condition during free-play. Results indicated that low-SES mothers were in mutual activity episodes more frequently than were middle-SES mothers, $F(1)=3.87$, $p \leq .05$. There were no main effects for SES in the frequency of episodes of passive participation and independent play (see Table 3a). The sample was then grouped as a whole and a Student's t-test was performed to examine whether the frequencies of the three involvement conditions varied. The results indicated that the frequency of passive participation episodes was greater than the frequency of mutual activity, $t(39)=4.40$, $p \leq .000$, and independent play, $t(39)=5.26$, $p \leq .000$. The frequency of mutual activity episodes was equivalent to that of independent play.

The second ANOVA was performed with duration of interactions as the dependent measure. Duration was determined by combining the amount of time mothers spent in

Table 3a

<u>Source of Variance</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
SES:				
Mutual Activity	1	84.100	3.868	<.050
Passive Part.	1	1.600	.295	<.865
Independent Play	1	115.600	3.564	<.067

Caption 3a. Results of Analysis of Variance Conducted on
Frequency of Maternal Degree of Involvement by Middle- and
Low-SES Mothers During Free-Play.

Table 3b

<u>Source of Variance</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
SES:				
Mutual Activity	1	4846.602	.425	<.838
Passive Part.	1	172580.769	2.116	<.154
Independent Play	1	93344.582	1.267	<.267

Caption 3b. Results of Analysis of Variance Conducted on
Duration of Maternal Degree of Involvement by Middle- and
Low-SES Mothers During Free-Play.

each involvement condition to get a total amount of time mothers were in each condition during free-play. The results of the ANOVA revealed no significant differences in the amount of time middle-SES and low-SES mothers spent in each involvement condition (see Table 3b). The sample was then grouped as a whole and a Student's t-test was performed to examine whether mothers spent more time in any one condition. The results of the analysis indicated that mothers spent more time in mutual activity, $t(39)=3.61$, $p \leq .001$ and passive participation, $t(39)=2.84$, $p \leq .007$ than in independent play. Mothers spent comparable amounts of time in mutual activity and passive participation.

Therefore, it appeared that low-SES mothers engaged in more separate episodes of mutual activity, but were no different in the total amount of time they spent in mutual activity. Additionally, there were no SES differences in the frequency and duration of passive participation and independent play. These results did not support the predictions made.

Maternal Level of Distancing Strategies

More-Complex-Level Distancing Strategies

The third set of hypotheses examined the effects of SES and session on the amount of complex distancing strategies emitted by mothers while interacting with their children. A

main effect for SES was predicted with middle-SES mothers employing a significantly higher percentage of more-complex-level distancing strategies (intermediate and high level distancing strategies) with their children than low-SES mothers during both free-play and task-oriented sessions. An interaction was also predicted with the percentage of more-complex-level distancing strategies being significantly higher in the task-oriented session versus the free-play session for middle-SES mothers but not for low-SES mothers (see Figure 2).

A 2(SES) x 2(session) MANOVA with repeated measures on session was conducted to address these predictions (see Table 4 for results). Dependent measures in the analysis were the percentages of the various levels of distancing (this included task management statements, low, intermediate and high level distancing strategies). Percentages of all of the strategies were computed by dividing the frequency of each strategy's occurrence by the total number of utterances during each session. The results of the MANOVA revealed a main effect for SES, $F(4)=5.32$, $p \leq .002$; a main effect for session, $F(4)=50.43$, $p \leq .000$; and a SES x session interaction, $F(4)=2.54$, $p \leq .057$.

For the third set of hypotheses the univariate tests of significance were examined for the percentage of both the intermediate and high level distancing strategies (see Table 5a and 5b for results). The results of the analyses for the

Table 4

<u>Source of Variance</u>	<u>Hypo. df</u>	<u>Approx.F</u>	<u>p</u>
SES (A)	4	5.32	$\leq .002$
Session (B)	4	50.43	$\leq .000$
SES x Session (AxB)	4	2.54	$\leq .057$

Caption 4. Results of Multivariate Analysis of Variance
 Conducted on Percentage of Levels of Distancing of Middle-
 and Low-SES Mothers During Free-Play and Task-Oriented
 Sessions.

Table 5a

<u>Source of Variance</u>	<u>df</u>	<u>Hypo.MS</u>	<u>F</u>	<u>p.</u>
SES (A)	(1,38)	235.46	14.07	$\leq .001$
Session (B)	(1,38)	1289.16	60.71	$\leq .000$
SES x Session (AxB)	(1,38)	79.68	3.75	$\leq .060$
Error	(1,38)	21.23		

Caption 5a. Results of Univariate Analysis of Intermediate Level Distancing Strategies Emitted by Middle- and Low-SES Mothers During Free-Play and Task-Oriented Sessions.

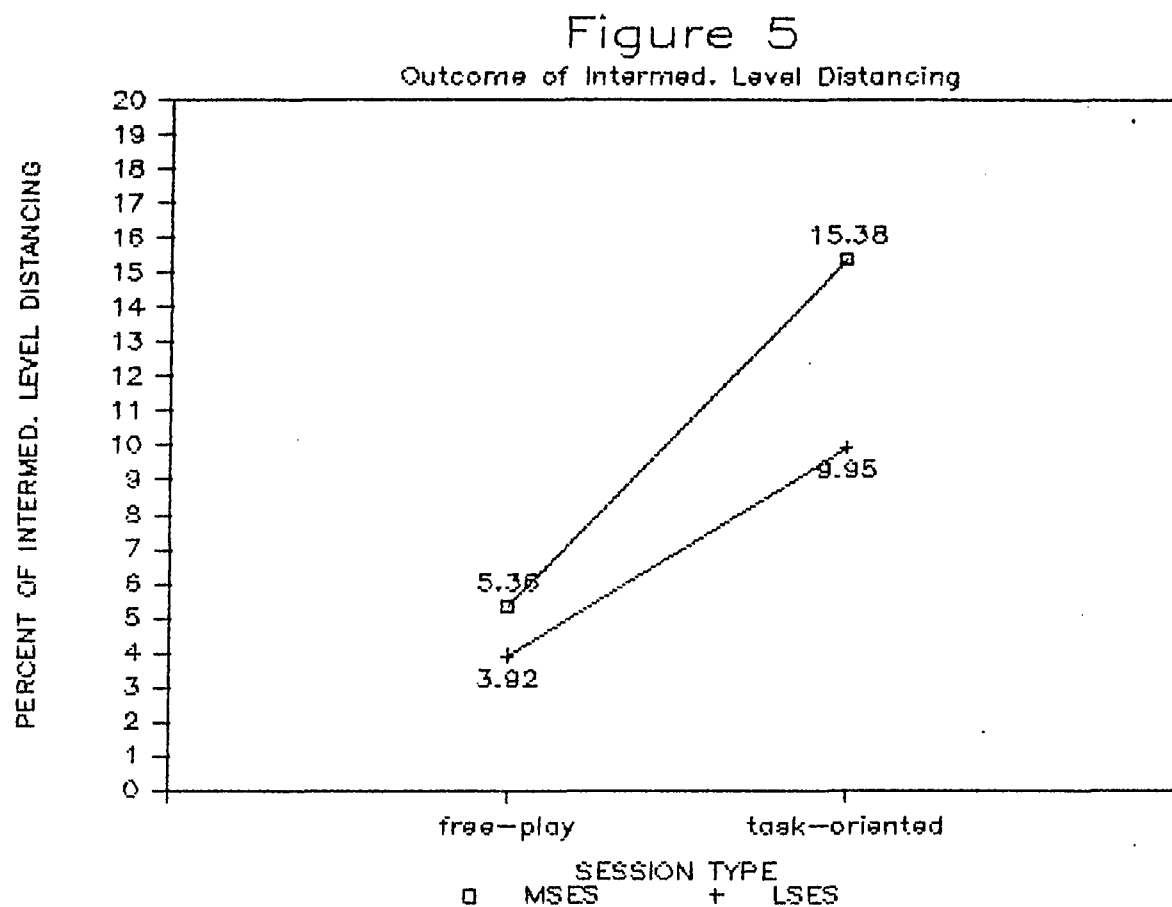
Table 5b

<u>Source of Variance</u>	<u>df</u>	<u>Hypo.MS</u>	<u>F</u>	<u>p.</u>
SES (A)	(1,38)	231.70	3.91	$\leq .055$
Session (B)	(1,38)	810.00	19.97	$\leq .000$
SES x Session (AxB)	(1,38)	138.25	6.92	$\leq .012$
Error	(1,38)	19.97		

Caption 5b. Results of Univariate Analysis of High Level Distancing Strategies Emitted by Middle- and Low-SES Mothers During Free-Play and Task-Oriented Sessions.

percentage of intermediate level distancing revealed a highly significant main effect for SES, $F(1,38)=14.07$, $p \leq .001$, with middle-SES mothers engaging in considerably more intermediate level distancing strategies than low-SES mothers. It also revealed a highly significant main effect for session, $F(1,38)=60.71$, $p \leq .000$, with mothers engaging in considerably more intermediate level distancing strategies during the task-oriented session. Finally, a marginally significant SES x session interaction, $F(1,38)=3.75$, $p \leq .060$, was found in the predicted direction, with middle-SES mothers increasing their use of intermediate level distancing more than low-SES mothers during the task-oriented session. The results of the univariate test conducted on intermediate level distancing strategies supported the predictions made in Hypothesis 2 (see Figure 5).

The results of the univariate tests of significance for the percentage of high level distancing strategies revealed a main effect for SES, $F(1,38)=3.91$, $p \leq .055$, with middle-SES mothers engaging in more high level distancing strategies than low-SES mothers. There was a highly significant main effect for session, $F(1,38)=19.97$, $p \leq .000$, with all mothers engaging in substantially more high level distancing during the free-play session versus the task-oriented session. Finally, a SES x session interaction was revealed, $F(1,38)=6.92$, $p \leq .012$, with middle-SES mothers decreasing



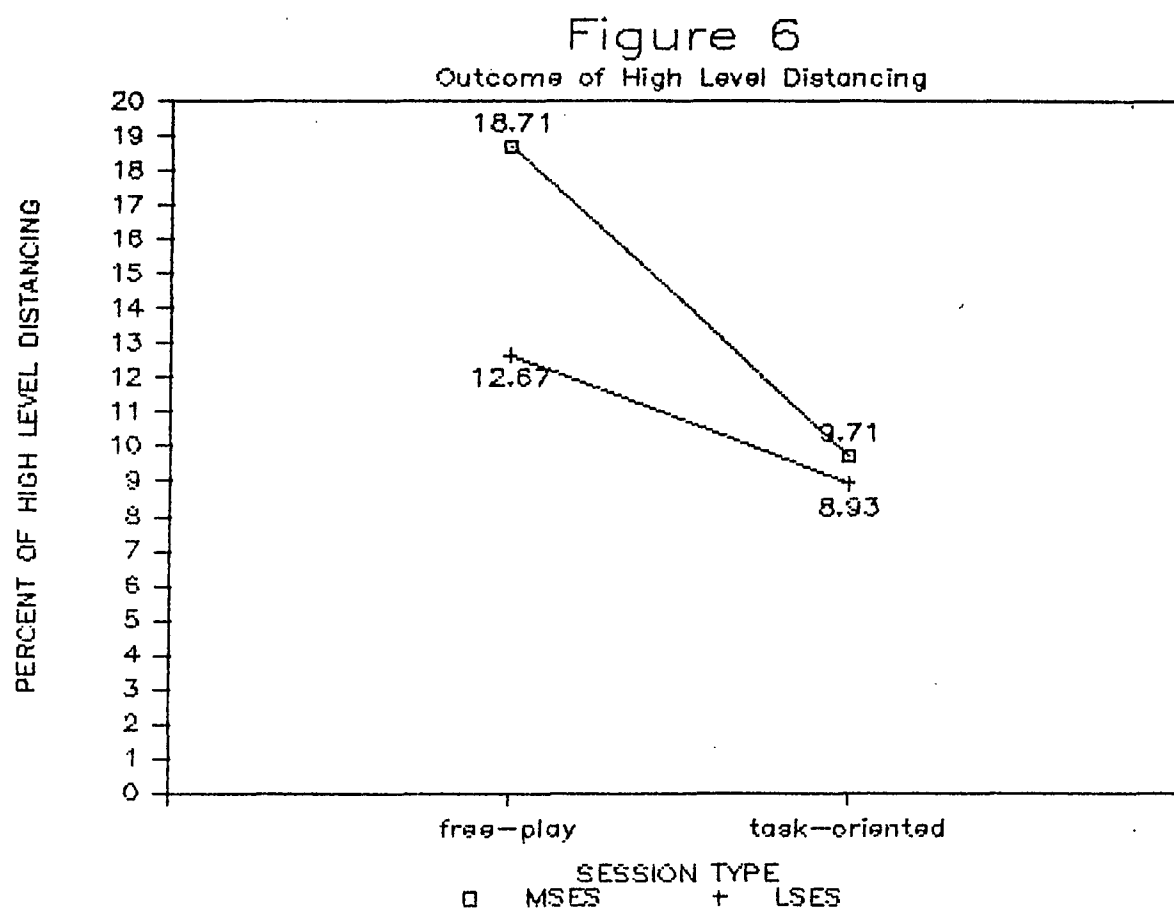
Caption Figure 5. Percent of Intermediate Level Distancing Strategies Emitted by Middle-SES and Low-SES Mothers During Free-Play and Task-Oriented Sessions.

their use of high level distancing strategies significantly more than low-SES mothers from the free-play to the task-oriented session. The main effect for session and the interaction were not in the predicted direction (see Figure 6).

The results of the analyses conducted on the intermediate level distancing strategies supported the predictions made, while some of the results of the analyses conducted on high level distancing strategies did not. Specifically, the results of the high level distancing analysis indicated that while there was a main effect for session it was not in the predicted direction. Mothers decreased their use of high level distancing strategies rather than increasing their use. Also, while there was a significant interaction it involved a decrease on the part of middle-SES mothers from free-play to task-oriented sessions rather than the predicted increase. In sum it appeared that mothers reacted as predicted when engaging in intermediate level distancing strategies but not when engaging in high level distancing strategies.

Less-Complex-Level Distancing Strategies

The fourth set of hypotheses examined the effects of SES and session on the amount of less-complex-distancing strategies mothers engaged in while interacting with their



Caption Figure 6. Percent of High Level Distancing Strategies Emitted by Middle-SES and Low-SES Mothers During Free-Play and Task-Oriented Sessions.

children. A main effect for SES was predicted with low-SES mothers engaging in a significantly higher percentage of less-complex-distancing strategies (this included task management statements and low level distancing strategies) than middle-SES mothers. A main effect for session was also predicted with mothers engaging in a significantly higher percent of less-complex-distancing strategies during the task-oriented session as compared to the free-play session (see Figure 3).

The same MANOVA was utilized to address these predictions as the one described in the third set of predictions (see Table 4). For the fourth set of hypotheses the univariate tests of significance were examined for task-management statements and low level distancing strategies (see Table 6a and 6b). The results of the analysis of the task-management statements indicated a main effect for SES, $F(1,38)=16.15$, $p \leq .000$. The percentage of task-management statements was higher for low-SES mothers than for middle-SES mothers. A main effect for session was also revealed, $F(1,38)=82.95$, $p \leq .000$, with mothers engaging in a significantly higher percentage of task-mangement statements in the task-oriented session as compared to the free-play session. There was no interaction. The results of this analysis support both predictions made in Hypothesis 3 (see Figure 7).

The results of univariate analysis of the low level

Table 6a

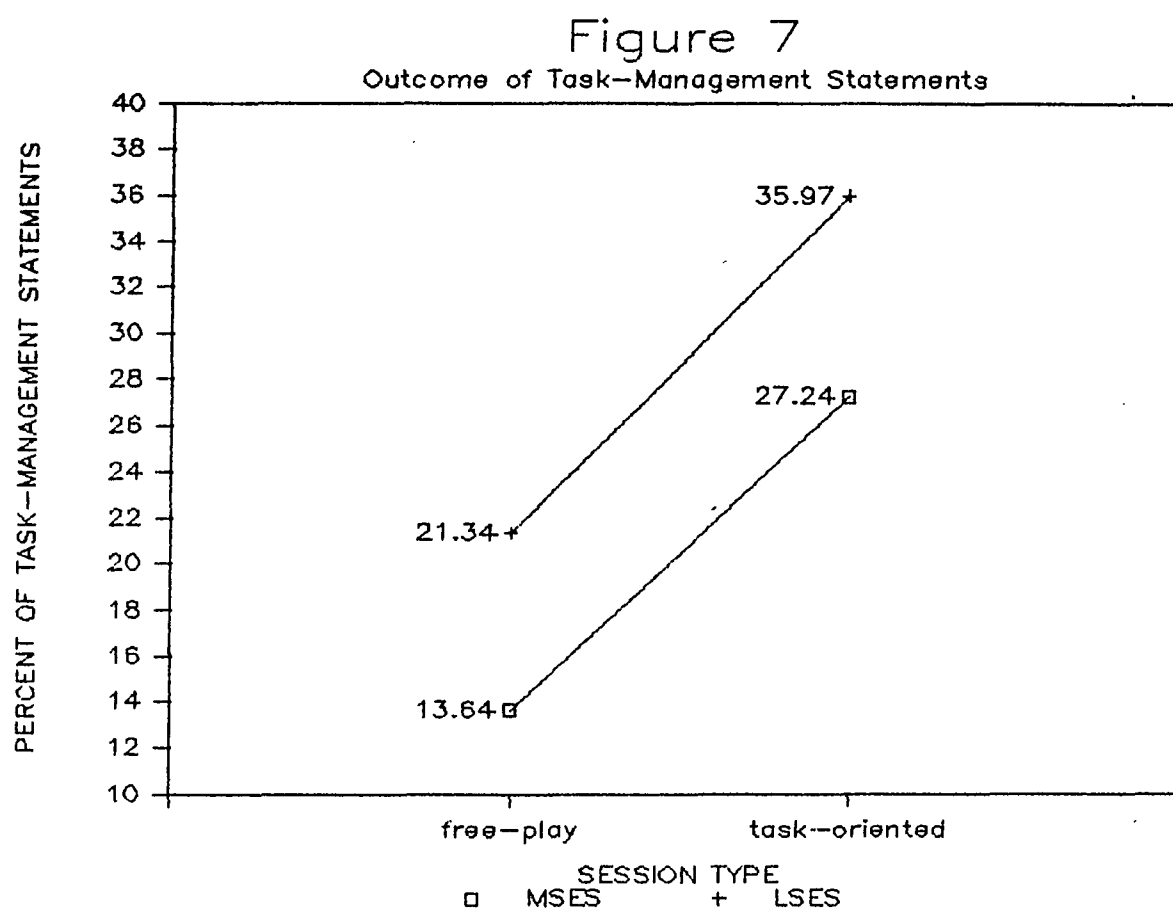
<u>Source of Variance</u>	<u>df</u>	<u>Hypo.MS</u>	<u>F</u>	<u>p</u>
SES (A)	(1,38)	1347.63	16.15	$\leq .000$
Session (B)	(1,38)	3982.65	82.95	$\leq .000$
SES x Session (AxB)	(1,38)	5.33	.11	N.S.
Error	(1,38)	48.01		

Caption 6a. Results of Univariate Analysis of
Task-Management Statements Emitted by Middle-and Low-SES
Mothers During Free-Play and Task-Oriented Sessions.

Table 6b

<u>Source of Variance</u>	<u>df</u>	<u>Hypo.MS</u>	<u>F</u>	<u>p</u>
SES (A)	(1,38)	48.94	.86	N.S.
Session (B)	(1,38)	412.34	12.42	$\leq .001$
SES x Session (AxB)	(1,38)	5.14	.15	N.S.
Error	(1,38)	33.20		

Caption 6b. Results of Univariate Analysis of Low Level
Distancing Strategies Emitted by Middle- and Low-SES Mothers
During Free-Play and Task-Oriented Sessions.



Caption Figure 7. Percent of Task-Management Statements Emitted by Middle-SES and Low-SES Mothers During Free-Play and Task-Oriented Sessions.

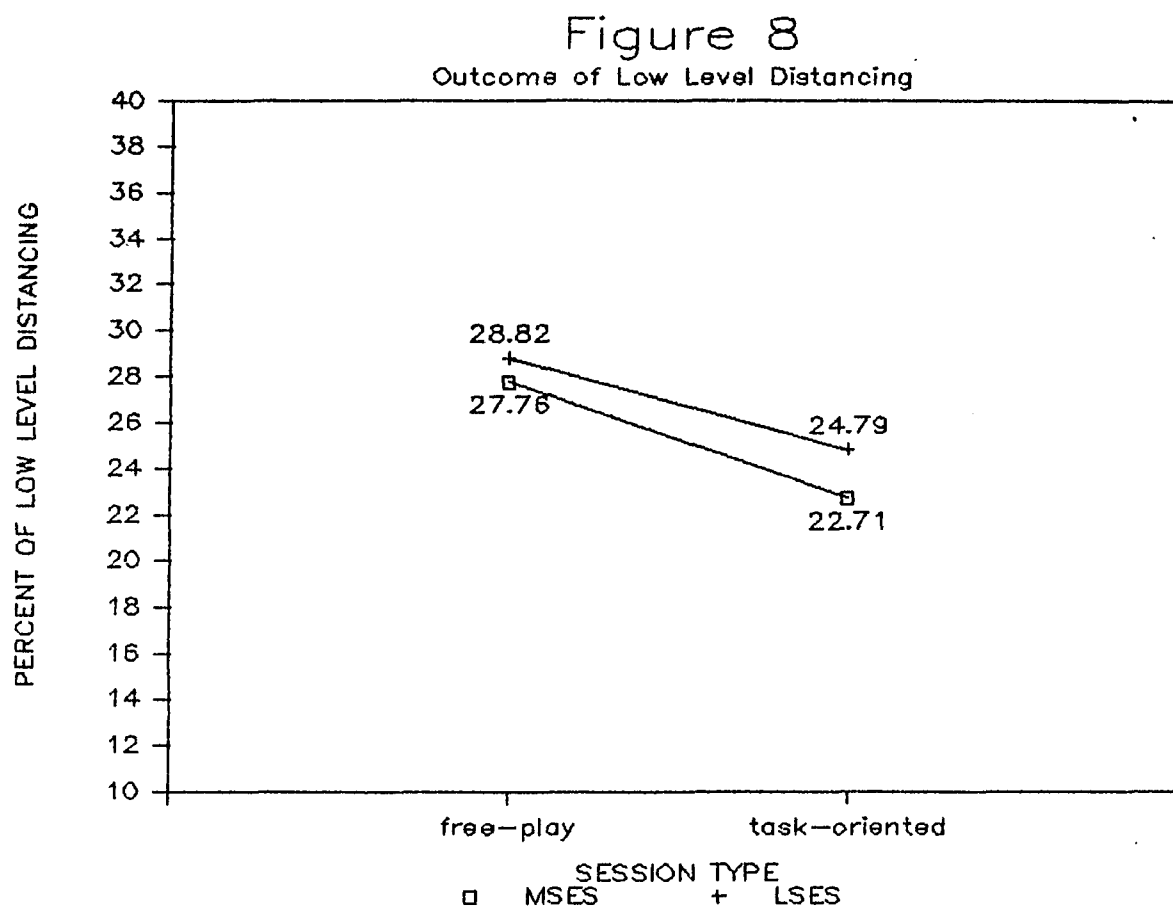
distancing strategies revealed no main effect for SES, it appeared that low- and middle-SES mothers engaged in equivalent percentages of low level distancing strategies. There was a main effect for session, $F(1,38)=12.42$, $p \leq .001$, with mothers engaging in a lower percentage of low level distancing strategies during the task-oriented session as compared to the free-play session. This main effect was not in the predicted direction (see Figure 8).

The results of the analyses conducted on the task-management statements supported the predictions, while the results of the analyses conducted on the low level distancing strategies did not. Specifically, the results of the low level distancing analysis revealed no main effect for SES and a main effect for session but in the direction opposite of what was predicted.

Relationship of Maternal Levels of Distancing, Maternal Degree of Involvement, and Children's Performance Scores

The fifth set of hypotheses made several predictions. First it was predicted that the percentage of maternal engagement in more-complex-levels of distancing would be positively correlated with children's performance on the PPVT-R and the WPPSI.

A Pearson product-moment correlation analysis was performed in order to address this hypothesis. All maternal



Caption Figure 8. Percent of Low Level Distancing Strategies Emitted by Middle-SES and Low-SES Mothers During Free-Play and Task-Oriented Sessions.

utterances (task-management, low level, intermediate level and high level distancing strategies) were entered into a correlation matrix with children's performance on the PPVT-R, the WPPSI Full Scale, the WPPSI Verbal and the WPPSI Performance scores (see Table 7). The results indicated that when taken together (all mothers utterances collapsed across SES and sessions) high level distancing strategies were positively correlated with the WPPSI Full Scale ($r=.57$, $p \leq .000$), WPPSI Verbal ($r=.40$, $p \leq .005$) and WPPSI Performance ($r=.59$, $p \leq .000$); intermediate level distancing strategies were positively correlated with PPVT-R ($r=.25$, $p \leq .059$), WPPSI Full Scale ($r=.32$, $p \leq .021$), WPPSI Verbal ($r=.30$, $p \leq .028$), and WPPSI Performance ($r=.27$, $p \leq .048$); low level distancing strategies were negatively correlated with WPPSI Full Scale ($r=-.30$, $p \leq .031$) and WPPSI Verbal ($r=-.31$, $p \leq .027$); and task-management statements were negatively correlated with PPVT-R ($r=-.30$, $p \leq .031$), WPPSI Full Scale ($r=-.57$, $p \leq .000$), WPPSI Verbal ($r=-.36$, $p \leq .011$), and WPPSI Performance ($r=-.62$, $p \leq .000$).

Pearson product-moment correlations were also computed to investigate whether maternal utterances were more highly associated with children's outcome measures during free-play or task-oriented sessions. A series of Student's *t*-test for dependent *r*'s (Klugh, 1986) were performed to compare the correlations of maternal low level, intermediate level, high level and task-management statements during free-play and

Table 7

	PPVT-R	WPPSI Full Scale	WPPSI Verbal	WPPSI Performance
Percent				
High Level	r=.21	r=.57	r=.40	r=.59
Distancing	p=.093	p= .000**	p=.005**	p=.000**
Percent				
Intermediate	r=.25	r=.32	r=.30	r=.27
Level	p=.059	p=.021*	p=.028*	p=.048*
Percent				
Low Level	r=-.09	r=-.30	r=-.31	r=-.21
Distancing	p=.288	p=.031*	p=.027*	p=.095
Percent				
Task-	r=-.30	r=-.57	r=-.36	r=-.62
Management	p=.031*	p=.000**	p=.011*	p=.000**

* p<.05

** p<.001

Caption Table 7. Pearson Correlation Matrix of Children's Performance on the PPVT-R, WPPSI Full Scale, WPPSI Verbal, WPPSI Performance by Percent of Maternal Levels of Distancing and Task-Management.

and task-oriented sessions to children's performance. The t-test "permits us to test the significance of the differences between two values of r obtained from two independent or dependent samples" (Edwards, 1967, p.250). The t-test revealed that: maternal low level distancing during task-oriented session was more negatively associated with children's performance on the WPPSI Full Scale, $t(37)=2.40$, $p \leq .05$, and that maternal task-management statements during free-play were more negatively associated with childrens' PPVT-R, WPPSI Full Scale, and WPPSI Verbal scores; $t(37)=2.12$, $p \leq .05$; $t(37)=3.00$, $p \leq .01$; and $t(37)=3.32$, $p \leq .01$, respectively.

Finally, Pearson product-moment correlations were performed to investigate whether the association of maternal utterances to childrens' performance differed according to SES from the correlation of the group as a whole. A series of Student's t-tests for dependent r 's were performed to compare the significant correlations. No differences in association according to SES were revealed.

Secondly, it was predicted that measures of maternal involvement (mutual activity, passive participation, and independent play) would be moderately correlated with childrens' scores on the PPVT-R and the WPPSI. A Pearson product-moment correlation was performed to investigate this hypothesis (see Table 8). The results revealed that the amount of time in mutual activity was negatively correlated with WPPSI Performance ($r = -.34$, $p \leq .02$), while the time

Table 8

		WPPSI	WPPSI	WPPSI
	PPVT-R	Full Scale	Verbal	Performance
Time in	r=.10	r=-.23	r=-.03	r=-.34
Mutual Activity	p=.28	p=.08	p=.42	p=.02*
Time in	r=.07	r=.18	r=.03	r=.26
Passive Part.	p=.33	p=.13	p=.43	p=.05*
Time in	r=-.20	r=.08	r=.01	r=.13
<u>Independent Play</u>	<u>p=.11</u>	<u>p=.31</u>	<u>p=.48</u>	<u>p=.21</u>

* $p < .05$

Caption Table 8. Pearson Correlation Matrix of Children's Performance on the PPVT-R, WPPSI Full Scale, WPPSI Verbal and WPPSI Performance by Maternal Degree of Involvement.

spent in passive participation was positively correlated with WPPSI Performance ($r=.26$, $p\leq.051$). No other significant correlations were observed. Student's t-tests for dependent r's were performed to investigate whether the association of maternal involvement to childrens' performance scores differed according to SES from the group as a whole. No differences in association were revealed.

This second prediction was only partially confirmed. It was expected that there would be more significant positive correlations between time in mutual activity and passive participation and childrens' scores on the performance tests. In particular, a negative correlation between time in mutual activity and WPPSI Performance was not expected.

Thirdly, it was predicted that maternal more-complex-level distancing strategies (intermediate and high level distancing) would be moderately correlated with the amount of time mothers' spent (duration) in mutual activity and passive participation. A Pearson product-moment correlation analysis was performed in order to address this hypothesis (see Table 9). The results indicated that intermediate level distancing strategies were not significantly correlated with the amount of time that mothers spent in mutual activity or passive participation. High level distancing strategies were negatively correlated with time spent in mutual activity ($r=-.41$, $p\leq.004$) and there was no significant correlation with time spent in

Table 9

	<u>Low</u>	<u>Intermed.</u>	<u>High</u>	<u>Task-Management</u>
Time in	r=.21	r=-.04	r=-.41	r=.20
Mutual Activity	p=.10	p=.39	p=.004*	p=.11
Time in	r=-.16	r=.25	r=.08	r=-.18
Passive Part.	p=.16	p=.06	p=.30	p=.13
Time in	r=-.08	r=-.21	r=.41	r=-.05
Independent Play	p=.31	p=.09	p=.004*	p=.38

* p<.05

Caption Table 9. Pearson Correlation Matrix of Maternal Levels of Distancing by Maternal Degree of Involvement.

passive participation. Unexpectedly, high level distancing strategies were positively correlated with time spent in independent play ($r=.41$, $p \leq .004$).

The results of this analysis did not support the predictions made. Rather, it appeared that more-complex-level distancing strategies were not significantly correlated to time in mutual activity or passive participation, except for the negative correlation of high level distancing strategies to mutual activity. Contrary to the reasoning behind the fifth set of hypotheses it was noted that high level distancing strategies were positively correlated with the duration of independent play episodes during free-play.

Finally, it was predicted that the correlations between maternal distancing behavior and childrens' PPVT-R and WPPSI scores would be significantly greater than the correlations between measures of maternal involvement and childrens' PPVT-R and WPPSI scores. A series of four stepwise multiple regression analysis were performed in order to address this prediction. The dependent measures for each regression analyses were, respectively, PPVT-R score, WPPSI Full Scale score, WPPSI Verbal score and WPPSI Performance score. The explanatory variables (maternal distancing-high level distancing strategies and maternal involvement- time in mutual activity) and socioeconomic variables that were felt to be important predictors (mother's age, mother's education

in years, and the age child started daycare) were then entered in a stepwise fashion. Summary statistics of the significant predictors and the final multiple R's have been presented in Table 10.

The only major predictor variable for the children's scores on the PPVT-R was maternal distancing (final multiple $R = .56$, final $R^2 = .32$). The remaining variables were not significantly predictive of PPVT-R scores.

The stepwise regression on children's WPPSI Full Scale score accounted for 72% of the variance (final multiple $R = .85$, $R^2 = .72$). Again, the strongest predictor was maternal distancing. The second most significant predictor was age the child started daycare, followed by mother's age. All were positively correlated with WPPSI Full Scale.

On the WPPSI Verbal scores a different pattern was observed. The age that the child started daycare was the best predictor of children's performance on the WPPSI Verbal scale followed by maternal distancing. These variables accounted for 45% of the variance (final multiple $R = .67$, final $R^2 = .45$).

Finally, the stepwise regression on children's WPPSI Performance score accounted for 69% of the variance (final multiple $R = .83$, $R^2 = .69$). Maternal distancing was the strongest predictor of children's WPPSI Performance score, followed by mother's age.

Table 10

Predictor Variable	Best Predictor Mult.R	Second Predictor Mult.R	Third Predictor Mult.R	Final R ² Mult.R
PPVT-R	Maternal Distancing			
	.56			.32
WPPSI Full Scale	Maternal Distancing	Age of Daycare	Maternal Age	
	.72	.79	.85	.72
WPPSI Verbal	Age of Daycare	Maternal Distancing		
	.52	.67		.45
WPPSI Performance	Maternal Distancing	Maternal Age		
	.78	.83		.69

Caption Table 10. Multiple Regression Correlation

Coefficients for Children's Performance on the PPVT-R, WPPSI Full Scale, WPPSI Verbal and WPPSI Performance by Maternal Variables and Socioeconomic Factors.

In general, then, it appeared that the hypothesis was confirmed with maternal distancing strategies being stronger predictors of childrens' performance on the PPVT-R and WPPSI Full Scale and Performance, and with age of daycare being the best predictor of children's performance on the WPPSI Verbal scale. In terms of the WPPSI Verbal scores, maternal distancing was the second most predictive variable of children's performance. Maternal degree of involvement did not contribute any predictive power to these analyses.

Effect of Involvement Category on Maternal Verbalizations - A Conditional Probabilites Analysis

An important issue of interest within this study was the effect of context on mothers' behavior. It has already been reported that mother's talk to their children changes from one task to another. It was also of interest to observe whether mothers differentially verbalized depending on their state of involvement with their children. The data collected for this study were scored in such a way as to allow for the examination of maternal distancing strategies according to maternal degree of involvement using a system developed by Farran & Haskins (1980).

A three-step analysis was conducted in order to determine whether middle- and low-SES mothers verbalized differently within the 3 involvement conditions. First, the

conditional probability was calculated for each level of distancing (low, intermediate, high and task-management) within each involvement condition (mutual activity, passive participation and independent play). For example, the conditional probability of mothers' emitting a high level distancing strategy during mutual activity was computed by dividing the number of high level distancing strategies that occurred within mutual activity episodes by the total amount of time in mutual activity. This was done for each level of distancing within each involvement condition. The result of these calculations were profiles of maternal distancing across involvement conditions according to SES.

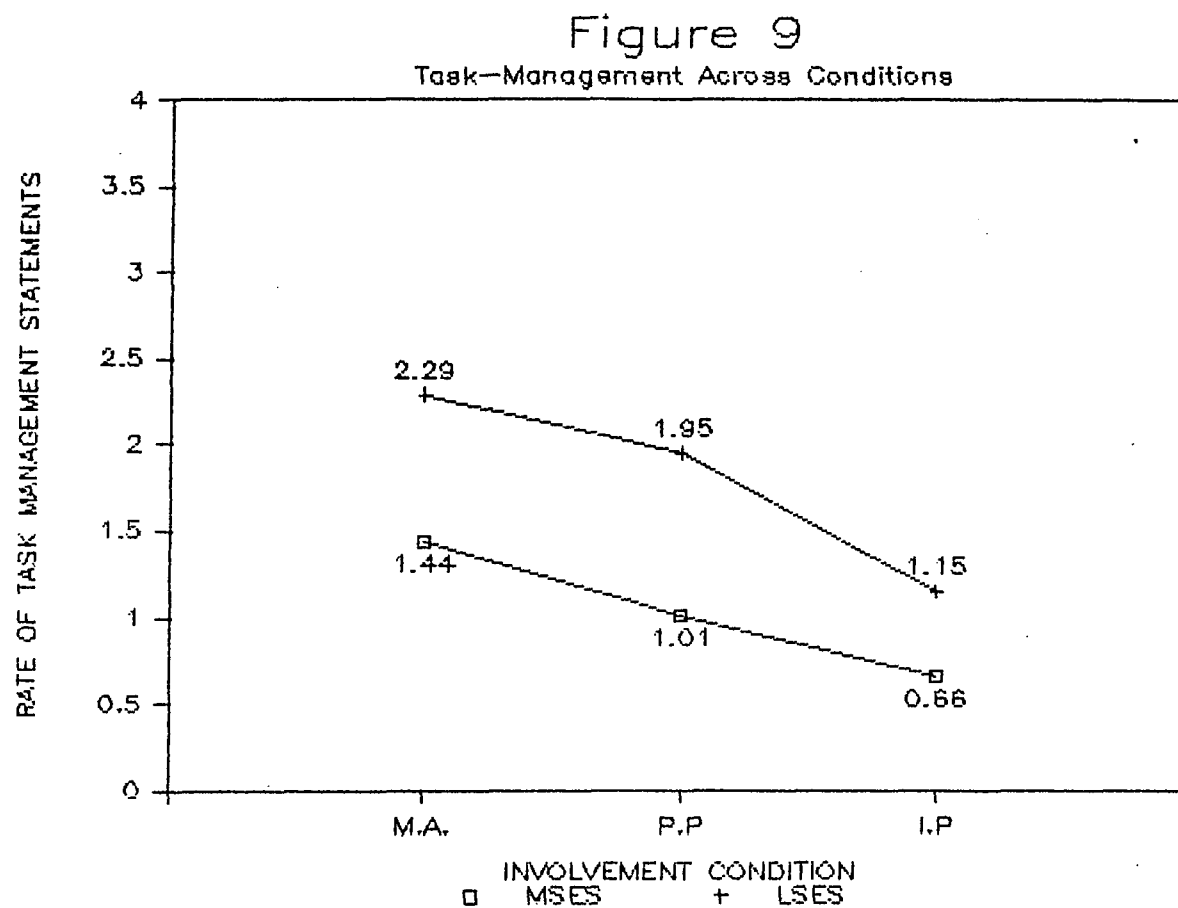
Next, contrast scores were computed by subtracting the probability of one level of distancing during one involvement condition from its probability during another involvement condition. Two contrast scores were obtained for each level of distancing. For example, contrast scores were computed for high level distancing by subtracting its probability during mutual activity from its probability during passive participation and then subtracting its probability during passive participation from its probability during independent play. This was done for each level of distancing.

Finally, these contrast scores were used as dependent variables in a repeated measures MANOVA in order to test the differences in profiles of levels of distancing across

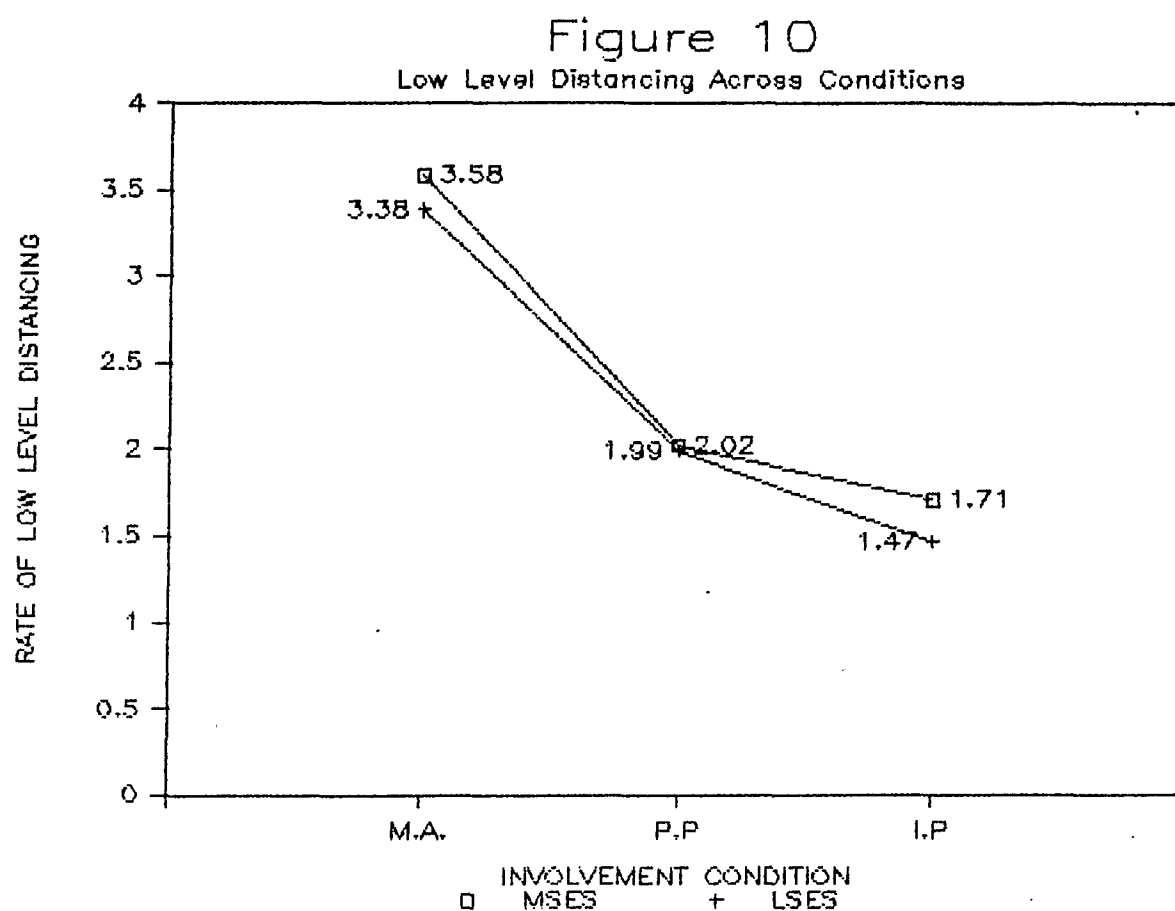
involvement conditions by middle- and low-SES mothers. First, group differences in profiles were examined. If no differences were noted in the profiles then the profiles were examined for the sample as a whole.

Analysis of the task-management statements indicated that the two groups of mothers did not differ in their profiles as a function of the involvement conditions (see Figure 9), although they did differ in the overall amount they utilized task-management statements. Therefore, the task-management profile for the sample as a whole was examined utilizing Student's *t*-test. Mothers used more task-management statements when they were in mutual activity than when they were in passive participation, $t(39)=2.46$, $p \leq .019$, and independent play, $t(39)=3.57$, $p \leq .001$. Mothers also used more task-management statements while in passive participation than when they were in independent play, $t(39)=2.60$, $p \leq .013$.

Analysis of low level distancing strategies indicated no difference in the profiles of the two groups of mothers as a function of the involvement condition (see Figure 10). Therefore, the low level distancing profile was examined for the sample as a whole using Student's *t*-test. Mothers used more low level distancing strategies during mutual activity than when they were in passive participation, $t(39)=5.35$, $p \leq .000$ and independent play, $t(39)=3.97$, $p \leq .000$. Mothers



Caption Figure 9. Profile of Task-Management Statements for Middle-SES and Low-SES Mothers Across Involvement Conditions (M.A.=Mutual Activity; P.P.=Passive Participation; I.P.=Independent Play).



Caption Figure 10. Profile of Low Level Distancing Strategies for Middle-SES and Low-SES Mothers Across Involvement Conditions (M.A.= Mutual Activity; P.P.= Passive Participation; I.P.= Independent Play).

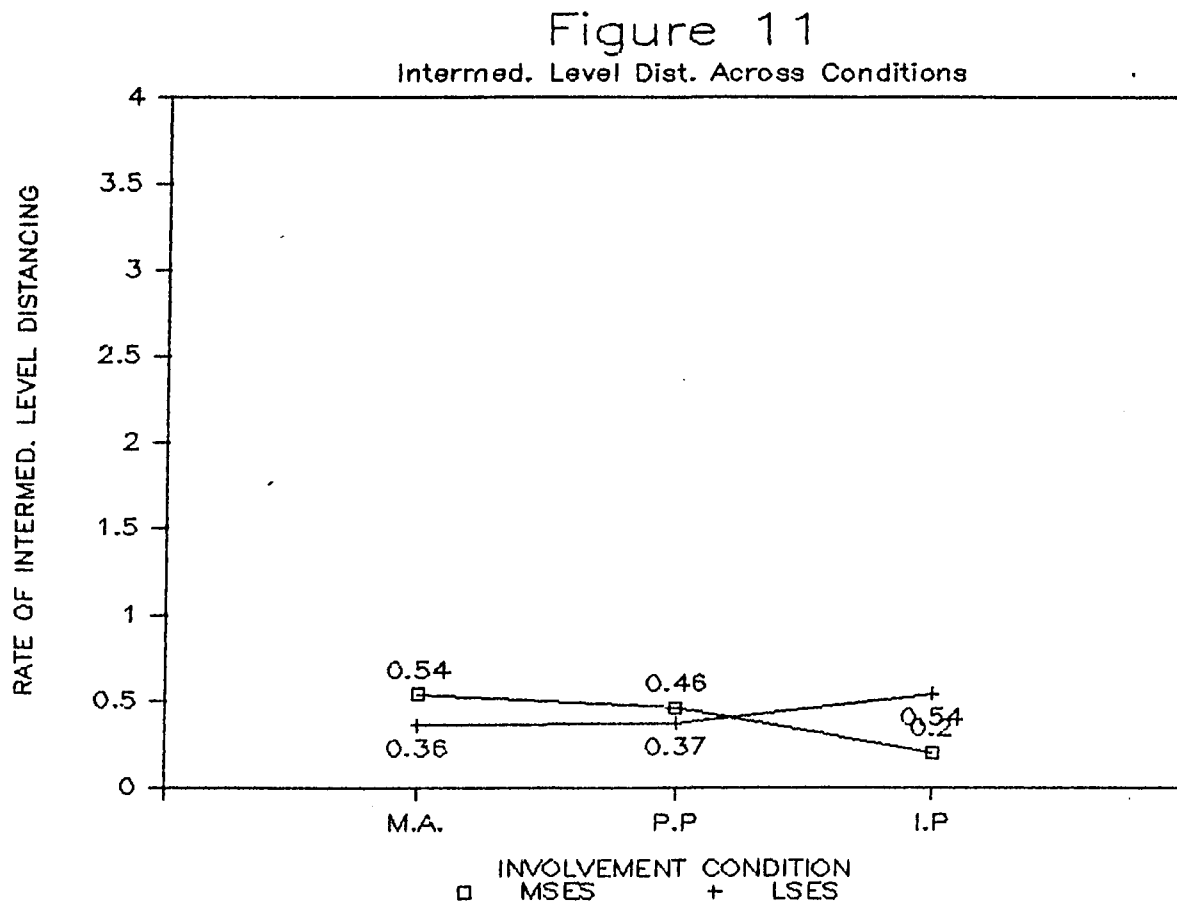
used comparable amounts of low level distancing strategies during passive participation and independent play.

The analysis of intermediate level distancing strategies revealed no difference in the profiles of the two groups of mothers as a function of the involvement condition (see Figure 11). The sample was then examined as a whole. It appeared that mothers utilized intermediate level distancing strategies at an equivalent rate across all of the involvement conditions. Condition did not appear to have an effect on the use of intermediate level distancing strategies.

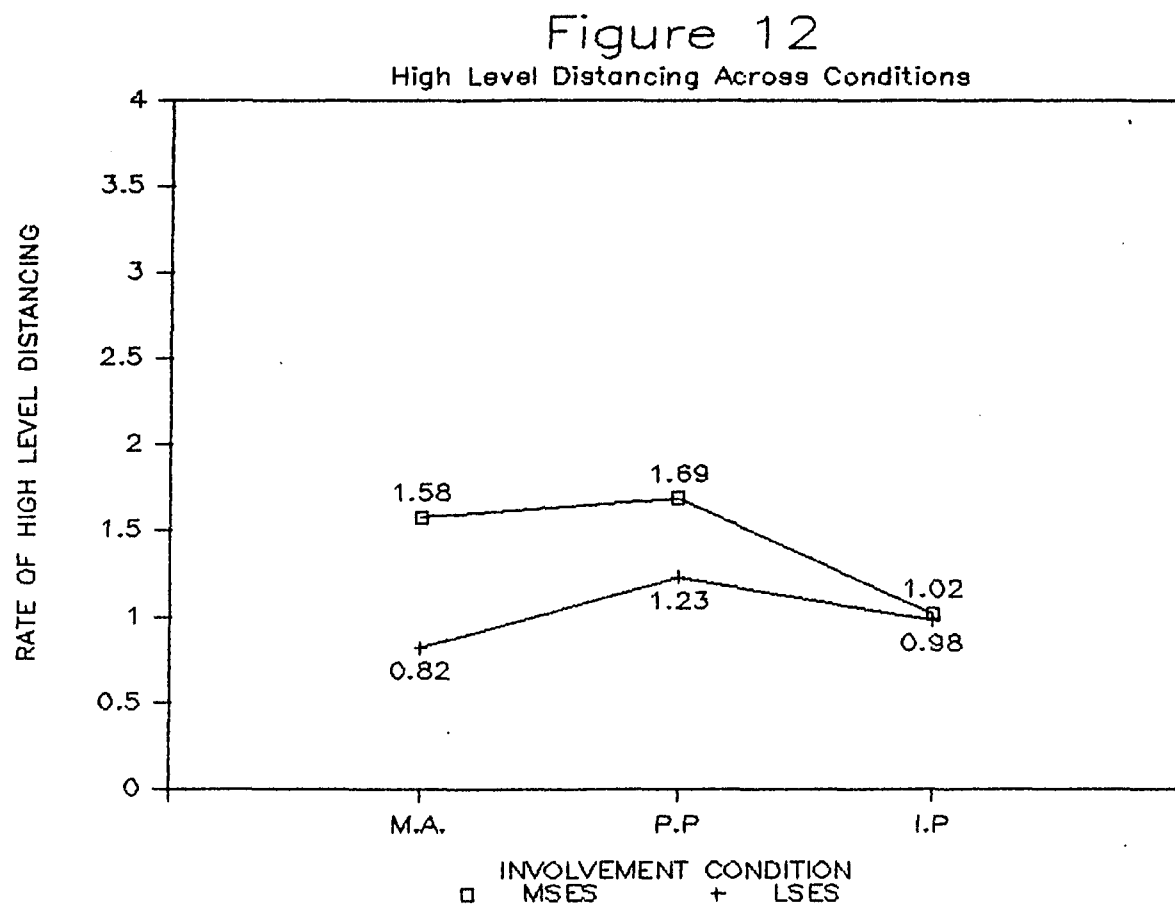
Lastly, the analysis of high level distancing strategies revealed no difference in the profiles of the two groups as a function of the involvement condition. As before, the sample was then examined as a whole. As with the intermediate level distancing strategies, it appeared that mothers utilized high level distancing strategies equally across all three involvement conditions (see Figure 12).

Additional Results

The results discussed in the previous sections pertain explicitly to the hypotheses that were being investigated in the present study and to the conditional probabilities analysis that was performed. However, due to the considerable data that were collected during this study



Caption Figure 11. Profile of Intermediate Level Distancing Strategies for Middle-SES and Low-SES Mothers Across Involvement Conditions (M.A.= Mutual Activity; P.P.= Passive Participation; I.P.= Independent Play).



Caption Figure 12. Profile of High Level Distancing Strategies for Middle-SES and Low-SES Mothers Across Involvement Conditions (M.A.= Mutual Activity; P.P.= Passive Participation; I.P.= Independent Play).

additional analyses were performed. See Appendix J for the results of these additional analyses.

CHAPTER 4

DISCUSSION

This study helps clarify the influence of socioeconomic differences within two components of maternal-child interactions: maternal involvement and maternal verbalizations. The relationship of these maternal behaviors to children's cognitive skills is also examined. In addition, information is made available regarding differences in these specific maternal interactional behaviors between tasks. This information is deemed important based on empirical evidence which suggests that parental influences during children's early development are related to their ability to succeed on language and cognitive tasks and within an academic environment.

It is understood that by socioeconomic status we mean a cluster of demographic variables that represent an individual's life circumstances. These variables include, but are not solely represented by, the individual's economic, educational and occupational status. Included in the cluster of variables that make up socioeconomic status are variables such as historical experiences, available parenting models, learning opportunities, cultural experiences related to ethnicity, living conditions

living conditions such as overcrowding, single or dual parenting, stressors related to employment or lack thereof, and more. Thus, it should be understood that SES is a form of shorthand to discuss these clusters of correlated variables which moderately predict demographic characteristics and life events. These variables, and others, affect maternal behavior.

Session Effects

The issues of primary concern in this study were how middle- and low-SES mothers differed in their involvement and verbalizations with their children and whether those variables were associated with children's performance on the PPVT-R and WPPSI. The free-play session was chosen as a semi-naturalistic setting in which those questions could be addressed. Of secondary interest was the issue of whether differences noted across SES groups were the result of a skills suppression or a skills deficit on the part of the mothers. The task-oriented session was added in order to address this concern. By observing mothers in two different settings a broader sample of the maternal behaviors of interest was available for observation. Especially since both sessions were very different in nature. It was hoped that maternal behaviors that were not evident in one session for a particular mother or group of mothers might be evident

in the next. If so, some tentative conclusions could be drawn about the skill suppression issue.

The free-play session always preceded the task-oriented session: therefore, sessions were not counter-balanced. This was done to avoid the strong possibility that serious carry-over effects from the task-oriented session to the free-play session would threaten the internal validity of the study. Keppel (1973) stated that "if the experimental conditions are subject to differential carry-over effect, then counter-balancing is an inappropriate method of control" (p.399). This concern might account for studies such as those reported by Zegiob and Forehand (1975); Hatfield, Ferguson, and Alpert (1967); Baumrind (1967); Levine, Fishman, and Kagan (1968) in which unstructured and structured tasks were also not counter-balanced.

However, by not counter-balancing, caution must be exercised in drawing any conclusions about the causes of behavioral differences from the free-play to the task-oriented session. No conclusions can be drawn without taking into account that free-play always preceded task-oriented sessions. Two "plausible rival hypotheses" (Webb, Campbell, Schwartz & Sechrest, 1981) are proposed to account for the changes in maternal behavior observed from the free-play to the task oriented session. The first hypothesis suggests that any changes in maternal behavior are due to warm-up effects over time. The alternative

hypothesis suggests that the demands placed on mothers during the task-oriented session strongly pull for certain behaviors to be emitted. Thus, because the task-oriented session is designed to demand that the mothers teach their children how to complete the task, certain teaching behaviors would be expected to increase, while other irrelevant behaviors would be expected to decrease. Which rival hypotheses accounts for the results most parsimoniously, and thus represents the most plausible hypothesis must be decided based on the data.

In addition, it is important to note that whether the differences between SES groups are due to task demands or warm-up effects is of relatively minor importance in this study. The real question is whether low-SES mothers and middle-SES mother interact similarly with their children. For example, if low-SES mothers exhibit comparable skills to middle-SES mothers during the task-oriented session and not the free-play session it can be argued that a suppression of skills was evident in the free-play session for low-SES mothers, due either to the task demands, a warm-up effect, or both. In other words, if what we're interested in is whether mothers have certain skills or not, then it makes no difference what the circumstances are under which we observe the skills (i.e., only when preceded by free-play) since what's of interest is simply whether mothers have the skills or not.

Nevertheless, changes from the free-play to the task-oriented session were examined and plausible hypotheses were proposed. With respect to maternal involvement, there was a noticeable change from the free-play to the task-oriented session. Both groups of mothers went from spending part of the time with their children in all three involvement conditions (mutual activity, passive participation, and independent play) during the free-play session to spending almost all of their time in mutual activity with their children during the task-oriented session. There was so little variability in how involved mothers were with their children during the task-oriented session that coding was suspended.

A random sample of 10 dyads was more closely examined to determine whether there were systematic effects within involvement conditions across time. In particular, it was expected that if mothers were merely warming-up to being exclusively mutually involved with their children (as they were during the task-oriented session), a steady increase in mutual activity would be evident across the free-play session. Three repeated measures analyses of variance were conducted, one for each involvement condition. The mean time of involvement during the first 5 minutes, second 5 minutes, third 5 minutes and fourth 5 minutes of the free-play session were the dependent variables. If maternal involvement increased or decreased over time then it was

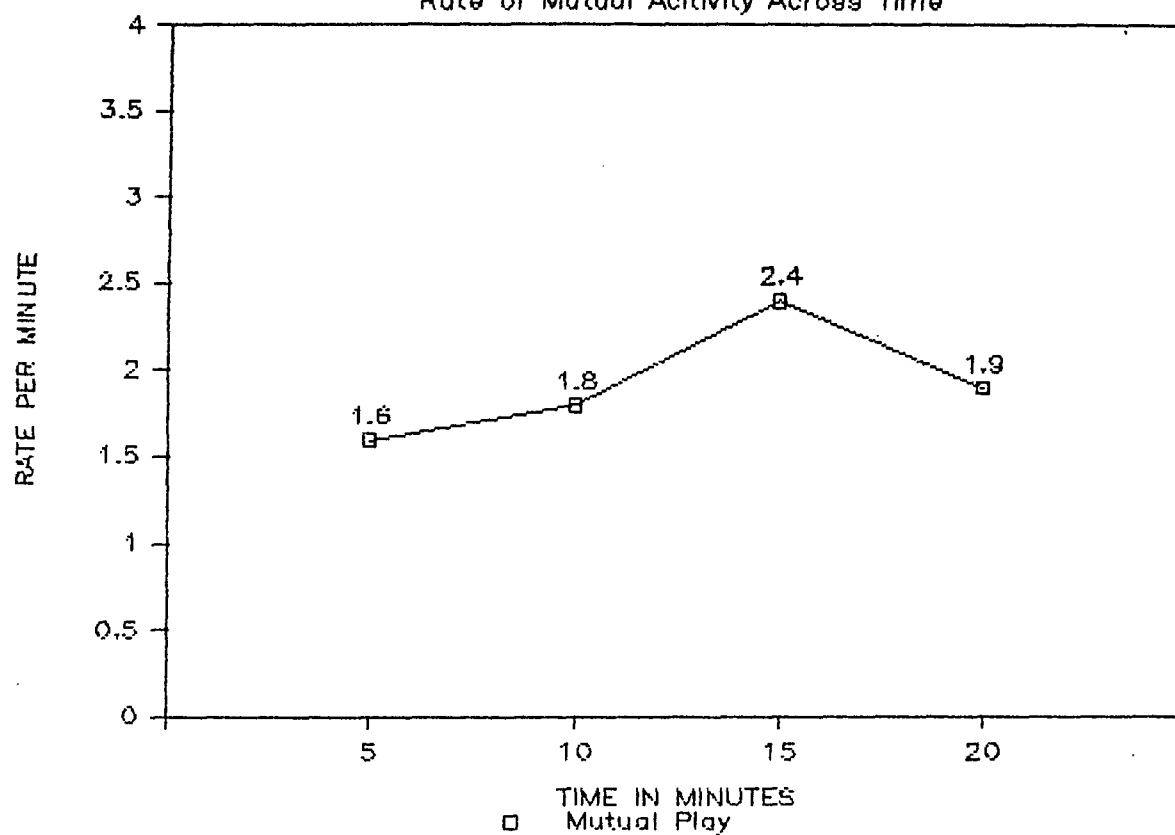
expected that a significant difference between means would be revealed (see Figures 13a, b, and c). The results indicated that there were no differences in maternal engagement in mutual activity, passive participation or independent play across time. These data suggested that warm-up effects due to time were not apparent during free-play. The dramatic and immediate change occurred between free-play and task-oriented sessions. All involvement during the task-oriented session became mutual activity.

The alternative hypothesis, that mothers were responding to task demands during the task-oriented session, appeared to a more plausible explanation. Specifically, it appeared that mothers split their time during free-play so as to engage in all three involvement conditions equally throughout the session. When the task-oriented session was introduced, all the mothers became mutually engaged with their children exclusively. It seems likely that mothers interpreted the experimenter's directions to teach their children the block building task as requiring them to be actively engaged with their children throughout the task. With respect to maternal involvement it appeared that the most plausible hypothesis was that mothers were responding to the task demands inherent in the task-oriented session.

While continuous changes over time can be ruled out, one can not rule out completely the possibility that having experienced free-play, mothers were ready to teach. Thus,

Figure 13a

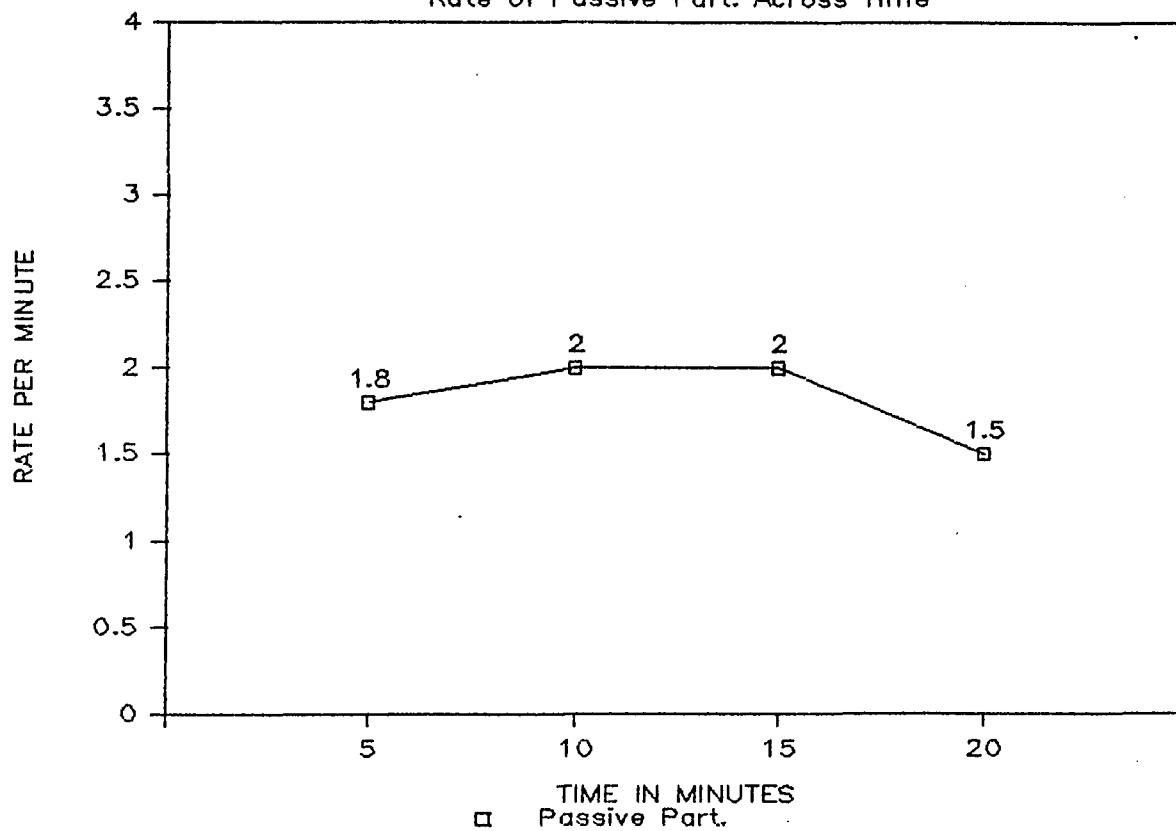
Rate of Mutual Activity Across Time



Caption Figure 13a. Mean Time in Mutual Activity Within 5 Minute Segments During 20 Minute Free-Play Session.

Figure 13b

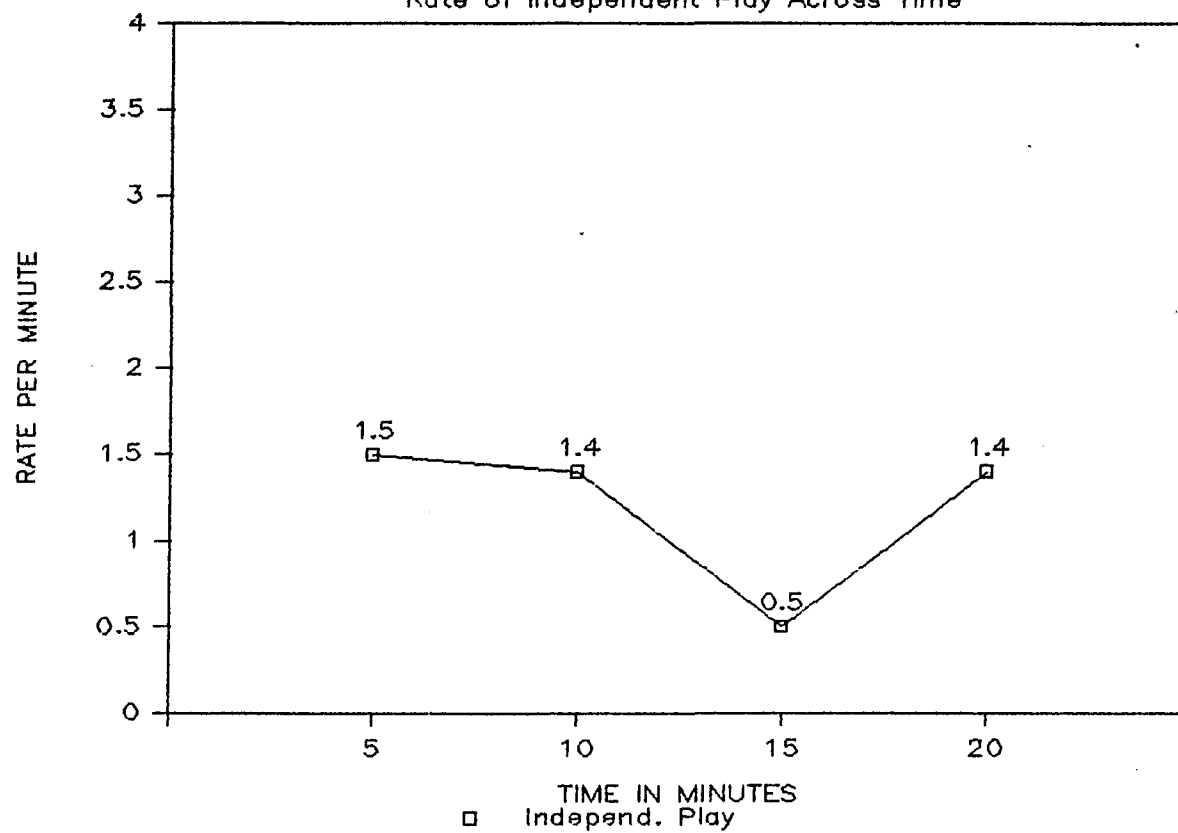
Rate of Passive Part. Across Time



Caption Figure 13b. Mean Time in Passive Participation Within 5 Minute Segments During 20 Minute Free-Play Session.

Figure 13c

Rate of Independent Play Across Time

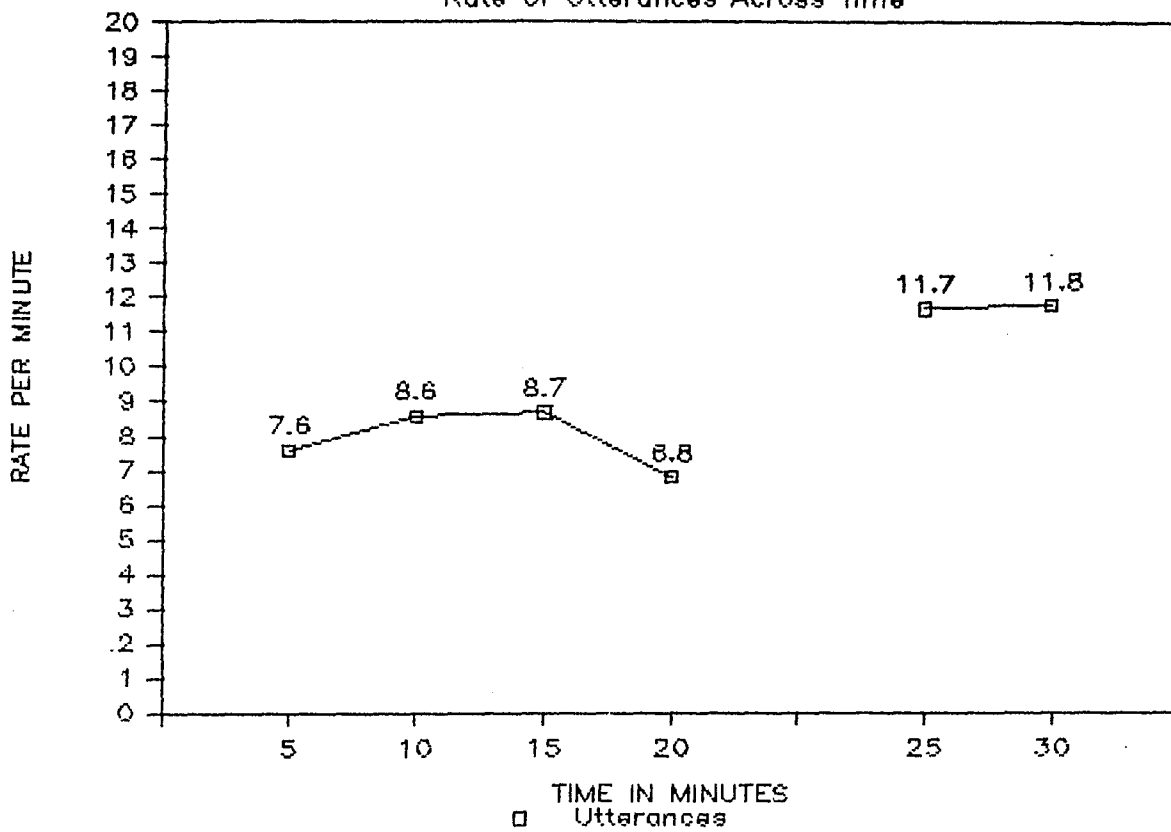


Caption Figure 13c. Mean Time in Independent Play Within 5 Minute Segments During 20 Minute Free-Play Session.

the effect of a high level of mutual activity in the task-oriented session is the result of the combined effects of the instructions by the experimenter (task demands) and the previous experience of the free-play session.

With respect to the rate of maternal verbalizations, it appeared that all mothers talked more during the task-oriented session. However, low-SES mothers also increased their rate of speech from free-play to task-oriented sessions more than middle-SES mothers. Again, the same sample of 10 dyads was examined to determine if the increase in maternal verbalizations across tasks could be accounted for by time. A repeated measures analysis of variance was performed on rate of utterances. The mean rate of utterances across progressive 5 minute time segments within and between free-play and task-oriented session were the dependent variables (see Figure 14). The results revealed a significant effect across time ($F=8.10$, $p<.000$). Post-hoc analysis utilizing Tukey's test revealed that the means at 5, 10, and 20 min. did not differ from each other, but they all differed from the means at 25 and 30 min. In addition, the means at 15, 25 and 30 min. did not differ from each other. As with maternal involvement it appeared that the data could not be adequately accounted for by invoking the warm-up hypothesis. Rather, it seemed more likely that mothers were responding to the task demands in the task-oriented session with respect to their

Figure 14
Rate of Utterances Across Time



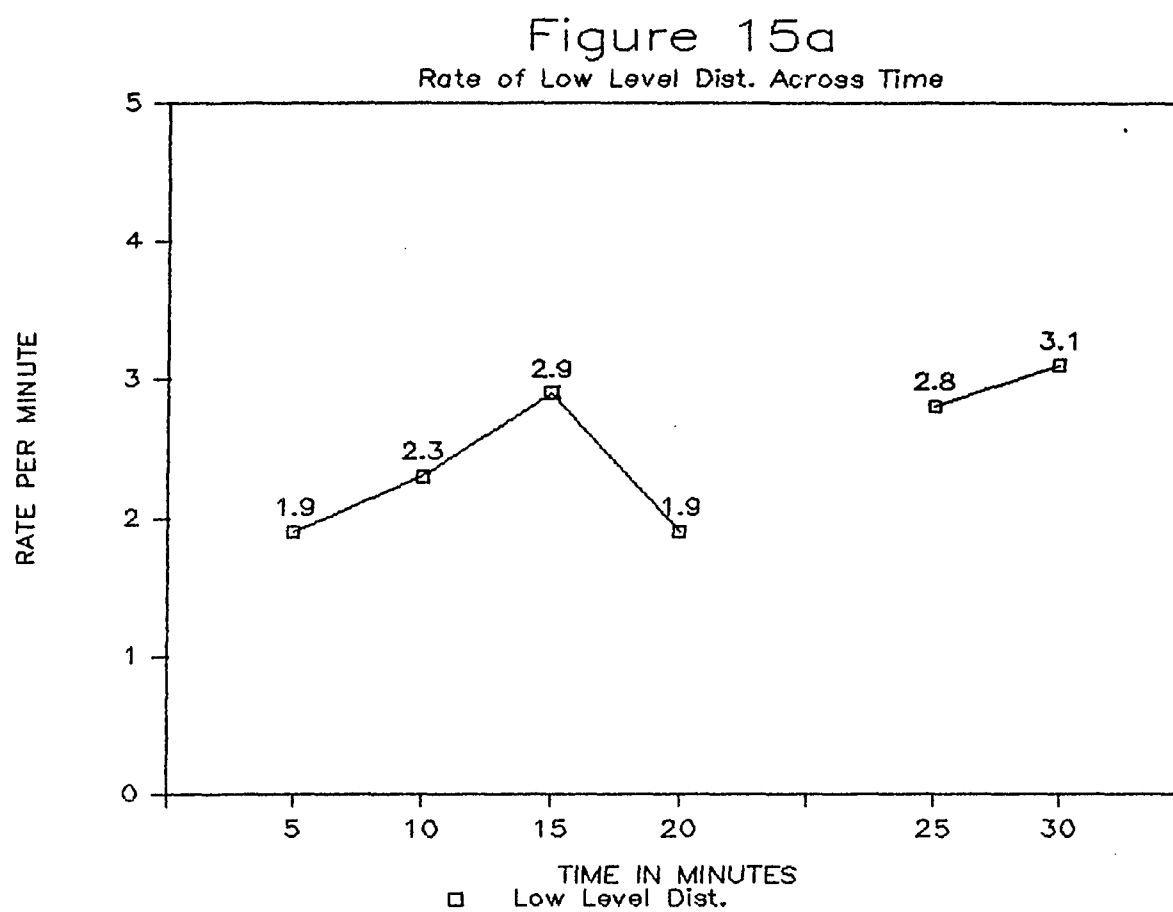
Caption Figure 14. Mean Rate of Utterances
Within 5 Minute Segments During 20 Minute
Free-Play and 10 Minute Task-Oriented Sessions.

verbalizations as was argued with respect to maternal involvement.

Once again, as with maternal involvement and maternal verbalizations, both groups of mothers changed the amount and type of distancing strategies that they used from the free-play to the task-oriented session. All of the mothers increased their use of intermediate level distancing strategies and task-management statements while decreasing their use of high level and low level distancing strategies during the task-oriented session.

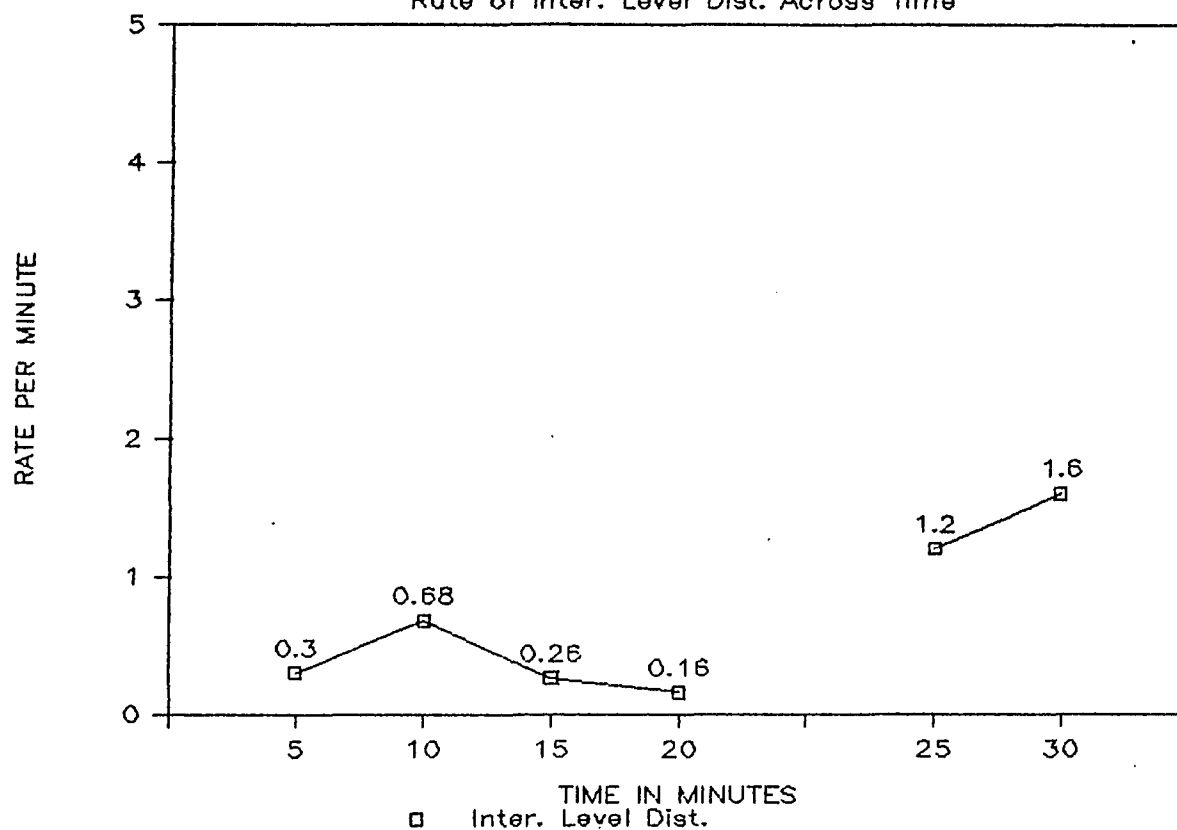
The same random sample of 10 dyads was examined to determine the most likely hypothesis to account for these changes. Four repeated measures analyses of variance were performed, one for each level of distancing and task-management statements. Again the dependent measures were the means of each level of distancing across progressive 5 minute segment within and between free-play and task-oriented session (see Figures 15a, b, c and d). With respect to low level distancing strategies the results revealed no difference in means. Thus, mothers did not increase or decrease their rate of low level distancing strategies across time within or between sessions.

With respect to intermediate level distancing strategies the analysis revealed a significant effect across time ($F=7.00$, $p \leq .000$). Tukey's test indicated that the means at 15, and 20 min. did not differ from each other or from



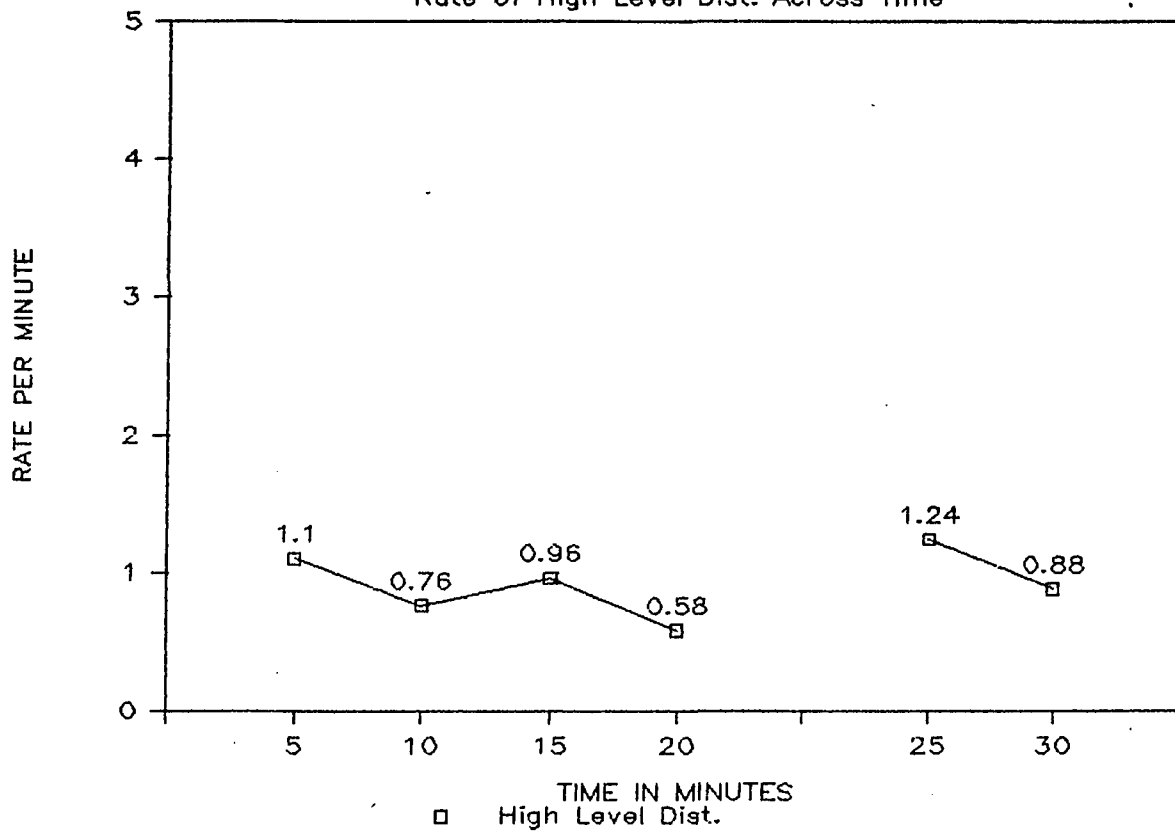
Caption Figure 15a. Mean Rate of Low Level Distancing Strategies Within 5 Minute Segments During 20 Minute Free-Play and 10 Minute Task-Oriented Sessions.

Figure 15b
Rate of Inter. Level Dist. Across Time



Caption Figure 15b. Mean Rate of Intermediate Level Distancing Strategies Within 5 Minute Segments During 20 Minute Free-Play and 10 Minute Task-Oriented Sessions.

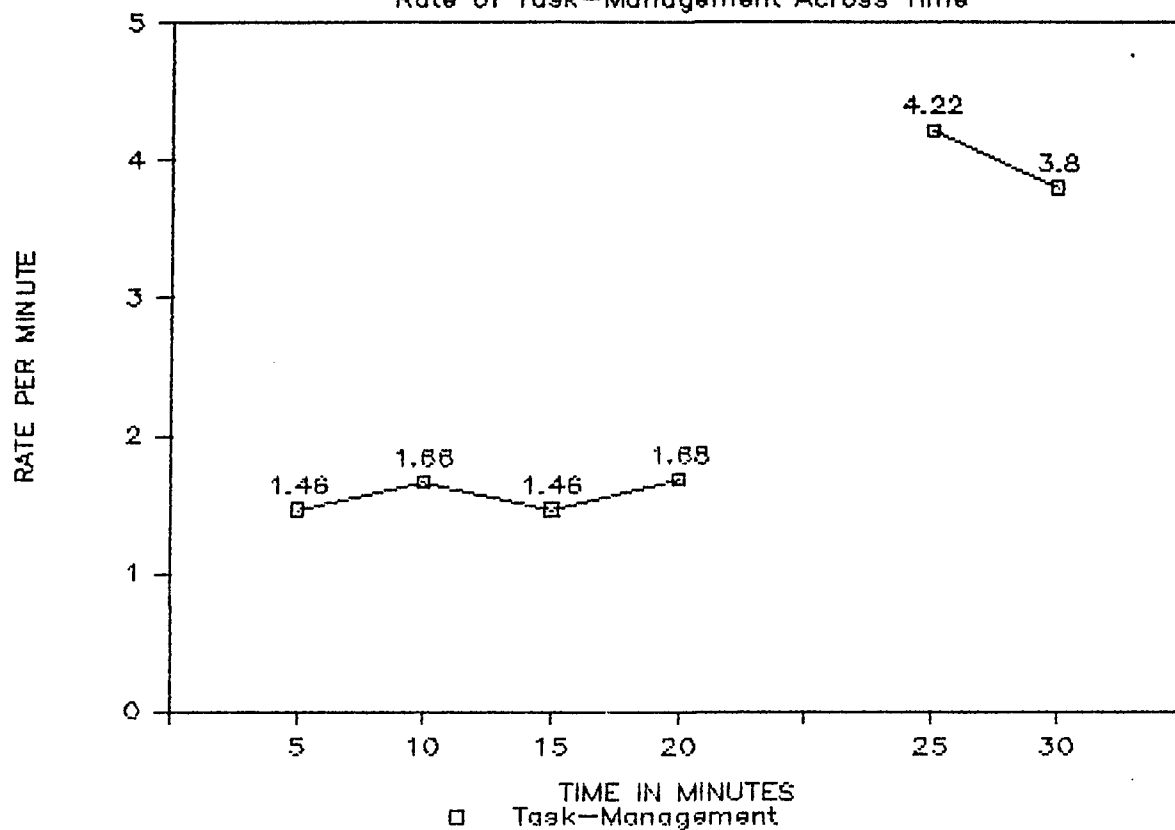
Figure 15c
Rate of High Level Dist. Across Time



Caption Figure 15c. Mean Rate of High Level Distancing Strategies Within 5 Minute Segments During 20 Minute Free-Play and 10 Minute Task-Oriented Sessions.

Figure 15d

Rate of Task-Management Across Time



Caption Figure 15d. Mean Rate of Task-Management Statements Within 5 Minute Segments During 20 Minute Free-Play and 10 Minute Task-Oriented Sessions.

the means at 5 and 10 min. They did differ from the means at 25, and 30 min. In addition, the mean at 5 min. differed from the mean at 30 min. The means at 10, 25 and 30 min. did not differ from each other. These results suggested that mothers did not increase or decrease their rate of intermediate level distancing strategies in any systematic manner within the free-play or task-oriented session. However, there was a significant increase in the rate of intermediate level distancing strategies across sessions.

The results of the analysis on high level distancing strategies indicated that there were no differences in means across time. Thus, mothers did not increase or decrease their rate of high level distancing strategies across time within or between sessions.

Finally, the analysis on task-management statements revealed a significant effect across time ($F=12.50$, $p<.000$). Tukey's test indicated that the means at 5, 10, 15 and 20 min. did not differ from each other, but did differ from the means at 25 and 30 min. The means at 25 and 30 min did not differ from each other. Thus, mothers did not systematically increase or decrease their rate of task-management statements within free-play or task-oriented sessions. However, they did substantially increase the rate of task-management statements across sessions.

It appeared that during the free-play session, the rate of each level of distancing and task-management statement

remained approximately the same. With the introduction of the task-oriented session, there appeared to be an increase in the rate of intermediate level distancing strategies and task-management statements. The rate of low level and high level distancing strategies remained the same. The warm-up hypothesis would have predicted consistent trends over time to account for the increases and decreases that were revealed when mothers went from the free-play to the task-oriented session. No such trends were evident.

The alternative (task demand) hypothesis would have predicted that maternal levels of distancing and task-management statements would increase or decrease from free-play to task-oriented sessions depending on their relevance to the task at hand. This was what was found. Specifically, the successful teaching of the block building task demanded that mothers be more directive (task-managing) and encourage their children to sequence, compare and number (intermediate level distancing). As predicted by the task demand hypothesis both task-management statements and intermediate level distancing strategies increased while the less relevant low level and high level distancing strategies decreased.

Once again, the lack of a clear trend over time accompanied by discrete changes in level of response associated with session strongly argues against the warm-up hypothesis. Still, these data must be interpreted with

caution since mothers first experienced the free-play session prior to the task-oriented one. Thus, changes in speech in the predicted direction are the result of the combined effects of task demands and previous experience in the free-play session.

In sum, it appeared the most plausible hypothesis to account for the changes in maternal behaviors across sessions had to do with the task demands that were inherent in the task-oriented session. While this hypothesis cannot be conclusively confirmed given the design of the study, it seems likely that mothers were reacting to the task demands and previous experience in the free-play session and not merely to a warm-up effect across time.

Additionally, the only differences due to SES appeared to be the quantity of maternal levels of distancing. In general, mothers from both SES groups were able to engage their children using each level of distancing even though there were SES differences in the amount of each category. Therefore, the differences noted between middle- and low-SES Hawaiian/part Hawaiian mothers did not appear to be one of deficiency but rather, one of preferred style.

Differences and Similarities Between SES Groups

One issue addressed in this study concerns the belief that the performance differences consistently noted between

middle- and low-SES children are due to differences in their rearing environments. Specifically, maternal behaviors have been scrutinized as a source of some of these environmental differences. At present, data from other studies (Schacter, 1979; Olson et al., 1984; Farran & Haskins, 1980) suggest that the variables most predictive of children's academic performance include measures of maternal involvement and maternal talk (maternal responsivity). The more mothers are involved and talk with their children, the more likely their children will do well on measures of academic and cognitive performance. Others have proposed (i.e., Sigel, 1982) that the crucial variables in mother-child interactions are not how much mothers talk with their children, rather how they talk with their children. Sigel argues that the cognitive complexity of maternal speech is highly predictive of children's performance on standard measure of cognitive ability.

The present study was designed to look at differences within the variables of maternal involvement and maternal distancing strategies according to SES groupings. These variables were felt to be strong predictors of children's performance. It was hoped that by observing the differences that occurred within these behavioral realms that a better understanding of how SES might mediate children's learning environments would ensue.

The results clearly indicated that, with the following exception, there were no differences due to SES in maternal involvement while dyads were engaged in a free-play setting. Low-SES mothers were in and out of mutual play with their children more often than were middle-SES mothers. Despite this, both groups of mothers spent the same amount of time in mutual activity as well as in passive participation and independent play. This was not as predicted. This finding was contrary to that reported by Farran & Haskins (1980). Farran & Haskins found that middle-SES mothers spent almost twice as much time in mutual activity with their children during free-play than low-SES mothers. In addition, low-SES mothers spent more time in independent play and no clear activity than middle-SES mothers.

While the methodologies of the two studies were very similar (the present study having been modelled after the Farran & Haskins study), there was at least one important difference: the populations used in the studies. The present study utilized a relatively culturally homogenous population of Hawaiian/part-Hawaiian mother-child dyads. These dyads were then grouped according to SES. By doing so, differences between the two groups could more easily be attributed to conditions associated with SES. In contrast, Farran & Haskin's SES groups differed considerably in composition. Their middle-SES group was composed almost exclusively of caucasians, while their low-SES group was composed

predominately of blacks. Therefore, the differences noted between the two groups could be attributed to either their SES standing or their ethnic and cultural background, or some combination of both.

This does not imply that the differences found in the Farran & Haskins study were any less real than the lack of differences found in the present study. Socioeconomic factors may be highly influenced by cultural factors. At times, cultural and ethnic factors may be stronger influences on behavior than SES. The Hawaiian culture may be one that overrides the influence that SES variables have on maternal involvement. In the same vein, the differences found by Farran & Haskins may have been mediated by ethnic differences in the ways that mothers interact with their children, especially in terms of how involved they were with their kids.

These results do imply, however, that the performance differences noted between the two groups of children in the present study are not related to differences in maternal involvement as measured by the fact that both groups of mothers spent equivalent amounts of time in mutual activity, passive participation and independent play. Carrying this one step further, the results suggest that Farran & Haskins may not have been measuring the variables that were crucial in determining the contributing factors to the performance differences exhibited by different SES groups. The children

in the present SES groups persisted in exhibiting performance differences despite the fact that their mothers were not differentially involved with them. The implication is that there may be other variables, not investigated by Farran & Haskins, that might be more highly predictive of children's cognitive performance.

With respect to the results on maternal verbalizations we first examined how much mothers talked to their children. When examined together, collapsed across both sessions, the results indicated that middle- and low-income mothers verbally engaged their children with comparable amounts of speech. This was contrary to the predicted outcome. However, when session type was taken into consideration, middle- and low-SES mothers rate of speech differed. Low-SES mothers increased their rate of speech more than middle-SES mothers between the free-play and the task-oriented session. Thus, rate of speech in Hawaiian/part-Hawaiian mothers was mediated by the interaction of session type and SES.

In general, these findings were inconsistent with early research which reported that low-income mothers did not talk with their children as much as middle-income mothers (Hess & Shipman, 1965; Clarke & Clarke, 1976; Schacter, 1979). However, these findings did find support with a different subject population in a more recent study conducted by Clunie (1984). She coded the verbal interactions of dyads from the Farran & Haskins study. Clunie concluded that both

groups of mothers utilized similar numbers of words per turn and similar numbers of conversational turns with their children during the free-play session. In sum, these measures revealed that middle- and low-SES mothers from different ethnic backgrounds talked the same amount to their children.

Results of the analyses on maternal levels of distancing revealed information about the complexity of the language mothers used to talk to their children. Unlike the results on maternal involvement or rate of maternal verbalizations, there were clear differences according to SES in the extent to which mothers engaged their children using the different levels of distancing during both sessions. Middle-SES mothers used considerably more high level and intermediate level distancing strategies while low-SES mothers utilized more task-management statements, as predicted. These findings indicated that middle-SES mothers verbally engaged their children using more cognitively demanding language than low-SES mothers, who used language that basically directed and commanded the listener.

These results were consistent with those repeatedly reported by Sigel and his colleagues (Sigel, 1979; 1981; 1982; Sigel, McGillicuddy-Delisi & Johnson, 1980). Sigel has worked with populations that were similar to those used by Farran & Haskins. The fact that the results were replicated when controlling for ethnic and cultural influences suggests

that maternal distancing styles transcend these demographic variables. Thus, maternal distancing may represent an important contributor to environmental differences between SES groups of varying ethnic and cultural backgrounds. .

There are several possible explanations that might account for the differences in the types of distancing strategies that mothers from the two SES groups employ with their children. First, they will be presented and, then, they will be discussed. It may be that mothers from low-SES backgrounds do not engage in as many teaching and play episodes with their children as middle-SES mothers. This may be due to differences in the value that middle- and low-SES mother place on such interactions. Hess & Shipman (1965) have suggested that middle-SES families may value time spent with their children in teaching and play episodes, while low-SES families may value children's obedience and compliance more. A result of these differing values might be that low-SES mothers are not as well practiced in how to spend time with their children and, therefore, may not be as familiar with their child's cognitive abilities. This could result in an underestimate of the level at which the child can be verbally engaged. Another possibility might be that mothers from low-SES background do not have the educational or intellectual experiences that middle-SES mothers have to engage their children in more cognitively demanding language. A final possibility might be that most mothers

merely model the parenting styles to which they have been historically exposed. These are the parenting styles that they are brought up with and which they observe in their day to day living.

The study was not designed to make definitive statements as to which of the above hypotheses might actually be the case. The data do, however, suggest which one might be the more likely possibility. With respect to whether low-SES mothers are as well practiced in spending time with their children in play and teaching situations the data on maternal involvement and rate of speech indicate that low-SES mothers are just as involved in the dyadic interactions as middle-SES mothers. In addition, both groups of mothers change their interactional styles in similar ways from one setting to the next. These results suggest that low-SES mothers are just as involved and sensitive to play and work situations with their children as middle-SES mothers. With respect to whether low-SES mothers have the education or intellectual experiences needed in order to engage their children using higher level distancing strategies, the data indicate that low-SES mothers do engage children using more-complex-level distancing strategies, but to a lesser extent than middle-SES mothers. Therefore, it does not appear to be a deficiency on the part of low-SES mothers, rather, a tendency to use a greater percentage of less-complex-level distancing strategies. It seems more

likely that mothers from both SES groups utilize the distancing strategies and parenting styles to which they were exposed in their upbringing, and; therefore, are most familiar and comfortable.

Finally, a conditional probability analysis was performed to examine whether involvement condition affected mothers' level of distancing and whether this differed according to SES. There were no differences due to SES. Both groups of mothers exhibited the same pattern of distancing strategies across involvement conditions. Examining the groups of mothers together, the results revealed that mothers utilized less-complex-level distancing strategies more frequently during mutual activity than during either passive participation or independent play. Mothers also used more task-management statements while in passive participation than while in independent play. Meanwhile, mothers utilized more-complex-level distancing strategies to an equal degree regardless of which involvement condition they were in.

These findings reveal that maternal verbalizations that are less cognitively complex are influenced by how involved the mother is with her child, while maternal verbalizations that are more cognitively complex are not. It appears that more-complex-level distancing strategies remain relatively stable regardless of how involved the mothers are with their children in a free-play setting. Thus, a mother could be

relatively uninvolved with her child on a physical level and yet deeply involved with her child on a verbal and cognitive level. On the other hand, a mother could be quite involved physically with her child but not very verbally or cognitively involved. This is evidenced by the report that mothers use more low level distancing strategies and task-management statements during mutual activity. These findings strongly suggest that what may be critically important in the interaction is how cognitively engaged mothers are with their children. This is consistent with the other findings reported in this study.

In summary, it appears that middle- and low-SES Hawaiian/part Hawaiian dyads differ in the types of maternal distancing strategies used in both a free-play and task-oriented session, while they did not differ in terms of how much they talked or how involved they were with their children. These findings suggest that an important difference in the rearing environments of middle- and low-SES families may be how cognitively demanding the verbal environment is.

Relationship of Maternal Behaviors to Children's Performance

Another issue in this study concerns the relationship of the maternal behaviors under observation and children's performance on the PPVT-R and the WPPSI. Given that there

are differences in maternal interactional styles according to SES that may be affecting the children's rearing environment, do these differences relate to the performance differences that are exhibited by the two groups of children?

With respect to the relationship of maternal involvement to children's performance on the PPVT-R and WPPSI, the results revealed that time spent in mutual activity was negatively correlated with WPPSI Performance scores while the time spent in passive participation was positively correlated with WPPSI Performance. While Farran & Haskins did not relate maternal involvement to children's performance along any measure, they suggested that the length of time that mothers spent playing with their children might contribute to differences in development between children of different backgrounds. Contrary to this suggestion, the present results implied that time spent together in mutual play had little effect on children's cognitive performance and was negatively associated with skills measured in the WPPSI Performance scores. However, passive participation in which the mother stepped back and only peripherally engaged the child was positively related to those measures.

It may be the case that mothers who do not physically interfere or impose themselves on their child's play, and who observe and guide the play may be promoting more

independent processing and problem solving skills in their children. Mothers who interfere with their children's play may actually be preventing them from engaging in certain problem solving processes on their own. It may also be the case that maternal involvement as measured in this study is irrelevant to children's performance. As discussed earlier, the conditional probabilities analysis clearly demonstrates that mothers are cognitively engaged with their children to an equal degree regardless of the involvement condition. The important maternal behavior in dyadic interactions is the degree of cognitive engagement as measured by language rather than physical engagement.

It is important to note that since Farran & Haskins did not relate the maternal involvement conditions to any measure of children's performance, it is difficult to say whether the Hawaiian/part Hawaiian mothers' involvement differed in its relationship to children's performance from non-Hawaiian ethnic groups. It may be that the present population interpreted times of mutual activity and passive participation differently than other ethnic groups.

With respect to the relationship of levels of distancing to children's performance, the results indicated that high level distancing strategies were positively correlated with WPPSI Full Scale, WPPSI Verbal and WPPSI Performance scores. Intermediate level distancing strategies were positively correlated with PPVT-R, WPPSI Full Scale,

WPPSI Verbal and WPPSI Performance scores. Meanwhile, low level distancing strategies were negatively correlated with WPPSI Full Scale and WPPSI Verbal scores. Task-management statements were negatively correlated with PPVT-R, WPPSI Full Scale, WPPSI Verbal and WPPSI Performance scores. These results strongly suggest that cognitively demanding maternal verbalizations, which provide models of abstract problem solving strategies for their children, are positively related to children's performance on standard tests of cognitive ability. Maternal verbalizations that are directive and commanding and supply the child with little opportunity to explore alternative solutions or to think about a problem are negatively correlated to children performance on the same standardized tests. These results are consistent with previous findings which indicate that there is a strong relationship between mothers who engage their children in more elaborate and complex language repertoires and their children's ability to perform in a variety of circumstance and on a variety of tests (Hess & Shipman, 1965; 1972; Blank, 1978; Sigel et al., 1980).

Several regression analyses were performed in order to determine which maternal variables were most predictive of children's performance. The variables which entered into the equation (in a stepwise manner) were maternal levels of distancing, maternal involvement, and socioeconomic variables. Fairly consistently, maternal levels of

distancing accounted for most of the variability on measures of children's ability. In none of the analyses did maternal involvement account for any significant part of the variance. These results further support the hypothesis that maternal language complexity is highly predictive of children's performance on tasks that are traditionally designed to measure cognitive abilities.

The highly predictive nature of maternal distancing strategies to children's performance is consistent with findings reported by Slater (1983). Slater taught mothers of high-risk children to use either more low level (by talking more) or high level distancing strategies (by asking more what and why questions). Results indicated that the children in the high level distancing group demonstrated increases in their scores on some subtest of the McCarthy. This makes intuitive sense given the extremely verbal nature of the standard forms of cognitive assessment. Children who are exposed to the types of language that are typically found in school and in standard assessments of their abilities are more likely to do better in those situations.

Staats (1975) argues that what is frequently referred to as cognitive ability under close analysis is revealed to be examples of language problem solving repertoires. Distancing strategies are examples of these problem solving strategies. Mothers who provide their children with models

of how to apply these verbal problem solving strategies provide the child with two important types of information.

First, verbal problem solving strategies provide the child with specific cues which allow the child to discover how to complete the task. For instance, during the block building task used in the task-oriented session, a mother who asks her child "What comes after the red one?" (intermediate level distancing strategy) is cueing her child to follow a sequential pattern in solving the problem. This is much different from a mother that says to her child "Put the blue one next to the red one." (task-management statement). While both of these verbalizations teach the child sequencing, the first one allows the child to be an interactive problem solver. By doing so the child learns a problem solving strategy that is potentially generalizable to new problem situations. The latter example provides the child with the correct sequential move without providing the child with a verbal strategy that might be helpful in solving future tasks. Thus, the child is learning a very specific rule, in this instance red follows blue, without learning any generalizable question-asking skill or reflective strategy.

Secondly, abstract verbal problem solving strategies also provide a general model for verbally approaching a problem solution. An example of this might be a mother who says to her child "Remember, we have to build this building

from the bottom up." (high level distancing strategy), versus a mother who says "First, put all the blue ones on the bottom" (task-management statement). In the first example, the mother is providing the child with a general rule for completing this type of task, while the second mother is not. Given this reasoning, children who are exposed to the more abstract verbal repertoires which are captured in more-complex-level distancing strategies should do better on tasks that require facility with verbal problem solving skills.

It is important to view the verbal data in terms of what kind of verbal learning environment the mother is creating with the child. Middle-class mothers, during free-play, are more likely to model problem solving strategies which relate ongoing activities of the child to past and future events, as well as to general concepts about skills that the child has already learned. During task-oriented episodes when the task is more well defined, a middle-class mother begins to engage her child in more goal-directed strategies which are still guiding in nature yet provide more specific cues for the child. These more specific cues help the child focus more clearly on how to successfully complete the task with a minimum of maternal involvement in its actual completion. These cues allow the child to complete the task while also learning the verbal problem solving strategies that accompany this type of task.

A lower-class mother, during free-play, appears more likely to direct her child's behavior, suggesting things for them to do without tying their activity into events outside of the immediate environment. This provides the child with a "poorer" verbal environment, one in which verbal repertoires are not expanded in ways that relate present behavior with unobservable events. During task-oriented episodes, lower-class mothers appear more explicitly directive about what the child needs to do next in order to complete the problem. The verbal problem solving strategies that they adopt are more specific to the task at hand and less generalizable to novel tasks.

In general, these results clearly demonstrate the highly predictive nature of maternal distancing strategies on children's performance on the PPVT-R and the WPPSI. It is proposed that one way children learn verbal problem solving strategies is through maternal modelling of verbal strategies. Strategies that are general in nature allow the child to apply those strategies to new problem solving situations. More-complex-level distancing strategies represent these more general strategies, whereas less-complex-level distancing strategies represent strategies that are more specific and, therefore generalize poorly to new problem situations. Children who are exposed to a greater percentage of more-complex-level distancing strategies are expected to do better on measures which test

problem solving abilities than children who do not get as much exposure to such strategies.

Conclusions

When comparing the interactional styles of low- and middle-SES Hawaiian/part-Hawaiian mothers numerous similarities were evident. In particular mothers were equally engaged with their children both in terms of how much they talked to their children and how involved they were with their children. In addition, mothers from both groups responded to the changes in settings in very similar ways.

These similarities are important since it has often been concluded that what lies at the root of the performance differences in low- and middle-SES children is a general lack of parental involvement on the part of low-SES mothers. This study does not support this conclusion. Rather, it suggests that differences due to SES are very specific in nature and have to do with the cognitive level of demand in the mothers' speech.

While both groups of mothers modelled problem solving strategies to their children, low-SES mothers modelled more concrete strategies while middle-SES mothers modelled more abstract strategies. More abstract problem solving strategies or higher level distancing strategies provided

the child with two important types of information. Specific cues which allowed the child to discover how to complete the task at hand and a general model for verbally approaching a problem solution. More concrete or lower level distancing strategies merely required the child to follow the verbal directions without providing that child with the general verbal strategies to approach a new task. Verbal problem solving strategies that teach a child a more general approach to solving a problem would be more helpful over a variety of tasks. It would be reasonable to assume that a child exposed to verbal problem solving strategies that generalize easily to novel problem situations will be better able to use those verbal strategies when faced with new tasks.

Consistent with this reasoning, the results reveal that measures of mother's use of distancing strategies are better predictors of children's cognitive and language abilities than measures which strictly attend to the degree of maternal involvement. Further, the data demonstrate that mothers verbally engage their children at higher levels of distancing consistently across all involvement conditions. Thus, physical involvement seems to have little relation to children's cognitive and language development as well as the cognitive complexity of maternal speech. It seems that what may be critical in dyadic interactions is the verbal environment which is created. It is this verbal environment

that is highly predictive of children's cognitive and language performance.

Finally, it is important to note that mothers from each SES group were able to engage their children using each level of distancing even though there were differences in the amount each level was used. This finding, in addition to the evidence that suggests that the nature of a child's verbal environment has an impact on his or her cognitive competence, has implications for early intervention. In cases where children are at-risk for school failure, it may be most worthwhile to involve mothers in the intervention process. Since it appears that most mothers already have the ability to engage their children at higher levels of distancing, it may just be a matter of encouraging and training mothers to use those skills more frequently and appropriately. By involving mothers in the intervention process, it is also more likely that the effects of intervention will carry over to the child's home environment. This increases the likelihood that long term gains will be achieved.

It may also be worthwhile to incorporate these findings into early education curriculum. By increasing the cognitive complexity of the child's verbal environment while in daycare or preschool, and by providing more elaborate verbal problem solving models, teachers may be able to increase the probability that the children will succeed in the classroom.

As usual, these suggestions are in need of empirical testing.

Finally, a note about the one-sided nature of this study. It is recognized that this study examined only the mothers' behavior during interactions with their children. This is a one-sided view of what is actually a very complicated and reciprocal process. All of the data reported in this study are interactive with both the mother and child as important influences on each other's behavior. However, due to the nature of the questions asked in this study it was deemed appropriate to concentrate on mother's behavior alone.

An important follow-up to this study would be to examine the reciprocal influence of children on their mothers, particularly with respect to the maternal behaviors examined in this study. Due to the correlational nature of this study definitive statements regarding the directionality of influence between mothers and their children cannot be made. It may be that mothers adapt their speech to accommodate their children's verbal and cognitive abilities. An experimental design (such as that employed by Slater, 1983), that would allow for the examination of causality within the mother-child relationship is warranted. Without such studies, definitive answers regarding the effects of maternal behavior on children, and children's behavior on mothers cannot be answered, only speculated.

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Appendix A

Determination of SES

SES was determined according to Hollingshead's Two Factor Index of Social Position (1957) and household income.

The Hollingshead Index was designed in such a way that a rank is applied to the head of household's occupation and education level. For this study head of household was defined as the parent in the family with the highest occupational and educational rank. The ranks were weighted according to the index and scores were determined for both occupation and education. These scores were added and a total score was obtained. Scores falling at or above 44 were considered as falling within the low-SES, while scores falling below 44 were considered as falling within the middle-SES.

Information about household income was also obtained. Based on family size, income was determined as falling above or below the poverty line for Hawaii according to the Native Hawaiian Profile (1979). Those families falling below the poverty line were considered low-SES, while those falling above the poverty line were considered middle-SES.

Only those families that fell into the low-SES and middle-SES categories according to both measures were designated as such for participation in the study.

Appendix BDemographic Questionnaire

**DO NOT WRITE
IN THIS SPACE**

Initial: _____

**THE KAMEHAMEHA SCHOOLS
APPLICATION FOR PRESCHOOL
FOR SCHOOL YEAR 1985 - 1986
(PLEASE PRINT OR TYPEWRITE)**

(Date of application)NAME _____ SEX: M F (Circle One)
Last First MiddleHome Address _____
No. & Street or P.O. Box City Island State Zip CodeMailing Address _____
(If different from above)

Home phone _____ Contact phone (if no home phone) _____

Birthdate _____ Age Requirement: Child must be born in calendar year 1981.
Month Day Year

Emergency Contact:

Name _____ Relationship to child _____

Home Address _____ Home Phone _____

Father's/Step-father's/Adoptive father's/Guardian's Name _____
(CIRCLE appropriate person) Last First

Occupation _____ Bus. phone _____

Employer _____
(Firm name and address)

Father's Education: Highest Grade Completed _____ Diploma or Degree: _____

Mother's/Step-mother's/Adoptive mother's/Guardian's Name _____
(CIRCLE appropriate person) Last First

Occupation _____ Bus. phone _____

Employer _____
(Firm name and address)

Mother's Education: Highest Grade Completed _____ Diploma or Degree: _____

Parents' Marital Status: Married _____ Single _____ Separated _____ Divorced _____

Mother deceased _____ Father deceased _____

(Please check (✓) one of the above)

Who has legal custody of this child? _____

CHILD'S HEALTH:

Has child had any serious illnesses? Yes _____ No _____ If yes, what were the illnesses _____

Have school, medical, health or other persons said that this child needed further evaluation or training for special problems?

Yes _____ No _____ If yes, what evaluation or training was suggested? _____

By whom? _____

Has the child ever received special treatment or training? Yes _____ No _____

For what reason? _____

Name of child's physician: _____

Address: _____ Business Phone: _____

PRESCHOOL OR DAY CARE ATTENDANCE:

Has child attended or is child presently attending a preschool or day care center? Yes _____ No _____

If YES please list the preschool(s) or day care center(s) child has attended:

Preschool or Day Care Center	Age child started	Age child ended program
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____

If child does not or has not attended a preschool or day care center who provides or has provided care for the child during the day?

Relationship to Child	Age of child during period of care	Number of hours care provided	No. of other children in the home
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____

LANGUAGE:

Does the child speak languages other than English at home? Yes _____ No _____

If yes, what language(s)? _____

Name of person completing this application? _____

What is your relationship to this child? Mother _____ Father _____ Other _____

Please explain other _____

HOUSEHOLD:

Please list the names of all members of the household and his/her relationship to the child. List the highest grade in school each person has completed and indicate yes or no whether the person is employed.

	NAME	AGE	RELATIONSHIP	HIGHEST GRADE COMPLETED	EMPLOYED?
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____
9.	_____	_____	_____	_____	_____
10.	_____	_____	_____	_____	_____
11.	_____	_____	_____	_____	_____
12.	_____	_____	_____	_____	_____

Please check (✓) the annual total (gross) income of the household.

Less than \$1,000 _____	\$10,000 to \$11,999 _____	\$35,000 and above _____
\$1,000 to \$4,999 _____	\$12,000 to \$14,999 _____	
\$5,000 to \$7,999 _____	\$15,000 to \$24,999 _____	
\$8,000 to \$9,999 _____	\$25,000 to \$34,999 _____	

Is father and/or mother or guardian of the applicant receiving "general assistance or aid to families with dependent children" from the STATE DEPARTMENT OF SOCIAL SERVICES? Yes _____ No _____

BIRTH:

Weight at birth: Lbs. _____ Oz. _____

Was child: Full term _____ Premature _____ If premature, how early? _____

Was pregnancy normal? Yes _____ No _____ If no, what were the problems? _____

Appendix CParental Consent Form

**THE KAMEHAMEHA SCHOOLS/BERNICE PAUAAHI BISHOP ESTATE
STATE OF HAWAII - DEPARTMENT OF EDUCATION**

PRESCHOOL PROGRAM 1984 - 85

PARENTAL CONSENT FORM

I/We understand that The Kamehameha Schools/Bernice Pauahi Bishop Estate is interested in finding out how my child, who is enrolled in the preschool program, does so that KS/BE can better evaluate their program. I/We also understand that all information which KS/BE obtains on my child will be held in confidence, and that it will not be shared with anyone outside of KS/BE without my permission. However, I/We also understand that some of the information may be presented as research findings, and give permission for KS/BE to share this information with other researchers and educators, as long as information on my child is not presented in a way that my child or my family could be identified.

This means I/we agree to the following:

1. I give permission for school officials at public or private schools which my child attends after leaving the preschool program to give to KS/BE results of ability or achievement tests administered at the school and to discuss my child's academic progress with KS/BE.
2. I give permission to KS/BE to administer to my child ability and achievement tests designed to help evaluate the effectiveness of the preschool program with the understanding that such tests will not unreasonably interfere with my child's school work.
3. I give permission to KS/BE to take audio visual recordings of my child such as videotape and films. I grant KS/BE the right to use and publish these recordings for the purposes of education, training and publicity. I release all proprietary rights to these recordings.
4. As a condition for enrollment, I, the undersigned, consent to the observation, filming, and viewing of my child for the educational purposes mentioned above. I acknowledge that the Center for Development of Early Education, the Kamehameha Schools/Bernice Pauahi Bishop Estate, its employees and Trustees intend to limit publication and viewing to nonprofit purposes.

Child's Name: _____ Birthdate: _____

Parent's or Guardian's Name(s): _____

Signature: _____

Relationship(s) to Child: _____

Witness: _____ Date: _____

Revised 4/84

Appendix DLetters to Parents

ELEMENTARY SCHOOL
OFFICE OF THE PRINCIPAL
Kapalama Heights
Honolulu, Hawaii 96817
Telephone: 842-8624

KAMEHAMEHA SCHOOLS / BERNICE PAUHI BISHOP ESTATE

October 1984

Dear Parents:

The Kamehameha Elementary School is part of CDEE (Center for the Development of Early Education) which promotes on-going research efforts to improve the quality of education available to Hawaiian and part-Hawaiian children. Kamehameha Elementary School participates openly and willingly in many research projects, including the development and implementation of The Schools reading-language arts program.

As parents of children who are enrolled at KES, we are inviting you to participate in a research project being conducted by Kamehameha's Pre-Kindergarten Education Program (PREP). The project is concerned with learning more about how preschool age children play and work with their toys and their mothers. Since you have a preschool age child, we hope you will consider participating in this study.

Your participation in the project is voluntary and will involve both mother and preschool age child. The study is coordinated by two educational researchers, Margaret Barnes and Ed Kubaney. They have prepared the attached letter describing the program to you. Please read the letter carefully and note the times and the ways in which you will be asked to participate.

We would encourage you to join us in this research effort. You will gain insights into your personal relationship with your child and will also contribute to gathering information that may have long-lasting implications for the education of Hawaii's children.

Thank you for your interest and support.

Cordially,



Kahele Kukea
Principal

Attachment

Center for the Development of Early Education
PRE-Kindergarten Educational Program
Kaalama Heights
Honolulu, Hawaii 96817
Telephone: (808) 842-8656

KAMEHAMEHA SCHOOLS / BERNICE PAUAI BISHOP ESTATE

October 1984

Dear Parents and Friends,

A warm Aloha from the Pre-kindergarten Educational Program (PREP). Many of you may not be familiar with PREP but are familiar with the Kamehameha Early Education Program (KEEP). The goal of KEEP is to improve the quality of education of Hawaiian and part-Hawaiian children. Many of KEEP's efforts have taken the form of research with kindergarten and elementary school children. PREP will extend the goals and activities of KEEP to include infants, toddlers and preschool age children.

What is the PREP Study About?

The study that Mr. Kukea mentioned in his opening letter is concerned with how preschool age children learn. By gaining a better understanding of how young children learn, we will be better able to serve these children. Children learn in many different ways and under many different circumstances. We are particularly interested in how preschool age children learn when playing with their toys and their mothers.

What Does the Study Involve?

We will be asking mothers and their children to attend two, hour and a half sessions at our preschool on the Kamehameha Schools campus. During this time some videotaping and standardized testing of children and their mothers will take place. After the videotaping and testing is completed a time will be set up at each mother's convenience to discuss the study and their child's test results. Many parents may find it helpful to have this kind of test information on their children.

It is important to know that participation is completely voluntary and that all information about mothers and their children will be kept strictly confidential. No information will be released to anyone without written consent of the parent.

What Happens Next?

Within the next 2 weeks, either Margaret Barnes or Ed Kubany from PREP will be calling you to determine if you are eligible and interested in participating in this study. If you are interested, and if you and your child qualify, then more details will be given at that time. Or feel free to call Margaret Barnes at 842-8657 to find out more about the study. You are under no obligation to participate in this study and can decline participation at any time. We would, however, greatly appreciate your help in our endeavor to assist Hawaii's children.

Mahalo for your time and consideration. We will be in touch with you soon.

Sincerely,
The Pre-Kindergarten Educational Program

Center for the Development of Early Education
PRE-Kindergarten Educational Program
Kapalama Heights
Honolulu, Hawaii 96817
Telephone: (808) 842-8656

KAMEHAMEHA SCHOOLS / BERNICE PAUHI BISHOP ESTATE

November 6, 1984

Dear Parents and Friends,

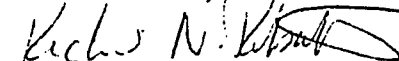
The Pre-kindergarten Educational Program is now ready to begin its first study. The study is concerned with how young children learn outside of the classroom while playing with their toys and their mothers. For this reason we are asking the mothers of our Ulupono children to help us.

We will be asking you to spend about an hour and a half with us and your child at the preschool. During this time we would like to videotape your child playing with toys and with you. We would also like you to spend some time with us looking at the videotape and giving us your views on what was happening with your child.

Margaret Barnes will be contacting you soon to set up a time when you can come in. Also, Margaret will be spending her mornings at Ulupono if you would like to speak with her in person about the study.

I look forward to this opportunity of working together in an effort to improve the quality of education available to Hawaiian children.

Mahalo Nui Loa,



Dr. Richard N. Roberts
Director of Pre-kindergarten Educational
Program

Appendix E

Telephone Script for Call to KES Mothers

Name:_____ Child's Name:_____ Date:_____

Tel. #:_____ Sex of Child:_____ YES:_____

Address:_____ NO:_____

_____ Call Back:_____

When:_____

Hello, this is _____ calling from the Pre-kindergarten Educational Program at Kamehameha School about the letter that was sent out to you. Did you receive that letter?

If No the say: Well, Mr. Kukea and the preschool program here at Kamehameha sent out a letter describing a study that will be conducted here asking parents to volunteer some of their time. I'd like to send you that letter if you haven't received it, may I have your address? (write above) Thank you, you should be receiving that letter in a few days. I'll call back again after you've had a chance to read the letter. Thank you again, Goodbye. _____ (check here to call back in few days).

If Yes then continue:

I'm calling to find out if you are interested in taking part in the study that was described in the letter.

If No then say: Thank you for your time.

Goodbye._____(check here) If Yes then say: Oh, good..

This call is really just a screening call to determine if those people who are interested in participating in the study are eligible. There are a few questions that I would like to ask you to help determine if you and your child are eligible. For instance, we are restricted to using children who fall between the ages of 3 years, 10 mos. and 4 years, 10 mos. Does you child fall within that age range? Birthdate of child_____.

If No then say: I'm afraid you child is a little too (old or young) for the study, but we do thank you for you interest and support in our project.
Goodbye.

If Yes then say: Is _____ a boy or a girl (if name is ambiguous)? We also need to know how many members of the household there are, including yourself and your child.

Name	Relationship	Education
-----	-----	-----
-----	-----	-----
-----	-----	-----
-----	-----	-----

Can you also tell me the relationship of each member to you
 child and the highest grade completed by each person?

Education level needed to qualify:-----

If not enough to qualify then say: Since this call
 is merely a screening call, I'd like to call you
 back in about a week or so after we've had a
 chance to talk with everyone who is interested in
 taking part in the study. Once everyone has been
 called I'll get back to you to discuss the next
 step. Do you have any questions?

I'll be back in touch with you in about a week
 then. Thank you for your time. Goodbye.

(Call back in a week to say that there was
 such a good response to the study that we had
 to randomly select people to participate and
 that, unfortunately, they were not selected
 but that we deeply appreciate their interest
 and that we'd like to keep their names on a
 waiting list in case a position opens up in
 the study.) ----- (check here).

If enough to qualify then say: If you are interested in the study and if you have some time now I'd like to give you some more information about the study so that you can make a decision about whether you would like to take part or not.

(Continue or select a time to call back to give info.)

The study will require that you and your child make 2 visits to our preschool on the Kamehameha Schools campus. On the first day we will be asking you and your child to spend about 30 min. together in a small waiting room that will be furnished with some toys for your child and some magazines for you. We will be videotaping you and your child during those 30 min. We are interested in seeing how children play with their toys and their mothers. After the 30 min. are over we'd like to ask mothers to spend some time viewing the videotapes with us to tell us what was occurring at different times during the 30 min. We'd also like to give your child a brief vocabulary test at that time. The whole day should last about an hour and a half.

On the second day we would like to administer a standard intelligence test to your child. The testing will take about 1 hour. At the end of the

testing we will schedule a time to get together to discuss the study in more detail and to review your child's performance on the test. The test results and a copy of the videotape will be made available to you on your request. All the information that we may obtain in the course of this study will be kept strictly confidential and will not be released to anyone without your written consent.

Do you have any questions so far?

We realize that you may have some difficulties concerning the days that you can come or possibly in terms of transportation to the campus. We will be conducting the study in the mornings, Monday through Saturday, so even if you work we should be able to schedule a time for you. Also, for people who don't have their own car we will supply transportation . We can't supply it for everyone so we are asking people with their own transportation to supply their own.

Do you have any more questions about what I just said?

After hearing about the study do you think it's something that you would like to do?

If No then say: Well, thank you for taking time to consider it. It was a pleasure talking with you.

Goodbye. _____ (check here).

If Yes then say: That's great! Let me just verify your address so were sure we have all the correct information (write on front of page). Can you tell me what mornings would be best for you?

What I'm going to do is call you back in about a week to let you know when the study is going to begin and to set up a scheduled time for you and your child to come in. I'm excited that you've decided to help us in our project, I really think that you'll enjoy yourself while also learning more about your child. Thank you for your support. I'll be back in touch with you soon.
Goodbye.

Comments:

Appendix F

Subject Information Sheet

Date_____ I.D.#_____

Mother's Name_____

Age_____ Marital Status_____

Child's Name_____ Child's Birthdate_____

Address_____

Telephone Number_____

Persons who live in the household with the child:

<u>Relationship to child</u>	<u>Age</u>	<u>Occupation</u>	<u>Education</u>
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			

Primary caretaker of child_____

Previous Day Care or Preschool experience:

1. None_____

2. Number of days per week_____

3. Number of hours per day_____

4. Age when he/she began_____

Approximate yearly family income: (see card)

A:_____

D:_____

G:_____

B:_____

E:_____

H:_____

C:_____

F:_____

Consent Form

I do hereby consent to participate in the research project being conducted by Margaret L. Barnes from the Pre-kindergarten Educational Program at Kamehameha Schools. This investigation is designed to study the ways in which children play with their toys and their mothers. I understand that my identity and that of my child's will remain confidential, but that my child and I will be videotaped and that these videotapes will be used/seen by individuals involved in research at Kamehameha Schools. I grant Kamehameha Schools the right to use and publish these recordings for the purposes of education, training and publicity. I release all proprietary rights to these recordings. I also give permission to Kamehameha Schools to administer to my child ability and achievement tests. Results of this testing will not be released to anyone without my written authorization. I understand that no deception or aversive stimuli will be used in this study and that I may withdraw my child and myself at any time from the study if I should so desire.

Signed: _____

Date: _____

Appendix G

Instructions to Mothers

Prior to Free-Play Session

We think that children's social development is just as important as their intellectual development. Because of this we are also interested in seeing how children behave naturally and play as they usually do. The best thing would have been to do the filming at home to see how children play in their own home with their toys and their mothers. Unfortunately, there are frequently many problems with doing this and often people feel uncomfortable with us in their homes. So, instead we have asked you to come here and to pretend that you are with your child at home and that you have about 10 minutes or so, with no other demands (like the telephone ringing or getting dinner ready), to spend with your child. So, as much as possible, do whatever you do with your child as you would at home. We're just interested in how your child plays with toys and with you. We're not looking at how to be a right or a good parent since each child is different and places different demands on their parents, so just do what you do naturally.

Just make yourself at home and help yourself to whatever is in the room. I am going to leave you in here

with your child for about 20 minutes, O. K.? Do you have any questions? Good, I'll come back in when time is up.

Prior to Task-Oriented Session

Now that I have seen how your child plays with you and with the toys, I'd like to see how he/she works when give a task to do. I have some blocks here and cards with pictures of block designs on them. I'd like you teach

----- (child's name) to make a design with the blocks that looks like the one on the card. You and your child can sit at this table while you do that. I'm just interested in how your child works on a task with his/her mother, so just do what you do normally with your child. There are three design cards, I'd like you to start with this one (pointing to the first card). If you finish that before I come back into the room just go ahead and start on the next design. I'll be back in about 10 minutes. Do you have any questions? Good, I'll be back in when time is up.

Appendix H

Levels of Distancing Coding Manuscript

Levels of Distancing Coding System - Modified from parent-child interaction observation schedule (Sigel, Flaughter, Johnson, & Schauer, 1980). Levels of distancing will be coded according to the mental operational demands that are placed on the child. These demands will be defined according to the system described below.

Coding maternal verbalizations - Unitizing

1. Every utterance from the mother will be coded.
2. Exact repeats will be coded as one unit, e. g., "That's right, that's right."
3. A complex sentence with two separate demands will be separated by demand and coded separately.

Example: "Look at #2 and tell me what to do."

Code - observe

Code - plan

4. When the demands are redundant in a complex sentence or question, meaning the same mental operational demand appears in both parts, code the demands only once.

Example: "Hand me a piece of paper and take one for yourself." Code as structuring

5. When the demands are redundant in 2 utterances and there is a 2 sec. delay or less code as one utterance. If there is a 3 sec. delay or more between utterances then code separately.
6. Code 2 utterances separately, even if they make the same demand, if a child's utterance comes inbetween.
7. Code a statement and a question together if no additional demand is made and there is a 2 sec. delay or less inbetween utterances. Code as a question.
8. Code acknowledgements along with the next utterance if there is a 2 sec. delay or less between utterances. If the second utterance is a question, then code the acknowledgement and the utterance as a question.

Example: "O.K...What now? - Code as a question.

(If acknowledgement has approval/disapproval quality this should not interfere with coding form and mental operational demand if appropriate).

I. FORM

This is coded for all maternal verbalizations. This is the first digit in the 3 digit code and can have a value of 0, 1, 2, or 3.

0. Inaudible

1. Imperative/Statement - A command; giving directions for a behavior; one word commands are acceptable; a declarative sentence, telling, giving information. Coded for demand on child, including the demand to attend and to understand the mental operation performed by the parent, although the engagement of the child may be quite passive. Acknowledgements are also coded here, one word utterances used to acknowledge the child or to orient the child to the task.

Example: Imperatives - "Fold it this way."

"Stop that!"

"Be still!"

"Come!"

Statements - "I'm going to make one
first."

"The blocks are made of
wood."

Acknowledgements - "O.K."

"Alright."

"Yeah."

Comment: Acknowledgements may or may not have approval quality. If they do then code approval in addition to form.

2. Question - Any question either open or closed may reflect convergent thinking; may be one word answers or imitative statements; closed questions involving recall, or simple yes-no answers.

Examples: Parent asks: "What did I just say?"

"What is the name of the book you read in school?"

"What three ways can you fold the paper?"

"Do you want to turn the page?"

"Yeah?"

"O.K.?"

Or, may be an open question with "demand" quality or elaborated, divergent qualities where the question requires reconstruction and where the child has a choice in how the answer is given.

Examples: Parent asks: "What ways can the paper be folded?"

"What kinds of boats do you like?"

"What did you do in school today?"

"What did you like about the
story?"

3. Fragment - Incomplete utterances, false starts. Fragments are coded only for utterances that are incomplete and cannot be coded for emotional support, mental operational demand or task-management.

Examples: "Now we're..."

"Wha..."

Comment: If a fragment occurs and is followed immediately by an imperative/statement or question then do not code as a fragment. Code as imperative/statement or question.

Examples: "Wha...no, not that way!"

"Wha...what?"

"We're...that's very good."

II. Emotional Support System (ESS)

This is not coded for all verbalizations. These are parental verbalizations which provide affections and/or support for the child. Most of these behaviors do not make cognitive demands, but rather they serve to encourage and/or to guide the child's efforts in dealing with the task. The parent seems to be responding to the child's previous performance as well

as providing emotional support for subsequent performance. Mental operational demands (MOD's) and task-management can be coded along with approval/disapproval if appropriate. MOD's can be coded along with Information Feedback when it occurs in question form and occasionally when it occurs in imperative form (i.e., "Look at this."), otherwise Information Feedback and Correction are mutually exclusive of MOD's and task-management. This is the second digit of the 3 digit code and can take the value of 0, 1, 2, 3, 4 or 5.

0. No ESS

1. Approval - Positive verbal feedback without additional task specific information. This includes all statements intentionally meaning to praise. Clues of intentional praise are exclamations, emphasis, animation, and physical attention.

Examples: "That's very good."

"That's great!"

"Isn't that great?" (not waiting for response)

"I really like that."

"Right!"

"O.K.!"

- a. Approval with Elaboration - Positive verbal feedback with additional task facilitation, MOD's or verbalizations that move the task forward.

Examples: "Yes, now fold it this way."

"Right, now what do we do?"

"O.K., now look at No.2."

Comment: Not all approvals are in response to a correct answer by the child, however, those maternal comments that occur after a correct response by the child code as approval (i. e., O.K., alright, um hum). The exception to this are those instances where the mother makes a mistake by saying "no" to a correct response by the child. Code those as disapproval.

- 2. Disapproval - Negative verbal feedback without additional task specific information.

Examples: "That's wrong."

"No, not like that."

"It'll never fly!" (with disapproving tone of voice.)

- a. Disapproval with Elaboration - Negative verbal feedback with additional task facilitation.

Examples: "No, look at No. 3."

"No, what should we do?"

Comment: Code instances of indignation as disapproval (i.e., "Help you! But I didn't do anything!").

3. Information Feedback - Parent responds to the child's inquiry by providing information. A simple, directly relevant and non-elaborated response.

Examples: Child asks: "What is this called?",

Parent responds: "A sailboat."

Child asks if the plane is ready to fly and the parent responds: "Not yet."

Child asks: "Where?" and parent responds "Look." Code this as Information Feedback and MOD.

Or, an elaborated response which expands the information into more than one statement; may go on for several statements (a child utterance may occur without disrupting the continued feedback). MOD's will not be coded as long as the parent is replying to the child's inquiry in statement form (in question form and occasionally in imperative form can code for MOD's).

Examples: Child asks: "How does a sailboat work?" and parent responds: "The air gets caught in the sail of the boat and pushes it along. Also, there is a rudder which you move to steer the boat."

Child asks: "How old am I?", mother responds "How old do you think you are?" Code as Information Feedback and MOD.

Comment: If the answer by the mother includes a "no" still code as Information Feedback as long as it doesn't have disapproval quality (i.e., child asks: "Are there any more?", mother responds: "No, no more.>"). Instances where child asks the mother to guess, do not code mother's guess as Information Feedback, code as a 0 (no ESS).

4. Correction - Feedback when a mistake has been made but no overt approval or disapproval; includes task specific information. It only occurs in statement form. Do not include MOD or task management along with correction.

Examples: "It would work better if you folded it over here."

"If that were pressed down harder, it would be easier."

Child says: "I don't know.", mother
 responds: "It's an E."

Comment: Corrections could also be
 interpreted as structuring. Give coding
 priority to correction if clearly in response
 to an error by the child.

5. Reflection - Parent in response to the child,
 captures the child's meaning or mood in
 statement form; can be essentially the same
 word, adding no information so that the
 meaning of the child's statement is not
 changed. Direct or implied questions are not
 reflections even though the meaning is
 similar. There is no explicit or implicit
 demand in a reflection. Do not code for MOD
 or task-management.

Examples: Child: "That's a sailboat."

Parent: "That is a sailboat."

Child: "That's hard, I can't do
 it."

Parent: "You feel that's too hard
 for you."

Do not code these as reflections:

Child: "That's a boat."

Parent: "That's a sailboat." (the
 "sail" adds additional information

so code the statement and
correction).

Child: "That's just like the
picture."

Parent: "That's just like the
picture?" (the question form puts a
demand on the child to respond so
code the question and MOD).

III. Mental Operational Demands

Statements or questions that make mental demands on the child. MOD's can occur according to three levels of distancing strategies. MOD's are mutually exclusive of task-management statements, they are never coded together. This is the last digit in the 3 digit code and can have a value of 0, 1, 2, 3, or 4.

0. None - No MOD's are present, can include self-talk, acknowledgements, etc.

1. Low Level:

A. Observe - Definition: Getting the child to attend using any senses; hearing, seeing, smelling; asking the child to examine, e.g., parent demonstration which demands that the child observe. Can be in question or statement form.

Examples: "Look at the book."

"Do you see No.1?"

"Watch, this is how you fold
it."

"Look what happens when I fold
it this way."

Comment: The form of the demand is in a verbal context and the parent's action is a demonstration, but the child to comply must observe, hence parent demand behavior coded as observe. If parents says, e.g., "I'll show you." or "Show me the book", code as observe. Must be distinguished from structuring (see structuring/ demonstration and structuring/explanation). Do not code as observe if the parent is telling the child what is going to happen in general or uses "we" in the demand, e.g., "We are going to look at the book." - code as task-management.

B. Label - Definition: Naming a singular object or event or action; naming a place, appropriate designation of something, locating; identify, a single discrimination; **no elaboration**:

ownership, possessives. Labelling is discrete and does not involve inference.

Can be in question or statement form.

Examples: "Do you know the name of this book?"

"What is the color?"

"What do you have on your feet?"

"What do you call what she is doing?"

"Where is the book?"

"Whose book is this?"

"This is a sailboat."

Comment: To be distinguished from concept or class labelling which is symmetrical classifying (see symmetrical classifying), which refers to labelling classes of instances not singular occurrences.

1. Produce Information -

Definition: Produce, process, confirm or reject information about general knowledge of instances, materials, events; associational information.

Requires a yes-no answer from child, but not all yes-no answers are produce information.

Examples: "Is this called a boat?"

"Is the boy throwing the rock?"

"Is this a rainbow?"

Comment: Only questions appear here, no parent telling.

C. Describe - Definition: Providing elaborated information of a single instance, e.g., appears like, looks like. A statement may be definitional of the observation field. Actions or inner states of self such as feelings, fantasies, ideas, are classes of parent verbalizations coded in this category. Can be in question or statement form.

Examples: "There are many flowers hiding the rainbow."

"What is the boy doing?"

"What is a rainbow?"

"What is make-believe?"

"The boy is pretending the rock is all these different things."

"Do you feel happy (sad, cold, hungry)?"

Comment: Static; no dynamic relationship among elements, no use, no functional context.

1. Interpretation - Definition: To attribute or to explain meaning; more personal than a definition.

Examples: "What do you mean?"

"What does it mean to make believe?"

D. Demonstrate - Definition: Showing primarily through action or gestures how something is to be done; the how process. Can be in question or statement form.

Examples: "Show me how to fly it?"

"Let me see you make the airplane."

Comment: If the parent does the demonstrating, the demand on the child is to observe (see comment under observe).

2. Intermediate Level :

A. Sequence - Definition: Temporal

ordering of events, as in a story or carrying out a task; steps articulated.

Types of key words are last, next, afterwards, start, begin, then, first.

Can be in question or statement form.

Examples: "What do we do next?"

"What did the boy do first?"

Comment: Not to be confused with structuring, as in "Paul, it's your turn."

B. Reproduce/Recall - Definition:

Reconstructing previous experiences; dynamic interaction of events, interdependence, functional; open-ended; child's organization of previous experience. Or, demand that the child recall a previous experience or event. Can be in question or statement form.

Examples: "Did you make one of these with Daddy?"

"Have you flown on an airplane?"

"What did you do in school today?"

"Name the three steps we just did."

C. Compare - Definition: Describing or inferring characteristics or properties across classes, not within two separate instances being compared; noting the existence of a similarity or difference, describing or inferring only how alike or different. Can be in question or statement form.

Comment: No explicit statement of what characteristic is common to both is coded here, since that is symmetrical classification.

1. Describe Similarities -

Definition: Noting ostensive common characteristics. Perceptual analysis/comparisons of sensory materials present in the interaction.

Examples: "Is your boat like mine?"

"Fold yours the same way as mine."

2. Describe Differences -

Definition: Noting ostensive differences among instances.

Perceptual analysis/comparisons of sensory materials present in the interaction.

Examples: "Is you plane different from mine?"

"Which plane looks different from #6, yours or mine?"

3. Infer Similarities - Definition:

Identifying non-observable commonalities. Conceptual analysis/instances not present for sensory comparison.

Examples: "This looks more like a hat than a boat."

"Does it look like a mirror to you?"

4. Infer Differences - Definition:

Identifying non-observable differences. Conceptual analysis/instances not present for sensory comparison.

Examples: "Does your plane look different from a real plane?"

"How does this rock
differ from the last
one?"

Comment: Inference refers to
literal non- presence of all or
part of the materials. In
inferrring "Are a dog and a tiger
alike?", neither instances may be
present which requires an inference
about both of them; or one of them
may be there.

D. Combine - Definition: Stating the
reason for combining. Can be in question
or statement form.

1. Symmetrical Classifying -

Definition: Identifying the
commonalities of a class of
equivalent instances of labeling
the class; stating why instances
are alike, not how. Estimating
quantity.

Examples: "Why is yours like mine?"

"What do you call red,
yellow, blue and green?"

"How often do you see
rainbows?"

"How many steps are on
the board?"

2. Asymmetrical Classifying -

Definition: Organizing instances within the same class in some sequential ordering; logical hierarchy; viewing the relationship as a continuum; seriation of any kind; comparative where each instance is related to the previous one and the subsequent one; relative (bigger to smaller, more or less). Enumeration of number of things; ordinal counting.

Examples: "Is your boat better than mine?"

"Which boat looks most like the one on the board, yours or mine?"

"Count the steps on the board."

"Counts the rocks in the book."

3. Synthesizing - Definition:

Organizing components into a unified whole; explicit pulling

together; creating new forms; sum
of a number of discrete things.

Examples: "When you add 'rain' to
'bow', what word does
that make?"

"How many things do you
know that can fly?"

3. High Level:

A. Propose Alternatives - Definition:

Different options, different ways of
performing the task; no negative aspect.
Possible key words are; other, another,
different from before. Can occur in
question or statement form.

Examples: "What other way could we fold
this?"

"Do you know another way to
make this?"

Comment: Not additive as in "What else
do we need to add?" or "Can you tell me
something else?". No articulation or
judgement as in a "better" way to do it.

B. Resolve Conflict - Definition:

Presentation of contradictory or
conflicting information with a
resolution; problem-solving; negative

condition exists with focus on an alternative solution. One situation which is an impossibility needs to be resolved in another way; does include inferences of cause-effect relationships but includes an additional element of identifying the central element in one situation that can be transferred to another situation. Can occur in question or statement form.

Examples: "If there were no paper, how could we make an airplane?"
 "If there is no light in here, how could we see to read?"

C. Evaluate - Definition: Assessing the quality of any givens.

1. Consequence - Definition:

Assessing the quality of a product, or outcome, or feasibility, or the aesthetic quality of personal liking. Criteria needed for evaluation, e.g., good-bad, right-wrong, fun-not fun, silly-not silly. Evaluation of parent's interpretation of what the child

means. Can occur in question or statement form.

Examples: "If rainbows are real,
can you play with them?"
"Can we build a castle
with sand?"
"This is hard to make."
"Do you like this book?"

Comment: Conditional competencies or qualified "can you" questions are included under this category.

2. Own Competence - Definition:

Assessing own competence or ability.

Examples: "Can you fold it like
this?"
"Are you sure?"
"Do you understand what I
mean?"

Comment: Includes those statements that use the word can literally, e.g., physical and/or social feasibility; also must contain a personal reference (not a collective "you" or "we").

3. Affect - Definition: Assessing the quality of a feeling state.

Examples: "Is it fun to feel
happy?"

"Do you like to feel
sad?"

"How do you feel about
feeling sad?"

4. Effort and/or Performance -

Definition: Assessing the quality of the performance and/or effort on a task (ignore confirming, e.g., "That's neat."; "That's good.>").

Examples: "Did you work hard at
that?"

5. Necessary and/or Sufficient -

Definition: Assessing information that is necessary or sufficient for something to happen; reality confirmation; recognition of absurdities.

Examples: "Can the boy really catch
the rainbow?"

"Can you have a rainbow
when there is no sun?"

D. Infer - Definition: Focusing on nonapparent, unseen properties of relationships. Can occur in question of statement form.

1. Cause-Effect - Definition:

Predicting outcome on the basis of causal relationships of instances or statement thereof; explanation or reason for some event, direct or indirect.

Examples: "How can you make it fit in the hole?"

"We can make a boat by folding this paper."

"How can you keep the wind from blowing the paper away?"

2. Affect/Feelings - Definition:

Predicting or assessing how a person feels or believes, or intends.

Examples: "Was the boy feeling sad?"

"Did Pat mean to tear up the box?"

Comment: Not a description of affective behavior.

3. Effects - Definition: Predicting what will happen without articulating causality; effects of a cause; prediction of someone else's competence, or feasibility, or location.

Examples: "Did he find it?"

"Where will the rainbow hide?"

"Will Pat tear up the box?"

E. Generalize - Definition: Application or transfer of knowledge to other settings or objects; a new situation going beyond the immediate task or context. Can be in question or statement form.

Examples: "This is my own shirt and that is your own shirt and that is a rainbow of it's own."

"Now that we know rainbows and rain water go together, do you think the fishbowl water can make a rainbow?"

F. Transform - Definition: Changing the nature, function, appearance of instances; focusing on the process of change of state of materials, persons, or events. Inferring is a part of this - the prediction of what will happen relating to a change of state. Can occur in question or statement form.

Examples: "What do you need to do to a rock to change it into sand?"
"What will Catarina become when she lives in the castle?"

G. Plan - Definition: Arranging conditions to carry out a set of actions in an orderly way; acting out a rule of the task or actual carrying out the task. The child is involved in the decision. Can occur in question or statement form.

Examples: "What do you want to do?"
"How can we make a plane with this paper?"
"Do you want to read to me?"

Comment: If cause-effect is indicated, materials must be present. Most often appears in the form of questions; but

indirect questions and imperatives seeking information may also appear. In general plan concerns what is going to happen in the future.

1. Confirmation of Plan -

Definition: Checking whether the plan was carried out.

Examples: "Does it look the way you expected it to?"
"Did it turn out the way you wanted?"

H. Conclude - Definition: Relating actions, objects or events in an additive and/or integrative way; summarizing, reviewing. This category is used for the last parent statement or question in a series or questions leading up to a conclusion. Can occur in question or statement form. Key words are so, therefore.

Examples: "Are you finished?"

"Looks like it's wet so
must've rained." "Who's winning the race?"

4. Task-Management: Preparation and maintenance of the task. Mutually exclusive or MOD's.

A. Structuring of the Total Task -

Definition: Global telling of what is going to happen, gestalt of the task.

Examples: "I'm going to teach you how to make that boat."

"We are going to look at this book together."

B. Structuring of Task Related Behavior

- Definition: Specific behavioral directions related to task or to facilitating task. Telling child what is going to happen short of defining total task. Also action to delay child's response as a means of facilitating organization or reorganization of thought or actions.

Examples: "Fold it right here."

"Turn it over."

"Wait! Just a minute."

Comment: The only questions to appear under structuring are "Will you..." questions, e.g., "Will you get me a piece of paper?", "Would you clean the table?"

C. Structuring with Explanation -

Definition: Telling the child what to do

or what is going to happen with an accompanying explanation. Key word- because.

Examples: "You have ot crease it hard to make it stay folded."

"I can't do it for you because I'm suppose to teach you how."

D. Structuring Rule - Definition:

Setting up of the rules of an activity, game, task, use or materials or explanation of rules, or social interactions with adults and/or peers; defining the limits. This includes rules of social interaction, but deals only with setting or defining the limits, not with enforcement after the rule has been broken.

Examples: "The rule is you have to make a plane."

"What are you suppose to make?"

Comment: The only types of questions to appear under this category refer to expected actions, e.g., should you, supposed to do, need to do questions referring to the rules or the procedures

of an activity: "What should you do with the paper?", "Where do you need to place the chair?".

E. Structuring with Demonstration -

Definition: Telling child what to do with the additional element of parent showing or demonstrating.

Examples: "Fold it this way." (parent demonstrate)

"Turn it the way I'm turning mine."

"Push harder right here."

(parent demonstrate)

Appendix I

Reciprocal Control Categories for Scoring

Social Interactions: 36 and 60 months

by

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The attached set of categories was developed to code the social interactions of mothers and children in a 20 minute free-play laboratory situation. The categories are divided into primary "modes" with each mode being divided into smaller units of behavior. Within each mode the duration categories are mutually exclusive. Frequency categories within a mode and duration categories across modes (except where noted) may be scored simultaneously. Mother and child are coded separately. The categories were established to be coded from videotape recordings onto an event recorder (IBM PC-XT). Following coding, the recorded codes must be processed through a series of software programs. The first cleans the data. Clean references a "T codes" file which contains a description of all codes used, whether they are frequency and duration codes or only

frequency, and if a duration code, which other codes terminate it (duration codes must have terminating codes; frequency-only codes do not). The second merges the records of mother and child (the program automatically adds the prefix "1" to all child codes and "0" to all mother codes). The third program provides a frequency count of the duration and frequency of all codes. For further information on the software contact William Crocker, Frank Porter Graham Center, 1985.

CONVENTIONS FOR CHILD AND MOTHER

1 PLAY WITH TOY

1-1 Non-directed play with toys. (Duration and Frequency)

Child or mother is touching or holding toy or object (which is not a book), but is not engaged in purposeful play. (He may be walking with toy in hand; getting toys out to toy box, preparing to play with toys, e.g. setting crayons on table). A new 11 is not scored if subject picks up part of the same toy - the teacup and then the saucer, for example. 11 terminates "3" and other "1" codes.

Conventions

- a. Always score 11 before going to 12, except at beginning of session if § is already engaged in purposeful play.

- b. 11 is used for behaviors which involve materials, not just toys, e.g., playing with the lights, microphone, or digging in a purse.
- c. 11's should be scored if subject ceases playing directly with the toy and begins just carrying it around (count 3 seconds before reverting to this).
- d. Taking things in and out of the toy box, such as looking for something to do, is the same activity (11) even though the subject is touching new toys. But when the subject takes something from the box and then starts playing with it and ignores the box, then this is a new 11 with the appropriate new 4- code with that toy.
- e. Always score the subject's latest activity even if he is still holding parts of the previous activity.

1-2 Directed play with toys. (Duration and Frequency)

Subject is touching toys and is engaged in purposeful play. Any sequenced, repeated activity with toy will be termed "directed" play. He may be putting toys in and out of the toy box or he may be engaged in clear sequenced activity around a particular toy, i.e., "cooking and serving food" with the kitchen set, coloring with crayons in coloring book. 12 terminates "3" codes and "1" codes.

Conventions

- a. Putting crayons in the crayon box is a 12, but when the box is closed and the child is just holding it then score a 11.
- b. After child empties the blocks sack, score 12. However, if child then stands there and doesn't begin to play or at least sit down and touch the blocks, go back to 11 after 3 seconds.

1-3 Show/extend toy. (Frequency) Subject holds out his arm which contains a toy in the direction of the other. Also scored when subject points to a toy while looking at or vocalizing to other. Frequency count only, no duration.

Conventions

- a. Show is scored only for a definite gesture toward the mother or a gesture which is calling the other's attention to some aspect of an object either verbally or by holding it out toward the other.
 - b. Score 13 for each separate show or point.
 - c. To score 13, the other subject must be capable of seeing what (s)he is doing (i.e., in the line of vision) or subject must look at other and point, show, or say "here...".
- 1-4 Give toy. (Frequency) Subject places toy in other's lap or hand so that the other has physical contact with toy. Frequency count only. If subject ceases to have contact with toy for more than 3 seconds, score "10".

(Gives can occur with one placing an object in the other's lap but maintaining contact).

- 1-5 Mutual Play. (Duration and Frequency) Child and mother are both in contact with toy and are engaged in mutually involving play. If mother and child are actively involved in a sequential activity (e.g., hide and seek) which does not involve toys, score 15 (RARE). 15 terminates "1" and "3" codes. Mutual reading is "33", not "15".

Conventions

- a. The 15 begins when both have touched the toy. Regardless of how the beginning occurs (join, suggest join, etc.), the 15 is scored until the other has touched the toy. In the case of a non-toy activity, both must have made a physical gesture indicating involvement, e.g., singing, hiding eyes, etc.
- b. The 15 can continue even though both are not still touching the toy or toy part. For this to occur, the partner not touching the toy must: 1) be in close proximity; or 2) not have moved away from the location of activity. When 2) is violated, the 15 ends.
- c. If mother and child were in 15, then completed their activity, keep them in 15 as long as they are discussing the previous activity.
- d. Both members of the dyad must be actively involved for a 15 to continue to be scored. If a member backs away

(for example sits back), then score 4710 for her and 12 or 11 for the other.

- 1-6 Inappropriate play with toy. (Frequency) The child bangs things with toy or throws toy. Reserved for instances of inappropriate force, coloring on anything but paper, or doing something which the mother has already prohibited. Child must clearly not be "playing" with toy. Usually child's facial expression will indicate anger or frustration. Frequency count only; therefore score each time behavior occurs; e.g., each time crayon is raised from book and a new mark is made.

Convention

- a. Going to the door with clear intention of trying to escape or being provocative is a 16.
- 1-0 End play with toy. (Frequency) Subject no longer has contact with a toy. Duration of out of contact must be at least 3 seconds before 10 scored to avoid momentary pauses in a sequenced play with toy; i.e., a child searching for another piece of puzzle while no longer holding any pieces would not be scored out of contact until 3 seconds had elapsed. Terminates all "1" or "3" codes.

Convention

- a. If child still visually engaged with toy; e.g., coloring book- when looking at pages first colored, do

not score 10. Reserved for times when child's physical activity indicates he has finished an activity.

3 BOOKS

- 3-1 Contact. (Duration and Frequency) Scored whenever subject is in contact with book or magazine, whether opened or closed.

Convention

- a. A 31 is scored even if the book or magazine is lying in the person's lap.

- 3-2 Read Alone. (Duration and Frequency) Book is open. Subject is looking at book and reading (or talking about) to self while the other is involved in a different behavior. Terminates all "1" codes as well as "3" codes.

Conventions

- a. 4731 Mother looks up and verbalizes to child. Break the 4132 and score 4731. If mother verbalizes but does not look up, do not break the 4132; even if mother's verbalizations is a 51 or 42. If mother looks up without verbalizing, count to 3, then break the 4132 and score 4731. If look is less than 3 sec, do not break the 4132.
- b. 4132 In going back to 32 from a previous 47, break the 47 as soon as the mother looks back at the book. However, if mother is talking to child when returning

to look at the book, keep the 47 going until mother and child stop talking to each other.

3-3 Read together (Duration and Frequency) Both partners are near to and looking at the same book. One may be pointing to pictures or talking about the book or reading the text aloud. Terminates all "1" and "3" codes.

Conventions

- a. Both partners must be actively involved to be in 33. If child or mother moves away or backs off, score a 4730.
- b. If mother and child were in 33, then completed their activity, keep them in 33 as long as they are discussing the book.
- c. A 33 begins when either mother or child touches a book and the other is either touching the book or is actively involved visually.
- d. Mother and child must be in close proximity to be in a 33. A mother (or child) reading aloud to a child (or mother) sitting in the chair coloring, for instance, is not a 33. If listening is the child's only activity then it would be a 33.

3-0 Terminate. (Frequency) All involvement (reading or contact) with book ended. If mother or child closes book but continues to hold it or have it in lap, score 31.

4 INITIATION OF ACTIVITY

- 4-1 Self Initiated. (Duration and Frequency) Scored at the beginning of each new activity that has not been verbally or physically suggested by the other. Activity is defined as either 1) play with a different toy from one currently engaged in or 2) play with a toy after a period of no activity or 3) a clearly new activity with the same toy; i.e., putting blocks into bag after a period of building with them, coloring in coloring book after a period of looking through coloring book. 41 always is coded in conjunction with a molecular category unless instance 3 described above occurs, in which case the "1" category would continue to run.

Conventions

- a. Wait 3 sec. before changing from 41 to 4010. Also when changing from a 41 to another 41, the new 41 must last at least 3 sec. This convention will avoid disrupting an ongoing 41 (or 15) when child briefly touches another toy.
- b. If child is building with blocks, and then builds something different, this is not a new 41. Similarly, if in 4115 with blocks and mother says; "Build me an X", score this a 51 for mother and 52 for child is appropriate, not 42 and 45.
- c. After playing with toys, if S begins to put them up, score a new 41 if it is not part of the ongoing

activity. Putting toys away is a new activity, score 41.

- d. If S is putting away one set of toys, then begins putting away other toys, do not score a new 41 (the major activity is putting away). Similarly, if the other says "Now put away (different toys)", score 51 and not 42. If S does it, score 52, and not 45.

4-2 Suggested New Activity. (Frequency) The child verbally or nonverbally suggests that the other begin an activity different from the one in which he is engaged. Child may vocally suggest the new activity or may bring a toy to the mother as a suggestion. If child has been engaged in activity himself (12) prior to the suggestion, score 43 not 42.

Conventions

- a. If child brings something to mother and asks her to fix it or do something to it score 43 for child if he was already in 12 with toy and 45 for mother. If child moves away, watching her, score 47 for child.
- b. If S picks up toy and gestures for other to take the toy, score 411142.
- c. A 42, like a 45 and 43 does not have to be verbal, nor does it have to include toys.

4-3 Suggests other to join play. (Frequency) Child engaged in directed play with toy (12) and suggests (verbally or nonverbally) that mother join his activity.

Conventions

- a. When a child is indirectly asking for mothers help (e.g., "I can't do this.") score as a 43, for the child unless the verbalization is not directed toward the mother.
- b. The difference between a 42 and a 43 is: a 43 is scored when S has a toy (12) and is suggesting the other join. A 42 is scored when S is suggesting that activity for the other to do.
- c. If S says "I'll show you" and on his/her own accord brings the object to the other, it is a 43. Or if S shows subject to other and gives it to her then it is a 13 and a 1443.
- d. The mother or child has to be in a 12 to request the other to join (43).

4-4 Join. (Duration) The other is engaged in some activity and the subject enters into the activity by playing with the same material. Subject must actively begin to interact in same activity or with same materials; if subject merely moves closer in order to observe other's activity, she is scored 47 (passive participation).

Conventions

- a. If child is doing something and mother says "Let me see that" it is a 51 and a 4415 for mother is child brings it to her (and a 5215 on the child's part).

- b. If mother says "Would you like me to help you?" and then moves to become involved when child says "yes", score 44 on her part.

4-5 Accept (Duration) The other complies with a 43 (suggests join) or a 42 (suggests) beginning a new activity which was suggested.

Conventions

- a. A 45 must be a physical response, not merely verbal acquiescence.
- b. If S gives part of toy to other and other takes it, it is a 43-45 regardless of length.
- c. At the beginning, prior to the start of the session, if child has initiated activity by bringing to mother, score 411543 (child) and 4515 (mother).
- d. If subject is passively participating (47) and joins or accepts the other activity, a 44 or 45 MUST be scored.
- e. If mother suggests several things to do and the child goes over and does them in that order, the first is a 45 and then the rest become 41's.

4-6 Reject. (Frequency) The subject rejects the other suggested activity or invitation to join or command to stop. The refusal must be verbal ("NO"... "I won't"), or actively physical (hand motion, obvious 16). Ignores do not count.

Convention

- a. If child suggests something like "Give me some butter" as an invitation to join play, and mother says "No, I don't have so and so" it is a 46.

4-7 Passive Participation. (Duration and Frequency) The subject observes what the other is doing without participating. Subject must be attending to other's activity: visually oriented, leaning forward, actively aware of other's activity without touching the toy.

Conventions

- a. When 40 and 47 are difficult to separate, use vocalizations to other as an index of 47.
- b. If child is sitting in front of mother (or standing) talking with her and is not in a 4111 or 12, score child as 47.
- c. 47 is coded for both the mother and child if they are engaged in a conversation and the conversation is the sole activity and does not pertain to an activity just completed. A conversation is defined as two or more verbal turn-takings.

4-0 No clear activity. (Duration and Frequency) The subject stands or sits without looking at other or engaging in any manipulations of objects.

Conventions

- a. If mother or child is eating and not attending to anything else, score 40.

- b. When the mother is smoking and not attending to anything else, score 40 (10).

5 MODIFICATION OF BEHAVIOR

- 5-1 Attempt to modify other's behavior. (Frequency) One verbally or nonverbally indicates a suggestion that the other alter his physical behavior (i.e., "Come here", "Mommy, look"). Does not include verbal interactions which are a request for verbal information (i.e., "What color is that?" -- but would include "Point ot the red crayon.").

Conventions

- a. S1 includes suggestions or indirect commands that would require physical responses, i.e., "Wouldn't it be better to put the toast on a plate?"
- b. "Where" is only a S1 if the question requires a physical response.

- 5-2 Comply. (Frequency) One does whatever the other told him/her to do. (Mother does look, etc., when requested.)

Conventions

- a. If mother tells child to do something, and child tries to comply, even if unsuccessful the child still gets a 52; e.g., tries to put a puzzle piece in but cannot do it.

- b. If child says "Mom, Mom" and mother looks up, score 51 and 52 if the child's voice seemed to be insisting that the mother look; e.g., rising inflection at the end of a utterance.
- c. Any verbal response to any question is not 52, regardless of the form of the question. If the other interprets a question to contain a behavioral request, do not score 52. Only score 52 when the question clearly requires a physical response; e.g., not 52's: Responses to where are the crayons? Where does this one go?; are 52's: Responses to why don't you turn off the lights? Why don't you come here?

5-3 Reject. (Frequency) One actively refuses to do whatever has been suggested by either continuing the same behavior if the other has told him/her to stop, verbally refuses, etc. Does not include ignoring requests by other.

Convention

- a. 53 can be nonverbal in the following situations: 1) turning head away; 2) kicking and/or staying turned away; 3) or continuing to do what the other has said not to do - each time the prohibited behavior is done following a prohibition, score 5316. Deliberate ignoring, unless this includes continuing a prohibited behavior, is not a 53.

51 or 42

1. When playing with puzzle, if mother does not verbally tell child where to place puzzle piece, but taps the place where it belongs, give mother a 5113 and child a 52 if he/she puts the piece where mother tapped.
2. If child has not entered a 12 after touching a toy, and mother says: "Do X", or "You could do X", or "Why don't you do X", then score mother as 42 and child as 45 if he/she complies.
3. If child brings something to mother and asks her to fix it or do something to it, score 43 for child if child is in a 12 with toy or 42 if he is in 11, and 45 for mother. If child moves away while watching her, score 47.
4. If S says "Do X" and the other is already doing X, then do not score 51 or 52. For example, if child is bringing blocks to mother and she says "Bring me the blocks", then mother does not get a 51 and child does not get a 52. Nothing is scored. Generally these are more "comments" by mother rather than commands and one can tell by the tone of voice.
5. If S gives two different 51's or 42's at the same time; e.g., "See that paper? You can draw on it.", score two 51's (or 42's). Then if the other does both things, give two 52's (or 45's).

6. In scoring the control categories, ignore the form of the utterance and score the content; e.g., mother suggests that child play with blocks by saying, "Would you like to play with the blocks?" or "Play with the blocks.", or "What about the blocks?", or "Those blocks look like fun.", or "See those blocks over there?" All of these would be scored 42.
7. If child is in a previous 41 and says "Let's do (a new 41)", give the child a 42 and if mother does it, give mother 45. Also, give child a 41 when the activity begins, even if mother actually begins first.
8. If S says "Do you want me to (perform some activity)?", and the other says "Yes", do not score 51 or 42. However, if the other repeats the 51 (or 42) or modifies or further clarifies the 51 (or 42), then score the other as 51 (or 42), and S as 52 (or 45) if S does it. Example: Mother says, "May I play with the blocks?" while child is playing with blocks. Child says "Yes, build me a hotel". Then score 42 for child and 45 for mother if she does it.
9. A general admonition such as "Play with the toys." without specifying which toy is a 51 not a 42.
10. If mother makes suggestions about what to do with the toy that the child is playing with, score them as 51's, e.g., child is playing with the blocks (12) and mother says, "You gonna build me a house?"

11. If the mother says something which sounds like a 51 but the child is already doing that, then the mother's comment is not a 51; e.g., mother says, "You going to give the baby some milk" while the child is already feeding the doll. These are more of repetitive comments than requests. But when only one person is playing with the toy and invites the other to join her by saying, "You want to feed the baby?", then this is a 43.

52 or 45

1. If 51 or 42 occurs, and the other's response is verbal, do not score 52 or 45. If other does clear behavioral response to 51 or 42, then score 52 or 45 as appropriate. Latency between 51 or 42 and 52 and 45 is not time. For a 52 or 45 to occur it must be the next behavioral response following a 51 or 42 no matter how long the time period is. Otherwise do not score the response even if later the other clearly complies.
2. Any verbal response to any question is not 52, regardless of the form of the question. If the other interprets a question to contain a behavioral request, do not score 52. Only score 52 when the question clearly requires a physical response.
3. If mother tells child to do something, and child tries to comply, even if unsuccessful, the child still gets a

52; e.g., tries to put a puzzle piece in but cannot do it.

4. If S says "Give me X" and the other tries to find X to give, but does not actually give it, score 52 for the other since the other attempted to comply.

Appendix J

Additional Results

Analyses were performed on the children's performance scores (PPVT-R, WPPSI Full Scale, WPPSI Verbal and WPPSI Performance), form of maternal utterances (inaudible, statement, question and fragment) and emotional support in maternal utterances (no emotional support, approval, disapproval, information feedback, correction and reflection). The results of those analyses will be discussed in this section.

Differences in children's performance on the 4 performance tests were investigated with a one-way MANOVA. The dependent measures were children's scores on the performance tests PPVT-R, WPPSI Full Scale, WPPSI Verbal and WPPSI Performance. The MANOVA revealed a significant main effect for SES, $F(1,38)=6.20$, $p<.001$. Univariate tests were examined to determine on which test the children differed. The univariate analyses indicated a main effect for PPVT-R, $F(1,38)=16.47$, $p<.000$; a main effect for WPPSI Full Scale, $F(1,38)=16.61$, $p<.000$; a main effect for WPPSI Verbal, $F(1,38)=9.98$, $p<.003$; and a main effect for WPPSI Performance, $F(1,38)=12.71$, $p<.000$. All of the univariate analyses revealed that middle-SES children scored higher than low-SES children on the performance tests.

Differences in the form of maternal utterances were investigated with a 2 (SES) x 2 (session) MANOVA with repeated measures. The dependent variables were the percent of utterances that were either inaudible, statements, questions or fragments. The MANOVA revealed a main effect for SES, $F(3,38)=3.05$, $p=.041$. A main effect for session, $F(3,38)=13.23$, $p=.000$ and no SES x session interaction. Univariate tests were examined to determine which categories of form accounted for the findings. The univariate analyses for SES revealed no individually significant findings. The univariate analyses for session revealed a main effect for inaudible utterances which occurred more in free-play sessions, $F(1,38)=7.87$, $p=.008$. Statements occurred more frequently during task-oriented sessions, $F(1,38)=18.70$, $p=.000$; questions occurred more during free-play session, $F(1,38)=13.32$, $p=.001$; and fragments occurred more frequently during free-play sessions, $F(1,38)=5.60$, $p=.023$.

Differences in the emotional support exhibited during the dyadic interactions were also examined utilizing a 2(SES) x 2(session) MANOVA. The dependent variables were the percent of maternal utterances that exhibited no emotional support, approval, disapproval, information feedback, correction and reflection. The MANOVA revealed a main effect for SES, $F(5,38)=3.97$, $p<.006$; no SES x session interaction; and a main effect for session, $F(5,38)=30.14$, $p<.000$. Univariate tests were examined to determine which categories

of emotional support accounted for the findings. The univariate analyses for SES revealed a main effect for approval with middle-SES mothers engaging in more approving utterances than low-SES mothers, $F(1,38)=7.61$, $p=.009$; and a main effect for disapproval with low-SES mothers engaging in more disapproving utterances than middle-SES mothers, $F(1,38)=18.82$, $p=.000$. The univariate analyses for session revealed a main effect for no emotional support with mothers engaging in more during the free-play session, $F(1,38)=36.32$, $p=.00$; a main effect for approval with mothers engaging in more during the task-oriented session, $F(1,38)=130.16$, $p=.000$; a main effect for disapproval with mothers engaging in more during the task-oriented session, $F(1,38)=11.42$, $p=.001$; a main effect for information feedback with mothers engaging in more during the free-play session, $F(1,38)=20.39$, $p=.000$; and a main effect for reflections with mothers engaging in more during the free-play session, $F(1,38)=56.59$, $p=.001$.