

THE DEVELOPMENT OF SYMBOLIC PLAY FROM AGES ONE TO THREE:
A LONGITUDINAL STUDY OF MOTHER-CHILD PLAY INTERACTION

by

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ABSTRACT

This longitudinal study investigated mother-child interaction in symbolic play development. Twenty five mother-child pairs were observed and videotaped in a standard university playroom setting when the children's ages were 12-14, 20-22, and 33-39 months. The following measures were scored for each subject partner at each session: frequency and complexity of symbolic play, amount of functional object use, and amount of information expressed about objects. At the third session, three additional variables were scored for each subject partner: number of play themes initiated, number of elaborations of themes initiated, and number of statements in which play was verbally organized and coordinated. At each session, two measures of social interaction were also scored: the proportion of joint versus solitary or parallel play, and the proportion of play incidents directed by the mother.

The symbolic play of both children and mothers increased in complexity across sessions. Two Principal Components analyses were conducted, one analyzing all of the child play variables from all sessions, the other analyzing the maternal and interactional variables. Mother and child scores on the factors that represented symbolic play at each session were highly positively intercorrelated within sessions. Weaker, non-significant positive relationships were found across sessions between most factor scores representing

mother and child symbolic play. Among the original variables, there were positive intercorrelations between most of the mother and child variables within each session. Across sessions, the child's symbolic play complexity was generally significantly positively related to earlier maternal play and to earlier joint participation scores, and negatively related to earlier maternal directiveness.

It is suggested that both mothers and children adjust their own play to that of their partners in active joint play, that early maternal play may be a determinant of later child play, and that some aspects of later maternal play may be determined by earlier child play levels. This study provides validation for the model of symbolic play complexity developed by the author. Directions for future research using this model, and also for future research into mother-child play interaction, are suggested.

DEDICATION

To my mother, Lois Phasey, who gave me my introduction to the topic in my own infancy; to my son, Adam Russell, who reintroduced me to it during his infancy; and to Krishna Govender, who has taught me that one must never become too grown up to use one's imagination.

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I would also like to sincerely thank the many people who have helped in the collection of the data. Frans Vanlakerveld, Marguerette Mosher, and the late Robbie Russnaik are among them. Katherine Graham and Frances Newman have listened, criticized constructively, and made many informal contributions over the years this project has been in progress. I thank them both.

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Chapter One: Theoretical Issues

Some of the earliest evidence of the ability to represent objects, events, and relationships symbolically may be found in the appearance of symbolic or pretend play in the first half of the second year of life. With the emergence of this ability, along with the beginnings of language and deferred imitation, the infant begins to leave behind a total dependence on the sensorimotor mode of cognition, and starts to develop a new mode -- one in which mental activities no longer depend entirely on immediately present sensory events, and in which mental representations come to play an increasingly dominant role. The period in which symbolic play first develops is thus a crucial one for our understanding of the development of representational thought. The aim of the present research was to investigate longitudinally the emergence of symbolic play ability between the ages of one and three years, with particular emphasis on the relationship between infant symbolic play ability and mother-infant play interaction. Following a review of the theoretical and empirical literature, a description of and rationale for this investigation will be presented.

General Theoretical Approaches to Symbolic Play

Most theorists and researchers agree that symbolic play is related to other representational abilities, is a vehicle for ego

expression in early childhood, and has important implications for later social and/or cognitive development. Further, most theorists agree that despite, or in addition to, its functions in cognitive and/or social development, symbolic play is a pleasurable activity that most children carry out in a spirit of playfulness and fun. Despite these basic agreements, differences of opinion exist over the precise function it serves, its organization, and the mechanisms involved in its development. While the most influential theoretical overviews are those of Piaget (1962) and Vygotsky (1966), the psychoanalytic view (Freud, 1922) has also influenced research and theory in this area.

Piaget

In the Piagetian view (Piaget, 1962; Sinclair, 1970) symbolic play is characterized by the acting out of familiar behavioural sequences (schemes) in the absence of the appropriate environmental cues. Originally, the symbols used by the child are simply his or her own sensorimotor schemes applied to unconventional objects. For example, a child might hold a block of wood to the lips and act as if drinking from a cup. Later, the child applies his or her own schemes to other people or objects (e.g., a parent or a doll is "given a drink" using the block of wood), and also symbolically enacts the action schemes

of others (e.g., a child pretends to carry out the actions a parent carries out in preparing dinner). Ultimately, according to Piagetian theory, symbols become interiorized images that are no longer dependent on overt action and concrete physical objects. In contrast to language, in which the word is seen as an arbitrary "sign" with a shared social meaning, the "symbol" of symbolic play is seen as egocentric, usually having meaning only for the individual child.

Symbolic play first appears at the age of about 18 months, during the sixth stage of the sensorimotor period. It is part of the general symbolic or semiotic function, which also includes language, imitation, and mental imagery. It follows, and is based on, the development of deferred imitation. The child must be capable of imitating his or her own and others' non-play activities some time after their original occurrence in order to act out schemes in the absence of appropriate cues. Although for Piaget symbolic play requires deferred imitation, it does not require immediate imitation of the specific pretend play behaviour of adults or others. It is a purely assimilative cognitive activity carried out for the child's pleasure, and is independent of the process of socialization.

Vygotsky

Vygotsky (1966) has interpreted children's fantasy play as "the imaginary, illusory realization of unrealizable desires"

(pp. 7-8). Symbolic play comes about because the child has needs and aspirations that are not immediately attainable in reality. Ultimately, language and thought are vehicles through which such needs and desires may be immediately realized. Symbolic play is, to Vygotsky, a transitional stage in the development of representational thought. The child uses one object to represent another as a "pivot" for severing meaning from the exclusive realm of concrete physical objects. Language and internal mental representation are the ultimate outcomes of this process. It is noteworthy that for Vygotsky, it is the constraints of the social world that motivate the child to pretend. A five-year-old is not allowed to drive a bus, however much he or she might wish to do so when riding in one. In Vygotsky's view, the child will likely satisfy desires such as this (at some future point, not necessarily at the time they first occur) by pretending to be a bus driver, and may thus avoid having to wait for adulthood and the issuance of a license to drive buses. Thus, Vygotsky's view contrasts with that of Piaget in that the child's pretense is in some sense an accommodation to external social reality, whereas for Piaget, pretense is a purely assimilative activity in which the child imposes his or her own schemes on external objects and events.

Freud

The Freudian view (Freud, 1922), while it is concerned with ego dynamics and not with cognitive development per se, shares some aspects of the viewpoints of both Piaget and Vygotsky. Freud was the first theorist to suggest that symbolic play represents a vehicle for the expression of wishes that may not in reality be satisfied, and he viewed it as an anxiety-reducing mechanism arising in response to the conflict between id (unsatisfied wishes) and the demands of both the superego and reality. Thus, symbolic play may be viewed as a kind of ego function mediating between social reality and private, unsatisfied desires, a position similar to that of Vygotsky. On the other hand, the general psychoanalytic view of fantasy play has been that it represents a flight from reality, a position similar to Piaget's description of symbolic play as "egocentric thought in its pure state" and his argument that the function of such play is to protect the ego against the demands of reality (Moore, 1964).

Other psychoanalytic theorists have suggested that fantasy play serves to assist the child in assimilating traumatic experiences, to resolve specific anxieties associated with each psychosexual stage of development, and to prepare the child to accept unpleasant aspects of reality, such as the idea of death. Alternatively, it has even been suggested that for the child,

realistic, non-fantasy play is an escape from the anxiety produced by conflict between the pleasurable fantasies of the id and the frightening fantasies of punishment produced in response by the superego (Moore, 1964). The influence of psychoanalysis may be seen in such contemporary writers as Murphy (1972), who states that: "At 16 or 18 months, when deprived of mother's presence, a child will be a mother to her doll, thereby not only compensating for the temporary loss of mother but clarifying her caretaking role while identifying with it" (p. 125).

While the psychoanalytic school has focussed on the role of symbolic play in ego functioning, and Piaget and Vygotsky have focussed broadly on cognitive developmental issues, there have also been more specific recent speculations that symbolic play facilitates the development of certain social and cognitive abilities.

The Importance of Symbolic Play in Social and Cognitive Development

Social Development

Recently, interest has begun to focus on symbolic play as a precursor or facilitator of social-cognitive abilities such as role-taking. For example, Watson and Fischer (1980) have provided evidence that symbolic play skills (in particular, a

hierarchy of symbolic play steps involving the ascription of agency to self, dolls, and substitute objects) are precursors of social role-taking skills requiring the coordination of two and more role perspectives. More generally, Bateson (1971, 1972, 1976) has argued that play (and more specifically, socially-shared symbolic play) teaches the child that social situations are not always to be interpreted literally. He has proposed that in situations such as playful fighting or dramatic role play, the message "this is 'not real'; it is play" is being transmitted. Thus, such play introduces to the child the idea of metacommunication, or communication about how social messages are to be interpreted. Such messages, in Bateson's view, are almost always nonverbal, and serve to frame the context within which literal statements and social actions are to be understood. Other authors (e.g., Ross, Goldman, and Hay, 1976) have also suggested that play in general is important in the acquisition of "meta-rules" regarding social communication.

Bateson has also pointed out that play teaches the child that social roles may shift from situation to situation, and even within a given situation. In taking on a role in pretend play, the child learns not only something about how to carry out that role, but also something about the general nature of roles:

The child is playing at being an archbishop -- I am not interested in the fact that he learns how to be an archbishop from playing the role; but that he learns that there is such a thing as a role. He learns or acquires a new view, partly flexible and partly rigid, which is introduced into life when he realizes that behavior can in a sense, be set to a style. It is not the learning of the particular style that you are playing at, but the fact of stylistic flexibility and the fact that the choice of style or role is related to the frame and context of behavior (1971, p. 265).

Thus, for Bateson, symbolic play introduces the child to the idea of role reversibility within the dictates of social context. While the relationship between symbolic play and the development of role-taking ability and social comprehension requires considerably more empirical substantiation than is presently available, it is certainly possible that dramatic role play, with its components of role reversibility and its metacommunicative features, is a contributor to the development of social skill. That there may be a relationship between sociodramatic play and at least one index of social skill -- peer popularity -- is suggested by Rubin and Maioni's (1975) report of a positive correlation between preschoolers' sociodramatic play and sociometric popularity ratings. It is further bolstered by Doyle and Connolly's (1978) report that adult role play was significantly positively correlated with the child's social competence in play with an unfamiliar peer, as well as their report that the child who engages in dramatic play scores higher on peer sociometric ratings (Connolly and Doyle, 1978).

Cognitive Development

Because of its imaginative character, symbolic play has been identified by several writers (e.g., Singer, 1973; Sutton-Smith, 1971) as a potential contributor to creativity in children. The gist of their arguments is that symbolic play provides practice in what might be termed hypothesis-activation, an ability that is broadly useful in problem-solving situations and in creative endeavours. For example, Sutton-Smith (1971) has focussed on the role of fantasy play in the development of associative fluency (the ability to use objects in novel and creative ways). He has argued that:

Play, like other expressive characteristics (laughter, humor, and art) does not appear to be adaptive in any strictly utilitarian sense. Rather it seems possible that such expressive phenomena produce a superabundance of cognitions as well as a readiness for the adoption of an 'as if' set, both of which are potentially available if called upon for adaptive or creative requirements" (p. 258).

Dansky (Dansky and Silverman, 1973, 1975) has empirically demonstrated the play-associative fluency relationship, then gone on in later research to show that it may be mediated by make-believe play. In a training study, Dansky (1980) assigned a group of "players" (children who spent more than 25% of their time pretending in a nursery school) and a group of "nonplayers" (children who spent less than 5% of their time pretending) to three conditions. In a free play condition, children were permitted to play with a set of objects as they wished. In an

imitation condition, children observed and imitated an experimenter's novel (but non-pretend) actions with the same set of objects. In a convergent problem-solving condition, children received practice in attempting to solve problems regarding the objects. Immediately after the training sessions, all subjects were asked to name all of the uses they could produce for four objects that were not present during the training sessions.

It was found that subjects in the free play condition produced significantly more uses than did subjects in the other two conditions, and also that the "players" produced, over all conditions, significantly more uses than did the "nonplayers". "Players" in the free play condition produced more uses than did subjects in any of the other classification by condition cells. That this difference may have been related to recent participation in symbolic play is supported by the finding that 88% of the "players" pretended during the free play session, whereas only 6% of the "nonplayers" did so. Because the set of objects used to test for novel uses were not those present during the training sessions, Dansky has argued that the facilitating effects of make-believe cannot be due to specific associations formed in previous play, but instead are due to the general activation of "as if" thinking. Nonetheless, he cautions that the relationship may not be causal, and that a third factor may be responsible for both pretend play and associative fluency.

A further issue in the relationship between symbolic play and cognitive abilities has been the question of whether such play facilitates general cognitive development. The past decade has seen the publication of several studies in which disadvantaged preschool children have been trained to pretend, with reported subsequent increases in several cognitive abilities. Such training has been reported to produce increases in creativity as measured by the Torrance tests (Feitelson and Ross, 1973); verbal communicative ability (Freyberg, 1973); problem-solving ability (Rosen, 1974); IQ scores, memory tasks, impulse control and empathy (Saltz and Johnson, 1974; Saltz, Dixon, and Johnson, 1977); and conservation of mass and liquid (Golomb and Cornelius, 1977). In their 1977 study, Saltz and his colleagues demonstrated that the actual enactment of symbolic play (acting out fairy tale scenarios or the children's previous experiences) was crucial for increases in cognitive development and impulse control. A training group who merely heard and discussed fairy tales, but did not enact them, did not later differ on these variables from a control group of children who spent the same amount of time interacting positively with adults in non-pretend play activities.

Golomb and Cornelius (1977) tested the proposition that pretending, with its focus on reversibility (in that objects or people may adopt pretend identities, then revert to their "real" identities) should aid in general cognitive decentration.

Specifically, they engaged an experimental group of preschoolers in imaginative play scenarios, during which objects took on pretend identities. At some points in these sessions, the experimenter suddenly "played dumb", challenging the child as to how an object could both be itself and also have a pretend identity. They reported large increases in conservation ability for this group compared to controls, following a very brief training period, both in making correct conservation judgments and in providing adequate justifications for such judgments. Although this work suggests that training children in symbolic play may be a powerful tool for enhancing cognitive development, the discovery of such a technique may have been "too good to be true". A later study has failed to replicate these findings. Guthrie and Hudson (1979) used identical training procedures, except that they replaced Golomb and Cornelius' single experimenter with multiple experimenters (i.e., different experimenters conducted training and administered conservation tasks). They also conducted a delayed posttest two weeks after training. They found no effect of symbolic play training on conservation measures at either the immediate or the delayed posttest. Whereas Golomb and Cornelius reported that two-thirds of their experimental group subjects gave adequate justification for their conservation judgments following training, only one of Guthrie and Hudson's subjects did so. The latter authors suggested that sampling differences may have produced the

discrepancy in results, that the use of a single experimenter in the earlier study may have set up associations for the subjects that prompted them to question their non-conservation judgments, or that the multiple experimenters in their own study may have prevented the formation of a relationship of rapport and trust between them and the children. It is to be hoped that further research will be conducted on the topic, because the issue may be of significant practical importance in designing cognitive enrichment programs for disadvantaged preschoolers.

In addition to the growing body of research relating symbolic play training to subsequent increases in various cognitive skills, there is also evidence from correlational studies that a relationship exists between symbolic play and other cognitive skills. For example, Rubin and Maioni (1975) have reported that dramatic play scores were positively correlated with classification ability and negatively correlated with spatial egocentrism in a preschool sample. The possibility remains, in both correlational and training studies, that symbolic play is not in and of itself conducive to cognitive gains (as has been suggested by Golomb and Cornelius, 1977); but instead, that engaging in such play activates some superordinate cognitive ability that manifests itself subsequently in other areas (much as Sutton-Smith has suggested in his 1971 work). While the topic requires further study, there is nonetheless reason to believe that symbolic play ability may be, directly or indirectly, conducive to general cognitive growth.

It is only relatively recently that much attention has been paid to factors that influence the original emergence -- or nonemergence -- of symbolic play in infancy. While some of the training studies have stimulated such play in children in whom it is infrequent or absent, they have not addressed the issue of how it is that preschool children come to vary -- often substantially -- in the degree to which they demonstrate this skill.

The theorists reviewed earlier have not directly addressed the question of environmental factors that may be necessary for (or at least supportive of) the development of this ability. However, the general inference may be made from their writings that symbolic play emerges spontaneously in the regular course of cognitive, personality, and/or social development. Is symbolic play a spontaneously occurring product of general developmental processes, or do social and/or other environmental factors play a major role? The following section of this chapter will present the views of theorists who have implicated social factors in the emergence of symbolic play, and review the current empirical evidence on this topic.

Symbolic Play: Spontaneous or Socially Learned?

In contrast to the implicit views of the Piagetians, the Russian researchers El'Konin (1966, 1969) and Repina (1971) have viewed symbolic play as an important product of the process of

socialization, one that does not develop spontaneously. They have argued, in effect, that adults must teach children to pretend, either by modelling symbolic play activities or by means of verbal suggestion. Initially, they say, children must be shown that one object may be substituted for another, or that one person may assume the role of another. El'Konin (1966) has presented findings suggesting that at first children act out symbolic play sequences only with those objects and in those activities earlier shown to them by adults. There is at first no independent transfer of these activities to other objects by the child. Only later do children begin to carry out symbolic actions with different objects, and gradually generalization of pretend play occurs. Thus, symbolic play is viewed by the Russian researchers as a socially-learned skill, one based initially on specific imitation of adult pretend activities. While the Russian research is suggestive, the available reports offer few methodological details, and rely heavily on diary-type studies of small numbers of children.

In recent years, a growing number of Western writers have suggested that adult stimulation and other social factors may facilitate the development of symbolic play, although none have adopted the extreme view that direct adult teaching of such activities is essential for their occurrence. Smilansky's (1968) demonstration that disadvantaged Israeli preschoolers show little ability to engage in sociodramatic play compared to their middle

class peers, and that adult intervention may be used to stimulate such play in the disadvantaged group, has motivated much of the training study research reviewed in the last section. In addition, it has focussed attention on the issue of cultural and social class differences in symbolic play. Smilansky's results demonstrated social class differences, but in her study the social class variable was confounded with cultural origin. Her lower class subjects were Israelis of Middle Eastern or North African origin, while her middle class subjects were Israelis whose cultural roots were European. Subsequent research has examined both culture and socioeconomic status in relation to children's symbolic play.

Cultural Differences

If symbolic play were a spontaneously occurring product of a universal sequence of cognitive and/or personality development, one might expect that its occurrence in young children would be relatively unaffected by cultural variation. In fact, the tendency to assume cultural invariance in the occurrence of several forms of play has characterized the writings of play theorists in the early part of this century. That these assumptions may well have been based on ethnocentric views has recently been pointed out by Feitelson (1977):

During the long period in which practically all students of child behaviour had themselves been raised within the orbit of Western civilization -- and moreover as members of certain social classes within that civilization -- play was considered a universal manifestation common to all mankind, and students of child development even charted sequential, supposedly non-variant stages in the development of play interests and activities (Buhler, 1928; Valentine, 1938; Piaget, 1951). In fact, much of the evidence on which statements on play were based would hardly be considered conclusive by modern research standards. Instances of play in natural settings being a somewhat elusive phenomenon, the researchers' offspring seem to have served not infrequently as the main or even sole source for many of their statements (p. 6).

In her review of cross-cultural studies of representational play, Feitelson has drawn extensively on anthropological work, a resource largely ignored in the psychological literature. According to Feitelson, misinterpretations of archaeological findings may have fostered the impression that symbolic play is a universal activity in young children. The unearthing of "toy-like artifacts" (such as miniature replicas of human and animal figures and tools) in archaeological digs may often have led to the (ethnocentric) conclusion that children had engaged in pretend play throughout the course of human history. However, Feitelson argues that modern observations of traditional cultures in which similar objects are still in use has demonstrated that there are a variety of non-toy uses to which objects are put (e.g., as fetishes, fertility talismans, and representations of material possessions to be placed in graves), and that the use of doll-like objects is often either forbidden to children or else

restricted. In short, Feitelson argues that the mere existence of toy-like objects in older cultures does not demonstrate the universality of representational play.

Feitelson makes the case that ethnographic studies strongly support Sutton-Smith's distinction between forms of representational play found in Western, versus traditional, societies. Sutton-Smith (1972, as cited by Feitelson) has distinguished between "ascriptive" game cultures (characteristic of traditional societies) and "achievement" game cultures (characteristic of Western societies). In the former cultures, children's representative play imitates the behavior of adults, but does not transform objects and events. In the latter cultures, children's representational play focuses on transformations of subject, object and role relations. In support of this claim, Feitelson cites, for example, Margaret Mead's (1946) cross-cultural observations of children in non-technological societies, which revealed only literal imitative behaviour and no instances of symbolic transformation; and a large number of ethnographic studies conducted in rural India and Africa that have described little or no imaginative play beyond simple imitation of adult activity. Feitelson has commented that in reading accounts of such play, "one is struck by the short duration, discontinuity and lack of complexity in the play episodes of these children compared with that of their Western peers" (p. 9). In a somewhat similar vein, Garvey

(1977) has commented that the themes found in ethnographic studies of symbolic play tend to reflect culturally relevant adult skills. For example, Hopi children have been observed engaging in make-believe rabbit hunts, or pretending to make pottery.

Both Feitelson and Garvey have noted that several studies have found a complete absence of any representational play. Such is the case in studies of rural north Indian, rural Middle Eastern, Kenyan, and Kurdish children. Feitelson argues that there is evidence that adults in cultures where symbolic play is almost or totally nonexistent actively discourage children from playing. Further, she contends that while two of the factors cited by Singer (1973) as prerequisites for imaginative play -- ample play space and undisturbed time periods for free play -- may facilitate such play, they are not in themselves sufficient to elicit it. Feitelson describes cultures in which there is plenty of space for free play, but representational play does not exist (e.g., the Manus children observed by Margaret Mead); and, on the other hand, cultures in which there is little available play space, but representational play flourishes (e.g., children of East European immigrants to Israel housed in crowded flats with no designated play space). In fact, Feitelson argues, it is the cultural attitude toward children's play that determines whether available physical space can legitimately be used by playing children. On the topic of legitimate time available for free

play, Feitelson reaches a similar conclusion -- that in some cultures, children with little free time will nonetheless "snatch" opportunities for imaginative play, while in others where there is free time available, high-level representational play does not occur.

What factors, then, do seem essential for the occurrence of symbolic play? Feitelson has centred on two variables that do appear, cross-culturally, to predict the occurrence of such play: the availability of play objects, and the existence of a social atmosphere conducive to imaginative activities. Feitelson argues that the availability of objects specifically allocated for play is essential, and that such objects must be "familiar, permanent, and freely available whenever needed" (p. 12). In support of this contention, she cites ethnographic studies that have documented a dearth of toys in cultures in which little representational play is found. Feitelson challenges the common assumption that "natural" or "non-play" materials are equivalent or even superior to manufactured toys in eliciting play (e.g., sticks, stones, or plant materials in rural areas, or pots, pans, and utensils in urban areas). She points out that some children who live in arid zones (e.g., in Egypt) have few natural play materials available; that in some cultures (e.g., the Manus) there is an abundance of natural play materials, but children do not pretend with them; and that it is only in advanced technological societies that household goods such as pots and

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pans are abundant enough that adults allow children to use them in play. To demonstrate her point that toys must be permanent and freely available, Feitelson contrasts the findings of studies of European versus North African and Middle Eastern immigrants to Israel. The European children had permanent toys for which storage space was allocated even in crowded housing conditions. However, Feitelson reports that mothers in the North African and Middle Eastern groups considered toys given to their children in the course of a research project to be "rubbish", and refused to provide space for them.

On the issue of the provision of a social atmosphere conducive to representational play, Feitelson cites El'Konin (1966), Smilansky (1968), American training studies, and Soviet manuals on preschool education, to the effect that adult encouragement and modelling is facilitative of or even essential to the emergence of symbolic play. Calling on her own work with Middle Eastern immigrants to Israel, she reports that:

Middle Eastern mothers not only did not model play or provide play objects but felt called upon to interfere actively when imaginative elements cropped up in a play situation... Time and again there was occasion to observe that mothers seemed to feel threatened whenever play became imaginative, or even when children started to show initiative or became joyfully engrossed in their play. Were not children expected to be silent shadows of adults, with no evidence of a will of their own? (p. 13).

Feitelson's work thus not only points out cross-cultural variations in symbolic play occurrence, but also points to the

probable existence of pervasive cultural attitudes toward play that result in variations in the availability of play materials and also in adult encouragement of imaginative activities. It is likely that such variations exist not only cross-culturally, but also along social class lines within cultures.

Social Class Differences

On the basis of a comparison of the sociodramatic play behaviour she observed in 36 Israeli kindergarten classes, 18 in high socioeconomic areas and 18 in areas populated by Middle Eastern immigrants (considered to represent low socioeconomic status), Smilansky (1968) has concluded that culturally deprived children do not develop symbolic play ability between three and seven years of age. Smilansky found the imaginative play of the disadvantaged children to be comparatively infrequent and less complex than that of the higher socioeconomic group. Her strong conclusion that disadvantaged children never develop symbolic play has been challenged by Eifermann (1971), who has reported that Israeli children in "deprived" areas show a peak in symbolic play activity at a later age (six to eight) than do their middle-class peers. Eifermann has thus concluded that there is a developmental lag in the symbolic play of disadvantaged children, rather than a relative absence of such play.

Eifermann and other commentators (e.g., Smith, 1977) have criticized Smilansky's work both for its general lack of quantitative measures and for the stringency of the criteria she used in assessing sociodramatic play. For example, Smilansky reported that the fantasy play of disadvantaged children involved less elaborate use of objects than that of middle class children, but no quantitative data were provided to support this assertion. In addition, her criteria for sociodramatic play required a minimum duration of 10 minutes for a play episode to be scored, thus preventing the possible detection of class differences in duration, but not frequency, of such play. Smilansky's critics have suggested that, despite the stringent scoring, even her own data indicate slower development of sociodramatic play in disadvantaged children, rather than its absence. Nonetheless, there is general agreement amongst researchers with the weaker conclusion of Smilansky's study -- that the representational play of the disadvantaged child lags behind, or is more poorly developed than, the play of middle class children (Smith, 1977).

Support for this position may be found in the work of Feitelson (1977, cited above), who has compared the play of Israeli children from the same cultural groupings as Smilansky used, and has drawn similar conclusions. It may also be found in the work of American, British, and South African researchers. In the United States, interest has centred on the use of adult tuition to increase the symbolic play skills of disadvantaged

children (Feitelson and Ross, 1973; Freyberg, 1973; Rosen, 1974; Saltz and Johnson, 1974) rather than on comparisons of spontaneously-occurring levels of such play in children from different social classes. Perhaps this reflects the general American focus on application and intervention, in that these researchers appear to have relied upon Smilansky's (1968) work rather than independently establishing the existence of American social class differences before proceeding to intervention studies. The only American study conducted explicitly for the purpose of comparing socioeconomic groups on symbolic play is that of Griffing (1980), who compared the symbolic play of black American children from high and low socioeconomic backgrounds.

Using a modification of Smilansky's (1968) play categories, Griffing scored the elicited play of 169 kindergarten children for the occurrence of role play, make-believe with objects, verbal expression of make-believe, persistence in role-play, interaction with other players, and verbal communication. All six play variables were highly intercorrelated, and a Principal Components analysis of the data from all subjects identified two main factors: a play maturity factor on which all variables loaded highly, and a bipolar factor differentiating solitary, dramatic play (role-play, make-believe with objects, and persistence in role-play) from group dramatic play (verbal expression of make-believe, interaction with other players, and verbal communication). Although Griffing found socioeconomic

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status differences on all six variables favouring the high SES group, the highest differences were on the variables that distinguished group dramatic play in the Principal Components analysis, especially verbal expression of make-believe.

Interestingly, Griffing found no IQ differences on any of the play variables, although there was a significant effect of the mother's education level on all play variables for boys. The same (but not significant) trend was found for girls.

In Britain, at least two studies have explicitly examined social class differences in imaginative play. Although their measures were less fine-grained than those of Griffing, Tizard and her colleagues reported that English preschoolers in predominantly working class schools engaged in less symbolic play than did their counterparts in predominantly middle class schools (Tizard, Philps, and Plewis, 1976). In a more elaborate investigation of social class differences, Smith and Dodsworth (1978) compared the free play of three- and four-year old British children from lower and middle class nursery schools. Although the mean length of fantasy episodes did not differ between social classes, the middle class group showed a significantly higher frequency of fantasy play, and thus also spent a higher overall portion of their time engaged in such play. The fantasy play episodes of middle class children had more participants (in line with Griffing's findings of more "social" fantasy play in middle class children), and middle class children used objects in a more

elaborate fashion (engaging in object substitution and imaginary object use) than did lower class children, who were more likely to engage solely in the use of realistic replicas of real objects. The latter finding is in line with Smilansky's (1968) unsupported assertion that the play of disadvantaged children involves the less elaborated use of objects. Nonetheless, Smith and Dodsworth stressed that despite lower levels of activity and complexity, the majority of their lower class subjects did show some fantasy play. They concluded that their results support Eifermann's (1971) developmental lag hypothesis rather than Smilansky's (1968) assertion that disadvantaged children do not develop symbolic play.

The most recently published investigation of social class differences was one in which middle and lower class preschoolers in both Israel and South Africa were compared in free-play settings. Udwin and Shmukler (1981) reported a significantly lower incidence of imaginative play across cultures in lower class, as compared to middle class, subjects. They found no cultural differences (Israel vs. South Africa) and no interaction between culture and social class. The Israeli subjects were all from Western European backgrounds, as were the South African subjects, who were all white, so that their cultural backgrounds probably did not differ substantially in any event. The Israeli lower class children studied were enrolled in state-run kindergartens, where, as the authors commented, they

probably received comparable stimulation to that received by middle class children. The investigators reported a non-significant tendency toward a positive association between imaginative play and two familial variables -- playing imaginative games with parents, and helping parents at home. They comment that: "it is argued that these [lower class] children do not lack stimuli or experiences per se, but rather that their home environments have failed to provide them with means of integration, with instrumentation and adult models on which to fashion their imaginative play" (p. 70).

In this comment, Udwin and Shmukler have voiced the by-now-familiar theme that cultural and social class differences in the development of symbolic play have their roots primarily in adult attitudes toward such play -- attitudes that may determine the presence or absence of suitable toys, the encouragement or discouragement of imaginative activities, and the availability or lack of adult models for activities to be enacted. Their comment also suggests a more direct factor that may influence the occurrence of symbolic play in children, that of direct parental influence.

Parental Influence

While there is a distinct lack of empirical research on the direct influence of parental behaviour on the development of symbolic play, the theoretical literature contains several

suggestions that parents, particularly mothers, may play a major role in this process. (The lack of attention to the paternal role probably reflects the general lack of attention to the roles fathers play in child development, rather than any specific notion that fathers have no part to play in symbolic play development.) Singer (1973) has stressed the importance of adult modelling in the development of imaginative play, stimulating other researchers such as Johnson (1978) to adopt the stance that:

Theoretically, parents contribute to their children's tendency to fantasize by playing with them in imaginative ways, thus providing both content for subsequent pretend play and a model of the "as if" attitude necessary for make-believe play. Historical and concurrent parental influences on imaginative play are suggested by theory (p. 124).

Murphy (1972) has focussed on maternal input to children's play as a prerequisite for the kind of cognitive structuring necessary to bring about the change from simple sensorimotor play to more complex symbolic and constructive play. Murphy maintains that "active mutual mother-baby play", rather than simply elementary caretaking, is necessary for this transition to occur. Although Garvey (1977) has not singled out maternal play interaction with the specificity of Murphy, she has also asserted that the general quality of the child's home environment is an important factor in symbolic play development. Referring to the cross-cultural work on factors that appear to be necessary for the emergence of imaginative play, Garvey has concluded that "the

home environment probably influences the degree to which children engage in make-believe" (p. 97). Such a position is generally (but weakly) supported by Feitelson's (1977) informal observations that mothers discourage make-believe play in cultures where children demonstrate little of it; by Udwin and Shukler's (1981) report of a non-significant trend toward a positive relationship between symbolic play and self-reported parental engagement in such play with children; by Marshall's (1961) report of significant positive correlations between the frequency of children's dramatic play suggestions in nursery school and parental reports of dramatic play topics discussed with the child; and by reports from early observational studies (e.g., Valentine, 1938) that the presence of a familiar adult facilitates the expression of symbolic play in very young children.

Only three studies have involved the direct observation of mother-child imaginative play, and in one, this was not the primary focus of research attention. In a study of the relative effects of mothers and peers on the play of young children, Cohen and Tomlinson-Keasey (1980) compared the in-home play of 26 two-year-olds under four conditions: alone, with the mother, with a familiar peer, and with both mother and peer present. They found that male children playing with peers exhibited the most "creative play" (fantasy play, role playing, using objects in an unusual manner), while boys playing with their mothers

demonstrated the least creative play. High levels of creative play were also shown by mothers and daughters playing together, and by girls playing alone. While the results provide contradictory evidence regarding the facilitating effects of maternal involvement for boys and girls, they are inconclusive in that they do not focus clearly on symbolic play and on specific maternal or child behaviours that may be implicated in such play.

Two other studies have reported findings with more direct implications for the issue of maternal involvement in symbolic play development. Johnson (1978) observed four-year old children in free play with their mothers, then correlated maternal and child imaginative play scores in these sessions with measures of the child's spontaneous play in nursery school, and with the child's score on a self-report "fantasy propensity" interview. Although Johnson found a positive correlation of .60 between the proportions of imaginative behaviour demonstrated by mothers and by children in the joint play sessions, neither of these scores were significantly related either to the child's interview score or to the child's spontaneous imaginative play score in the nursery school setting. Although Johnson attributed the lack of correspondence among these measures primarily to the overriding importance of situational factors in accounting for children's play, he also pointed out the possibility that by four years of age, the child may already be past the age where the determinants of peer play may be looked for in concurrent mother-child interaction.

The only study that has closely examined the symbolic play of mothers and infants at an early age is that of Dunn and Wooding (1977). Their emphasis was on the relative initiation by mothers and children of symbolic acts and other forms of play. Dunn and Wooding observed the unstructured activities of 24 infants and their mothers in the subjects' own homes. The study was cross-sectional, and infants were observed between the ages of 18 and 24 months. They found that the majority (60%) of pretend play sequences were initiated by the child, but that in most cases the child soon involved the mother in such play or else initiated such play while both mother and child were jointly attending to the same objects. In contrast, in non-pretend activities with objects the child rarely involved the mother in his or her play. Thus, symbolic play constituted a much higher proportion of child initiations than did non-symbolic object play. A similar but smaller difference was found in the mother's initiation of symbolic play versus non-pretend object play, with pretend play constituting 40% of the mother's initiations and object play constituting 29%. Similar patterns were found for the use of representational materials such as books. The authors comment that:

For these very young children then, the first essays into symbolic play and representation seem very closely bound up with the mother. Not only is she active in initiating this play but the child, in the majority of instances, energetically seeks her comment and involvement. It is as if he looks for confirmation of his play with the new world of symbols... In playing symbolically at this early stage the child actively involves the mother in a situation where it seems natural for an observer to judge that the child is learning how the physical world is categorized into classes of objects, and how items of behaviour are classified into appropriate and inappropriate actions (p. 51).

The authors report no analyses of the relationship between the complexity of maternal and child symbolic play behaviour, however, nor do they report any analyses of relationships between infant frequency and complexity of symbolic play and other maternal behaviours such as object use, maternal direction of play, encouragement of the child's pretense, etc.. Nonetheless, the study does provide a needed descriptive beginning to the study of mother-infant interaction in symbolic play development.

Summary and Rationale for the Present Research

Theoretical and empirical work has focussed on the role of symbolic play in general cognitive and personality development, and on its potential importance in the development of social skills, creativity, and various cognitive abilities. A review of the literature on cultural and social class influences on the development of symbolic play indicates that there is wide cultural variation in the occurrence of such play, and that in

Western cultures, differences favouring middle class over lower class children exist in both the frequency and the complexity of symbolic play. It has been suggested that cultural and class differences are related to variations in adult attitudes toward the provision of toys and the encouragement of play. Further, several writers have suggested the importance of parental (specifically maternal) behaviours in the emergence of symbolic play in children.

The Russian rese~~ar~~chers El'Konin (1966, 1969) and Repina (1971) have presented the radical proposition that symbolic play does not develop without adult stimulation in the form of modelling or explicit suggestion. While Western writers have generally taken the milder position that maternal stimulation facilitates children's pretend play (Dunn & Wooding, 1977; Garvey, 1977; Johnson, 1978; Murphy, 1972; Singer, 1973), they have nonetheless heavily implicated the role of mother-child interaction in symbolic play development. Despite these speculations, there is a paucity of empirical research into mother-child symbolic play interaction. This gap in the research is particularly striking when one notes the voluminous quantity of research currently available on mother-child interaction in another area of representational activity, that of early language development. The few existing studies that have directly observed mother-child symbolic play have either employed preschool subjects, who are most likely past the age at which

early symbolic play normally develops (Johnson, 1978); or have simply considered variables such as frequency of occurrence (Cohen & Tomlinson-Keasey, 1980) or frequency of initiation by mothers and children (Dunn & Wooding, 1977) in their analyses.

Thus, few researchers have attempted to address directly the question of how it is that symbolic play comes about in the normal course of development. Is it, as the work of the Piagetians suggests, a spontaneously occurring stage in cognitive development? Or is it a socially-learned behaviour that must be "taught" to the child, directly or indirectly? Is the development of symbolic play linked to the overall level of cognitive stimulation the child receives, or to the child's overall rate of general cognitive development? Is there a relationship between the child's functional object play and her or his symbolic play, or between the information the child receives about the functions of objects and such play? Does the child require the adult to take on the role of active participant in his or her symbolic play as a necessary or helpful condition for further development? All of these questions are concerned with the possible learned aspects of symbolic play, and involve the role of caregivers in its development.

If pretend play is important either to cognitive development, creativity, social development, or all three, the questions are of practical importance. (And if the capacity to engage in such play is a significant contributor to children's

enjoyment of their own play and their play with others, the question is also of significant "impractical" importance.) The intervention studies have demonstrated that adult involvement may stimulate symbolic play ability in preschoolers who lack it, but they have not addressed the issue of adult involvement in its original development or absence in infancy. If adult stimulation is necessary to the development of such play, or even if it is nonessential but has a facilitating effect, this information would be of benefit to infant caregivers. Parents, daycare workers, and others should know that by actively encouraging pretend activities they may facilitate the development of symbolic representation and/or other social and cognitive abilities.

The present research involved a longitudinal investigation of mother-child symbolic play over the period from approximately one to three years of age. The age span was selected to encompass the time between the earliest emergence of pre-symbolic activities (Piaget, 1962) and the age at which children enter the preschool period -- that is, the age span during which symbolic play typically emerges and develops up to the point of group sociodramatic play. Fifteen-minute videotaped records were made of 25 mother-child dyads in free play in a standard university playroom setting when the children's ages were 12-14, 20-22, and 33-39 months. Commercially available toys, some of which were judged to be conducive and some non-conducive to symbolic play,

were available. At each session, measures of symbolic play amount and complexity, functional object play, and verbal expression of information about objects, were scored for each subject partner. At the third session, when symbolic play was generally much more elaborated, additional measures of symbolic play organization were scored for both mothers and children. In addition, social interactional variables reflecting the degree of joint participation by both members of the dyad in play activities, and also the degree to which the mother (rather than the child) directed the content of play episodes, were measured at each session.

The aims of the research were: a) to chronicle the frequency and structural properties of symbolic play activities in both children and their mothers during the time span under study; b) to examine the relationship between symbolic play, functional toy use, and the verbal expression of information about toys; c) to investigate the degree of correspondence between maternal and child symbolic play frequency and complexity, both within and across sessions; and d) to examine the relationship between the frequency and complexity of symbolic play, and the social interactional variables of joint play and maternal direction of play. The aims of the research may be described as essentially exploratory and descriptive in nature, because of the lack of previous research in the area, the correlational nature of the design, the relatively small number

of subjects (particularly with respect to the number of variables investigated), and the relatively long intervals between observation sessions. Nonetheless, the investigation was motivated by some hypotheses for which the results might provide tentative support, as well as direction for future research. Because these hypotheses involve aspects of symbolic play that have not yet been reviewed, they will be presented at the end of the next chapter.

This chapter has outlined the conceptual background for, and broadly delineated the scope of, the present research. It has not, however, touched upon methodological concerns in the study of symbolic play, nor has it yet attempted the customary preliminary definition of the phenomenon to be investigated. Furthermore, the empirical literature on stage sequences in symbolic play development, relationships between symbolic play and the functional use of toys and other objects, and issues such as sex differences in symbolic play, has not yet been reviewed. These issues are the topic of the next chapter.

Chapter Two: Research into the Symbolic Play
Development of Young Children

Since the method for investigating mother-infant interaction in symbolic play used in this study was first described in the present author's M.A. thesis (Russell, 1977), research into the characteristics of symbolic play has proliferated. The earlier literature reviewed in Russell (1977) will thus be summarized briefly from that source in the following discussion, with particular attention to the literature relevant to the selection of variables used in the present study. Subsequent to the initiation of the present longitudinal research project in 1976, the small number of category systems available at that time for scoring symbolic play has increased substantially. These systems will be analyzed and discussed in some detail here. A growing literature has also addressed itself to the relationship between functional object use and symbolic play. These studies will also be reviewed in the present chapter. First, however, the question of conceptual and operational definition of symbolic play, which is (or at least, ought to be) a prior issue to the methods used to measure it, will be discussed.

Definition of Symbolic Play

Piaget's (1962) discussion of symbolic play has provided at least three definitional elements for such play: 1) that

familiar action schemes are carried out in the absence of the appropriate environmental cues; 2) that the child is aware that such activities are make-believe and not "real"; and 3) that during such play the child smiles, laughs, and/or generally indicates a mood of playfulness. The first element may most appropriately be applied to behaviours involving substitute or imaginary objects, role enactments, or self-related behaviours such as pretend eating or grooming. Piaget did not discuss symbolic play with dolls and other playthings, and thus his definition is not entirely appropriate to activities in which such toys are used. While the last two definitional elements are undoubtedly valid, they are difficult to operationalize, particularly in studying the play of infants, where identifying both might depend heavily on subjective judgment.

Several researchers have attempted conceptual definitions of symbolic play. For example, Sinclair (1970) has defined it as "all those activities that can be interpreted as 'acting as if' (p. 122). Garvey and Berndt (1975) have defined it as "any transformation of the Here and Now, You and Me, or the action potential in these features of the situation" (p. 4). Gowen (1978) has commented that "the essence of any symbolic activity is that one thing, the signifier, stands for something else, the signified" (p. 2). Feitelson (1977) has listed a set of characteristics of such play: 1) an imaginative play theme is used; 2) it is carried out alone or with others; 3) roles may be assigned to the self, others, or toys such as dolls or stuffed

animals; and 4) it may involve plot construction and planning. Some of these definitional statements tend toward tautology, and also fail to exclude certain non-symbolic-play activities, such as drawing pictures or telling stories. Garvey and Berndt's (1975) definition is perhaps the most satisfactory, although it is evident that none of the definitions are entirely clear-cut. It may also be noted that no uniform label is applied to the phenomenon. "Symbolic play" is Piaget's term, but there are many others in use. Feitelson (1977) has commented on the synonymous (or near-synonymous) use of "representational play", "make believe", "imaginative play", "sociodramatic play", and "thematic play". The terms "symbolic play", "pretend play", and "pretense play" may also be added to the list.

Given the apparent elusiveness of conceptual definition, it is not surprising that researchers have tended to avoid the question, and instead to rely on the presentation of behavioural categories which are then discussed with the implication that they represent symbolic play (e.g., Fenson, Kagan, Kearsley, & Zelazo, 1976; Lowe, 1975; Watson and Fischer, 1977). Weisler and McCall (1976) have pointed out that definitional problems are common in the general area of play research and that the absence of "comprehensive theoretical guidance" and definitional consensus makes it difficult to review play research. Still, Weisler and McCall have counselled researchers to persevere in attempting definition, rather than throwing their hands up in despair. While it is far from definitive, a working

conceptualization of symbolic play in the present research has been that it is solitary or joint play in which elements of the immediate situation (the roles of the participants, their physical actions, the function and other ascribed properties of objects, and/or the properties of the physical environment) are transformed by the player(s) in the enactment of imaginative themes. Where the problem of definition, and subsequent operationalization, is most acute is in devising comprehensive coding schemes for scoring symbolic play, particularly when working with infants, whose lack of speech and lack of motor precision in action introduce a considerable possibility of subjective error to the interpretation of play.

The Problem of Identifying Symbolic Play in Infants

Most adults (other than symbolic play researchers tortured by such academic issues) would likely say that it is easy to judge when a child is pretending. Such judgments are generally based on inference about whether or not the child thinks his or her activities are "real" or "pretend". But the child who seems to be stolidly eating her peas and carrots may in fact be pretending that they are chocolate cake; and the child who appears to be pretending to put his teddy bear to bed may in fact be exhibiting nothing more than a learned association between the objects "teddy bear" and "toy crib". In studying older children, the researcher may avoid the pitfalls of subjective inference by

relying on the child's linguistic abilities. The researcher may score the child's responses to instructions to pretend (e.g., Overton & Jackson, 1973), or may note the child's spontaneous comments indicating awareness of pretense during free play (e.g., Garvey & Berndt, 1975; Matthews, 1977a; McLoyd, 1980).

Such techniques are not available to the researcher who studies infants and toddlers. Two principal techniques have been used to study infant symbolic play: modelling techniques, and free-play observation. Watson and Fischer (1977) have devised a modelling technique in which adult models perform pretend activities, and subsequent imitative and spontaneous acts by the infant subjects are scored with respect to the types of play modelled. The technique has been used in subsequent studies as well (Jackowitz and Watson, 1980; Watson and Fischer, 1980). The modelling technique may be useful for examining stage sequence development in narrowly defined task domains because it elicits specific behaviours and thus may permit hypothesis testing. However, it cannot be used to identify the range of spontaneously-occurring symbolic play behaviours in infants, at least, not until a reliable taxonomy has been developed. Otherwise, the researcher will risk generalizing about sequences that apply only to the range of activities modelled.

While Watson and Fischer have argued for the technique's validity on the basis of correspondence between the level of acts imitated and spontaneously demonstrated by their subjects, and also from age differences in the tasks imitated, some doubt must

remain as to whether the technique taps underlying play competence, or mere imitative ability (which also covaries with age, and may do so particularly with respect to the complexity of modelled acts). The skeptic might ask, too, whether the child would make the functional distinction made by Watson and Fischer: "In this case, we used modelling to facilitate pretending and to disinhibit the child rather than to teach him new behaviours" (p. 829). Confirmation of the technique must await its validation against spontaneous behaviours independently observed in the same subjects. Although Watson and Fischer have argued (on the basis of unpublished research by Watson and a colleague) that too little spontaneous pretend play is observed in the laboratory free play of infants to allow the study of the emergence of stage sequences, other researchers have gleaned a good deal of data from observational studies.

Free-play observation, too, does present several difficulties. Among these are the problems of generalizing from the use of behavioural categories that are inextricably tied to the specific setting in which play has been observed, and of the necessity to interpret behaviour. While some past research has tended to ignore such problems, researchers have recently expressed awareness of the need for caution in distinguishing between symbolic play and play that reflects mere learned associations (e.g., Dunn & Wooding, 1977; Fenson & Ramsay, 1980). As Fenson et al. (1976) have commented: "The distinction [between pretending and simple learned association] is easier to

make semantically than empirically" (p. 235). Nonetheless, in spite of their stated awareness of the problem, Dunn and Wooding (1977) failed to take the obvious elementary precaution of calculating interobserver reliabilities for their play categories. Such methodological flaws abound in the observational research.

Observation of young children's symbolic play has been carried out rarely in home settings (e.g., Dunn & Wooding, 1977; Nicolich, 1977) or day care centres (Gowen, 1978), and most commonly in a laboratory setting, where stimulus materials and conditions of observation may more readily be standardized. Generally, the child has been observed playing alone. Although the mother is usually present, she is instructed not to initiate play and to respond only when necessary (e.g., Fenson & Ramsay, 1980; Nicolich, 1977; Ungerer, Zelazo, Kearsley, & O'Leary, 1981). The mother's presence seems to be used to prevent separation anxiety rather than to facilitate play, although Cohen and Tomlinson-Keasey's (1980) in-home observation of mother-infant play is an exception. With the exception of a peer play condition in Cohen and Tomlinson-Keasey's study, infants have not been observed playing with peers, nor have standard experimenters or confederates been used as play partners. Thus, most of our knowledge has been derived from free-play laboratory observation studies with the infant playing alone, although the mother is present.

Whether such conditions are the optimal ones for observing infant symbolic play is debatable. As Dunn and Wooding (1977) have demonstrated, infants in a naturalistic setting seem to prefer to interact with another person (i.e., the mother) during such play. In fact, the more advanced forms of symbolic play (role enactment, elaborate scenarios) often require more than one participant, and preschooler's pretend play in group settings is predominantly social. Researchers may be studying what is predominantly a social behaviour in an atmosphere of solitude. Nonetheless their work has provided a considerable body of information about the sequence of symbolic play development.

The Sequence of Symbolic Play Development

Research into the structural development of children's symbolic play has been hampered by a lack of clarity regarding exactly what dimensions reflect structural complexity and change. In the past few years, typologies of symbolic play have proliferated, but it is only recently that researchers have begun to take note of each others' typologies. Thus, very few studies exist in which the scoring categories and criteria are directly comparable. A pragmatic (rather than a conceptually-ordered) approach to the development of scoring systems has generally been taken. Developments on what may actually be one or more dimensions have been selected to serve as scoring categories (sometimes ordered a priori, sometimes not) and age-related

changes have been reported in the frequency of their occurrence. Most of the research has been cross-sectional, so that the resulting hypothesized scales of development may or may not actually represent invariant sequences. It is argued here that at least four different dimensions of symbolic play may be identified in the existing typologies, and further, that the confounding of these dimensions in individual studies has resulted in a lack of comparability of research findings, as well as contributed to the lack of conceptual clarity in the area. In addition, several typologies have not taken account of the full range of possible developments along any one dimension, so that information is sparse and incomplete in many areas.

The four dimensions identified by the present author will be described separately below, followed by an integration and an analysis of their significance in symbolic play. It must be pointed out that these dimensions are not generally distinguished or even acknowledged in the literature, and that other possible dimensional distinctions exist. However, the disparity of the existing literature on sequential development requires that some framework be superimposed in order to review the literature. Thus, the purpose of the dimensional analysis presented here is twofold: to serve as an organizational tool, and also to point out that several different kinds of conceptual dimensions are probably involved in the structural complexity of symbolic play.

Object Transformations

"Object transformations", as it will be called here, is the dimension along which the most clear-cut sequence of development has been identified, and the only one in which specific research has been conducted unconfounded by other dimensions. Several researchers have documented a progression in the symbolic use of objects as signifiers from the choice of objects with a high degree of perceptual similarity to the signified object, to the choice of objects less similar in form and/or function, to the use of totally absent, imaginary signifiers. The importance of object substitution in symbolic play has been acknowledged by most researchers, who have at least included a single object substitution category in their play typologies (e.g., Nicolich, 1977) or differentiated between object substitutions and imaginary substitutions (Inhelder et al., 1972; Lowe, 1975; Matthews, 1977a; McLoyd, 1980). Golomb (1977) has demonstrated that preschool children are more willing to substitute unrealistic objects for necessary items in pretend play than they are to do so in completing a puzzle with a missing piece. Form, obviously, has less importance in conducting object substitution in symbolic play than it has in conducting substitution in other non-pretend activities. Nonetheless, it still has a good deal of importance, most particularly for younger children.

For example, Fein (1975) has hypothesized that the complexity of symbolic play increases with the number of object transformations required. Most of her infant subjects were able to pretend with highly prototypical objects (e.g., a toy horse drinking from a cup); many of them could substitute an unrealistic object for one of the toys (a shell for the cup or a piece of metal for the horse); but most could not use two unrealistic substitute objects together (the metal "horse" drinking from the shell "cup"). Elder and Pederson (1978) have found an age-related progression in preschoolers' ability to carry out transformations using a) a perceptually similar substitute, b) a dissimilar substitute, and c) an imaginary object.

Gowen (1978) has categorized preschoolers' free-play substitutions along a dimension of signifiers from actual objects, to toy replicas, to perceptually dissimilar objects, to objects specially constructed by the child. She found that younger children used more toy replicas, while older children used more dissimilar objects and more imaginary signifiers. Interestingly, Gowen also included a category of animate beings used as signifiers in her study. Actions along this dimension ranged from the assignment of a pretend identity to the self, to assigning a pretend identity to a peer, then an adult, then an animal. Younger children most frequently used themselves as signifiers, while older preschoolers more frequently used peers than did younger children. Gowen has commented that the younger

children's play themes depended more on the nature of objects present in the environment, while older children's play appeared more directed by their own ideas. If the child's play required a particular object that was absent, older children would substitute something else or use an imaginary object. These observations agree with Fein's (1975) discussion of a progression from play determined by objects' perceptual characteristics, to play in which the child generates the items needed to enact an idea, through object substitution or imagination. Garvey (1977), too, has noted that play progresses from "dependence on the physical properties of things" to play in which "the physical properties of things are taken as indications of their possible use, but they no longer solely determine that use" (p. 45).

Recent work by Shore (1980) has substantiated a progression from use of a real object, to use of a replica, to use of an abstract object of the same general shape, to use of a perceptually dissimilar object. This progression was unaffected by the order of presentation of conditions in which children are asked to use different objects as substitutes, or by different coding schemes. Jackowitz and Watson (1980) have recently provided evidence for the scalability of a five-step progression of development on the object transformation dimension in 16- and 24-month-old subjects. Their scale included the use as signifiers of objects with: 1) similar form and similar function (a toy telephone for a real telephone), 2) similar form and dissimilar function (toy banana for telephone) or dissimilar form

and similar function (walkie-talkie for telephone), 3) dissimilar form and ambiguous function (wooden block for telephone), 4) dissimilar form and dissimilar function (toy car for telephone), and 5) no form, no function (no object present, i.e., imaginary substitution required). The study used Watson and Fischer's (1977) adult modelling technique to measure the children's responses, as have some other object realism studies (e.g., Shore, 1980). Thus, there appears to be substantial agreement regarding development along the object transformation dimension.

Agent Transformations

Within the framework of the play context, the child transforms the actions carried out literally by him/herself, in such a way that the self is used as an agent of pretend actions. In other instances, the capacity for pretend actions is attributed to other people and to inanimate objects such as dolls and stuffed animals. The term "agent transformations" will be used to refer here to such activities. Most symbolic play researchers have included categories measuring such transformations in their coding schemes. Inhelder et al. (1972), for example, have demonstrated a progression between 15 and 26 months from use of the self as agent (pretending to feed oneself), to the use of toys as passive partners in play (e.g., hugging a doll), to the use of toys as active partners e.g., pretending to feed dolls), to the use of toys as active agents in

their own right (e.g., putting a mirror in a doll's hand "so she can see herself"). It may be noted that the use of perceptually dissimilar substitute objects appeared at about the same time as active partner use, and that totally imaginary object substitutions appeared at about the same time as active agent use. Lowe (1975), using subjects in the 12- to 36-months age range, also found a progression from use of self as agent, to use as dolls as agents who took on first passive, then active roles.

Fenson, Kagan, Kearsley, and Zelazo (1976), who used only a toy tea set as stimulus material and provided no dolls or other objects, reported that symbolic acts were absent at seven to nine months, present in about half of their 13-month-old subjects, and present in all subjects at 20 months. The results probably apply only to self-as-agent feeding activities, but nonetheless they provide some support for the results of Inhelder et al. and of Lowe. Watson and Fischer (1978), examining the behaviour of subjects at 14, 19, and 24 months cross-sectionally with their modelling technique, found evidence for an invariant progression through the following steps: 1) use of self as agent, 2) use of animate toy as passive agent (their usage corresponds to "active partner" above), 3) use of a substitute object as passive agent, and 4) use of animate toy as active agent. It was found that children's frequency of performing these transformations declined with age in a "first in - first out" manner. As behaviours higher on the scale appeared, earlier behaviours in the sequence dropped out in the order in which they had been acquired.

Nicolich (1977), while using a category system concerned substantially with the "complexity of action sequences" dimension to be described below, nonetheless included a progression from early self-as-agent behaviours to more complex behaviours in which dolls were used as active partners in play. Fenson and Ramsay (1980) have reported that the majority of their 19- and 24-month-old subjects performed "passive other-directed acts" (corresponding to "active partner" above), while active other-directed acts (corresponding to "active agent") were less frequent. Self-directed acts decreased as a proportion of symbolic play, although they remained constant in frequency. The consensus of all of these studies appears to support a progression from self-as-agent, to use of toys as passive partners (animate status is attributed to them, but they do not yet perform implied actions), to use of toys as active partners (the implied capacity for actions is attributed to them, but they are not yet agents independent of the child's actions), to use of toys as active agents (the capacity for independent action is attributed to them).

Complexity of Action Sequences

The third dimension studied by symbolic play researchers could be called "complexity of action sequences". This dimension involves the increasing integration and organization of the schemes or action sequences depicted in the child's play.

Research in this area has been stimulated by Piaget's (1962) work, in which four stages of symbolic play were delineated: presymbolic play, in which the child enacts his or her own schemes out of context; Stage I, in which the child enacts the routines of other people (e.g., adults); Stage II, in which object substitution occurs; and Stage III, in which there is evidence of planning in the child's enactment of combinations of activities that represent realistic scenarios. Although Piaget's stage sequence contains elements of object and agent transformations as well, it does point toward a dimension of increasing complexity in action sequences. Further, Piaget's general theory of cognitive development in infancy delineates a progression from the use of single schemes carried out on one object, to generalization of both the number of objects to which schemes are applied and the number of actions carried out on any one object. As development progresses, the appearance of mental planning is signalled by the emergence of initially unordered, then ordered and integrated sequences of actions. One might, therefore, expect a similar progression in the symbolic use of action schemes.

Nicolich (1977) has developed a category system based on this principle, which is presented in Table I. Her system was validated using data from only five female subjects, who were observed longitudinally at monthly intervals for one year, beginning at the ages of 14-19 months. The evidence for scalability was not entirely consistent. There was no good basis

Table I: Categories Used by Nicolich

1. Presymbolic Schemes: Objects are used in relation to one another (e.g., child swishes mop on floor).
2. Auto-symbolic Schemes: The child pretends at his or her own activities (e.g., pretends to eat).
3. Single Scheme Symbolic Games: The child includes other actors in play, or pretends at the activities of other people or objects (e.g., child feeds mother; child moves block or toy car while making vehicle sounds).
4. Combinatorial Symbolic Games
 - 4.1. Single Scheme Combinations: One symbolic scheme is applied to several actors or recipients of action (e.g., child drinks from bottle, then feeds doll from bottle).
 - 4.2. Multi-scheme Combinations: Several schemes are related to one another in an unordered sequence (e.g., child kisses doll, puts it to bed, then puts spoon to its mouth).
5. Planned Symbolic Games
 - 5.1. Planned Single Scheme Symbolic Acts: One object is identified with another, or the child's body is identified with another person or object (e.g., child picks up play screwdriver, says, "Toothbrush", then pretends to brush teeth).
 - 5.2. Combinations with Planned Elements: Activities are constructed from the earlier levels, but include some planned element (e.g., child puts play food in pot; stirs; then says, "Soup" before feeding the mother; waits: then says, "More?", offering spoon to mother).

Note. Adapted from Nicolich, 1977.

for distinguishing between levels 4.1 and 4.2, or between levels 5.1 and 5.2. There was, however, general evidence for the increasing coordination of action sequences.

Dale, Cook, and Goldstein (1981) have modified the Nicolich sequence by subdividing the presymbolic schemes into three levels of relational play, and by differentiating between symbolic play with and without object substitutions. Their nine-step sequence is presented in Table II. Although there was evidence for the scalability of this sequence, some doubt must remain because there were so few play actions observed in their study that could be categorized in the last four levels of the sequence. Of 20 subjects (four observed cross-sectionally at each of the ages 12, 15, 18, 21, and 24 months), only four produced Sequential Symbolic acts, two produced Sequential Symbolic Substitution, two produced Planned Symbolic acts, and none produced Planned Symbolic Substitution. Thus, most of the play scored was at the first five levels, of which the first three are non-symbolic play categories. The study provided better evidence for the reliability with which increasingly complex functional and relational play precedes symbolic play; and for the appearance of early transformation of agent relations (Single Symbolic) before the appearance of object substitutions (Single Symbolic Substitutions). It also provided evidence that planned sequences are a later development.

Table II; Categories Used by Dale, Cook, and Goldstein

1. Pre-Relational: One object is used at a time (non-symbolic).
2. Single Relational: Includes functional relations between objects, grouping, etc. (non-symbolic).
3. Sequential Relational: Relational acts are repeated or carried out in sequence (includes pre-symbolic acts).
4. Single Symbolic: Known routines are directed to inanimate objects, self, mother, or doll.
5. Single Symbolic Substitution: Like single symbolic acts, but some substitution is shown.
6. Sequential Symbolic: Includes repeated or sequential symbolic actions.
7. Sequential Symbolic Substitution: Like sequential symbolic actions, but substitution is shown.
8. Planned Symbolic: Symbolic actions show evidence of planning.
9. Planned Symbolic Substitution: Like planned symbolic actions, but substitution is shown.

Note. Adapted from Dale, Cook, and Goldstein, 1981.

Fenson and Ramsay (1980) have also investigated the dimension of complexity of action sequences, which they scored independent of another set of categories reflecting agent and object transformations. Three levels of complexity of action sequences were scored: a) single scheme combinations (repetition of the same symbolic scheme); b) unordered multischeme combinations (e.g., putting a doll in bed, then combing its hair); and c) ordered multischeme combinations (e.g., cooking, then eating). Single scheme combinations were found to appear before multischeme combinations. Although most children performed single scheme combinations at 19 months, ordered multischemes did not generally appear until 24 months. Correspondences were found between single scheme combinations and passive other-directed and object-directed acts at both 19 and 24 months, while a correspondence was found between active other-directed acts and ordered multischemes at 24 months. No clear evidence that unordered multischemes appeared between single schemes and ordered multischemes was found.

Overall, the existing studies suffer from problems such as small sample sizes, insufficient instances of observations of the more complex categories, lack of differentiation between adjacent sequential levels, and/or confounding of the complexity of action sequences dimension with the agent and object transformation dimensions. However, it does appear that coordinated sequences are a later development in infants' and toddlers' symbolic play; and there is some evidence for a progression from the use of

single schemes carried out on one object, to sequential acts in which different schemes are applied to the same object or the same scheme is carried out on several objects, to integrated scenarios resembling real-life action sequences.

Verbal Organization of Scenarios

The final dimension along which symbolic play activities have been categorized involves the verbal organization of symbolic activities carried out by two or more players. Stage sequences have not been proposed in this area, which is predominantly represented in the coding schemes used to study the play of toddlers and preschoolers. Joint symbolic play requires that a pretend frame of reference be established amongst the players, so that these players can avoid incidents such as the daddy feeding the baby its dinner before the mother has finished cooking it, or one player stepping on the flower garden imagined by another player. (Any parent who has had a child with an imaginary playmate will recognize the necessity for communication over such matters after having once sat on what he or she supposed was an empty chair.) As symbolic play becomes more elaborate the need for verbal organization of play must necessarily increase. A scene in which a child gives herself a drink from an empty cup, then gives the mother a drink, requires little verbal organization, or none at all. A scene in which dolls are fed, bathed, and put to sleep in extended sequence is very difficult to coordinate without verbal structuring.

Garvey and Berndt (1975) have studied the kinds of verbal communication preschoolers engage in while pretending together in pairs. Other studies have included a category or categories in their coding schemes that reflect such activity. Gowen (1978) included a category of "comments" in studying preschoolers' play (verbally indicating the pretend identity of an object or being), and also included verbal statements in her "preparation" category. She found that preparation and comments increased with age, and that in older children, comments were frequently used without supporting objects or actions. Matthews (1977a) and McLoyd (1980), who used very similar coding schemes, both included a category reflecting verbal organization in their systems for investigating preschoolers' modes of transformation in fantasy play. This was situational attribution (pretending that an imaginary situation exists -- e.g., "We're at the store now"). While little information is available about the manner in which this dimension emerges, it is likely that the verbal organization of scenarios increases as the child's cognitive and linguistic capacities increase, and as play becomes more complex along the other dimensions.

Relationships Among the Four Dimensions

As has been noted earlier, most researchers have included items from one or more than one of the dimensions presented here in their categories for scoring symbolic play, and have usually

not exhausted the possible categories within any one dimension. Few have attempted to measure the dimensions separately from one another. One exception is Jackowitz and Watson (1980), who acknowledged the confounding of dimensions in previous studies (including that of Watson and Fischer, 1977), and who restricted their hypothesized developmental sequence to the realm of object transformations. Another exception is Fenson and Ramsay (1980), who examined complexity of action sequences separately from transformations of agent relations, although one category dealing with object realism appeared amongst their agent relations categories.

It is argued here that although developments along two or more of these dimensions may form integrated continua, there is value in considering each, as well, as a separate dimension. Confounding these dimensions to different degrees has been a partial cause of the lack of comparability of scoring systems for symbolic play. Further, it is argued that only two of the dimensions reflect abilities that are particular to symbolic play, while the others reflect abilities that may perhaps more fruitfully be viewed as general play abilities that characterize competence not just in symbolic play, but in many other kinds of play. Object realism is a dimension applicable specifically to symbolic play, as is the transformation of agent relations. Complexity of action sequences, on the other hand, is a dimension that could conceivably be applied to constructive play or to social non-pretend play as readily as to symbolic play per se.

Verbal organization, too, is a requirement for any kind of complex social play, including games with rules. The latter two dimensions no doubt reflect skills that enrich symbolic play, or may be required for advanced forms of such play, but they do not reflect the essentially "symbolic" character of symbolic play per se.

The confounding of various dimensions in studies of symbolic play has recently been referred to by Jackowitz and Watson (1980), who have commented that three dimensions have been confounded. These have been called by them "level of transformation", "object category", and "sequencing of actions". Level of transformation, in their usage, refers to "the ability to distance symbolic objects from their referents in terms of attributes such as form and function" (p. 543). Object category refers to whether objects are used as agents (e.g., dolls) or recipients of action (e.g., toy dishes). Jackowitz and Watson point out that this dimension probably interacts with "level of transformation", later referring to Pein's (1975) finding that young children had difficulty using two substituted objects together, when one was used as agent and one as recipient. Sequencing of actions, in their usage, corresponds to "complexity of action sequences" as outlined above. While their distinctions are valid, it is argued here that "level of transformation" does not fully distinguish between agent and object transformations; and that object category, while important, is probably a side issue within the object transformation dimension. Sequencing of actions is, indeed, probably a separate dimension.

Fenson and Ramsay (1980) have prefaced their report with the statement that two major developmental trends may be observed in play during the child's second year: 1) "progressive decentration from self in the locus of children's actions", and 2) "increasing integration of separate actions into a more fluent stream of behavior" (p. 171). They measured self-directed acts, passive other-directed acts, active other-directed acts, and object-directed acts as reflections of the first trend. The second trend was measured using the complexity of action sequences dimension. Their observations are very useful in that they imply that a) these may be major developmental play trends, not necessarily restricted to symbolic play, and b) at least two dimensions exist, one characterized as decentration, and the other as integration.

It is suggested here that the dimensions of transformation of agent relations and object realism both reflect decentering abilities, while those of complexity of action sequences and verbal organization of scenarios reflect integrative abilities. Along the transformation of agent relations dimension, the capacity for direct action in pretense is first restricted to the self, then gradually attributed to inanimate objects: beginning with according them animate status; then behaving as if they were actors, but only as partners in the child's activities; then finally attributing to them the capacity for independent activity. Along the object realism dimension, the child initially centres completely on the stimulus properties of the

object, then gradually decentres from the immediate perceptual attributes of objects, until finally no specific stimulus characteristics are necessary for representation, and even totally imaginary entities may be used. These two dimensions, thus, clearly contain elements of progressive decentration.

On the other hand, the dimensions of complexity of action sequences and verbal organization reflect integrative abilities. It may be noted that, although both decentration and integration increase with developmental age, the two skills may operate independently. For example, actions low on the "decentration" dimensions, such as the use of self as agent or the use of prototypical objects as substitutes, may be combined to form complex, integrated sequences. Actions high on the "decentration" dimensions, such as attributing direct actions to toys or using imaginary objects, may be performed as single scheme activities. Any kind of agent or object transformation may or may not be accompanied by verbal organization. Thus, it is suggested here that while developments on all four dimensions may well increase with general cognitive development, the confounding of decentration and integration dimensions in studying the sequence of symbolic play development may only serve to obscure the nature of that sequence. For this reason, researchers should separate at least the decentration and integration dimensions (if not all four dimensions) in constructing models of symbolic play development.

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One other dimensional distinction has been made in the literature. Gowen (1978), Matthews (1977a) and McLoyd (1980) have all referred to modes of transformation or representation. Gowen did not subcategorize modes, but instead simply listed these activities as constituting different modes: enactment (behaving as the signified entity might behave), object substitution, symbolic construction (constructing or modifying objects for use as signifiers), preparation (verbally or motorically preparing for a pretend activity) and comments (verbally indicating pretend transformations). Both Matthews and McLoyd have distinguished between two subcategories of transformational modes: material modes (object substitutions, attribution of pretend functions to objects, and attribution of animate properties to objects) and ideational modes (imaginary substitutions, reference to imaginary situational factors, and enactment of imagined social roles). While it is unclear how the dimension of transformational modes may relate to the previously listed four dimensions, both Matthews and McLoyd have reported no age differences in the frequency of occurrence of material and ideational modes. Their subjects were four years of age, and three and five years of age, respectively. It is possible, indeed likely, that age differences would be found were researchers to examine the play of younger children as well. Imaginary substitutions ("ideational"), for example, have reliably been found to follow object substitutions ("material").

In fact, this dimension might basically be considered to be a decentration dimension, although it does confound elements of all of the four dimensions discussed earlier.

Drawing together the findings of many researchers (Dale et al., 1981; Elder & Pederson, 1978; Fein, 1975; Fenson et al., 1976; Fenson & Ramsay, 1980; Garvey, 1977; Garvey & Berndt, 1975; Golomb, 1977; Gowen, 1978; Inhelder et al., 1972; Jackowitz & Watson, 1980; Lowe, 1975; Matthews, 1977; McLoyd, 1980; Nicolich, 1977; Piaget, 1962; Shore, 1980; Sinclair, 1970; Ungerer et al., 1981; Watson & Fischer, 1977, 1980), some generalizations may be made across dimensions regarding the sequence of play development between approximately 12 and 36 months. First, the child demonstrates functional play in which actions are used appropriately on single objects. Next, objects that go together are combined in functional relationships. Next, relational acts are repeated or carried out in sequence. At this stage, early symbolic or perhaps presymbolic behaviours (using toy replicas as their functional counterparts, acts with self as agent in which familiar schemas are carried out out of context, and/or use of toys as passive animate partners) occur.

What may definitely be called symbolic play occurs first in the use of toys as active animate partners, followed by the use of toys as active animate agents, along with the use of perceptually-dissimilar substitute objects. Totally imaginary substitutions occur next. Elaborate role assumptions (e.g., playing "fireman"), elaborate planned scenarios, and highly

verbally-organized play follow. Clear and consistent evidence for this sequence is somewhat lacking, due to the inconsistencies in the order of occurrence of some steps from one study to another. Nonetheless, this general sequence is consistent with the concepts of increasing decentration and integration; and further, with the concept that decentration progresses somewhat in parallel in the use of objects and in the attribution of agency. The sequence also stresses the link between functional object use and the development of symbolic play, a relationship that has been noted by several researchers and theorists.

Functional Object Use and the Development of Symbolic Play

The findings of Nicolich (1977) and Dale et al. (1981) have already been noted with respect to the link between functional object use and symbolic play. Garvey (1977), too, has placed functional object use before symbolic behaviours in her discussion of the development of play. Other theorists and researchers have suggested that the child must have information about the conventional uses of objects before one object may be used to represent another one. Inhelder et al. (1972) found that the ability to use one or more objects "adequately and according to conventional usage" appeared to develop along with the production of symbolic play behaviours. Their 12- to 16-months-old subjects, who exhibited no pretend play by their criteria, applied action patterns indiscriminately to objects.

Their 16- to 19- months-old subjects, who exhibited pretend play with self as agent and also used toys as passive partners, were able to use one or more objects adequately (e.g., wiping with a cloth, looking at the pictures in a book, etc.). By 19 to 26 months, children had discovered the functions of objects to the extent that they had begun to classify them according to function. These subjects used toys as active partners, used substitute objects, and had begun to use imaginary objects.

Inhelder et al. have commented that:

Representation of functional relationships between actions and objects precedes that of functional relationships between the objects themselves. The stability of these functional relationships permits their elicitation by means of anticipation. It is not until this step is taken that one thing may be used to signify another, and the first acts of pretend do not appear until the infant grasps the conventional usage of familiar objects and becomes capable of imitating the actions associated with them (p. 239, present author's translation).

Fein (1975) has argued that the child must first have constructed "stable internal representations of familiar objects and activities" in order to select the appropriate stimulus properties in using objects for pretense. Noting a correspondence between object use and symbolic play in her 12- to 18-months-old subjects, she commented that in pretense the child clearly demonstrates his or her knowledge of objects' functions. The difference is merely that this demonstration is detached from the typical context for such object use.

El'Konin (1966) has also viewed the acquisition of socially correct methods of using objects as a precondition for the development of pretense. For him, the functional use of objects is socially learned through interaction with adults. He has commented that: "This refers not only to everyday objects, whose use is taught to the child by adults, but also to playthings. For the child the plaything is still not separate from other objects" (p. 223). Whether or not adult interaction is necessary for the acquisition of information about the functions of objects, it is clear that researchers in the area consider such information to be a precondition for or a concomitant of symbolic play development.

Sex Differences

In the area of symbolic play development, as in many areas of development, there are inconsistencies from study to study in reports of sex differences. Some studies have reported finding no sex differences in the symbolic play of infants and preschoolers (Griffing, 1980; Rubin & Maioni, 1975; Watson & Fischer, 1977). Other studies have examined the content of the roles enacted by older preschoolers, and have reported that boys and girls chose stereotypically sex-appropriate roles in sociodramatic free play (Garvey & Berndt, 1975; Matthews, 1977b).

The studies that have reported sex differences favoring boys in both the quantity and quality of symbolic play have almost all been conducted with preschoolers rather than with infants. For

example, Singer (1973) has reported significantly more make-believe play among boys, along with a greater variety of fantasy themes. Pulaski (1970) has reported that boys are more active in make-believe play, and also that they show more positive affect than girls. McLoyd (1980), who observed the play of black American preschoolers, has reported that boys enacted more "fantastic" roles (Spiderman, monsters, etc.) than did girls. Girls, in fact, enacted no such roles at all during her observations. Sanders and Harper (1976) have reported that male preschoolers displayed more fantasy free-play than did girls, and also that the boys were more physically active in such play and performed more of it outdoors. Cooperative role play was more common in girls. Sanders and Harper have suggested that boys may have had more opportunity for outdoor play than girls, and thus may have developed more active styles of outdoor fantasy play. Thus, the studies of preschoolers appear to agree that the symbolic play of boys is both more active and more varied in themes than the symbolic play of girls, although Rubin and Maioni (1975) have reported finding no sex differences in preschoolers' play. Among researchers using preschool subjects, two have reported sex differences favouring girls. McLoyd (1980) has reported that girls performed more transformations (substitutions and role attributions) than boys; and Matthews (1977a) has reported that girls, compared to boys, favoured "ideational" modes of transformation (imaginary transformations) to "material" modes (object transformations).

Most of the studies of infants that have reported sex differences have found differences in development favouring girls. Fein (1975) has reported that no sex differences were found in early (self-as-agent) forms of pretend play, but that more and earlier role transformations (e.g., child assumes "mother" role in feeding dolls, etc.) were found in girls than in boys. Lowe (1975) has found that girls were ahead of boys in doll-related activities, especially grooming; and that whereas both sexes were equally likely to place a doll in a feeding situation by 36 months, girls were much more likely to actively "feed" the doll. Lowe also reported that boys were ahead in pretend play using trucks, and that only boys "fixed" the trucks or "put gasoline" in them. Fenson and Ramsay (1980) have found that 19-month-old girls performed more "passive other-directed" play than did boys of the same age, and that at 24 months, girls performed both more passive other-directed and more active other-directed play. Fenson and Ramsay also reported that girls performed more ordered and unordered multischeme combinations at both 19 and 24 months than boys, although only the difference at 24 months was significant. Cohen and Tomlinson-Keasey (1980) have reported equivocal results in terms of sex differences. Their 21- to 24-month-old male subjects engaged in the most "creative play" (fantasy play, role playing, object transformations) found in the study while playing with a familiar peer. However, high levels of such play were found in girls playing alone and in girls playing with their mothers, while boys playing with their mothers showed the least creative play.

It seems possible that the sex differences reported by Fein (1975) and Lowe (1975) may be related to the predominance of "female-appropriate" toys present in their studies. Both Franklin (1973) and Garvey and Berndt (1975) have reported a progression from the representation of caretaking and other domestic activities, to the representation of activities that occur outside the home (e.g., street scenes). It may be that domestic activities, because of familiarity, are the easiest for young children to enact. Differential socialization may favour the enactment of domestic activities by girls, rather than boys, and thus result in the apparent earlier development of symbolic play in girls. It is noteworthy that previous studies have not reported any attempt made to counterbalance for stereotypic sex-appropriateness in the choice of toys for use as stimulus materials, and that at least some of them (in cases where stimulus materials have been fully described) have used mostly female-stereotyped toys such as dolls, dishes, and caregiving equipment. It may also be noted that in Lowe's (1975) research, sex differences favouring boys were found on the symbolic use of the male-stereotyped toys present (i.e., trucks).

The research reviewed in this chapter has provided considerable information upon which to base the present study of symbolic play interaction between infants and their mothers. While the studies reported since 1976 (the time at which the present longitudinal study was initiated) have considerably expanded our knowledge of early symbolic play development, they

have not contradicted the earlier research upon which the development of the method used in the present study was based. Following a presentation of the hypotheses, the method used in the present study will be described.

Hypotheses of the Present Study

The purposes of the present research were primarily to describe the course of symbolic play development from ages one to three and to examine the relationships of maternal, interactional, and other variables to its development. Despite limitations (discussed earlier) that prevent the drawing of firm conclusions, the study was guided by some hypotheses for which tentative support and/or direction for future research might be obtained in the present research.

First, it was hypothesized that the general pattern of symbolic play in children, as well as the play of individual children, would show a regular developmental sequence of structural complexity during the period under study. Further, it was predicted that the symbolic play of mothers would also increase in structural complexity as their children matured. This prediction was based on the general assumption that mothers gear their interactions with young children to the children's emerging levels of developmental competence. While no such finding has previously been demonstrated in the area of symbolic play, research in mother-child language interaction (deVilliers & deVilliers, 1979) supports the viability of such a prediction.

Second, it was hypothesized that the child's amount and complexity of symbolic play would be positively related to measures of functional toy use and to the verbal expression of information about the properties of toys; and further, that the child's symbolic play would be positively related to the mother's scores on the same variables. Reference has already been made to speculation that the presence of familiar toys is necessary for symbolic play development (Feitelson, 1977). Moreover, the existence of a sizeable body of theoretical and empirical work on the relationship between functional toy use and symbolic play justifies these hypotheses.

Third, it was hypothesized that a positive relationship would be found between maternal and child symbolic play frequency and complexity, both within and across sessions. Due to the rapid developmental pace of infancy and toddlerhood, the extensive intervals between observation sessions, the multitude of developmental and environmental events that could influence symbolic play development and were not measured in this study, and the presence of situational play determinants for both subject partners in the laboratory setting, it was expected that interrelationships between mother and child play would be strongest within sessions. However, the literature on parental influences on symbolic play would support the prediction that there should be a time-lagged correspondence as well between the child's play at later sessions and the earlier play of the mother. While the earlier-mentioned speculation that mothers may

adjust the pace of their own play to their child's emerging abilities might suggest that earlier child play levels may be related to later maternal play levels as well, no such formal prediction was made in this study, although such relationships were examined.

Finally, it was predicted that the child's frequency and complexity of symbolic play would be positively related to the degree of joint mother-child play observed (as opposed to solitary or parallel play by the subject partners during the play sessions). If symbolic play has its origin in "active mutual mother-baby play" (Murphy, 1972) or if "in playing symbolically at an early age the child actively involves the mother" (Dunn & Wooding, 1977), then one would expect that the joint play of mothers and children who demonstrate the most symbolic play would be highly interactive.

The issue of whether a high degree of maternal direction of play content would be a concomitant of high levels of child symbolic play is a somewhat different matter. Here, the question is not whether the mother is involved in, interested in, and encouraging of the child's play, or even whether she provides models for the child's play. It is simply whether it is she, rather than the child, who is directive with regard to the actual content of play. On the one hand, a high degree of maternal direction might expose the child to a richer variety and complexity of play themes than if s/he were allowed to set the pace of play. On the other hand, high maternal directiveness

might impede the child's play development by denying the child the opportunity to select and develop play themes that arise from the child's own past experiences, interests, new perceptions, or simple curiosity about new toys. Instead, it might force the child to engage in themes that may not be salient, or that overshoot the child's level of cognitive development. For these reasons, no formal hypothesis was made with regard to the relationship between maternal direction and children's play levels, although the direction of the relationship was of interest in the study.

It may be seen that although the study was designed to illuminate the nature of mother-child interaction in symbolic play development in a descriptive and exploratory fashion, the correlational nature of the research precludes the drawing of conclusions regarding causal relationships among the variables studied. In fact, it is unlikely that any study would be able to definitively resolve causal issues, due to the essentially inscluble problem that we lack the means of control that would be needed to make definitive predictions in this area of study. The environmental matrix in which children's play evolves is a highly complex one in which a myriad of factors may operate at any one time, and interactions of such factors across time produce a practically infinite number of possible alternative bases for the development of any relatively complex phenomenon such as symbolic play. It is obviously not possible to directly test, for example, the Russian proposition that adults must teach symbolic

play to children. Clearly, one could neither ethically nor practically manipulate children's early environments in such a way that symbolic play definitely is or is not modelled by anyone in the children's presence. Even in the Russian residential nursery schools, where a high degree of control is exercised over the child's environment, such an experiment would be practically impossible to arrange. Dunn and Wooding (1977) have commented on this issue:

On the origins of symbolic play, the Russian claim that adult modelling is responsible for early symbolic activity has been mentioned; to test this one would have to follow individual children with meticulously close attention for the entire course or the early life (a procedure which not even Piaget can have found practicable). At the end of several of the observations we asked mothers about the incidents of symbolic play we had seen. In several cases they spontaneously described the symbolic play as originally demonstrated by adults. The question must remain open (p. 56).

Thus, research in this area takes place, and must of necessity remain, in the sphere of correlational rather than experimental design, although it is to be hoped that future studies will examine the questions at issue here with the use of more meticulous and stringent designs. Nonetheless, and bearing in mind the important caveat that causality may not be inferred from the results of this research, the argument is made that findings of positive relationships between children's play and

maternal and interactional variables would go some small distance toward illuminating our knowledge about the original development of symbolic play. It was in the spirit of exploration and description, then, that the methods used in this study were selected.

The Choice of Methods for the Present Study

First, it must be reiterated that the present longitudinal study was initiated before most of the literature reviewed in this chapter had been published. The methods used to devise a category system for scoring symbolic play complexity by the present researcher in 1976 relied primarily on the work of Fein (1975), Fenson et al. (1976), Inhelder et al. (1972), Lowe (1975), and an early draft of Watson and Fischer's (1977) paper. There was, and still is, no other existing method for investigating mother-child interaction in symbolic play. The development of the methods used in the present research is described in the author's M.A. thesis (Russell, 1977), and has been briefly described as well in Russell and Ames (1978) and in Russell and Russnaik (in press).

A technique was devised to divide transcribed videotaped records of joint mother-child free play into incidents, or sequences of play behaviour organized around a theme or set of toys. It was decided to score both the amount and the complexity

of symbolic play on the part of each subject partner at each of three observation sessions spaced over infancy and toddlerhood. The mother's verbal suggestions that the child pretend were also scored. Because of the hypothesized relationship between object use and symbolic play, an object use measure was also included in the study, as was a measure of subject verbalizations that involved labelling an object and/or mentioning its physical properties.

The choice of stimulus materials was based on several considerations. First, given the very young age of the subjects at the outset of the study (12-14 months), it was decided to use objects that were predominantly toy replicas of real, functional objects, although some objects that could be used in dissimilar object substitutions were also available. Attention was also paid to choosing stimulus materials that would create minimal ambiguity in interpreting the child's actions with them. The problem could not be entirely avoided; however, pilot research had indicated that some objects (e.g., a toy telephone, dolls' dishes, and a toy broom) were poor choices because the actions that infants carried out with them were very difficult to interpret. For example, it was found that no judgment could readily be made as to whether a child who held a toy telephone receiver to her ear and said "Hi" was pretending to conduct a conversation by phone, or simply demonstrating a learned association between the object and the actions. Thus, stimulus objects were chosen that were replicas of functional objects

likely to be familiar to the children, but were not replicas of objects (such as cups and plates) used every day in the subjects' own typical activities. Examples of the toy replicas chosen are baking utensils and carpentry tools.

A second consideration in choosing toys was that toys unlikely to elicit symbolic play should also be included. The existing studies had not all included such objects. While it is appropriate to choose toys likely to elicit pretend when studying the symbolic play abilities of infants (in order to maximize the likelihood that the subjects will pretend), non-pretend toys must also be included if the aims of the research involve examining variations in individual levels of pretend play. This is necessary in order to allow the "non-pretenders" to play normally, and also in order to allow the frequency of pretending to vary in all subjects in a manner representative of their usual play. Thus, non-pretend toys (e.g., books, puzzle, and abacus) were also chosen as stimulus objects.

A final consideration in choosing stimulus materials was related to the finding of sex differences favouring girls in past research (Fein, 1975; Garvey & Berndt, 1975; Lowe, 1975). The earlier studies had all used predominantly female-stereotyped toys as stimulus objects (dolls, dishes, housekeeping and caregiving equipment). Because the earlier-obtained sex differences could have been due to bias in toy selection, it was decided to counterbalance the quantity of "male" and "female"

toys used in the present study. Thus, if sex differences were found, they could be analyzed in terms of the toys used, and the reason for their occurrence could more readily be investigated.

The category system used to score symbolic play complexity evolved over the course of the study. It was necessary that a system be devised that was not only capable of quantifying very simple to increasingly complex symbolic play on the part of children, but also was capable of quantifying the play of mothers. Conventional object use (functional play) was scored independent of symbolic play categories. Initially, a set of categories of symbolic play was devised on the basis of previous research and of pilot observations. This set of categories included use of a toy replica, self-as-agent behaviours, use of toy as passive animate partner, use of toy as active animate partner, dissimilar-object substitutions, use of toy as active animate agent, and imaginary substitutions. By the time the children were observed at three years of age, play had become considerably more complex than in the earlier two sessions. An additional category called "verbal substitutions" was added to the set of symbolic play categories, when mothers and some children were observed to substitute verbal statements for actions (e.g., saying "Let's say the dolls have had their lunch", without enacting the lunch scenario). This activity was thought to qualify as a type of substitution, so it was included at the end of the agent and object transformation categories.

It was also obvious that measures of the sequential complexity and the verbal organization of play scenarios were needed at the time of the third observation sessions. Accordingly, categories (independent of the complexity categories described above) were devised to reflect these two dimensions. These included the number of themes initiated by each subject partner (e.g., cooking, eating, sleeping, repairing objects, driving vehicles, etc.), and the number of elaborations initiated in the course of these themes (adding discrete action elements or descriptive details to the theme), as reflections of the complexity of play sequences. A "verbal organization of scenarios" category was also added (specifying pretend activities in advance, verbally coordinating players' actions, specifically mentioning pretense, discussing the appropriateness of objects for representation, giving the reason for an enacted activity, or verbally designating physical areas as locations in the scenario).

Thus, it may be seen that the category system used in the present research, although developed relatively independently, reflects aspects of the four dimensions discussed earlier, separates "decentration" from "integration" dimensions, and includes the important steps in the sequence of symbolic play development generally gleaned from the current literature. It may be noted that four categories reflect increasing complexity along the transformation of objects dimension (use of toy replica, dissimilar-object substitutions, imaginary object

substitutions, and a possible new contender: verbal substitutions). Agent transformations are represented in four categories as well (self-as-agent, passive animate partner, active animate partner, and active animate agent). Independently, complexity of action sequences (themes initiated, elaborations initiated) and verbal organization of scenarios (verbal organization) are also represented.

Because of the literature suggesting strong (but generally unspecified) effects of maternal interaction on symbolic play development, it was also decided to include one additional measure of maternal behaviour (number of verbal suggestions that the child carry out a pretend activity), and two social interactional measures: the proportion of joint, versus solitary or parallel, play incidents; and the proportion of play incidents in which the mother directed the content of play.

Chapter Three: Method

Subjects

At the outset of the study, the subjects were 30 Caucasian children, 12 females and 18 males, and their mothers. They were drawn from a file of volunteers contacted at Greater Vancouver maternity wards at the time of the children's births, and from respondents to advertisements in a daily newspaper and on a radio station. There was no remuneration for participation, although the children were given inexpensive books as presents after each testing session. When the study began, all of the infants were cared for at home by their mothers, thus minimizing their likely degree of exposure to other caregivers and to other children as play models. Twenty seven of the children were firstborn, while three of them had one older sibling apiece. The infants came from two-parent families in which the fathers were employed at a variety of middle and lower class occupations, although the majority held technically skilled jobs.

Over the course of the study, attrition reduced the sample size by four, and technical difficulties in videotaping one session for an additional subject reduced the number of complete observation records to 25 in total. Of these 25 child subjects, 10 were female and 15 were male. All but three were firstborn.

At the time of the first session, the infants' mean age was 12.68 months (range = 12.10 - 14.57, SD = .75). At the second session, their mean age was 20.48 months (range = 19.80 - 22.47, SD = .81), and at the third session it was 34.45 months (range = 32.57 - 39.90, SD = 1.87). The mean age of their mothers at the time of the third session was 29.4 years (range = 22 - 36, SD = 2.6). The mothers' mean education level was 13.5 years of schooling (range = 10 - 17, SD = 1.9) and the fathers' mean education level was 13.4 years (range = 9 - 19, SD = 2.5). Maternal age and maternal and paternal education levels did not differ significantly between the male and female subjects.

By the time of the third session, seven mothers had taken employment outside the home. Six of these mothers worked twenty or fewer hours per week, and one worked full time. At this time, 17 of the 25 children participated in some form of organized children's programme (nursery school, community recreation programmes, or day care in the case of the child whose mother worked full time). The mean number of hours spent in group programmes for these children was 9.9 hours per week (range = 1 - 50, SD = 14.7, mode = 2). Aside from group programmes, the 25 children were cared for by a babysitter or relative a mean of 4.8 hours per week (range = 1 - 10, SD = 2.6) at the time of the third session. Mothers reported at this time that, aside from group programmes, their children spent a mean of 12.8 hours per

week (range = 0 - 40, \underline{SD} = 11.9, mode = 10) playing with other children. The mean age of their most frequent playmate was slightly higher than the mean age of the subjects themselves, at 4.1 years (range = 2.5 - 9.5, \underline{SD} = 1.6).

Three of the five subjects whose data were not used because their records were incomplete left the study because the families moved away from the city. These subjects, and the one whose videotaped record could not be used, were all comparable to the group of remaining subjects in terms of maternal age and education and in terms of the play scores calculated for both mothers and children in early sessions for which data were available. The fourth subject pair who dropped out of the study did so because the mother reported that she had started a job and no longer had the time to participate. This mother had been the youngest in the study, at 19 years, and had an education level equivalent to the lowest value recorded for the remaining sample, at 10 years. The mother and her daughter had received the lowest play scores in both of the first two sessions, and these sessions had been very atypical, with almost no mother-child interaction occurring during them. Thus, it is possible for this subject pair that the reason for attrition may have been related to the variables being investigated.

Apparatus, Stimulus Materials, and Setting

The play sessions were carried out in a 3.1 m by 4.6 m carpeted playroom on the university campus. A Fairchild videocamera (Model TC 177), equipped with a Cosmimar 12.5 mm lens, was positioned in a corner of the playroom in such a way that most of the available play area could be recorded. A partition .9 m in height separated the camera area from the 2.8 m by 3.1 m section of the room in which the mother and child played. An Altec Lansing omnidirectional microphone (Model 5606) was suspended from the ceiling in the centre of the room. A SONY Model 3650 videorecorder was located in an adjacent room equipped with a one-way mirror facing into the playroom. Videotaping of the first 15-minute session was timed using a Galab Universal timer (Type 171). During the last two sessions, the videorecorder was equipped with an RCA Date-Time Generator (Model 1440A), which produced a time record on the videotape.

The playroom contained a chair, a low table, and an assortment of commercially available toys, initially arranged in a standard manner on the floor. To control for stereotypic "sex appropriateness", the set included some toys considered stereotypically masculine (car, motorcycle, schoolbus, screwdriver, screw, hammer, and nail), some toys considered

stereotypically feminine (bed, crib, blanket, table, chairs, bathtub and toilet, muffin tin, rolling pin, and spoon), and some toys considered neutral with regard to sex-typing (abacus, nesting cups, shapebox, foam rubber ball, books, and puzzle). There were also three small flexible plastic dolls of appropriate size to fit either on the furniture or inside the vehicles. The masculine and feminine toys, all of which (along with the dolls) were considered likely to elicit symbolic play, were clearly distinguishable as play objects on the basis of miniaturization, enlargement, colouring, and/or material of construction. The neutral toys, all of which were considered unlikely to elicit symbolic play, were also clearly identifiable as toys.

At the time of the second session, the Mental Scale of the Bayley Scales of Infant Development (Bayley, 1968) was administered as a measure of general cognitive development. Testing was conducted in a small room adjoining the playroom area, which contained a table and three chairs. Approximately two years after the third observation session, the Peabody Picture Vocabulary Test was administered to the 22 subjects whose mothers were willing to participate at that time. Testing was administered on campus, in a laboratory equipped with table and chairs, except in the case of three subjects who were unable to come to the university and thus were tested in their own homes. At the time of the third observation session the mothers

completed a questionnaire (presented in Appendix A) that asked for demographic information and information about the children's activities and play preferences. A short play attitude questionnaire was also included, but the results were not used in the present study.

Observation Procedures

The study was initiated in the spring of 1976. Each of the three sets of observation sessions were conducted over a four month period, the first between February and June of 1976, the second between October, 1976 and February, 1977, and the third between December, 1977 and April, 1978. For individual subject pairs, the mean interval between the first and second sessions was 7.8 months (range = 7.4 - 8.8, SD = .31), and between the second and third sessions it was 14.0 months (range = 12.6 - 17.4, SD = 1.36). All three observations were conducted using an identical procedure, although other testing was also carried out at the time of the second and third sessions. Over the course of the three sessions, the mother was informed only in general terms that she and her child were participating in a study of the development of play, and no mention of symbolic play was made. The first observation sessions were conducted entirely by the present (female) experimenter, the second by two female

undergraduates under the supervision of the present experimenter, and the third by the present experimenter and a male graduate student.

At each of the three sessions, the mother was asked to play with her child, as she normally would, for 15 minutes. After presenting these instructions, the experimenter left the mother and child alone in the playroom, allowed a short (approximately three-minute) period for familiarization with the room, then videotaped the session from the adjoining observation room, observing the play interaction on the video monitor and also through the one-way mirror. The sessions were terminated by stopping the videorecorder, then entering the playroom to inform the subjects that the play session was over.

At the second session, following the observation period, a 15-minute break occurred, during which the mothers and children sat with the experimenter in an adjacent lounge. The mother was given coffee, and the child was allowed to play with a small number of toys that had not been present in the playroom. The experimenter engaged the mother and child in conversation and attempted to allow the child to become comfortable in her presence. The mother, child, and experimenter then proceeded to the adjoining testing room, where the experimenter (who has been trained in child assessment) administered the Mental Scales of

the Bayley Scales of Infant Development to the child. The mother was instructed not to assist the child with the tasks, but was sometimes asked to encourage the child to respond, in accordance with the standard Bayley procedures. Testing sessions had to be terminated before completion for seven of the final 25 subjects due to their restlessness and/or fatigue. Test protocols were retained only for the 18 subjects for whom, in the opinion of the experimenter, the testing session represented a fair assessment of their performance.

At the third session, the mother-child play observations were immediately preceded by a ten-minute videotaped session in the playroom during which the child played alone with the standard set of toys while the mother completed a questionnaire. The mother was instructed not to initiate interaction with her child during this time, and to respond to overtures from the child only if she considered it necessary. In such cases she was instructed to inform the child that she was busy writing, that the child should continue to play alone with the toys, and that she would be available to play with the child in a few minutes. The data collected during these observations were not used in the present study. Following the mother-child play observations, an additional procedure was carried out, the data from which were also not used in the present study. This procedure took approximately ten minutes, and involved a task in which the child

was asked to categorize into groups a set of objects that had not been present in the playroom. Between the observation sessions and this procedure, the mother was given coffee and the child was given a snack of cookies and juice.

Although they do not form part of the present study, further observations of the same children were subsequently made by a different experimenter. In one set of observations, the children played together in peer dyads formed on the basis of social skill levels scored by the other experimenter using the videotaped mother-child play observations described here. Fifteen of the children also participated in a later study, in which large peer play groups were formed and observed in a series of group play sessions. Subsequent to these sessions, and approximately two years after the third mother-child observation sessions, 22 of the final 25 subjects in the present study participated in a final testing session. At this time, a male graduate student trained in assessment techniques administered the Peabody Picture Vocabulary Test, followed by a battery of role-taking tasks. Only the scores on the PPVT were used in the present study.

Transcription of the Videotapes

Because of the complexity of the interactions between mothers and infants, it was impossible to accurately code data

directly from the videotapes. Therefore, detailed transcriptions of the subjects' behaviour and verbalizations related to the variables of interest were prepared. Six videotapes from each of the first two sessions were independently transcribed by the experimenter and another observer. The two sets of resulting transcripts were compared by totalling the number of lines in the 12 paired transcripts, then calculating the percentage of lines on which the observers had agreed substantially as to content. Lines counted as disagreements were those on which the observers differed as to which toys were used, what activities were carried out, or what was said by either subject; and lines that described content present in one transcript but absent in the other. Minor disagreements over the phrasing of utterances (where content was clearly the same), the failure to note gestures or body movements (unrelated in any discernible way to the variables of interest) in either transcript, or the failure to note uninterpretable vocalizations in either transcript were not counted as disagreements.

The six paired transcripts from the first session totalled 1889 lines, and there were disagreements on 50 of them, producing a percentage agreement rate of 97%. The transcripts from the second session totalled 2238 lines, with 43 disagreements, for an agreement rate of 98%. These rates were judged sufficiently high to justify the transcription of the remaining videotapes from

Sessions 1 and 2 by the experimenter alone. At the third session, another experimenter had prepared complete transcripts of all verbalizations for 22 of the final 25 subject pairs as a part of his own research project on language development. These transcripts had first been prepared from the videotapes, then rechecked against the tapes and corrected where necessary. Given the high agreement rate on transcription for the first two sessions, the accuracy check on the available language transcripts from the third session, and the highly verbal nature of interaction at that session, a decision was made to prepare play transcripts of the third session without calculating transcription reliabilities beforehand. Accordingly, the experimenter used the available language transcripts as a base to which notations of all relevant nonverbal behaviour was added while viewing the videotapes of the third sessions. Full verbal and behavioural transcripts were also prepared by the experimenter for the three tapes for which language transcripts were unavailable.

Division into Incidents

Because spontaneous play involves complex behavioural sequences that must be considered as a whole, time-sampling techniques were rejected in favour of dividing the transcripts into incidents involving the mother, the child, or both. Each

incident contained a sequence (verbal, behavioural, or both) in which activities or verbalizations with a central theme were carried out with a particular toy or group of toys. These incidents excluded activities in which toys were merely handled, held, mouthed or thrown inappropriately, or touched; and also excluded nonplay activities such as the mother's wiping the child's nose. The set of instructions used for incident division is presented in Appendix B. Six transcripts from each of the sessions were divided into incidents independently by the experimenter and a second observer. (A different person acted as the second observer at each session.) Before working on the transcripts used for reliability calculations, the second observer received training (on different transcripts) in incident division.

The problem of calculating reliability for incident division presented some difficulty. Using a group of observers, one may calculate an agreement rate for dividing a stream of behaviour into events by examining the variance of event division points around points where breaks are frequently made (Newton, 1976). However, two observers present a sample size too small for the use of such techniques. One possible method is to count as agreements all transcript lines after which both observers have either placed or not placed a break point. This technique is too liberal because lines following which breaks are made represent

only a small portion of total transcript lines. A second possible method is to calculate agreement by break points only. This technique is too conservative, because no weight is given to all of those lines after which both observers have agreed in not placing a break point. Thus, incident division reliability was dealt with in this study by calculating both liberal (agreement by lines) and conservative (agreement by breaks) reliability figures.

To avoid counting as disagreements break points that differed by only a small number of lines on the two observers' transcripts, in cases where any doubt was present, observers specified both explicit lines following which breaks were made, and also ranges of lines around these break points within which they were confident that a transition from incident to incident had occurred. In such cases, a disagreement on breaks was scored only if content that could be scored on the variables of interest appeared within these ranges of lines on either transcript.

For the first session, the six transcripts totalled 1872 lines. There were 394 breaks made by one or both observers, and there were disagreements on 80 of these breaks (i.e. 80 of these breaks were made by only one observer). Line agreement was 96%, and break agreement was 80%. For the second session, the transcripts totalled 2238 lines. There were 358 breaks made by

one or both observers, and 61 break disagreements. Line agreement was 95% and break agreement was 83%. The six transcripts from the third session totalled 1962 lines. A total of 52 breaks were made, with eight break disagreements. Line agreement was 91%, and break agreement was 87%. It may be noted that the number of breaks made declined substantially at the third session, where incidents tended to be much lengthier than in the earlier sessions. The remaining transcripts from all sessions were divided into incidents by the experimenter alone.

Procedures for Scoring the Transcribed Observations

The transcripts from all three sessions were scored, incident by incident, according to a category system that classified types of symbolic play and coded other variables of interest. The symbolic play categories were scored for all activities that were consistent with deliberate pretense (in terms of the apparent transformations of agent and object relations involved), but it should be stressed that there was no assumption that these activities necessarily involved awareness on the child's part that such activities were "not real". Care was also taken to exercise conservative judgment in scoring activities as symbolic play. All of the behaviours coded in each incident were scored separately for the mother and for the child. In order to receive a score in any category, the individual

subject partner had to actually carry out the behaviour described in the category, regardless of whatever behaviour the other subject partner had produced. After coding was completed, variables were derived from the coding scheme for use in data analysis. Because some of these variables were derived from the portion of the coding scheme that was used to score symbolic play complexity, that system will be described before a list of variables scored from the transcripts is presented.

The symbolic play complexity system was developed through an iterative process over the course of the study. The author's M.A. thesis (Russell, 1977) describes the process by which an initial set of complexity levels was selected and ordered. This system was based on the behaviours observed in pilot research and in Session 1. After transcripts had been prepared for Session 2, the set of complexity levels was modified on the basis of the existing literature and on the basis of the frequency of occurrence of the various symbolic play behaviours at Sessions 1 and 2. This procedure produced a set of complexity levels tentatively ordered as follows: toy replica use alone, self-as-agent behaviours, passive animate partner, active animate partner, dissimilar-object substitutions, active animate agent, and imaginary substitutions. When the Session 3 transcripts were examined, an additional activity that had not occurred earlier was noted: verbal substitutions. This category was added to the upper end of the scale.

After all of the symbolic play incidents on the transcripts had been scored using the tentative scale described above, the highest level of play produced at least once in a session was calculated for each child for each session. The resulting data were examined, and some small adjustments were made to the complexity sequence in order to best reflect the observed sequence of appearance of each of the play categories. This procedure resulted in the development of the finalized sequence of complexity levels presented and described in Table III. It will be noted that Levels 5a (dissimilar object substitutions) and 5b (active animate agent), although conceptually distinguished as separate categories, have both been placed at the same level of complexity because of their simultaneous order of appearance in the children's play.

The procedure for coding the incidents identified on the transcripts is presented in Appendix C. In order to illustrate the coding procedure, examples of scoring for each category are presented in Appendix D. The variables used in this study that were derived from the coding scheme are presented in Table IV. Symbolic play amount, symbolic play complexity, object use, and information about objects were scored separately for each subject partner at each session. Mother's symbolic play suggestions were also scored at each session, as were two interactional variables:

Table III: Symbolic Play Complexity Levels

- (1) Toy replica use alone: Realistic toy replicas are used as if they were their functional counterparts, with no further symbolic play elaboration accompanying the replica use (e.g., pushing a car and making an engine noise).
- (2) Self-as-agent behaviours: The subject is the agent of her or his own regular routines, carried on out of context (e.g., feeding oneself from empty toy dishes, pretending to sleep or blow one's nose).
- (3) Passive animate partner: Activities are performed in which an inanimate toy, used as if it were animate, acts as a passive partner to the subject (e.g., hugging a doll and saying, "Nice baby", without further elaboration).
- (4) Active animate partner: Activities are performed in which an inanimate toy, used as if it were animate, is treated as an active partner in the subject's activities, but does not "speak" or carry out other entirely independent actions (e.g., dolls are fed lunch, put to bed, or taken for a ride in the car).
- (5a) Dissimilar-object substitutions: One object (a non-replica) is substituted for another different object (e.g., using tiny geometric plastic shapes as food).
- (5b) Active animate agent: Inanimate toys are animated by attributing direct action (speech, actual or specific potential motion) to them (e.g., "walking" a doll across the floor, "talking" for a doll, "barking" for a dog while making it "jump up", placing a doll's hands on a steering wheel "so that he can steer").
- (6) Imaginary substitutions: Acting as if an imaginary person, object, or substance were present and real, without using stimulus objects as necessary props (e.g., talking to an imaginary person or eating an imaginary substance from an imaginary spoon). Does not include actions such as eating imaginary food from a real spoon (because in this case the spoon is a necessary prop).
- (7) Verbal substitutions: In the construction of symbolic play scenarios, the subject substitutes verbal statements for one or more portions of the action sequence (e.g., saying, "Let's say the babies have had their dinner, and now it's time to put them to bed", then putting the dolls in bed without physically acting out the "eating dinner" portion of the sequence).

Note. Levels 5a and 5b, although distinguished conceptually from each other, both receive a score of 5 on the complexity scale.

Table IV: Description of Variables Scored
from Transcribed Observations

- A. Variables scored independently for the mother and the child at each of Sessions 1, 2, and 3:
- (1) Symbolic play amount: The number of times the subject partner performed symbolic play activities in the course of the session, regardless of the specific content or the complexity level involved.
- (2) Symbolic play complexity: The highest complexity level (Table III) demonstrated at least once by the subject partner in the course of the session.
- (3) Object use: The number of different toys (of the 20 toys available) that the subject partner used in a conventional or functional manner in the course of a session.
- (4) Information about objects: The number of times the subject partner expressed information about objects by labelling them or by mentioning their physical properties (colour, size, texture, shape, quantity, etc.).
- B. Variable scored only for the mother at each of Sessions 1, 2, and 3:
- (1) Mother's symbolic play suggestions: The number of times the mother verbally suggested that the child carry out a symbolic play activity, regardless of whether or not the child complied with the suggestion.
- C. Interactional variables scored at each of Sessions 1, 2, and 3:
- (1) Joint participation: The proportion of incidents in which both subject partners performed activities that could be scored in any of the categories of sections A and B above.
- (2) Maternal directiveness: The proportion of incidents in which the mother directed or determined the content of play (as opposed to direction of play content by the child).
- D. Variables scored independently for the mother and the child at Session 3 only:
- (1) Themes initiated: The number of themes (cooking, eating, sleeping, driving vehicles, using bathtub and/or toilet, repairing objects with tools, etc.) initiated by the subject partner in the course of a session. Note that this is independent of symbolic play amount. One theme could involve one or more than one symbolic play activity.

Table IV (Cont'd)

(2) Elaborations initiated: The number of times the subject partner initiated an elaboration (addition of a discrete action element or descriptive detail) to a theme in the course of a session.

(3) Verbal organization: The number of times the subject partner verbally planned and organized a theme (by specifying activities in advance, verbally coordinating the players' actions, specifically mentioning pretense, discussing the appropriateness of objects for representation, giving the reason for an enacted activity, or designating a physical area as a location in the scenario) in the course of the session.

joint participation and maternal directiveness. At the third session only, when the complexity of play warranted their inclusion, three additional variables were scored for each subject partner separately: themes initiated, elaborations initiated, and verbal organization.

Six of the transcripts from each of the sessions were independently coded by the experimenter and another observer (a different person at each session). The second observer had received training beforehand in using the coding scheme, employing different transcripts for training purposes. Interobserver percentage agreement rates for all of the categories in the coding scheme, calculated on the basis of incident-by-incident agreements and disagreements on the codes scored, are presented in Appendix C along with the coding procedure. Only the reliabilities relevant to each of the variables analyzed in this study will be presented here, and may be found in Table V. It should be noted that these percentage agreement rates apply to the incident-by-incident agreement rate in coding, and not simply to the frequencies or proportions derived from the coding to form variable scores.

Table V: Interobserver Reliabilities Applicable to Each Variable

<u>Variable</u>	<u>Session</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
Child's symbolic play amount	89%	92%	97%
Child's symbolic play complexity	89%	92%	97%
Child's object use	75%	89%	92%
Child's information	--	82%	84%
Mother's symbolic play amount	86%	95%	96%
Mother's symbolic play complexity	86%	95%	96%
Mother's object use	85%	87%	94%
Mother's information	85%	84%	88%
Mother's symbolic play suggestions	76%	81%	94%
Joint participation	100%	100%	100%
Maternal directiveness	88%	86%	90%
Child's themes initiated	--	--	90%
Child's elaborations initiated	--	--	84%
Child's verbal organization	--	--	91%
Mother's themes initiated	--	--	93%
Mother's elaborations initiated	--	--	86%
Mother's verbal organization	--	--	94%

Note. Percentage agreement figures are derived from incident-by-incident coding agreements and disagreements on the codes that were summed across incidents in order to obtain variable frequencies and proportions. Thus, they reflect agreement as to specific locations of behaviours in the transcripts, and not simply agreement on the overall frequencies or proportions.

Chapter Four: Results

Only the data obtained from the 25 subjects who completed all three observation sessions were prepared for analysis. After that had been done, it was decided to exclude from the analyses the results obtained from one girl and her mother, because their scores on several variables were very discrepant from those of the rest of the sample. Neither the child nor her mother demonstrated any symbolic play at any of the three sessions, and thus received scores of zero on symbolic play amount and symbolic play complexity at all three sessions, and on themes initiated, elaborations initiated, and verbal organization at Session 3. After Session 1, they were the only subject pair in the study to receive scores of zero on any of these variables. In addition, their play at all three sessions involved incidents in which one toy, such as the shapebox or puzzle, was used for a considerable length of time with the same actions repeated many times, or incidents in which books were read at length. Thus, the total number of incidents for this subject pair was exceptionally low at the first two sessions, as were their object use scores. While the results observed for this subject pair are of interest in terms of the hypotheses of the study, the exclusion of their data allows a more accurate description of the general pattern of findings. Thus, all analyses reported here are based on a sample size of 24.

The means and standard deviations of all of the variables scored from the observation sessions are presented in Table VI. For all analyses, square root transformations were performed on the maternal and child information variables because of their relatively large variabilities. Thus, the means and standard deviations presented for these variables here, and in subsequent tables and discussions, are those of the transformed variables, squared. No other variable scores were transformed. Because of the small number of children who had non-zero information scores at Session 1, and the small number of mothers who had non-zero symbolic play suggestions scores at Session 3, these variables were not used in any of the analyses.

Analyses of Variance

In order to examine differences in the means of several variables across sessions, a series of one-way repeated measures analyses of variance (ANOVAs) were carried out. Because age increases were expected on all of the child play variables, these were used as dependent measures in the ANOVAs, as were the mother's symbolic play amount and complexity, which had been hypothesized to increase with the child's age. Although no hypotheses had been made with respect to session-to-session changes in the mother's information score, the joint participation scores, and the total number of incidents, the

Table VI: Means and Standard Deviations of all
Observation Session Variables

<u>Variable</u>	<u>Session 1</u>		<u>Session 2</u>		<u>Session 3</u>	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
<u>Child Scores</u>						
Sym. Play Amount	2.25	2.27	7.29	4.56	6.17	4.14
Sym. Play Complexity	1.92	1.69	3.75	.85	5.21	1.02
Object Use	7.29	3.17	11.46	3.23	10.71	2.58
Information	*	*	8.04	4.20	32.66	.70
Themes Initiated	--	--	--	--	2.38	2.10
Elaborations Initiated	--	--	--	--	10.88	7.46
Verbal Organization	--	--	--	--	3.08	2.00
<u>Maternal Scores</u>						
Sym. Play Amount	4.42	3.20	6.63	3.81	6.29	3.28
Sym. Play Complexity	3.63	1.56	4.08	1.10	5.25	.90
Object Use	10.17	2.79	11.21	3.64	11.00	2.54
Information	19.42	1.73	43.96	2.01	48.76	1.16
Sym. Play Suggestions	3.25	3.42	7.33	5.16	*	*
Themes Initiated	--	--	--	--	1.92	1.14
Elaborations Initiated	--	--	--	--	12.54	9.19
Verbal Organization	--	--	--	--	2.79	1.53
<u>Interactional Scores</u>						
Joint Participation	.51	.14	.67	.12	.91	.11
Maternal Directiveness	.63	.15	.54	.15	.61	.21
Total Incidents	24.00	6.76	21.75	5.82	7.33	2.65

Note. Asterisks denote variables not scored at some sessions. Only seven infant subjects said anything intelligible at Session 1. At Session 3, only four mothers made verbal suggestions that their children pretend, independent of already-occurring symbolic play. These scores were not used in analyses.

means of these variables also increased with the child's age, and thus ANOVAs were carried out on these dependent measures as well. Significant Session effects were found in all of these analyses. For child symbolic play amount, $F(2, 46) = 13.75$, $p < .001$; for child symbolic play complexity, $F(2, 46) = 56.94$, $p < .001$; for child object use, $F(2, 46) = 18.32$, $p < .001$; for maternal symbolic play amount, $F(2, 46) = 4.00$, $p < .05$; for maternal symbolic play complexity, $F(2, 46) = 21.35$, $p < .001$; for joint participation, $F(2, 46) = 74.29$, $p < .001$; and for total incidents, $F(2, 46) = 64.37$, $p < .001$.

Post hoc comparisons between all pairs of means were conducted for each of the dependent variables using Tukey's Honestly Significant Difference test. The results of these comparisons are presented in Table VII. It may be seen that the child's symbolic play amount increased significantly between 12-14 and 20-22 months of age, but that significant increases did not occur between 20-22 and 33-39 months. The child's symbolic play complexity level increased significantly between 12-14 and 20-22 months, and again between 20-22 and 33-39 months. The child's object use increased significantly between 12-14 and 20-22 months, but not subsequently. Mothers demonstrated a significantly greater amount of symbolic play at the second session than at the first, but their amount of symbolic play did not increase significantly again at the third session. Maternal symbolic play complexity, on the other hand,

Table VII: Post Hoc Comparisons Between Session Means
for each Dependent Variable

<u>Variable</u>	<u>Means</u>			<u>Comparison</u>		
	<u>Sess1</u>	<u>Sess2</u>	<u>Sess3</u>	<u>S1-S2</u>	<u>S1-S3</u>	<u>S2-S3</u>
Child S.P. Amt.	2.25	7.29	6.17	*	*	
Child S.P. Comp.	1.92	3.75	5.21	*	*	*
Child Obj. Use	7.29	11.46	10.71	*	*	
Moth. S.P. Amt.	4.42	6.63	6.29	*		
Moth. S.P. Comp.	3.63	4.08	5.25		*	*
Moth. Info.	19.42	43.96	48.76	*	*	
Joint Particip.	.51	.67	.91	*	*	*
Total Incidents	24.00	21.75	7.33		*	*

Note. Comparisons were made using Tukey's Honestly Significant Difference test. Asterisks indicate differences between session means significant at $p < .05$.

did not increase significantly from the first to the second session, but did do so between the second and third sessions. The proportion of incidents in which both subject partners jointly participated increased significantly from Session 1 to Session 2, as well as from Session 2 to Session 3. The total number of incidents did not significantly differ between the first and second sessions, but decreased significantly and dramatically at the third session, to approximately one-third of what it had been at the first two sessions.

In order to examine differences in the means from session to session for the two variables for which scores were used only at two sessions, repeated measures t -tests were conducted on these variables. The child's information score increased significantly from a mean of 8.04 at Session 2 to a mean of 32.66 at Session 3, $t(23) = 6.62, p < .001$. The maternal symbolic play suggestions scores also increased significantly from a mean of 3.25 at Session 1 to a mean of 7.33 at Session 2, $t(23) = 4.49, p < .001$. It may be noted that, while no significance tests were conducted, the child's information score also increased dramatically at Session 2 from Session 1, when too few appropriate responses occurred to use the scores. By the same token, it may be noted that maternal symbolic play suggestions decreased dramatically at Session 3, when too few maternal suggestions occurred for the scores to be used.

Increases in Symbolic Play Complexity

In addition to the ANOVAs conducted to examine increases in mean child and maternal symbolic play complexity across sessions, the complexity scores were also examined in terms of the order of appearance of different complexity levels in play at the three sessions. Table VIII presents the frequency and percentage of child subjects who were assigned to each level as their highest level of play demonstrated at each session. A similar description of the distribution of maternal complexity scores is presented in Table IX. It may be seen from Table VIII that behaviours lower on the scale predominated at Session 1, behaviours in the middle range predominated at Session 2, and behaviours higher on the scale predominated at Session 3. An examination of the proportions of children assigned to each level at each session indicates a pattern in which behaviours at Levels 1 and 2 are highest at Session 1, decline at Session 2, and are absent as highest levels at Session 3; Levels 3 and 4 increase from Session 1 to Session 2, then decline at Session 3; and Levels 5, 6, and 7 are absent or rare at Sessions 1 and 2, but increase at Session 3. The pattern is consistent with a step-like scale sequence. A similar pattern is seen in Table IX for mothers, although in general their complexity levels are somewhat higher than those of the children at each session.

Table VIII: Frequency and Percentage of Children Assigned to Each (Highest) Complexity Level at Each Session

<u>Level</u>	<u>Session 1</u>		<u>Session 2</u>		<u>Session 3</u>	
	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>
0. No S.P. scored	6	25.0	0	0	0	0
1. Replica alone	7	29.2	1	4.2	0	0
2. Self-as-agent	2	8.3	1	4.2	0	0
3. Passive partner	2	8.3	3	12.5	0	0
4. Active partner	6	25.0	17	70.8	7	29.2
5. Object subst./ Active agent	1	4.2	2	8.3	8	33.3
6. Imag. subst.	0	0	0	0	6	25.0
7. Verbal subst.	0	0	0	0	3	12.5

Table IX: Frequency and Percentage of Mothers Assigned to Each (Highest) Complexity Level at Each Session

<u>Level</u>	<u>Session 1</u>		<u>Session 2</u>		<u>Session 3</u>	
	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>
0. No S.P. scored	2	8.3	1	4.2	0	0
1. Replica alone	2	8.3	0	0	0	0
2. Self-as-agent	0	0	0	0	0	0
3. Passive partner	2	8.3	2	8.3	0	0
4. Active partner	11	45.8	14	58.3	5	20.8
5. Object subst./ Active agent	7	29.2	6	25.0	10	41.7
6. Imag. subst.	0	0	1	4.2	7	29.2
7. Verbal subst.	0	0	0	0	2	8.3

Tables X and XI present the complexity scores for individual children and mothers respectively at the three sessions. In only one of the 24 child subjects did complexity levels decline from one session to the next. This reversal was by one level from Session 1 to Session 2, and the complexity level increased once more at Session 3. In all other child subjects, complexity levels increased or remained constant from session to session. Reversals occurred for seven of the 24 mothers. In all but one case, these reversals were by one level only, and only from one session to another, not between both pairs of sessions. Statistical scaling techniques were not applied to these data because of the conditions under which the data were collected. The examination of data collected at lengthy intervals and in short free-play sessions would not allow a proper test of whether these complexity levels form a Guttman-type scale in the order of their appearance in children's play, or in the play of mothers with their young children.

Table X: Highest Complexity Level Demonstrated by Each Child at Each Session

<u>Subject No.</u>	<u>Sess. 1</u>	<u>Sess. 2</u>	<u>Sess. 3</u>
1	4	4	4
2	0	4	5
3	0	4	6
4	4	5	6
5	1	4	6
6	4	5	7
7	1	4	5
8	0	1	4
9	3	4	5
10	0	2	6
11	1	4	4
12	1	4	4
13	2	3	5
14	1	4	6
15	3	3	5
16	2	3	5
17	0	4	5
18	4	4	4
19	5	4	7
20	1	4	5
21	1	4	6
22	4	4	7
23	4	4	4
24	0	4	4

*

* Reversal of expected direction.

Table XI: Highest Complexity Level Demonstrated by
Each Mother at Each Session

<u>Subject No.</u>	<u>Sess. 1</u>	<u>Sess. 2</u>	<u>Sess. 3</u>
1	4	4	5
2	3	4	5
3	4	5	6
4	5	5	6
5	4	5	6
6	5	6	6
7	5	4	5 *
8	0	0	4
9	4	4	5
10	4	4	6
11	1	4	4
12	4	5	4 *
13	3	3	5
14	4	4	6
15	5	4	5 *
16	4	3	5 *
17	0	4	5
18	5	4	5 *
19	4	4	7
20	4	4	5
21	5	4	6 *
22	5	5	7
23	4	5	4 *
24	1	4	4

* Reversal of expected direction.

Principal Components Analyses

In order to reduce the large number of variables for further analysis, two Principal Components analyses were conducted. The first of these analyzed the child play variables (object use, symbolic play amount, and symbolic play complexity) from each of the three sessions, and the additional child play variables (themes initiated, elaborations initiated, and verbal organization) from the third session. The second analyzed the maternal play variables (object use, symbolic play amount, and symbolic play complexity) from all three sessions, the additional maternal play variables from the third session (themes initiated, elaborations initiated, and verbal organization), the maternal symbolic play suggestions variables from Session 1 and 2, the maternal information scores from all three sessions, and the interactional variables (joint participation and maternal directiveness) from all three sessions. The intent of these two analyses was to provide factor scores that could be used to examine relationships both within and across sessions between the child's play and the child's social environment during play. Social environment was conceived as maternal plus interactional behaviours, and thus maternal and interactional variables were analyzed together. In each of the two Principal Components analyses, a Direct Quartimin rotation was performed following the initial extraction of Principal Components. An oblique rotation was

selected because it was thought that allowing the components extracted to become intercorrelated would best reflect the likely nature of the dimensions of play at issue, and would thus allow an examination of the correlations between the factors within each of the sets of play variables.

In the analysis of the child play variables, 12 factors were initially extracted. Table XII presents the eigenvalues and variance accounted for by these factors. Three factors with eigenvalues greater than 1.00 were retained for rotation. These factors accounted for 74% of the variance. All of the child play variables from Session 1 loaded on the first factor, all of the variables from Session 2 loaded on the second factor, and all of the variables from Session 3 loaded on the third factor. Table XIII presents the loadings of the variables on these three factors. The correlations between the rotated factors are presented in Table XIV. It may be seen that there were low positive correlations between the factors representing play at Session 1 and Session 3 ($r = .20$), and between the factors representing play at Session 2 and Session 3 ($r = .25$). There was a more substantial positive correlation between the factors representing play at Sessions 1 and 2 ($r = .42$).

Table XII: Eigenvalues and Variance Accounted for by Unrotated Initial Factors from P.C.A. of Child Variables

<u>Factor</u>	<u>Eigenvalue</u>	<u>Cumulative % Variance</u>
1	4.98	41.52
2	2.67	63.80
3	1.21	73.85
4	.86	81.04
5	.61	86.18
6	.47	90.10
7	.43	93.66
8	.27	95.95
9	.21	97.72
10	.15	98.98
11	.08	99.69
12	.04	100.00

Table XIII: Loadings of Child Play Variables on Direct
Quartimin Rotated Principal Components Factors

<u>Variable</u>	<u>Factor_1</u>	<u>Factor_2</u>	<u>Factor_3</u>
Child Sym. Play Amt. Sess. 1	.95	--	--
Child Sym. Play Comp. Sess. 1	.82	--	--
Child Obj. Use Sess. 1	.79	--	--
Child Sym. Play Amt. Sess. 2	--	.87	--
Child Sym. Play Comp. Sess. 2	--	.71	--
Child Obj. Use Sess. 2	--	.96	--
Child Sym. Play Amt. Sess. 3	--	--	.89
Child Sym. Play Comp. Sess. 3	--	--	.79
Child Obj. Use Sess. 3	--	--	.63
Child Themes Initiated Sess. 3	--	--	.90
Child Elab. Initiated Sess. 3	--	--	.94
Child Verbal Organiz. Sess. 3	--	--	.75

Note. Variable loadings <.30 have not been entered in the table.

Table XIV: Correlations Between Rotated Factors from the
Child Principal Components Analysis

	<u>Factor_2</u>	<u>Factor_3</u>
Session 1 Play (Factor 1)		
Session 2 Play (Factor 2)	.42	
Session 3 Play (Factor 3)	.20	.25

In the analysis of the maternal and interactional variables, 23 factors were extracted. Table XV presents the eigenvalues and variance accounted for by these factors. Seven factors with eigenvalues greater than 1.00 were retained for rotation. These factors accounted for 80% of the variance. Table XVI presents the loadings of the variables on these rotated factors. All of the variables (with the exception of maternal directiveness) from Session 1 loaded on the first factor, along with small loadings for maternal symbolic play suggestions at Session 2 and maternal symbolic play complexity at Session 3. All of the variables except maternal directiveness from Session 2 loaded on the second factor, and the same variables from Session 3 loaded on the third factor.

The fourth, fifth, and sixth factors represent maternal directiveness at Sessions 1, 2 and 3 respectively. Maternal directiveness at Session 1 loaded positively on Factor 4, along with a small positive loading for object use at Session 1. Loadings for the following variables on Factor 4 were all negative: joint participation at Session 1, and maternal symbolic play complexity and information at Session 3. Factor 4 appears to represent maternal directiveness present from mid-infancy (Session 1) and related to a later lack of maternal complexity in symbolic play and a lack of conversation about objects. Maternal directiveness at Session 2 and subsequent joint participation at Session 3 loaded positively on Factor 5.

Table XV: Eigenvalues and Variance Accounted for by Unrotated Initial Factors from P.C.A. Of Maternal/Interactional Variables

<u>Factor</u>	<u>Eigenvalue</u>	<u>Cumulative % Variance</u>
1	7.08	30.78
2	3.23	44.82
3	2.10	53.95
4	1.70	61.36
5	1.62	68.40
6	1.38	74.40
7	1.21	79.67
8	.93	83.70
9	.76	87.00
10	.68	89.96
11	.51	92.16
12	.45	94.12
13	.40	95.88
14	.24	96.93
15	.24	97.97
16	.15	98.60
17	.12	99.15
18	.10	99.57
19	.05	99.78
20	.03	99.92
21	.01	99.96
22	.01	99.99
23	.00	100.00

Loadings for the following variables on this factor were all negative: maternal symbolic play complexity at both Sessions 1 and 2, and maternal themes initiated at Session 3. This factor appears to represent maternal directiveness arising at the time (Session 2) when children were first beginning to use language and to engage in more complex symbolic play, and is associated with a lack of maternal involvement in certain aspects of symbolic play at all three sessions. Maternal directiveness at Session 3 loaded positively on Factor 6, along with positive loadings for maternal information at Sessions 2 and 3, and maternal themes initiated at Session 3. The only negative loading is a small one for maternal symbolic play amount at Session 3. Factor 6 appears to represent directiveness arising when the child is older (Session 3), and is associated with maternal verbal activities (talking about objects and initiating symbolic play themes) carried out when the child is old enough to readily comprehend language.

Factor 7 is more difficult to interpret than the other factors, but appears to represent substantial maternal object use at the third session, negatively associated with joint participation then and also at Session 2. It is probable that this factor simply represents a maternal tendency to play alone rather than with the child as the child grows older, and therefore to use more different toys than would mothers engaged in more lengthy joint play episodes. However, for statistical

Table XVI: Loadings of Maternal and Interactional Variables on Directed Quartimin Rotated Principal Components Factors

<u>Variable</u>	<u>Factor</u>						
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Mo. S.P. Amt. 1	.52	--	.52	--	--	--	--
Mo. S.P. Comp. 1	.39	--	--	--	-.56	--	--
Mo. Obj. Use 1	.84	--	--	.32	--	--	--
Mo. S.P. Sugg. 1	.76	--	--	--	--	--	--
Mo. Info. 1	.85	--	--	--	--	--	--
Joint Particip. 1	.69	--	--	-.49	--	--	--
Mo. Direct. 1	--	--	--	.91	--	--	--
Mo. S.P. Amt. 2	--	.99	--	--	--	--	--
Mo. S.P. Comp. 2	--	.70	--	--	-.48	--	--
Mo. Obj. Use 2	--	.91	--	--	--	--	--
Mo. S.P. Sugg. 2	.36	.65	--	--	--	--	--
Mo. Info. 2	--	.65	--	--	--	.37	--
Joint Particip. 2	--	.40	.33	--	--	--	-.63
Mo. Direct. 2	--	--	--	--	.82	--	--
Mo. S.P. Amt. 3	--	--	.74	--	--	-.34	.37
Mo. S.P. Comp. 3	.31	--	.39	-.40	--	--	--
Mo. Obj. Use 3	--	--	.31	--	--	--	.68
Mo. Themes Init. 3	--	--	.47	--	-.48	.50	--
Mo. Elab. Init. 3	--	--	.87	--	--	--	--
Mo. Verbal Org. 3	--	--	.88	--	--	--	--
Mo. Info. 3	--	--	.35	-.34	--	.47	--
Joint Particip. 3	--	--	.67	--	.42	--	-.36
Mo. Direct. 3	--	--	--	--	--	.82	--

Note. Variable loadings <.30 have not been entered in the table.

Table XVII: Correlations Between Rotated Factors from the Maternal/Interactional Principal Components Analysis

	<u>Pl1</u>	<u>Pl2</u>	<u>Pl3</u>	<u>Dir1</u>	<u>Dir2</u>	<u>Dir3</u>
Sess. 1 Play (Factor 1)						
Sess. 2 Play (Factor 2)	.28					
Sess. 3 Play (Factor 3)	.35	.15				
Sess. 1 Direct (Fac. 4)	-.13	-.11	-.05			
Sess. 2 Direct (Fac. 5)	-.05	-.04	-.06	.09		
Sess. 3 Direct (Fac. 6)	.00	.13	-.02	.05	.02	
Factor 7	.15	.04	.16	.00	-.05	.04

reasons that will be discussed below, this factor and its relationship with the other child and maternal/interactional factors will not receive serious interpretive attention here.

Table XVII presents the correlations between the rotated factors from the maternal/interactional analysis. It may be seen that most of these correlations were of low magnitude, with the exception that the factor representing Session 1 play was positively correlated with the factors representing Session 2 play ($r = .28$) and Session 3 play ($r = .35$). Thus, there was some correspondence over time between very early maternal and interactional play and such play at both of the later sessions.

Correlational Analyses of the Factor Scores

In order to examine within- and across-session relationships between the set of child factors and the set of maternal/interactional factors, Pearson product-moment correlations between the two sets of factor scores were calculated. Because the scores to be intercorrelated came from two separate Principal Components analyses, it was necessary to ascertain whether the implied residuals from the concatenation of the two analyses were of sufficiently small magnitude to validate the use of the factor scores in the correlational analyses. To do this, estimates of the original variables in each of the analyses were calculated by summing the factor

scores, weighted by the variable loadings on each of the factors. Differences between the correlations of the original variables and the covariances of the corresponding pairs of factor score-generated variable estimates were then calculated. These differences correspond to implied residuals from a joint analysis of all of the variables from both the child and the maternal/interactional analyses. The magnitude of these implied residuals was compared to the magnitude of the actual residuals obtained from the two independent Principal Components analyses.

Figures 1, 2, and 3 present the cumulative percentage distributions of the residuals from the child and the maternal analyses, and of the implied residuals from a concatenation of the two analyses, respectively. Because in each case the distributions of positive and negative values were symmetrical, the tables present the distributions of residuals in terms of absolute magnitude. It may be seen that the implied residuals, although in general somewhat greater in magnitude than the actual residuals, are within the same general range as the actual residuals from the two analyses. 96.6% of the implied residuals are within the same range of absolute magnitude (0 to .25) as are the actual residuals from the other two analyses. However, five of the implied residuals had extreme values, between .35 and .55 in absolute magnitude. These five implied residuals involved the relationships between: a) child object use at Session 3 and maternal object use at Session 3, b) child

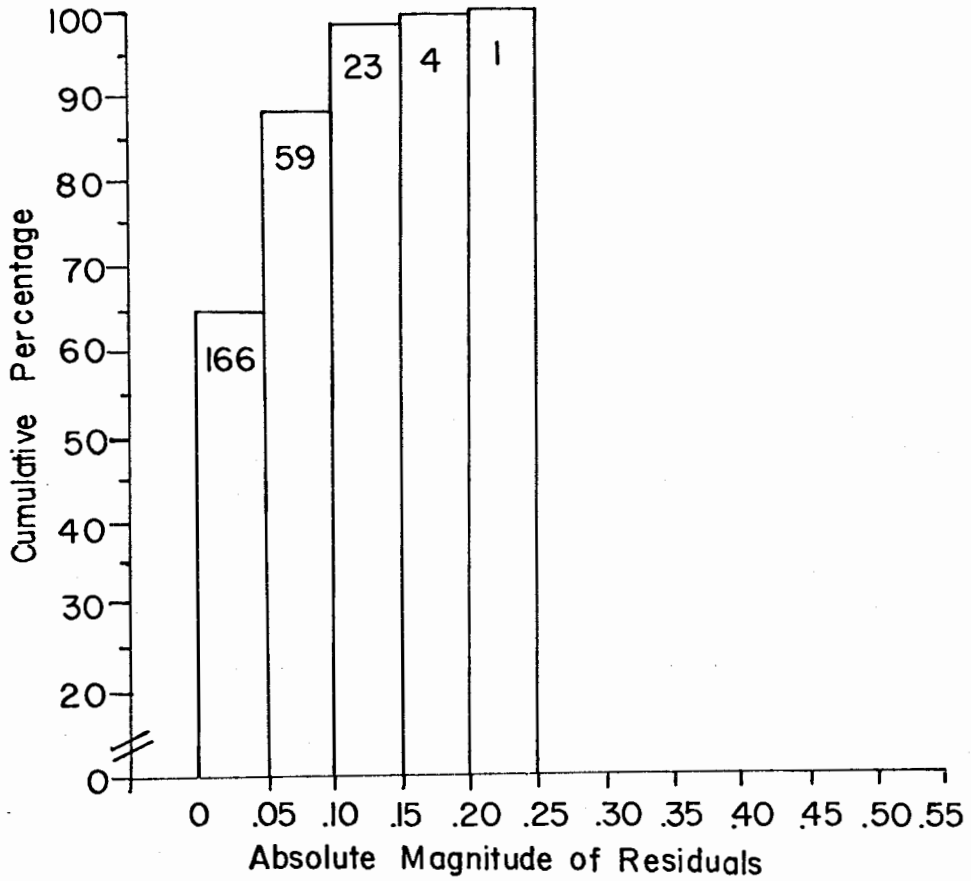


Fig. 1: Cumulative Percentage Distribution of Residuals from P.C.A. of Child Variables

Note. N=67. Frequencies inside bars.

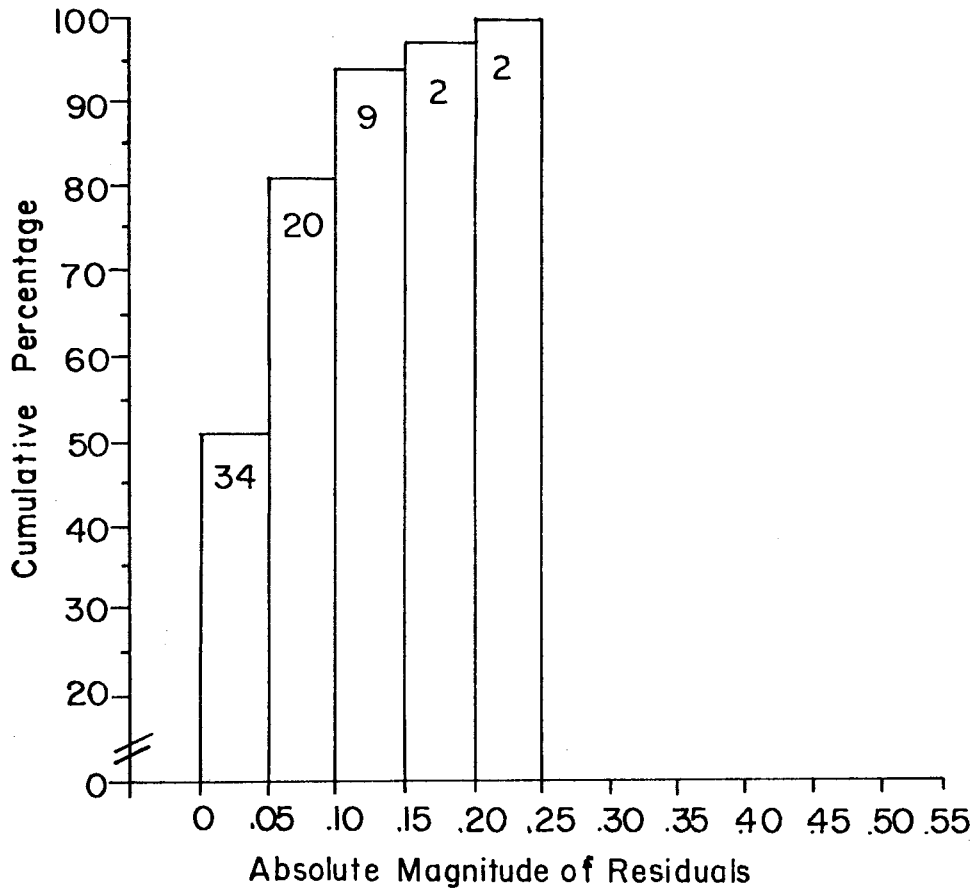


Fig.2: Cumulative Percentage Distribution of
Residuals from P. C.A. of
Maternal & Interactional Variables

Note. N = 253. Frequencies inside bars.

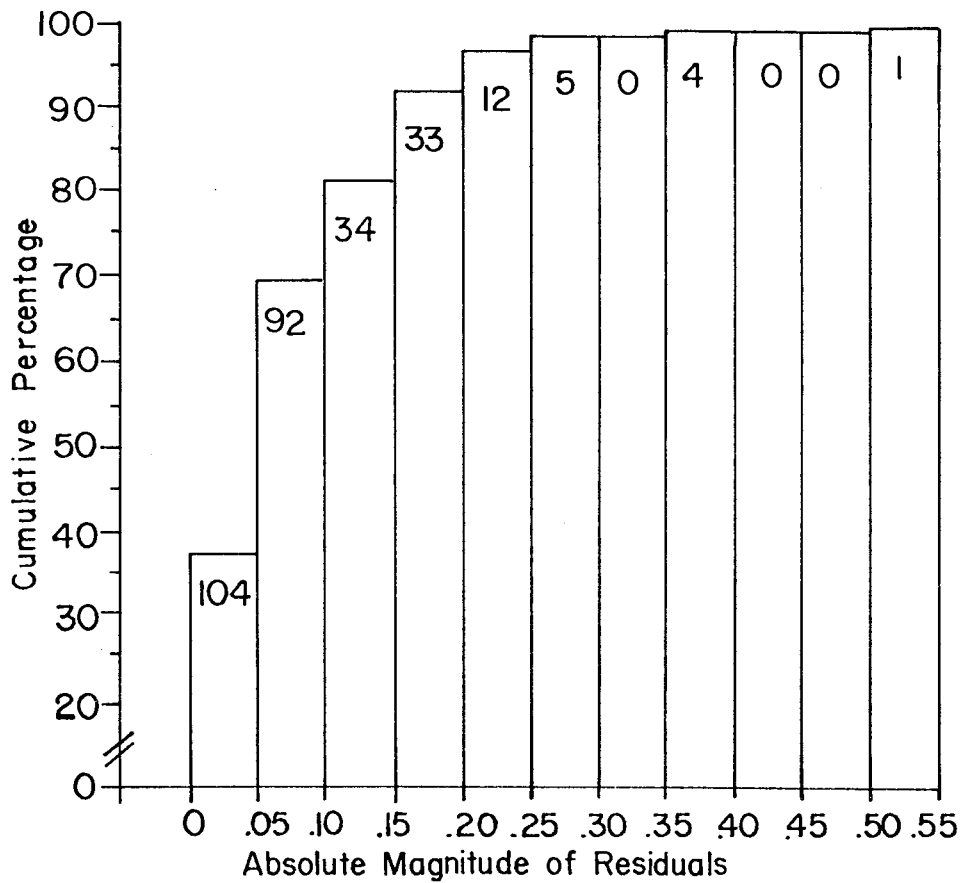


Fig.3: Cumulative Percentage Distribution of
Implied Residuals from the
Concatenation of the Two Analyses

Note. N = 285. Frequencies inside bars.

object use at Session 3 and maternal themes initiated at Session 3, c) child object use at Session 3 and maternal information at Session 1, d) child themes initiated at Session 3 and maternal themes initiated at Session 3, and e) child symbolic play complexity at Session 3 and maternal symbolic play complexity at Session 3. Because two of the variables involved in these relationships constituted the positive loadings on Factor 7 of the maternal/interactional analysis, that factor is suspect in terms of its relationship to the child analysis factors. The relationship between the factor representing maternal play at Session 3 and the factor representing child play at Session 3 must also be interpreted with caution, given the high implied residuals found for the relationships between Session 3 maternal play variables and Session 3 child play variables.

With these reservations borne in mind, the intercorrelations between the factor scores from the two analyses are presented in Table XVIII. It may be seen that the strongest relationships are those between maternal play factors and child play factors within each of the sessions. Across sessions, the Session 1 maternal play factor showed weak positive relationships with the child play factors at Sessions 2 and 3. The correlation with Session 2 child play ($r = .29$) was not significant, and the correlation with Session 3 child play ($r = .36$) was marginally significant. Session 2 maternal play was not significantly related to Session 3 child play. There

Table XVIII: Correlations Between Factor Scores from the Child and Maternal/Interactional Principal Components Analyses

<u>Maternal/Interactional Factors</u>	<u>Child Factors</u>		
	<u>Sess.1 Play</u>	<u>Sess.2 Play</u>	<u>Sess.3 Play</u>
Sess. 1 Play	.66***	.29	.36*
Sess. 2 Play	.32	.81***	.23
Sess. 3 Play	.35*	.34*	.72***
Sess. 1 Directiveness	-.09	-.06	-.46**
Sess. 2 Directiveness	-.28	-.22	-.08
Sess. 3 Directiveness	.06	.07	-.32
Factor 7	.03	-.17	.40*

* p<.10
 ** p<.05
 *** p<.001

was also a tendency for the maternal play factors at later sessions to be related to earlier child play factors. The Session 1 child play factor was non-significantly positively correlated with the Session 2 maternal play factor ($r = .32$) and marginally significantly correlated with the Session 3 maternal play factor ($r = .35$). The Session 2 child play factor was marginally significantly correlated with the Session 3 maternal play factor ($r = .34$). The three maternal directiveness factors were unrelated to child play factors at Sessions 1 and 2. However, child play at Session 3 was significantly negatively related to maternal directiveness at Session 1 ($r = -.46$), and marginally significantly negatively related to maternal directiveness at Session 3 ($r = -.32$). To summarize, the correlations of the factor scores from the two analyses indicated strong positive relationships between maternal and child play within sessions; weaker positive relationships between both early maternal and later child, and early child and later maternal, play across sessions; and negative relationships between child play at Session 3 and earlier and concurrent maternal directiveness.

The relationships between the child factor scores and other variables of interest in the study are presented in Table XIX. It may be seen that the child's information score, essentially a verbal measure, was related to the child play factors only at Session 3, where a marginally significant positive correlation

Table XIX: Correlations Between the Child Analysis Factor Scores and Other Variables

	<u>Child Factors</u>		
	<u>Sess. 1 Play</u>	<u>Sess. 2 Play</u>	<u>Sess. 3 Play</u>
Sess. 2 Child Information	.11	.22	-.06
Sess. 3 Child Information	.15	-.01	.38*
Sess. 1 Total Incidents	.50***	.45**	-.08
Sess. 2 Total Incidents	-.23	.24	-.10
Sess. 3 Total Incidents	-.21	-.34*	-.18
Maternal Education	.38*	-.17	-.16
Child Bayley Score	.05	-.19	-.09
Child PPVT Score	-.02	-.12	-.29

* $p < .10$

** $p < .05$

*** $p < .01$

was found ($r = .38$). The total number of play incidents in Session 1 was significantly positively related to the Session 1 child play factor ($r = .50$) and the Session 2 child play factor ($r = .45$). The total number of incidents at Session 2 was unrelated to the child play factors, but the total number of incidents at Session 3 was marginally significantly negatively related to the earlier Session 2 child play factor ($r = -.34$). Maternal education level was marginally significantly positively related to Session 1 child play, ($r = .38$), but not to the later child play factors. There were no significant relationships between the child play factor scores and either the Bayley administered at the second session, or the Peabody Picture Vocabulary Test administered subsequent to the third session. Correlations between the maternal/interactional factor scores and these other variables may be found in Appendix E.

Correlational Analyses of the Original Variables

The matrix of intercorrelations between all of the original variables may be found in Appendix F. Although the Principal Components analyses were carried out in order to reduce the large number of variables for further analysis, the relationships between the original child symbolic play variables, and between these and the maternal symbolic play and interactional variables, are nonetheless of interest. Table XX presents these correlations.

Table XX: Correlations Between the Original Child Variables and the Original Child, Maternal, and Interactional Variables

	<u>Child Variables</u>								
	<u>ChSP</u> <u>Amt1</u>	<u>ChSP</u> <u>Comp1</u>	<u>ChSP</u> <u>Amt2</u>	<u>ChSP</u> <u>Comp2</u>	<u>ChSP</u> <u>Amt3</u>	<u>ChSP</u> <u>Comp3</u>	<u>ChVer</u> <u>Org3</u>	<u>ChEl</u> <u>Init3</u>	<u>ChTh</u> <u>Init3</u>
Child Sym.									
<u>Pl. Comp. 1</u>	.71c								
Child Sym.									
<u>Pl. Amt. 2</u>	.36a	.31							
Child Sym.									
<u>Pl. Comp. 2</u>	.35a	.38	.46b						
Child Sym.									
<u>Pl. Amt. 3</u>	.13	.10	.07	.21					
Child Sym.									
<u>Pl. Comp. 3</u>	-.04	.24	.16	.26	.67c				
Child Verb.									
<u>Organiz. 3</u>	.31	.36a	.33	.27	.63c	.55c			
Ch. Elab.									
<u>Init. 3</u>	-.02	.24	.17	.13	.71c	.66c	.82c		
Ch. Themes									
<u>Init. 3</u>	-.02	.11	.09	.18	.69c	.61c	.74c	.80c	
<hr/>									
Mo. Sym. 1									
<u>Pl. Amt. 1</u>	.57c	.74c	.26	.43b	.46b	.43b	.40a	.42b	.28
Mo. Sym. 1									
<u>Pl. Comp. 1</u>	.43b	.55c	.37a	.39a	.38a	.46b	.32	.31	.14
Mo.									
<u>Inform. 1</u>	.28	.30	.22	.00	.23	.34	.13	.13	.18
Joint									
<u>Partic. 1</u>	.37a	.56c	.00	.23	.33	.49c	.44b	.42b	.27
Maternal									
<u>Direct. 1</u>	-.17	-.33	.02	-.15	-.17	-.46b	-.55b	-.36a	-.26
Mo. Sym.									
<u>Pl. Amt. 2</u>	.22	.29	.67c	.59c	.07	.23	.19	.16	.22
Mo. Sym.									
<u>Pl. Comp. 2</u>	.29	.33	.57c	.82c	.23	.41b	.31	.19	.23
Mo.									
<u>Inform. 2</u>	.32	.13	.54c	.29	.09	.17	.28	.11	.05
Joint									
<u>Partic. 2</u>	.12	.38a	.46b	.43b	.12	.12	.30	.22	.16
Maternal									
<u>Direct. 2</u>	.09	.00	-.11	-.03	.04	-.02	.02	.03	.07

Cont'd...

Table XX (Cont'd)

	ChSP <u>Amt1</u>	ChSP <u>Comp1</u>	ChSP <u>Amt2</u>	ChSp <u>Comp2</u>	ChSp <u>Amt3</u>	ChSP <u>Comp3</u>	ChVer <u>Org3</u>	ChEl <u>Init3</u>	ChTh <u>Init3</u>
Mo Sym.									
<u>Pl. Amt. 3</u>	.22	.13	.11	.29	.95c	.62c	.64c	.72c	.70c
Mo. Sym.									
<u>Pl. Comp. 3</u>	.01	.33	.17	.26	.70c	.94c	.62c	.78c	.66c
Mo.									
<u>Inform. 3</u>	.22	.29	.30	.12	.42b	.38a	.34	.32	.07
Joint									
<u>Partic. 3</u>	.11	.21	.05	.10	.37a	.29	.24	.35a	.18
Maternal									
<u>Direct. 3</u>	-.10	.07	.27	-.13	-.52b	-.46b	-.28	-.26	-.39a
Mo. Verb.									
<u>Organiz. 3</u>	.23	.21	.49b	.13	.77c	.45b	.67c	.70c	.48b
Mo. Elab.									
<u>Init. 3</u>	.21	.14	.26	.14	.69c	.35a	.54c	.55c	.25
Mo. Themes									
<u>Init. 3</u>	.43b	.24	.30	.29	.21	-.02	.00	.03	-.28

Note. Intercorrelations among child variables are above the line. Correlations between child and maternal/interactional variables are below the line.

a $p < .10$

b $p < .05$

c $p < .01$ (Some coefficients marked "c" are significant at $p < .001$.)

There were strong, significant positive correlations ($r = .46$ to $.82$) between all of the child play variables within each separate session. Across sessions, there were nonsignificant and marginally significant positive correlations ($r = .31$ to $.38$) between Session 1 child symbolic play amount and complexity, and Session 2 symbolic play amount and complexity and Session 3 verbal organization. There were no significant cross-session relationships between any other pairs of child play variables.

Strong, significant positive correlations ($r = .43$ to $.95$) were obtained between maternal symbolic play amount and complexity and child symbolic play amount and complexity, within each separate session. Maternal information scores were significantly positively related to child symbolic play amount at Session 2 ($r = .54$); and at Session 3 they were nonsignificantly or marginally positively related to child symbolic play amount and complexity, verbal organization, and elaborations initiated. Within sessions, joint participation scores were significantly or marginally significantly related to child symbolic play amount and complexity at Sessions 1 and 2 ($r = .37$ to $.56$), and at Session 3 they were related at a marginal level of significance to child symbolic play amount ($r = .37$) and elaborations initiated ($r = .35$). Maternal directiveness at Session 3 was negatively related to all of the Session 3 child play variables, significantly so for child symbolic play amount

and complexity ($r = -.26$ to $-.52$). Although in the two earlier sessions maternal directiveness was consistently negatively related to the child play variables, none of these relationships were significant.

Across sessions, child symbolic play complexity at Session 2 was significantly positively correlated with Session 1 maternal symbolic play amount ($r = .43$) and marginally positively correlated with Session 1 maternal symbolic play complexity ($r = .39$). Session 3 child symbolic play complexity was significantly positively correlated with Session 1 maternal symbolic play amount ($r = .43$) and complexity ($r = .46$); and also with Session 2 maternal symbolic play complexity ($r = .41$). Session 3 child symbolic play complexity was also significantly positively related to Session 1 joint participation ($r = .49$). Child symbolic play amount at Session 2 was correlated at a marginal significance level with Session 1 maternal symbolic play complexity ($r = .37$); and child symbolic play amount at Session 3 was marginally significantly correlated with Session 1 maternal symbolic play complexity ($r = .38$) and significantly positively correlated with Session 1 maternal symbolic play amount ($r = .46$). Two of the Session 3 child play variables were significantly negatively correlated with Session 1 maternal directiveness. These were Session 3 child symbolic play complexity ($r = -.46$) and child verbal organization ($r = -.54$). Session 1 maternal directiveness was also marginally

significantly negatively related to child elaborations initiated at Session 3 ($r = -.36$). It may be noted that although some relationships were found between Session 1 maternal and interactional variables and Session 2 child symbolic play, and between Session 2 maternal and interactional variables and Session 3 child symbolic play, the strongest cross-session relationships between early maternal and interactional variables and later child symbolic play scores were those between Sessions 1 and 3.

Some relationships were also found between early child symbolic play and later maternal and interactional variables. Child symbolic play amount at Session 1 was significantly positively correlated with Session 3 maternal themes initiated ($r = .43$), and a marginally significant positive relationship was found between Session 1 symbolic play complexity and Session 2 joint participation ($r = .38$). Session 2 child symbolic play amount was significantly positively related to maternal verbal organization at Session 3 ($r = .49$).

Sex Differences

A series of t -tests were conducted in order to determine whether mean scores on the child and maternal/interactional factors, and on the other variables of interest not included on the Principal Components analyses, differed between male and

female subjects. Table XXI presents the results of these analyses. It may be seen that the only variable on which significant sex differences were found was the maternal directiveness factor score from Session 1. The mothers of boys received significantly higher scores than did the mothers of girls, $t(22) = 2.21, p < .05$.

Table XXI: Results of T-Tests for Sex Differences on the Child and Maternal/Interactional Factor Scores and Other Variables

<u>Factor</u>	<u>Female</u> <u>Mean</u>	<u>Male</u> <u>Mean</u>	<u>t Value</u>	<u>p Value</u>
Sess. 1 Child Play	.15	-.07	.51	n.s.
Sess. 2 Child Play	-.16	.08	.55	n.s.
Sess. 3 Child Play	.40	-.20	1.41	n.s.
Sess. 1 Mother Play	.42	-.21	1.50	n.s.
Sess. 2 Mother Play	-.08	.05	.30	n.s.
Sess. 3 Mother Play	.03	-.01	.10	n.s.
Sess. 1 Mo. Directiveness	-.59	.30	2.21	<.05
Sess. 2 Mo. Directiveness	.15	-.08	.52	n.s.
Sess. 3 Mo. Directiveness	-.09	.05	.31	n.s.
Factor 7	-.14	.07	.65	n.s.
 <u>Variable</u>				
Sess. 2 Child Info.	9.55	7.33	.42	n.s.
Sess. 3 Child Info.	34.22	31.80	.58	n.s.
Sess. 1 Total Incidents	24.63	22.69	.31	n.s.
Sess. 2 Total Incidents	19.75	22.75	1.20	n.s.
Maternal Education	13.50	13.31	.23	n.s.
Child Bayley Score	110.17	115.45	.57	n.s.
Child PPVT Score	117.50	116.20	.24	n.s.

Note. For all tests conducted, df = 22.

Chapter Five: Discussion

In this chapter, the results will be considered with regard to the hypotheses, the relevant literature, and some speculative comments. The following organizational structure will be used to discuss:

1. Age-related changes on the child and interactional variables, and some speculations on the nature of these changes;
2. The results obtained for the children on the symbolic play complexity scale, considered in the light of the four complexity dimensions discussed earlier;
3. Changes in maternal behaviours over the course of the sessions;
4. The relationships among child play and other behaviours within and across sessions;
5. The relationships among maternal and interactional behaviours within and across sessions;
6. Within-session and cross-session relationships among child play and maternal and interactional play variables;
7. The relationships between child symbolic play and the other non-play variables measured in the study;
8. The absence of sex differences; and
9. Some concluding speculations about mother-child symbolic play interaction and some suggestions for the direction of future research.

Age-Related Changes in Child and Interactional Behaviours

Fein and Apfel (1975) have distinguished between style and structure variables in children's play. Style variables reflect the diversity of objects with which children play, or the variety of activities carried out with a single object. Fein and Apfel have noted that style variables have been associated with problem-solving abilities (e.g., Kagan, 1971) and with the child's rate of processing information (e.g. Messer & Lewis, 1972). Style variables may be influenced by "context sensitive momentary motivational or affective states" (p. 2) and, in general, by the situation in which play occurs. Structure variables, on the other hand, reflect changes in the kinds of activities children generally carry out with objects. Fein and Apfel have stated that such changes, in infancy, involve "a shift from simple sensory-motor activities to combinatorial activities which index the child's growing capacity to conceptualize relations between objects" (p. 2). In their longitudinal research with infants between the ages of 18 and 24 months, these investigators found that style variables are more volatile from situation to situation than structural ones, but that both are sensitive to age changes.

In the present study, the object use and symbolic play amount measures could be considered to be style variables, while

the symbolic play complexity measure is structural. Joint participation, a measure of the interactiveness of joint play, could be considered to reflect both style (situational determinants) and structural factors (coordination and integration of social activities). The total number of incidents, too, reflects both style (situational determinants) and structure (in that fewer play incidents in a fixed time interval indicate longer, usually combinatorial and integrated sequences of activities with objects). Age-related changes were found on all of these variables in the present research.

Symbolic play amount and object use both increased significantly in children between 12-14 and 20-22 months, but not between 20-22 and 33-39 months. It is likely that the early changes on both of these variables reflect increasing knowledge about the uses of objects. At the early session, when the children used a mean of 7.29 of the twenty toys available and engaged in a mean of 2.25 incidents of symbolic play, they demonstrated a relative lack of knowledge about the functions of the toys available in the playroom. Although such activities were not quantified, a large proportion of the infants' play at this session consisted of the application of simple, functionally-inappropriate sensory-motor action schemes (mouthing, banging, throwing, holding) to the available objects. By 20-22 months, the quality of object play had changed considerably. Functionally-inappropriate action schemes were far

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less prevalent, and the children now used a mean of 11.46 of the available objects in functionally-appropriate ways. The incidence of symbolic play increased from 2.25 to 7.29 incidents. Given the prevalence of toys in the playroom for which the appropriate function is symbolic play (dolls, toy vehicles, utensils, tools, etc.), the increase in symbolic play amount may be viewed as an increase in appropriate object use, as well as a signal that the children were now carrying out a new kind of (symbolic) activity that had been rare in their earlier play.

These observations are consistent with past research in which an increase in symbolic play activity has been observed during this period of infancy, concurrent with a general increase in appropriate functional play. Inhelder et al. (1972) have reported a similar concordance between functional play and symbolic play, as has Fein (1975). More generally, several researchers have reported increases in functionally-directed play between 12 and 20 months. For example, Zelazo and Kearsley (1980) have reported the following results from their cross-sectional study of infants' free play between 9.5 and 15.5 months:

Stereotypical play (87% of total active play at 9.5 months) gave way to relational (35% at 13.5 months) and functional play (52% at 15.5 months) as the dominant activity. Both functional play and the number of different appropriate uses of toys were rare at 9.5 months, appeared reliably at 11.5 months, and increased linearly through 15.5 months (p. 111).

Zelazo and Kearsley have offered two possible explanations for increases in both the diversity and specificity of actions with objects over this age span. One is that neuromotor maturation produces motor development that allows objects to be handled with greater ease and dexterity. However, their preferred explanation is that a major cognitive transition occurs at about 12 months, allowing what they term "hypothesis activation", or: "the increasing facility to activate prior knowledge of an object's functions and to direct it into a series of object-specific manipulations" (p. 113). It may be argued that the term "hypothesis activation" may overstate the degree of abstraction and logic involved in the cognition of one-year-olds, and also that both explanations may be valid and are not necessarily mutually exclusive. Nonetheless, it appears likely that cognitive changes over the second year of life result in more directed and organized behaviours with objects, a position generally held by the Piagetians.

The absence of significant increases in the present research in both object use and symbolic play amount between 20-22 and 33-39 months may reflect a kind of ceiling effect on increases in functional play. One plausible interpretation of these results is that a dramatic increase in knowledge about the functions (including symbolic functions) of toys occurs between approximately 12 and 20 months, but that by about 20 months, children are generally aware of the functions of typical toys for

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small children, and beyond that age, their actions with them show refinements of action schemes rather than increases in the number of objects used or in the number of times symbolic activities are carried out with toys. Simply put, there are only so many different play activities that can typically be carried out with a set of toys during a 15-minute period, and the ceiling (in terms of functional toy use) appears to be reached by about 20 months. After that, the number of objects played with remains relatively constant, and situational determinants (the child's mood and preferences, the available toys, and the actions of play partners) probably account for intra-individual variation in measures like the number of different toys used appropriately or the number of incidents of symbolic play. For this reason, frequency measures such as these are probably most appropriate for measuring developmental change in mid-infancy, but not necessarily later in development. Inter-subject differences, on the other hand, may nonetheless continue to tell us something about individual children's knowledge of objects and the kinds of play activities (including symbolic ones) that may be carried out with them.

It may also be noted that the mean total number of play incidents observed declined very sharply between 20-22 and 33-39 months. At the first two sessions, the means for this variable were 24.0 and 21.75 incidents respectively, but at the third session the mean number of play incidents had dropped to 7.33.

This change does not reflect a decrease in the number of different objects used, because the object use measure did not change significantly from Session 2 to Session 3. An examination of the play transcripts shows that between Sessions 2 and 3, the quality of children's play changed from short incidents (a mean of 41.4 seconds in length) in which relatively brief action sequences were carried out with objects, and in which the same objects were returned to several times; to longer incidents (a mean of 122.8 seconds in length) in which the uses of objects were demonstrated at length before play proceeded to the use of other objects.

It will be recalled that the total number of play incidents is a dyadic measure, in that an incident is defined as a play sequence involving the mother, the child, or both. However, an examination of only those incidents in which the child was actively involved (alone or with the mother) revealed that at Session 1, the mean proportion of child incidents with content repeated from earlier incidents was 44.6%; at Session 2 it was 35.6%; and at Session 3 it was 0.8%. The majority of children at Session 3 had no play incidents at all in which earlier content was repeated, and the other children had only a very small proportion of repeats.

These observations further clarify the nature of changes in the quality of play with toys over the age range studied. At both 12-14 and 20-22 months, infants and their mothers engaged in

a large number of play incidents of less than a minute's average duration. Over this period, however, the mean number of objects the child used appropriately increased from 7.29 to 11.6, and the proportion of child play incidents with repeated content dropped from 44.6% to 35.6%. Thus, the children engaged in as many play incidents as they had earlier, but now expanded the number of different objects they played with, and played less repeatedly with the same objects. At 33-39 months, the children still played with approximately the same number (a mean of 10.71) of different objects as they had at 20-22 months, but now their play consisted of far fewer incidents of longer duration (about two minutes on average) in which the same objects were rarely played with repeatedly. Between Sessions 2 and 3, the mean proportion of child play incidents with repeated content dropped from 35.6% to 0.8%, or practically none. Thus, the children now played with the same number of objects as they had earlier, but devoted more time to each object before going on to play with other, different objects. Measures such as the number of play incidents and the proportion of repeated incidents may, therefore, index increasing sophistication in children's play with objects over the period in question.

The joint participation measure may index another aspect of increasing play sophistication over the same age span -- that of increasing coordination of social play. The proportion of incidents in which children and their mothers both actively

participated (as opposed to solitary or parallel play incidents) increased significantly from a mean of 51% at Session 1, to a mean of 67% at Session 2, to a mean of 91% at Session 3. Thus, while only about half of the play carried out was socially interactive when the children were 12-14 months old, most of it was socially interactive by the age of 33-39 months. The question of whether these increases in interactivity were due to the mothers, the children or both, cannot be answered in the context of the present research design. However, it may be noted that in the first two sessions, approximately equivalent numbers of solitary or parallel play incidents were observed in both mothers and children. Therefore, it was not predominantly a case of children electing to play alone while their mothers attempted to engage them in joint play, nor of the reverse: mothers playing alone while the children attempted to engage them in joint play. Thus, it is suggested that both increases in the children's play and social skills, and in the mother's ability or motivation to engage the children in joint play, contributed to the increase in joint play observed. It may also be noted that the mothers may have found it easier and more pleasurable to engage in the coordinated play sequences of older children than in the sensorimotor play of younger infants.

Measures of structural change, such as the symbolic play complexity variable used in the present research, should by definition be reliable indicators of developmental progress. A

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significant linear increase in complexity was found in this study. The level of the most complex symbolic play behaviours observed for each child rose significantly from a mean of 1.92 at 12-14 months, to 3.75 at 20-22 months, to 5.21 at 33-39 months. These average group increments, as well as the patterns of individual change in symbolic play complexity to be discussed below, indicate that the complexity measure used in this study validly assesses structural change in symbolic play in infants and toddlers.

Changes in the Structural Complexity of Children's Symbolic Play

The child subjects demonstrated age-associated increases on both the object and agent transformation dimensions discussed in Chapter Two, as measured by the complexity scale devised by the present author. At 12-14 months, those infants who demonstrated symbolic play activities typically performed action no higher than the lowest four steps on the scale, the majority of those at Levels 1, 2, and 3 (see Tables III and VIII). On the dimension of object transformations, typical activities involved the use of toy replicas. Children pushed toy vehicles and made engine noises (Level 1); stirred a toy spoon around in a toy muffin tin, then put the spoon to their lips (Level 2); and hammered a toy nail with a toy hammer, holding the nail against a toy table (Level 1). On the dimension of agent transformations, the

children typically performed activities no more complex than self-as-agent behaviours (Level 2), such as pretending to drink from one of the nesting cups. In some instances, children used toys as passive animate partners (e.g. holding a doll and saying, "Hi, baby"). It may be noted that almost no instances of carrying out a physical activity (such as sleeping or blowing one's nose) out of context occurred during the observations. Such activities may be more likely to occur at home than in a playroom filled with toys.

At 20-22 months, by which time all children demonstrated some form of symbolic play, the majority (70.8%) of the children's most complex observed play activities were at Level 4. Only two subjects demonstrated more complex activities, both at Level 5. Twenty-one percent of the subjects' most complex activities were at lower levels, predominantly Level 3. On the dimension of object transformations, the children still did not typically demonstrate dissimilar object substitutions, and their object play still involved the use of toy replicas as if they were their functional counterparts. However, on the dimension of agent transformations, most children had progressed to the point of using the dolls as active animate partners (e.g., the children fed dinner to the dolls, took them off to the store in the toy vehicles, and put them to bed on the toy furniture). Those whose play had not progressed to this point were at least at the stage of using dolls as passive animate partners. The predominance of Level 4 play was striking at this session. Although activities that had earlier constituted the highest play levels observed

(toy replica use alone and self-as-agent behaviours) were still present in the children's play, the largest portion of play observed overall involved active animate partner activities.

At 33-36 months, more variability in the children's most complex observed levels of play was found. All of the children had progressed to at least Level 4 play, but 29.2% of the children demonstrated no higher levels. The majority of the child subjects had progressed to Levels 5 and 6 (33.3% and 25.0% respectively), and three subjects demonstrated play at Level 7. On the object transformation dimension, children now used dissimilar objects as signifiers (e.g., using books to make a highway and ramp for toy vehicles, using small geometric plastic shapes from the shapebox as food items, and pretending that the toy bathtub was a doll's bed). Some of the children now used totally imaginary objects, without using other stimulus objects as props for the imagined items and substances. For example, imaginary shampoo was poured into one child's hand from an imaginary bottle for use in washing a doll's hair. Other children took imaginary cookies out of imaginary ovens and gave them to their mothers, or took imaginary flour from imaginary flour bins for use in preparing food with the toy utensils. Three of the children substituted verbal statements for entire sequences of actions with objects (Level 7). For example, one child pushed the dolls along the floor in the schoolbus, saying "School!". Her mother responded, "Now they're going to school".

The child stopped the vehicle, took out the dolls, and immediately announced: "They just had school." (Level 7). Then she placed a doll on a motorcycle and arranged his hands so that he could hold on to the handlebars (Level 5b), and the doll "drove away from the school". Another child announced that a doll was going to eat some cookies after his mother had placed a muffin tin on the table at which the dolls were seated. His mother asked who had made the cookies. The child responded: "Me ... and you helped me." A pretend cookie-making session had not preceded this incident.

On the agent transformation dimension, several of the children demonstrated the use of dolls as active animate agents for the first time. The incident in which the doll's hands were placed on the motorcycle handlebars, described above, is an example. Other examples included dolls "walking" across the floor, children speaking in altered voices for the dolls as they "talked to them", and children holding out the muffin tin to dolls "so that they can take a cookie". Despite the movement of children's highest demonstrated complexity levels to Levels 5, 6, and 7, most of the play that occurred was still at Level 4. Use of the dolls as active animate partners predominated overall in the play observed. Some children still demonstrated use of toy replicas alone and self-as-agent behaviours, but these were less frequent than at Session 2, and often were integrated into more

complex sequences. For example, a child might seat the dolls at the table "to have lunch" (Level 4), and at the same time feed herself from the toy dishes.

The observed sequence of play complexity is generally consistent with the sequence gleaned from the literature reviewed earlier (e.g. Fein, 1975; Fenson & Ramsay, 1980; Inhelder et al., 1972; Jackowitz & Watson, 1980; Lowe, 1975). However, the observed sequence does not agree with Watson and Fischer's (1977) finding that the use of a substitute object preceded the use of an animate toy as an active agent. In the present study, the orders of appearance of these two activities were indistinguishable from one another. One possible explanation for this discrepancy is apparent. Watson and Fischer used the modelling technique described earlier, while the present study observed interactive free-play. It may be that the activities children are willing to imitate differ from those they spontaneously produce.

Because the present study measured performance, without any attempt to assess underlying competence directly, it is possible that some of the complexity levels may have appeared later (or in a different order) in the spontaneous play observed here than they would have if an attempt had been made to directly evaluate competence. The large inter-session intervals in the present study also prevent strong conclusions about the ages at which

activities of different levels of complexity first appear. It is likely, for example, that the half of the sample whose highest level of play moved up to Level 4 at Session 2 had not all suddenly acquired Level 4 play just at the time of the second session. Instead, it is probable that individual children had acquired this skill at different times between 12-14 and 20-22 months of age, and that the mean age of acquisition is in reality somewhere between these ages. By the same token, play at Levels 5 to 7 could have first appeared in the repertoires of individual children at any time between 20-22 and 33-39 months. They may even have appeared earlier, because the measures used here assess only the spontaneous play produced in 15-minute sessions widely spaced over the age range in question.

Nonetheless, there is a great deal of correspondence between the sequence of complexity observed in this study and the sequences found in earlier research. Full confirmation of the proposed symbolic play complexity scale must await future validation in studies using considerably shorter intertest intervals and techniques designed to elicit the highest-level play of which children are capable (rather than the levels they spontaneously produce). It is nonetheless argued, however, that the pattern of individual complexity score results presented in Table X indicates that the proposed complexity scale is a viable model of increasing developmental complexity along the agent and object transformation dimensions across the age range studied.

While the present study did not directly examine developmental increases along either the complexity of action sequences or the verbal organization dimensions, it may be noted that measures of these two dimensions were all strongly, significantly, and positively correlated with both symbolic play amount and symbolic play complexity at Session 3 (Table XX). Those children whose play was the most complex at 33-39 months were also those who initiated the largest number of integrated symbolic play themes, produced the largest number of elaborations of those themes, and also made the largest number of statements that verbally organized symbolic play scenarios. It may also be noted that the earlier discussion of total number of incidents, object use, and proportion of repeated incident measures supports the concept that play is increasingly organized into longer, integrated sequences as the child matures.

Changes in Maternal Behaviour as Children Mature

Changes in maternal, as well as child, symbolic play behaviour over time were found in this research. The amount of symbolic play demonstrated by mothers increased significantly from the first to the second session. Whereas at Session 1, mothers engaged in approximately twice as many symbolic play activities (a mean of 4.42) as did their children, at Session 2, maternal symbolic play had increased to a mean of 6.63

activities, slightly fewer than the mean for children. At Session 3, maternal symbolic play amount had decreased slightly to a mean of 6.29 activities. It seems probable that at Session 1, mothers engaged in more symbolic play than their infants because a) they were attempting to show their children how to play with the toys, b) they were, to some extent, amusing themselves with the available play materials, and/or c) the children did not yet have the skills to participate in the play initiated by the mothers. It is, however, noteworthy that mothers' symbolic play increased as the children's symbolic play increased at 20-22 months. While no significance tests were conducted, it is interesting to note that mean maternal object use measures differed very little from session to session (10.17, 11.21, and 11.00 at each successive session), while the children's object use increased from the first to the second session. It is interesting that mothers changed their style of play (to include more symbolic activities) from the first to the second session in correspondence with the children's emerging play skills, while their object use remained constant whatever the children's scores on that variable. This appears to reflect constancy in the quantity of objects used, but change in the activities carried out with them.

Mean maternal symbolic play complexity levels, on the other hand, did not differ significantly from the first to the second session, but increased significantly at the third session (means

of 3.63, 4.08, and 5.25 at each successive session). This pattern suggests the possibility that mothers match their own play levels to the emerging structural abilities of their children. Between the first and second sessions, as children produced significantly more symbolic play, so did mothers, although the mothers' complexity levels remained the same. After the children's complexity levels caught up to those demonstrated by the mothers, at Session 2, the mothers' own complexity levels increased significantly in Session 3, in a manner parallel to those of the children. Tables IX and XI also document increases in maternal play complexity across sessions. Although the design of this research cannot permit causal inferences, it is difficult to conceive of explanations for increases in structural play complexity in 30-year-old women, other than a) the availability of an increasingly sophisticated play partner, b) the desire to play at the child's own level, and/or c) the desire to teach the child new and appropriate play behaviours as the child matures. The choice among these three explanations cannot be made on the basis of the data available in this study, and may, in any event, be difficult to resolve through research. It may, however, be noted that the mean number of maternal suggestions that the child carry out pretend activities was relatively low at Session 1, when the children were not engaging in much symbolic play (3.25); more than doubled at Session 2, when the children were demonstrating more symbolic play (7.33); and dropped to a level

at which its occurrence was too infrequent to be analyzed at Session 3, when symbolic play seemed well established in most children's play repertoires. This suggests maternal sensitivity (deliberate and conscious or otherwise) to the developments occurring in the play of children.

Finally, it is also noteworthy that the frequency of maternal information about objects (labelling them or discussing their physical properties) more than doubled between the first and second sessions, from a mean of 19.42 to a mean of 43.96. Again, these increases may have resulted from the child's increasing language competence, or alternatively, from a maternal desire to provide increasing information in order to promote development as the child matures. It has been noted by deVilliers and deVilliers (1979) that mothers adjust the complexity of their language as their children develop linguistically. Perhaps a similar phenomenon occurs both in symbolic play and in the provision of verbal information about objects.

Relationships Among Child Play Behaviours

Within and Across Sessions

The child symbolic play amount and complexity measures were highly positively intercorrelated within each session (Table XX). At all ages studied, those children who engaged in the

most symbolic play were also those who played at the highest complexity levels. The results of the Principal Components analysis of the child play variables confirm the strong association between these measures within sessions, and also demonstrate that object use was strongly associated with them at each session (Table XIII). It may also be seen from the tables that the themes initiated, elaborations initiated and verbal organization of scenarios variables were strongly positively related to the other symbolic play and object use measures at Session 3. Several inferences may be drawn from these results. First, the strong concordance of these variables within sessions lends support to the proposition that these variables measure an underlying propensity for a particular kind of play in children: one that is rich in symbolic play amount and quality, and also demonstrates familiarity with the functions of toys.

Second, it may be seen (Table XIX) that the within-session factors that reflect play of this kind are related in an interesting manner, both within and across sessions, to the total number of incidents at the sessions. At Session 1, when infants' play generally involved a large number of incidents of short duration, the Session 1 Play factor was strongly positively related to the total number of incidents. At Session 2, the Session 2 Play factor and the total number of incidents were still positively intercorrelated, but the correlation coefficient was low and non-significant. At Session 3, when the children's

play had generally changed to fewer incidents of longer duration, the relationship between the Session 3 Play factor and the total number of incidents was negative. It may be noted that the Session 2 Play factor was significantly positively correlated with the total number of incidents at Session 1, but was significantly negatively related to the total number of incidents at Session 3. If, as has been suggested above, the total number of incidents drops at Session 3 as a reflection of increased play sophistication, it may also be suggested that the relationships between the Play factors and the total number of incidents measure indicates that the Play factors are associated with increasing general play sophistication at each of the sessions.

Third, the strong relationships between the symbolic play and object use variables at each session support the contentions of El'Konin (1966), Fein (1975), and Inhelder et al. (1972) that the symbolic use of objects is associated with the functional use of objects. In order to pretend with objects, it appears that the child must also be able to use objects in functionally-appropriate ways. It is interesting, however, that the relationship between functional and symbolic object use remained constant across sessions. It may be not only that increasing sophistication in functional object use is a precondition for early symbolic play, as the results of Dale et al. (1981) and Nicolich (1977) suggest; but also that functional object use continues to be associated with symbolic activities

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throughout infancy and toddlerhood. It may well be, of course, that this relationship does not involve a simple correspondence between using many objects functionally and pretending with objects over the course of early development. As children's symbolic play complexity develops, so too may the complexity of the non-symbolic actions carried out with objects develop. The present study was not designed to examine this issue, although it may be noted informally that children's non-symbolic play with objects became more complex over the study, as their symbolic play developed.

Finally, it may be noted that the Play factors obtained at each session appear to tap a distinctly play-related ability, rather than a general cognitive development factor of some sort. It may be seen (Table XIX) that at Sessions 1 and 2, the Play factors were not related to the child's information score. There was a positive relationship between the Session 3 Play factor and the child's information score. However, the kind of verbally elaborate symbolic play the children engaged in at Session 3, and the elaborations initiated and verbal organization measures in particular, probably require verbal skill, and the information measure taps verbal skill as well. Although the only available measures of general cognitive development are somewhat inadequate, due to the relatively small number of children for whom Bayley scores were obtained at Session 2 and to the length of time from the third session to the administration of the PPVT,

it may be noted that the Play factors (and also the original variables) were unrelated at all sessions to the Bayley and PPVT scores. Because a high correlation was obtained between the Bayley scores and the PPVT scores, despite a three-year interval between administration of the two tests, it does not seem likely that the tests were poor assessments of general cognitive achievement. It may also be noted that other researchers (e.g., Griffing, 1980) have reported that symbolic play measures were not correlated with IQ scores. A satisfactory account of the relationship between symbolic play and the kind of general cognitive achievement measured by IQ tests must, of course, await multivariate studies in which several marker variables are included along with symbolic play measures in order to test the discriminant validity of the concept of a symbolic play and object use dimension unrelated to other general cognitive dimensions. The present study includes too few non-play measures to allow such an analysis.

Although the symbolic play and object use measures in this study appear to tap a unitary play ability at each session, there was variability in individual children in the degree to which this ability was demonstrated consistently across sessions. Although the Play factors from the three sessions were positively correlated with one another, only the correlation between Session 1 and Session 2 play factors was substantial ($r = .42$). The correlations between Session 2 and Session 3 Play factors ($r =$

.25) and between Session 1 and Session 3 Play factors ($r = .20$) were of low magnitude (Table XIV). An examination of the cross-session correlations between the original child play variables (Table XX) indicates that the strongest cross-session relationships were between child symbolic play amount at Session 1 and child symbolic play amount ($r = .36$) and complexity ($r = .35$) at Session 2; and between Session 1 child symbolic play complexity and Session 2 symbolic play complexity ($r = .38$) and Session 3 verbal organization ($r = .38$). All of these correlations were marginally significant. No other cross-session child play variable relationships approached significance.

Two comments are in order here. First, one would expect that the strongest relationships in any study measuring a set of related variables in a series of longitudinal sessions using infant and toddler subjects, would be the relationships between variables measured at the same session. Given the long inter-session intervals in the present study, relatively low correlations are not surprising. Any multivariate procedure (such as a Principal Components analysis) designed to group variables on the basis of the strongest degrees of shared variance could be expected to group together the variables measured within, rather than across, sessions, simply because related behaviour measured at one time in small children would likely have more shared variance than behaviours measured at

widely-spaced intervals. Second, it may be noted that the kind of symbolic play demonstrated by children at Sessions 1 and 2 was more similar than the kind demonstrated at Session 3. At Session 3, symbolic play involved longer, more elaborate sequences and more verbal content than it had at the earlier two sessions. There were stronger correlations between Session 1 and 2 play scores than there were between Session 2 and 3 play scores. Thus, it is possible that symbolic play at Session 3 reflected some aspect of a previously irrelevant ability (e.g., verbal facility) that had become relevant by Session 3, and that therefore different children tended to score higher on the play variables at that time. The relationship between Session 3 play variables and the Session 3 child information score supports this possibility.

Relationships Among Maternal and Interactional Variables

Variables Within and Across Sessions

As was the case with the child play variables, a similar constellation of maternal and interactional variables was found at each of the sessions. The Principal Components analysis of these variables resulted in the extraction of a factor at each session on which maternal symbolic play amount and complexity, object use, information, and symbolic play suggestions (at Sessions 1 and 2) all loaded, along with joint participation in

play. At Session 3, maternal themes initiated, elaborations initiated, and verbal organization also loaded on the general Play factor. The most substantial correlation between these factors was that between Session 1 and Session 3 play ($r = .35$). A separate maternal directiveness factor was also extracted at each session, and these directiveness factors were uncorrelated with one another. An examination of the intercorrelations among the original variables (Appendix F) shows that in general, the maternal play scores were positively intercorrelated within sessions, unrelated or negatively related to maternal directiveness, and positively related to joint participation.

Thus, the mother who demonstrated the most symbolic play with her child was the mother who was most likely to be interactive and unlikely to be directive. In mothers, as well as in their children, there was more consistency within sessions than across sessions in the complex of play variables associated with symbolic play. It is noteworthy that mothers were more likely to be consistent in their scores on these variables between Session 1 and 3 than between Sessions 2 and 3, despite a two-year interval. A possible explanation for this concerns the child's linguistic development. At Session 1, the children were not yet talking, and were not pretending or playing with objects at an advanced level. It is possible that at Session 1, the mothers' play reflected to some extent an attempt to amuse themselves, faced with a very unsophisticated play partner.

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Thus, mothers who liked to engage in pretend play may have done so, while mothers who did not like to pretend may have done other things they liked, such as looking at books or playing with non-pretend toys. At Session 2, the children had begun to talk, and much of the mothers' attention may have gone to verbal activities and a focus on teaching the child words. Thus, mothers' behaviours at the second session may have been influenced less by their own play preferences, and more by their children's obviously-developing language abilities. By the time of the third session, the children's language skills were now more firmly established. Because the children were now "over the hump" of early language acquisition, the mothers may have once again returned to a style of play that more closely reflected their own play preferences. Thus, maternal play styles would more closely correspond between Sessions 1 and 3 because of individual maternal play proclivities, whereas at Session 2 these proclivities were somewhat submerged by the focus on child language learning.

The Relationship Between Child Play and Maternal and Interactional Variables

Before proceeding to a discussion of the relationship between child play and maternal and interactional variables, it must be reiterated that the correlational nature of this research

can permit only speculative inferences about the source or direction of causal relationships. As in any correlational research, the relationships found may be the result of a third variable or variables not measured in the study; or the direction of causation may be from maternal and interactional variables to child variables, or the reverse. The discussion of the relationship between maternal and child behaviours must, therefore, be regarded as descriptive of the relationships found in this research, speculative with regard to any suggestions about causation, and intended primarily to provide a basis for future research into the issues raised by it.

Furthermore, the method used in this study, because it involved the observation of joint mother-child play (without independent observations of child play without the mother present), leaves open the possibility that all measures of child play were dependent upon concurrent maternal play, and thus that the observed cross-session relationships represent little more than correspondences between maternal influences on the child from one session to another. This criticism of the research, while valid, is countered by the following arguments. First, given the young age of the infant subjects, the mother may be the best partner with whom to measure the child's play, because she is likely (at least in firstborns cared for at home) to be the child's most frequent and familiar play partner. Thus, the child's play with the mother probably represents most accurately

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his or her usual patterns of social play. In this sense, the mother could almost be considered to be a regular component of the child's usual play, and play measured without her (e.g., with the child playing alone) could be considered to be unrepresentative of the play of which the child is capable.

Second, care was taken in this research to score play categories for children only when the child independently indicated the play abilities measured. For example, if the child put a doll on a bed and the mother said, "The baby is sleeping", symbolic play was scored for the child only if the child independently indicated pretense that the baby was sleeping, e.g. by saying "Night-night", or by covering the doll with a blanket "so that he won't get cold". Thus, the argument is made that the child play scores reflect abilities of which the children were capable, even though the mothers may have elicited them. Third, the finding of generally higher levels of symbolic play for mothers than for children at all three sessions indicates that children did, to some extent, play at their own level, and did not take their cues from all of the actions of their mothers. In fact, the transcripts include many incidents of symbolic play initiated by the children, some in which the mothers did not participate, and others in which the mother attempted to initiate symbolic play but the child did not respond. It must be acknowledged that the mother may have determined a significant portion of child play, but it is argued that this state of

affairs may be externally valid, and may thus result in a reasonable assessment of the child's abilities. Nevertheless, the speculations made below must be regarded with caution, given the design of the study.

Within each session, strong relationships were found between child Play factor scores and maternal and interactional Play factor scores (Table XVIII, $r = .66$ to $.81$). An examination of the correlations between the original variables (Table XX) indicates that maternal symbolic play amount and complexity were strongly positively related to child symbolic play amount and complexity at each session ($r = .43$ to $.95$), and that joint participation was also related positively to these play scores at each session. There were also positive relationships between maternal information scores and child play scores at the second and third sessions, when the children's language was better developed. At each session, those mothers who demonstrated the complex of maternal behaviours described in the section above had children who demonstrated the most, and the most complex, symbolic play. Thus, it would appear that, at least at any given point in time, maternal play style may affect children's symbolic play. An interactive style and maternal symbolic play and object use were strongly related to child symbolic play abilities.

On the other hand, the factors representing a directive maternal style in play were unrelated to child play in the earlier sessions, and non-significantly negatively related to

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child play at the third session ($r = -.32$, Table XVIII). Correlations among the original variables indicated that while maternal directiveness was consistently negatively (although not significantly) correlated with child symbolic play variables at all sessions, Session 3 maternal directiveness was strongly and significantly negatively correlated with child symbolic play amount ($r = -.52$) and complexity ($r = -.46$) at the same session. There were also cross-session relationships between maternal directiveness and child symbolic play. The Session 1 maternal Directiveness factor was significantly negatively related to the Session 3 child Play factor ($r = -.46$), and among the original variables, maternal directiveness at Session 1 was significantly negatively related to Session 3 child symbolic play complexity ($r = -.46$) and verbal organization of scenarios ($r = -.54$). It was also negatively related to Session 3 child elaborations initiated ($r = -.36$) at a marginal level of significance.

It is suggested that a great deal of maternal direction of young children's play, particularly in infancy, may be detrimental to children's play development, in that the mother's control of play content may not allow the child to practise and develop his or her own play themes. It is important to distinguish here between directiveness, in the sense of control, and involvement in the child's play, in the sense of joint participation. In this research, the mothers whose children showed the highest levels of current and subsequent symbolic play

were those whose mothers were less directive, although they engaged in a great deal of joint play with their children. It is possible that a certain level of maternal directiveness is necessary for optimum development. It may be noted that the mean proportions of incidents directed by the mother for the entire sample were 63%, 54%, and 61% at each of the three sessions respectively. It seems obvious that some degree of maternal directiveness is necessary and beneficial for children who are, in effect, learning how to play. However, overdirectiveness may hamper the child's development by preventing the child from exploring his or her own interests. It seems unlikely that those mothers who were most directive in this study were directive because their children were generally slow in development, because there was no negative relationship between maternal directiveness scores at Sessions 2 and 3 and earlier child play scores. However, it may be noted that the maternal Directiveness factors from both Sessions 2 and 3 were marginally negatively correlated with the child Bayley scores at Session 2 ($r = -.37; -.38$). Thus, it is possible that mothers were more directive with children who generally had lower IQs. This possibility could not account, in itself, for the negative relationship between maternal directiveness and child symbolic play, however, because the Bayley scores were unrelated to the child symbolic play scores. It is also possible that early maternal directiveness was a determinant of lower Bayley scores in

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children by the time Session 2 occurred. Generally, then, it is suggested that maternal directiveness and control of play content, above some necessary level, may be detrimental to the development of symbolic play.

Across sessions, there was a tendency for earlier maternal Play factors to correlate positively with later child Play factors, although these correlations were not significant or only approached significance. Among the original variables, there were generally positive correlations ($r = .37$ to $.49$) between earlier maternal symbolic play and joint participation scores, and subsequent child symbolic play scores. The strongest relationships were those between Session 1 maternal symbolic play and joint participation and Session 3 child symbolic play. It is possible that these relationships were due to consistencies in maternal play style across sessions, along with the correspondences between maternal and child play within sessions, resulting in coincidental relationships between early maternal play and later child play. However, it is equally plausible that earlier maternal play styles were a determinant of later child play styles. Given the lengthy intervals between sessions and the rapid pace of change in infant development, it is noteworthy that these relationships were found. While no firm conclusions may be drawn from them, they nonetheless support the contentions of several theorists (e.g. Feitelson, 1977; Murphy, 1972; Singer, 1973) that maternal play with children is a determinant of symbolic play ability.

The present study cannot, of course, directly test the Russian assertion that children must be taught symbolic play through adult modelling and suggestion (El'Konin, 1966; Repina, 1971). However, it does lend support to the general idea that parents play an active role in symbolic play development. While the results from the subject pair who demonstrated no symbolic play had to be excluded from the data analysis because of their extreme disparity from the results from the rest of the sample, they are nonetheless of interest here. It will be recalled that neither the mother nor the child demonstrated symbolic play at any of the sessions. The mother's directiveness scores were also high at all three sessions. Although one such example cannot show the validity of the Russian position, and although the subject pair may have engaged in symbolic play outside the testing situation, it is nonetheless suggestive of the Russian viewpoint that the only child in the sample who did not pretend was one whose mother demonstrated no symbolic play. It is concluded that the present study offers sufficient validation of the hypothesis that children's early symbolic play may be determined by earlier maternal play to justify further research in this area.

Relationships were also found between earlier child symbolic play and later maternal symbolic play, although these were fewer in number than the relationships between earlier maternal and later child play. Considered along with the earlier discussed

changes in the general pattern of maternal symbolic play complexity across sessions, these relationships suggest, again, the possibility that mothers may adjust the quality of their own play to the emerging abilities of their children. It may be that mother-child interaction in the development of symbolic play is a bidirectional process, with mother's play behaviours influencing later child play, but also influenced themselves by the child's earlier and concurrent levels of play ability.

Relationships Between Child Symbolic Play and Other Variables

While this study was designed primarily to investigate the pattern of symbolic play development in infants and toddlers, and to examine the relationship between child and maternal symbolic play, some additional variables that may have been related to symbolic play development were also included. The absence of relationships between the IQ measures (Bayley, PPVT) and the child Play factors has already been discussed. The mothers' education level was positively and significantly related to the Session 1 child Play factor scores ($r = .38$), but not to subsequent Play factor scores. It was also unrelated to any of the maternal and interactional factor scores. The significant correlation with Session 1 child Play scores may be a chance

finding, or may possibly indicate that mothers with higher education levels have children whose play is more advanced in mid-infancy, although this effect disappears with increasing age.

It has been noted that the child's information score was positively related to the child Play factor at Session 3, although not earlier. This finding may reflect the increasing dependence of symbolic play on verbal abilities at the age of about three years. Although the information measure taps verbal abilities, it does not measure any specific linguistic abilities directly. Research using the same videotaped observations (Russell & Russnaik, in press) has reported that measures of mean length of utterance (MLU), length of longest utterance (upper bound), and the number of different words used (a situation-specific vocabulary measure) scored at Session 2 were unrelated to any of the symbolic play measures at Sessions 1 and 2. Russell and Russnaik have suggested that later symbolic play may be related to language development measures as children's play becomes more verbally elaborate and more interactional in nature. At the time of that research, the results from Session 3 were not yet available.

While it is outside the scope of the present thesis, it would be interesting to investigate the relationship between Session 3 symbolic play and various measures of linguistic development, as well as the possibility of relationships between Session 2 symbolic play and later language ability. Dale, Cook,

and Goldstein (1981) have reported few relationships between symbolic play development and pragmatic language use in the period between one and two years. However, Fein (1979) has reported relationships between measures of language expression and comprehension and measures of symbolic play in subjects aged 18 and 24 months. The issue of the interrelatedness of the development of representation in language and play is worthy of further research effort.

Sex Differences

The only variable in this study on which significant sex differences were found was the maternal Directiveness factor scores from Session 1, on which the mothers of boys received significantly higher scores than did the mothers of girls. Although one might expect at least one t -test to be significant by chance among so many t -tests conducted, a possible interpretation of this difference is that mothers pay more attention to deliberately directing the early play behaviours of boys into particular areas than to directing the early play of girls. Other research conducted using the same sample (Russell, Waller, James, & Ames, 1978) has found that in the first two sessions, boys initiated more play with male stereotyped toys than did girls. It was also found that although the mothers initiated equal amounts of play with male- and female-stereotyped

toys with both boys and girls, they were selective in their responses to children's initiations. Mothers of boys responded proportionately more positively to initiations of play with male-stereotyped toys than to initiations of play with female-stereotyped toys by their sons. The mothers of girls did not respond differentially to initiations of play with male- and female-stereotyped toys. This finding may be related to the sex differences found here, in that mothers of boys may be more concerned with controlling the content of boys' play so that it is "sex-appropriate", and thus may be more directive. However, the sex differences reported in Russell et al. (1978) were found at both Session 1 and Session 2, and the sex difference found in the present research was obtained only at Session 1.

The absence of sex differences on all of the symbolic play variables is of some interest. In the present research, a deliberate attempt was made to control for the stereotypic sex-appropriateness of toys, and no sex differences were found on any measure at any age. Thus, it appears possible that the sex differences found in earlier research with infants (e.g., Fein, 1975; Lowe, 1975) may have been due to bias in toy selection, and not to differences in male and female abilities. It may be pointed out that the selection of male-stereotyped toys conducive to symbolic play in infancy was difficult in the present research. Most of the toys that come to mind for pretend play in infancy are female-stereotyped (dolls, dishes, household goods,

etc.). Thus, a special effort must be made to select both male and female toys, given that the obvious ones are primarily stereotyped as female.

Concluding Speculations and Directions for Future Research

The present research has provided suggestive evidence that mothers may be facilitators of symbolic play development in infants and toddlers. These results lend credence to theoretical speculations (largely untested empirically) that the quality of mother-child play is a determinant of later child symbolic play. It is suggested here that it is not only mother-child play, but a particular style of mother-child play, that facilitates symbolic play development in children. That style of play is highly interactive, involves demonstrations of and conversation about the properties and functions of objects, and is not excessively directive of the content of the themes carried out in play. It is suggested that mothers who wish to facilitate symbolic play development should provide models of such play from early infancy, and actively attempt to involve the child, while gearing the level of play to one at or somewhat above the child's current abilities. However, it would appear that the child should be allowed to determine a portion of the play content.

The present research used a sample that was relatively homogeneous with respect to socioeconomic status and cultural background, so that no conclusions may be drawn with regard to

the sources of cultural and social class differences in symbolic play. However, it is noteworthy that significant variation in the development of such play was found between individual children, all of whose backgrounds could be considered relatively middle class, within a North American culture. As has been noted, no symbolic play whatever was observed in one of the children. It is suggested that future research might examine maternal play styles and mother-child play interaction cross-culturally and in different socioeconomic groups in an attempt to identify the sources of cultural and class disparity in children's play. Although cultural attitudes may underlie such differences (as Feitelson, 1977, has suggested), they are likely to manifest themselves in specific maternal behaviour patterns.

Obviously, the present study did not examine other potential social sources of differences in symbolic play, such as peer play experiences, the effects of fathers and siblings, and the effects of participation in group programs for children. There is no likely reason why mothers would be the only or even necessarily the primary social agents who may facilitate children's play, other than their familiarity as play partners and their rapport with children who are primarily cared for at home. Research into the social facilitation of symbolic play should be extended to examine the influence of other play partners. The results of such research may be of practical importance in the design of day care and nursery school programs, for example.

The correlational and exploratory nature of the present research precludes firm conclusions about the direction of the relationships observed. Future research might employ more tightly controlled methods in an attempt to provide firmer answers to causal questions. Such methods might include intensive observations of naturalistic mother-child interaction in the home, questionnaires and interviews about maternal play behaviours and attitudes, and criterion observations of child play independent of maternal play. In the present longitudinal research project, observations of the child playing alone were collected at 33-39 months, although they were not used as criterion measures because it was thought that solitary play was a poor measure of what is often a social behaviour, and because of the uncertainty of identifying deliberate pretense in play in which very little verbal behaviour occurred. However, videotapes of the same child subjects playing in previously-unacquainted peer dyads and also in large peer play groups were obtained by other researchers after the conclusion of the present research, and it is anticipated that these observations will be scored for symbolic play behaviours, enabling their use as assessments of child play independent of maternal influence.

The present research has provided some validation for the author's model of complexity levels in symbolic play development. Further tests of this complexity system are required in both longitudinal and cross-sectional observations of child free-play,

conducted at shorter inter-session intervals, as well as in studies designed to assess underlying competence rather than spontaneous performance. Watson and Fischer's (1977) modelling technique might be used in this regard, as an adjunct to measures of spontaneous play. It is suggested, however, that the model has some advantages over previously published symbolic play category systems, in that it consists of measures of the decentration dimensions of symbolic transformations (object and agent transformations) unconfounded by measures of the integration dimensions (complexity of action sequences and verbal organization of scenarios). It is also possible to use the categories in the system as independent measures of the object and agent transformation dimensions, rescoreing each in terms of the order of appearance of behaviours along each separate dimension.

Further research in the areas of complexity of action sequences and verbal organization of scenarios is required, measuring these dimensions on scales unconfounded by the object and agent transformation dimensions. The research of Dale, Cook, and Goldstein (1981), Nicolich (1977), Matthews (1977a), and McLoyd (1980) in these areas has provided a needed beginning. However, it is suggested that these dimensions might most profitably be investigated in the context of overall play (not only symbolic play); and the resulting scales of development on these dimensions should then be examined in terms of their

relationship to development along the decentration dimensions of symbolic play. Such a procedure would allow researchers to determine whether development along the complexity of action sequences and verbal organization dimensions is integrally related to the development of play symbolization per se, or whether instead these are separate developmental processes. It is possible that they may be correlated with development along the decentration dimensions only because all of them become more complex with general cognitive maturation. In any event, it is recommended that researchers take care to prevent the confounding of what may, in fact, be independent dimensions of symbolic play development. Although it is possible that the four dimensions identified here form an integrated unitary dimension of symbolic play, it would be best to resolve this issue by means of multivariate studies equipped to examine the relationships among measures of each dimension, rather than to assume a priori that one unitary dimension exists.

Because of the theoretical importance of symbolic play development in general cognitive growth, it has been suggested (e.g., Dale, Cook, & Goldstein, 1981; Lowe, 1975) that scales of symbolic play development be used in clinical assessments of children's development. In a review of the literature on the play of handicapped children, Mogford (1977) has noted that there are discrepancies in research reports about the symbolic play abilities of deaf children and of those with impairments in

language expression and comprehension. Generally, however, she has concluded that the research indicates that hearing and language impaired children do engage in symbolic play, although perhaps at a delayed level, and with obvious difficulties in engaging in socially interactive imaginative play requiring verbal communication. Studies of the play of mentally retarded children have indicated that, even at comparable mental ages, their play is more concrete and less imaginative than that of normal controls, although it is unclear whether these differences may be due to cognitive differences or to differential interaction patterns in play with parents and peers. Studies of the play of congenitally blind children with no additional handicaps have indicated delays in imaginative play. Mogford has summarized these results and concluded that blind children's early play is limited by their lack of visual access to actions that may be imitated in symbolic play, and that their doll play is delayed in that personalities and imaginary life are not attributed to dolls. Mogford notes that: "Imaginative play as such is almost entirely lacking at the nursery stage. Instead, the child tends to recapitulate experience by repeating the verbal exchanges which he has heard or in which he has participated, as if assuming different roles in the dialogue" (p. 178).

An additional possible contributor to blind children's relative lack of symbolic play is suggested by Bigelow's (1981) research on children's tactile identification of miniature

replicas of common objects. Bigelow has reported that in sighted children, the ability to identify miniature replicas of large objects (e.g., furniture, vehicles) by touch alone increases substantially between the ages of approximately three and five years. She has also reported that in pilot research, a totally blind toddler was able to identify regular sized large objects (e.g., sofa), regular sized small objects (e.g., keys), and miniatures of small objects (e.g., doll's spoon). However, he was unable to identify miniatures of large objects (e.g., doll's bed). Bigelow has suggested that this difficulty is due to the size of large objects being too large to allow easy tactile exploration of the overall shape. Blind children are restricted to tactile (rather than visual) exploration of objects. Thus, they may have greater difficulty than sighted children in using toy replicas in symbolic play, because they may be unable to associate the replicas with their larger functional counterparts.

Scales of symbolic play development could be used to index development in handicapped children, although such use would first require the validation of symbolic play scales on larger samples of normal children than have hitherto been employed, as well as extensive testing with different groups of handicapped children. Modifications to the existing scales might be required for use with, for example, blind children whose symbolic play is primarily verbal, or deaf children whose play is primarily nonverbal. It is suggested here that the clinical use of

symbolic play scales with handicapped children particularly requires the separation of different dimensions of symbolic play, in that children with different handicaps may be either delayed or even advanced in some aspects of symbolic play. For example, deaf children may be more likely to engage in object substitutions, while blind children may employ more verbal organization of scenarios. It is suggested that, given the current degree of information we have available on sequential complexity development in symbolic play, it is premature to attempt the development of clinical scales without more research on normal children. However, the examination of maternal play with handicapped children (Mogford, 1977) and the initiation of training studies with, for example, deaf children (as suggested by Dale et al., 1981) might be promising avenues for future research.

The issue of sex differences in symbolic play requires further research as well. It is suggested here that, if sex differences exist, they are likely to be found on "style" rather than "structural" variables. The pattern of findings discussed earlier suggests that the reported sex differences may be due to biased choices of toys as stimulus materials, and to male-female differences in the themes, locations, and types of role enactments preferred in preschoolers' play. It is important that future studies control for sex bias in the selection of toys as stimulus materials, analyze sex differences for differential toy

choice if they are found, and take care that the measures of play structure used do not reflect instead only stylistic dimensions on which boys and girls may vary.

Finally, a general plea for more research into the symbolic play of young children is in order. Although linguistic and social cognitive development deserve the volume of research attention they have recently attracted, a full account of the development of young children must also take account of the activities they spend much of their time engaged in -- active, and often imaginative, play.

APPENDIX A: QUESTIONNAIRE

Name of child _____
 Mother's name _____

We would like to have some background information on your child and your family for statistical purposes. All of this information will be treated confidentially, and will be presented in terms of group averages. Information regarding particular children will not go beyond the researchers working on the study.

A. Background information

1. Age of mother _____
2. Age of father _____
3. Mother's educational level _____
4. Father's educational level _____
5. Mother's present occupation _____
6. Mother's last occupation, if currently at home _____
7. Father's present occupation _____
8. Ages of other children, if any _____

B. Child Care Arrangements

9. Do you work outside your home? _____
10. If so, how many hours per week? _____
11. What child care arrangements do you have for the time you are at work (in-home day care, group day care, babysitter, relative, father, etc.)? _____
12. Whether or not you work, about how often is your child cared for by a babysitter, friend, or relative while you are out for reasons other than work? _____

C. Child's experiences with other children

13. Does your child participate in any organized children's play group (day care, nursery school, play group, etc.)? _____
14. If so, how many hours per week? _____
15. How many hours per week does your child spend playing with other children outside of organized children's groups? _____
16. What are the ages of the other children with whom your child plays most often? _____

D. Toys and activities

17. Please list your child's four favourite toys, in order of preference _____
18. Approximately how many hours does your child spend watching television every day? _____
19. What type of activity does your child usually carry out when s/he is playing? _____
20. How often do you read books to your child? _____
21. Does your child have an imaginary friend? _____
22. Does your child have his/her own bedroom, or is it shared? _____

Appendix B: Incident Division

An incident is defined as a set of behaviours (verbalizations and/or actions) carried out by one or both subject partners with regard to a particular toy or group of toys. An incident may be a) a play sequence in which a toy is used or a group of toys are used in relation to each other; (b) a verbalization by the child, mother, or both, in which information about the physical properties or uses of toys is conveyed, whether or not the toys are actually used; or (c) a verbalization suggesting that a play activity be carried out, regardless of whether or not the suggestion is acted upon.

The chief criterion for distinguishing the beginning and end of an incident is continuity of activities (verbal and/or behavioural) with the same set of toys. When discontinuity in toys (or in the ongoing activity being carried out with them) occurs, a new incident begins. Occasionally, one incident may be embedded within another. This occurs when one partner continues to carry out activities with one toy or a group of toys, while the other engages in a new activity; or when one partner continues to hold a toy or toys while briefly attending to a different toy set before returning to the first activity. Activities that do not meet the criteria for incidents outlined above are not to be treated as separate incidents (e.g., mere mouthing, banging, throwing, holding, or handling of toys without

using them in a play sequence; nonplay discussions or activities such as discussing a noise outside the room, the mother blowing the child's nose, etc.; or a simple game that does not make use of the stimulus objects, such as "peekaboo", singing a song, etc.).

Sometimes the transition between incidents is clearcut and abrupt. Other times there is a less clear transition period. If the exact transition point is not clear, use your judgment in specifying a particular transcript line as the transition point, but also indicate a range of lines within which you are confident that the transition point occurs.

Appendix C: Coding Procedures and Interobserver Reliabilities

1. Toys:

- | | |
|---------------------|--------------------|
| 1. car | 11. muffin tin |
| 3. schoolbus | 13. spatula, spoon |
| 4. hammer | 14. dolls |
| 5. nail, screw | 15. abacus |
| 6. screwdriver | 16. nesting cups |
| 7. bed, crib | 17. ball |
| 8. blanket | 18. shapebox |
| 9. table, chairs | 19. books |
| 10. bathtub, toilet | 20. puzzle |

Reliabilities: Session 1: mother: 88%, child: 83%; Session 2: mother: 92%, child: 89%; Session 3: mother: 95%, child: 93%.

2. Repeat:

0 = non-repeat; 1 = repeat

Score repeat only if the incident does not differ substantially in content and toys used from an earlier incident. A substantial difference would be using the same toys for a different purpose, or using different toys for the same purpose.

Reliabilities: Session 1: mother: 87%, child: 80%; Session 2: mother: 90%, child: 79%; Session 3: mother: 88%, child: 86%.

3. Director of incident:

0 = no; 1 = yes

Director is the person who sets the pace, or determines what the content of the incident is. If in doubt, score the subject partner who begins the incident as the director.

Reliabilities: Session 1: mother: 88%, child: 88%; Session 2: mother: 86%, child: 86%; Session 3: mother: 90%, child: 90%.

4. Suggests symbolic play:

0 = no; 1 = yes

One partner suggests that the other carry out a symbolic play behaviour (i.e., a behaviour that could be scored under any of

the categories in Table III). Includes commands, demands, requests, as well as suggestions. Score whether or not the other partner responds to the suggestion. Score only if the subject partner suggests an overall symbolic play incident (i.e. not merely an elaboration of a symbolic play incident that is already in progress).

Reliabilities: Session 1: mother: 76%; Session 2: mother: 81%;
Session 3: mother: 94%. Observers agreed that no children made suggestions at any session.

5. Information about objects (other than their use):

0 = no; n = yes (where n is the number of pieces of information)

Score if the subject partner:

1. uses the name of any object in the immediate environment, other than mother's or infant's name;
2. indicates physical properties of an object (colour, shape, size, texture, or attributes such as noisy, fast, etc.);
3. indicates similarity of one object to another; or
4. indicates quantity (counts, or says "a lot", "just a few", etc.).

Reliabilities: Session 1: mother: 85%; Session 2: mother: 84%; child 82%; Session 3: mother: 88%, child: 84%. Observers agreed on six of the seven one-word utterances reported for children at Session 1.

6. Conventional use of object:

0 = no object use, 1 = indicates use verbally or behaviourally

Score only when the activity does not involve symbolic play. Conventional use is any use that indicates some familiarity with the socially-defined use that is normally made of an object. Appropriate banging, throwing, and mouthing (e.g., throwing a ball or banging a hammer) are scored as conventional usage; inappropriate banging, mouthing, and throwing are not scored at all.

Reliabilities: Session 1: mother: 85%, child: 75%; Session 2: mother: 87%, child: 89%; Session 3: mother: 94%, child: 92%.

7. Symbolic play complexity levels

Symbolic play incidents are defined as incidents involving any behaviour that may be classified under any of the categories in Table III. Each time such a behaviour occurs, the mother and child are each to be given a score for the complexity level that

applies to their behaviour. More than one such behaviour may be carried out by the subjects in the course of an incident. For example, the child may pretend to feed herself, then to feed the dolls, then to walk them across the floor and put them to bed. For this incident, the child would receive the following scores: 2,4,5,4. However, do not give repeats of the same behaviours separate scores within the same incident. For example, if the child "walks" the doll, then puts it to bed, then "walks" it again in the same incident, score #5 once only. If the child "feeds" several different dolls, or "feeds" them two separate times in the same incident, score #4 once only. The same complexity level is, however, to be scored twice (or more) if different behaviours classifiable under that level occur twice (or more). For example, if the child "feeds" the dolls and also has them go for a ride in the car, #4 is to be scored twice. The rule regarding repeats within the same incident does not apply to repeats that occur in different incidents. Treat each incident as a separate body of behaviour.

Score the mother and the child independent of each other. Give each subject partner a complexity level score for each symbolic play behaviour in which they participate (non-repeats), whether or not they have initiated it. Participation may take many forms -- actions, verbal comments, even a rhetorical question such as "Is the baby having her dinner?". Be careful (a) that the subject and not just the partner has participated and (b) that you have carefully checked for brief comments or actions indicating participation in the pretense before you enter scores.

Reliabilities: Session 1: mother: 86%, child: 89%; Session 2: mother: 95%, child: 92%; Session 3: Mother: 96%, child: 97%.

Themes

Within each incident involving symbolic play with the dolls, cooking utensils, nesting cups, doll furniture, tools, and/or vehicles, further analysis is to be carried out on the symbolic play content. These toys may be used in the course of one incident of symbolic play to enact one or more themes. The themes mothers and their children enact with these toys are listed below. An incident contains more than one theme only if the themes are integrated with one another in a logical sequence -- e.g. a meal is cooked, the dolls are fed, the dolls have a bath, the dolls go to bed, and the dolls get up and go for a ride. If there is no such logical transition between the enacting of two themes, each theme will form a separate incident. In scoring the theme or themes of a symbolic play incident, the themes will be identified and the initiator of the theme identified, then the actors in the theme specified, and the type

of roles assigned to dolls (if any) scored. Then, more fine-grained analyses of the subjects' statements used to organize the theme and of elaborations made to the theme will be carried out.

8. Themes initiated

For each subject partner separately, score the category number(s) of the theme(s) initiated by that partner in the course of an incident. Either the mother or the child (but not both) must be scored as the initiator of each theme enacted in the incident. The initiator is the person who begins the theme by verbally suggesting it, behaviourally starting it in a manner that clearly indicates the theme, or verbally starting it, whichever occurs first.

1. Cooking
2. Eating
3. Sleeping
4. Driving and/or riding in vehicles
5. Using bathtub and/or toilet
6. Repairing objects with tools
7. Other (specify)

Reliabilities: Session 3: mother: 93%, child: 90%. Not scored at Sessions 1 and 2.

9. Verbal organization of themes:

For each subject partner, score the number of times that subject verbally plans and organizes the theme by noting the category numbers below.

1. Specifies activities in advance
- e.g., "We'll give them some supper now", "They're going to go for a ride", "I'll put them to bed", etc.. To be scored only if the statement refers to the subject's own activities (i.e., not to be scored for suggestions that the partner engage in an activity), and only if the verbalization occurs before the action begins.
2. Verbally coordinates actions
- e.g., "You put the mommy in the car and I'll put the daddy in", "I'll make the supper and you put the dolls at the table", etc.. Not to be scored if one partner merely

suggests that the other carry out an activity, but no coordination of both partners' activities is involved. May, however, be scored if one partner suggests that the other carry out an action required for the coordination of their activities (e.g., "You get the blanket", said while putting the dolls in bed). The criterion here is whether the subject could just as easily have said "I'll put them to bed and you get the blanket".

3. Specifically mentions pretense

- e.g., "We'll have to pretend", "That's a pretend blanket", "We'll pretend she took her clothes off", "We're only pretending".

4. Discusses appropriateness of objects for representation

- e.g., "That cup is too big for the dolls", "She's the right size to be the mommy", "That man's legs bend so he can sit at the table", "That cup is the right shape for a chair", etc..

5. Gives the reason for an enacted activity

- e.g., mentions that dolls are hungry so they must be fed, mentions that doll is in bed because it is ill, mentions that dolls are going to school when they ride in vehicles, etc.

6. Designates physical areas as locations in scenario

- e.g., clears space on the floor and calls it a road for the vehicles, groups bathtub and toilet and calls area the bathroom, designates part of the room as "my house", designates area as "the oven", etc.

Reliabilities: Session 3: mother: 94%, child: 91%. Not scored at Sessions 1 and 2.

Elaboration

Within each theme, one or both subject partners may elaborate upon the theme in several different ways. Each elaboration that occurs is to be scored as initiated by whichever subject begins the verbal and/or behavioural activities that constitute the elaboration. If the other subject partner responds to this initiation by including it in his or her own enactment (verbal, behavioural, or both) of the theme, s/he is to be scored as responding to the partner's initiation of elaboration. Thus, if a particular elaboration is initiated by the child, and the mother in no way acknowledges it as part of the theme, the child receives a score for "initiates elaboration" and the mother receives no score for it. If the mother initiates an elaboration (e.g., says "What kind of jelly are you making for

dessert?") and the child incorporates the elaboration as part of the theme (e.g., says "It's red jelly"), the mother receives a score for "initiates elaboration", and the child receives a score for "responds to partner's initiation of elaboration". Thus, the basic elaboration variables are:

10. Initiates elaboration:

11. Responds to partner's initiation of elaboration:

Four different categories of elaboration are possible. These are listed below. These category numbers are to be scored under variables 10 and/or 11 each time behaviours that are categorizable occur in the course of a theme. Each different elaboration receives scores under 10 and/or 11, provided that it adds a new detail to the theme. However, repeats of the same specific elaboration within a theme are not to be scored (e.g. saying that one doll is in bed because she is sick, then that another doll is in bed because she is sick; or repeating the statement that a particular doll is in bed because she is sick at two different points in the theme). Thus, a particular category of elaboration may be scored two or more times in the course of a theme, but only for different elaborations falling under that category. Categories of elaboration for 10 and 11 are:

1. Adds discrete action elements to the theme

- e.g., fixes tire of car, fixes engine of car, fixes wheel of motorcycle = 3,3,3; cooking food, serving food, washing pots = 3,3,3; using toilet, having a bath, washing hair, drying off with towel = 3,3,3,3; driving along road, having accident = 3,3.

2. Adds descriptive details to the theme

- e.g., "This is red jelly", "The father is the driver", "I'm all full now", "The little girl's got a big boy's bed", "The man can hold onto the handlebars", "I'm cooking potatoes", etc.. Score only if the comment adds a new descriptive element to the theme that enriches the detail. Do not score comments like "They're nice dolls" and "There are two chairs" (which is simply a literal description of the existing objects).

Reliabilities: Session 3: Mother initiates: 86%, mother responds: 77%; child initiates: 84%, child responds: 85%.

Appendix D: Coding Examples

Illustrative examples of incidents from the transcripts are provided below for the following coding categories: director of incident, suggests symbolic play, information about objects, conventional use of objects, symbolic play complexity, themes initiated, elaborations initiated, and verbal organization of themes. Transcript material is enclosed in brackets.

Director of Incident

1. [Ch. touches shapebox.

Mo.: "Pick them all up. Put them in there". Mo. puts shapes into open end of shapebox.

Ch. watches.

Mo.: "Put them away. All gone".

Ch. handles shapes.

Mo.: "All gone. Attagirl".]Session 1

Scoring: Mother scored as director. Note that although child initiated play by touching toy, mother directed content.

2. [Ch. puts finger to his lips, points to dog puzzle.

Mo.: "He's sleeping?".

Ch.: "Yeah".

Ch. moves away from puzzle.]Session 3

Scoring: Child scored as director.

Suggests Symbolic Play

1. [Mo.: "Now what are you going to do? Lookit, see the man? Put him to bed"; points to doll and bed.

Mo.: "Put them to bed. Go night-night"; puts dolls in bed.

Ch. watches mo..

Mo.: "Cover them up"; pauses; covers dolls with blanket.

Ch. walks away.]Session 1

Scoring: Symbolic play suggestion scored for mother, because she suggests that the child pretend, despite the child's lack of response.

2. [Ch. picks up spatula and spoon.

Mo.: "Can you cook something? Oh, it's a little pancake turner. Can you cook something?"; points to rolling pin.

Ch. picks up rolling pin.

Mo. hands muffin tin to ch..

Mo.: "Can you make a cake? Mix something up"].Session 2

Scoring: Symbolic play suggestion scored for mother.

Information about Objects

1. [Ch.: "Mommy".
 Mo.: "Uh huh?".
 Ch.: "Where's the road thing?".
 Mo.: "Where's the what, dear?".
 Ch.: "There's one"; picks up car; places it by schoolbus.
 Mo.: "Is that a jeep?".
 Ch.: "Jeep, yeah".
 Ch. touches motorcycle; says: "And this".
 Ch.: "Can you give me the screwdriver?"; points.
 Mo.: "Shall I give you the screwdriver? I'm coming"; gives screwdriver to ch..
 Mo.: "There's the screwdriver".

(Incident continues as ch. "fixes" car)]Session 3

Scoring: For this portion of incident, each subject receives a score of two ("jeep", "screwdriver").

Conventional Use of Objects

1. [Ch. moves beads on abacus.
 Mo.: "Can you count? One, two, three...."; moves beads.
 Ch. moves abacus beads across wires, one by one.
 Mo.: "One....three...."; watches ch. move beads.
 Mo.: "Where's the red ones? Are these the red beads?"; moves beads.
 Ch.: "Red"; touches red beads.
 Mo.: "Red beads, blue beads".
 Ch. shakes abacus.]Session 2

Scoring: Both child and mother receive score for using abacus conventionally. Although its formal function is as a counting device (demonstrated by the mother in this example), conventional use was generally scored if beads were moved from side to side, as child did. If abacus had merely been shaken (as the child did at the end of the incident), no object use would have been scored.

Symbolic Play Complexity

1. [Mo. pushes schoolbus; makes engine noise.
 Ch. pushes schoolbus; makes engine noise; then spins wheels.
 Mo.: "You like that bus, don't you? Look, here's another one with wheels. Look, honey"; shows motorcycle to ch..
 Ch. pushes motorcycle; makes engine noise.]Session 1

Scoring: Both mo. and ch. receive scores for Level 1 (toy replica use alone).

2. [Ch. handles small doll blanket; says "Night-night"; puts her head down on the blanket and closes eyes.

Mo.: "Want to go night-night? Take your blanket and go night-night".

Ch. sits up; picks up car.] Session 1

Scoring: Ch. receives score for Level 2 (self-as-agent).

3. [Ch.: "peep?"

Mo.: "The people are over here. Oh no, they're in the schoolbus. Want to take them out?".

Ch.: "Okay"; gets schoolbus.

Mo.: "Do you remember how to open the door?".

Ch. opens schoolbus door.

Mo.: "See the people?".

Ch. takes a doll out of schoolbus.

Mo.: "Who's that?".

Ch.: "Man".

Mo.: "A man, that's right".

Ch.: "Nose".

Mo.: "He's got a nose".

Ch. puts doll back in bus.

Ch.: "Man!"; takes doll out of schoolbus, puts it in car.]

....Session 2

Scoring: Child receives score for Level 3 (passive animate partner) because child behaves as if doll were animate, but does not imply that doll carries out actions.

4. [Ch.: "Man....cup of tea!"; searches around him.

Mo.: "There's the little girl. Maybe she'd like a cup of tea".

Ch.: "Okay....no....a bath"; puts doll into nesting cup.

Ch.: "No....bathtub!"; picks up bathtub.

Mo.: "Bathe her in the tub".

Ch. puts doll in bathtub: says "Soap?"; looks around.

Mo.: "We'll have to pretend there's soap".

Ch. moves away to other toys.]Session 2

Scoring: Ch. receives score for Level 4 (active animate partner) for implying that doll can bathe. Note that Level 5a (dissimilar-object substitution) was not scored when ch. placed doll in cup, because it was not entirely clear that she intended to substitute the cup for a bathtub, and she subsequently used the toy bathtub in preference to the cup. Note also that "Man....cup of tea!" did not receive a score, because no scenario was enacted, and it is ambiguous whether the child intended to give tea to a doll. Imaginary substitution (Level 6) was also not scored for the mother's statement "We'll have to pretend there's soap", because no substitution was acted out.

5. [Ch.: "Hey, the man, the man".
 Mo.: "Where's he going to sit?"
 Ch.: "He's gonna sit..."; looks around.
 Mo.: "Can you make a chair for him? Can you get something for him to sit on? How about one of those round things over there? Could you make a chair with one of those?"; points to nesting cups.
 Ch.: "All big"; looking at cups.
 Mo.: "A big one?"
 Ch.: "No, a little one".
 Mo.: "Okay, get a little one and make him a chair".
 Ch.: "Okay"; gets nesting cup; places it beside toy table.
 Mo.: "Alright?"
 Ch.: "Yeah, okay. He gonna make proper chair"; puts doll on overturned nesting cup.
 Ch.: "He's gonna make party".
 Mo.: "He's going to make party too, is he?"
 Ch.: "Yeah, he's gonna sit down".
 Mo.: "Oh, very good. That's a good chair".
 Ch.: "Yeah".
 Mo.: "What about the little baby? Is'nt she coming to the party?"
 Ch.: "Huh?"
 Mo.: "Where's the little baby?"
 Ch.: "Right there"; picks up doll.
 Mo.: "Yeah. You got a chair for her?"
 Ch.: "Yeah, right here"; places doll on another nesting cup in front of toy table. (continues...)] ...Session 3
- Scoring: Child receives score for Level 5a (dissimilar-object substitution) because he uses cup as doll's chair. Note that, although the mother initially suggests the substitution, the child independently indicates that he is substituting in two ways: by choosing an appropriate-sized cup, and also by repeating the substitution without explicit maternal instructions when he seats the second doll. Mother also receives a score for Level 5a, because she verbally suggests the substitution and then acts as if the cup were a chair ("That's a good chair").
6. [Mo. pushes motorcycle; makes engine noise.
 Ch.: "But it doesn't have any people on it".
 Mo.: "Maybe you could find somebody to ride it".
 Ch. picks up doll.
 Mo.: "He looks like he's ready to ride. His legs are all ready". (Doll's legs are bent.)
 Ch. puts doll on motorcycle.
 Mo. puts doll's hands on motorcycle handlebars.
 Mo.: "Okay, Joe. Hold on to the handlebars".
 Ch. pushes doll on motorcycle; says: "Where's he going?"
 Mo.: "Where's he going?".

Doll falls off motorcycle.

Ch.: "Oh-oh. He fell off. Maybe tomorrow he will ride it".

Mo.: "Yeah".

Ch. puts another doll on motorcycle; places its hands on the handlebars; says: "Hold on, Mommy Joe".

Ch. pushes doll on motorcycle; makes engine noise.]

....Session 3

Scoring: Child receives score for Level 5b (active animate agent) because he places doll's hands on handlebars and tells doll to hold on, implying that doll is capable of independent action. Mother receives same score for earlier placement of doll's hands on handlebars.

7. [(Mo. and ch. are pretending that child is baking cookies, using muffin tin and spatula.)

Ch.: "Hey, mommy".

Mo.: "What?".

Ch.: "I pretend I make some. I think I need some butter".

Mo.: "Are you going to make some butter?"

Ch.: "I pretend"; moves hand as if taking imaginary butter out of air and placing on imaginary dough in muffin tin.]Session 3

Scoring: Child receives score for Level 6 (imaginary substitution) because she clearly indicates that imaginary butter is present. Imaginary dough does not receive a similar score, because the muffin tin holding the "dough" is a necessary prop.

8. [Ch. and mo. are pretending that the dolls are having a party.)

Ch.: "He's going to eat some cookies".

Mo.: "He's going to eat cookies".

Ch.: "Yeah".

Mo.: "Who made the cookies?"

Ch.: "Me".

Mo.: "You did?".

Ch.: "And you helped me".

Mo.: "Yeah. I helped you. You helped make cookies".

Ch.: "Yeah".]Session 3

Scoring: Both child and mother receive a score for Level 7 (verbal substitution). No pretend cookie-baking episode had preceded this verbal exchange. Both subject partners engage in the verbal fiction that they made cookies together.

Themes Initiated

1. [Mo.: "Look at the baby over here"; touches doll.

Ch.: "Look, baby".

Mo.: "Yeah".

Ch.: "A girl".

Mo.: "Yeah, a little girl. I guess this is supposed to be her . mommy here"; places two dolls beside ch..

Ch. puts a doll on toilet.
 Ch.: "Mommy sit potty".
 Ch.: "Like ours. In potty".
 Mo.: "Oh. What's she doing?".
 Ch. takes doll off toilet; looks into toilet.
 Ch.: "Pee pee all gone. Now old lady all clean. Lady and daddy. And mommy daddy."
 Mo.: "Uh-huh. What do you think of that?".
 Ch.: "Man all tired"; puts doll on bed.
 Ch.: "A doggy?"; looks around.
 Mo.: "They don't have a doggy, I guess".
 Ch.: "A doggy's gone".
 Ch. puts other dolls on bed.
 Ch.: "It's sleeping. All sleeping".
 Mo.: "Put the baby in the baby's bed".
 Ch.: "Baby's bed".
 Mo.: "Uh-huh".
 Ch.: "Okay"; puts doll into crib.
 Ch.: "A baby".
 Mo.: "Cover her up".
 Ch. makes motions as spreading (imaginary) blanket over bed.
 Ch.: "I put them all sleeping now".
 Mo.: "What's the baby's name?".
 Ch.: "Baby Funny".]Session 3

Scoring: Child receives scores for initiating two themes: using bathtub and/or toilet, and sleeping. Note that the two themes occur in the course of one incident. Although the mother initiates the incident, the child selects the symbolic play themes carried out.

Elaborations Initiated

- [(In an earlier incident, mo. and ch. have cooked imaginary pancakes.)
 Mo.: "Put the pancakes on the table now".
 Ch. places toy table in front of mo..
 Ch.: "I'm going to put the chair there, chair there".
 Mo.: "You want the chair. Okay, I'll put the chair right here"; places chair in front of table.
 Ch.: "Now sit them. Sit them up. I'm going to sit on my chair".
 Ch. tries to sit on tiny toy chair.
 Ch.: "My chair. My chair I'm going to sit on".
 Mo.: "Ooops", as chair falls over.
 Ch.: "It's little".
 Mo.: "It's a little bit small for you. You're a really big boy".
 Ch. tries to sit on chair.
 Mo.: "Are you sitting on the chair? Are you going to eat your pancakes?".
 Ch.: "Ooops", still trying to sit on tiny chair.
 Mo.: "Now why don't you just pretend we're sitting on it,

okay? Use your fingers to pretend that you're sitting right there"; puts a finger on a chair.

Ch. puts a finger on a chair.

Mo. and ch. make motions as if eating imaginary food off the table with imaginary spoons.

Mo.: "I need a glass of milk now".

Ch.: "Shhhhhhhhhh. There"; makes motions as if pouring imaginary substance into imaginary cup; hands imaginary cup to mo..

Mo.: "Maybe we can use these for cups?"; picks up nesting cup.

Ch.: "Okay. Shhhhhhhhhh"; makes motions as if pouring substance from one cup to another.

Mo.: "Mmmmmmm"; acts as if drinking from cup.

Ch.: "Mmmmmmm"; acts as if drinking from cup.

Mo.: "That was really good. Did you like it?".

Ch.: "Yeah".

Mo.: "Did you like that? We have to wash the dishes with Joy".

Ch.: "Okay, here's your soap Joy"; hands nesting cup to mo.

Ch. moves on to other toys.]Session 3

Scoring: Mother receives scores for initiating the following action elements and descriptive details: putting pancakes on table, using fingers to pretend subjects are sitting on chairs, asking for a glass of milk, saying that the dishes must be done and that they must be done with Joy. The child receives a score for initiating the following: placing the chairs appropriately. Both subject partners receive scores for responding to each others' elaborations.

Verbal Organization of Themes

1. [(Mo. and ch. have just spent some length of time putting dolls in schoolbus, discussing who is driving, etc..)
 Mo.: "Do you see what it says on the side there? Schoolbus".
 Ch.: "Maybe she should come with us to the schoolbus"; points to small doll.
 Mo.: "Oh, she's going to playschool?".
 Ch.: "Yeah, a little playschool. The baby is going to school"; pushes doll in bus.
 Ch.: (appears to be talking for doll, using a high-pitched voice): "I want to go to school".
 Ch.: (in normal voice): "Okay".
 Ch. rolls bus up to mo..
 Mo.: "This is a dead-end street. Can't go any farther. Have to go around".
 Ch. clears path through other toys, rolls bus through path.
 Mo.: "Is this the road?".
 Ch.: "Yes"; rolls bus up to mother's hand; turns bus.
 Mo.: "Oh, she turned around because she saw my roadblock".

Scoring: Mo. receives scores for announcing activities in advance, specifying physical areas as locations in the scenario, giving the reason for an enacted activity. Ch. receives score for designating physical area as location in scenario.

Appendix F: Correlations Between the Maternal/Interactional Analysis Factor Scores and Other Variables

	<u>Maternal/Interactional Factors</u>						
	Play 1	Play 2	Play 3	Dir 1	Dir 2	Dir 3	Fac. 7
Sess.2 Child Information	.00	-.16	.03	-.32	-.40a	.09	-.54c
Sess.3 Child Information	-.22	-.07	.23	-.62c	-.05	-.05	-.04
Sess.1 Total Incidents	.39a	.37a	.13	.03	-.21	.47b	-.06
Sess.2 Total Incidents	-.10	.33	-.03	-.13	.26	.32	-.10
Sess.3 Total Incidents	-.18	-.09	-.50c	.10	-.09	-.10	.51b
Maternal Education	.22	-.14	-.07	.02	-.08	.02	-.06
Child Bayley Score	.13	-.21	-.05	-.20	-.37a	-.38a	-.31
Child PPVT Score	.17	.07	-.15	.20	-.09	.20	.12

a $p < .10$

b $p < .05$

c $p < .01$ (Some coefficients marked "c" are significant at $p < .001$.)

Appendix F: Correlations Between the Original Variables

Part 1: Correlations Between Child Variables

	<u>COU1</u>	<u>CSPA1</u>	<u>CSPC1</u>	<u>COU2</u>	<u>CSPA2</u>
Ch. Obj. Use 1					
Ch. Sym. Pl. Amt. 1	.73d				
Ch. Sym. Pl. Comp. 1	.57c	.71d			
Ch. Obj. Use 2	.43b	.38a	.34a		
Ch. Sym. Pl. Amt. 2	.44b	.36a	.31	.75d	
Ch. Sym. Pl. Comp. 2	.38a	.35a	.38a	.65d	.46b
Ch. Obj. Use 3	.31	.21	.19	.10	.21
Ch. Sym. Pl. Amt. 3	.24	.13	.10	.17	.07
Ch. Sym. Pl. Comp. 3	.14	-.04	.24	.21	.16
Ch. Verbal Org. 3	.40	.31	.38a	.42b	.33
Ch. Themes Init. 3	.11	-.02	.11	.25	.09
Ch. Elaborat. Init. 3	.15	-.02	.24	.19	.17

Part 1 (Cont'd)...

	<u>CSPC2</u>	<u>COU3</u>	<u>CSPA3</u>	<u>CSPC3</u>	<u>CV03</u>	<u>CTI3</u>
Ch. Obj. Use 3	.34a					
Ch. Sym. Pl. Amt. 3	.21	.65d				
Ch. Sym Pl. Comp 3	.26	.39	.67d			
Child Verbal Org. 3	.27	.33	.63c	.55c		
Child Themes Init. 3	.18	.45b	.68d	.61c	.74d	
Ch. Elaborat. Init. 3	.13	.55c	.71d	.66d	.82d	.80d

- a $p < .10$
- b $p < .05$
- c $p < .01$
- d $p < .001$

Part 2: Correlations Between Maternal and Interactional Variables

	<u>MSPS1</u>	<u>MOU1</u>	<u>MSPA1</u>	<u>MSPC1</u>	<u>MSPS2</u>
Mo. Sym Pl. Sugg. 1					
Mo. Obj. Use 1	.65d				
Mo. Sym. Pl. Amt. 1	.51b	.63c			
Mo. Sym. Pl. Comp 1	.34a	.48b	.60c		
Mo. Sym Pl. Sugg. 2	.50b	.54c	.43b	.34a	
Mo. Obj Use 2	.30	.24	.21	.18	.66d
Mo. Sym. Pl. Amt. 2	.27	.26	.32	.36a	.63c
Mo. Sym. Pl. Comp. 2	.27	.34a	.34a	.55c	.52c
Mo. Obj. Use 3	.30	.50b	.50b	.37a	.21
Mo. Sym Pl Amt. 3	.25	.35a	.50b	.44b	.19
Mo. Sym. Pl. Comp. 3	.43b	.45b	.52c	.54c	.26
Mo. Themes Init. 3	.01	.29	.33	.47b	.19
Mo. Verbal Org.	.38a	.44b	.41b	.35a	.39a
Mo. Elaborat. Init. 3	.18	.41a	.43a	.31	.30
Joint Participation 1	.45b	.48b	.59c	.35a	.24
Mo. Directiveness 1	-.04	.17	-.20	-.10	-.03
Mo. Information 1	.60c	.65d	.37a	.49b	.35a
Joint Participation 2	.15	.11	.13	.17	.26
Mo. Directiveness 2	.16	.26	.15	-.23	.18
Mo. Information 2	.27	.16	.15	.27	.54c
Joint Participation 3	.24	.34	.17	-.03	.21
Mo. Directiveness 3	.03	-.05	-.18	.00	.10
Mo. Information 3	.47b	.23	.38a	.26	.23

Part 2 (Cont'd)

	<u>MOU2</u>	<u>MSPA2</u>	<u>MSPC2</u>	<u>MOU3</u>	<u>MSPA3</u>	<u>MSPC3</u>
Mo. Sym. Pl. Amt. 2	.82d					
Mo. Sym. Pl. Comp. 2	.55c	.63c				
Mo. Obj. Use 3	-.12	.20	.23			
Mo. Sym. Pl. Amt. 3	-.15	.06	.26	.59c		
Mo. Sym. Pl. Comp. 3	.14	.25	.37a	.50c	.67d	
Mo. Themes Init. 3	-.16	.01	.18	.36a	.31	.02
Mo. Verbal Org. 3	.03	.14	.19	.39a	.72d	.55c
Mo. Elaborat. Init. 3	.03	.01	.03	.43b	.65d	.48b
Joint Participation 1	.05	.02	.34a	.13	.29	.53c
Mo. Directiveness 1	-.02	.10	-.21	.22	-.12	-.38a
Mo. Information 1	.15	.12	.23	.31	.13	.42b
Joint Participation 2	.37a	.41b	.37a	-.16	.07	.11
Mo. Directiveness 2	.24	.20	-.22	.20	.00	.08
Mo. Information 2	.57c	.68d	.40a	.06	.03	.16
Joint Participation 3	.08	-.07	-.18	.13	.36a	.37a
Mo. Directiveness 3	.17	.18	-.09	-.05	-.49b	-.08
Mo. Information 3	.29	.44a	.14	.37	.34a	.41b

Part 2 (Cont'd)

	<u>MT3</u>	<u>MVO3</u>	<u>MEI3</u>	<u>JP1</u>	<u>MD1</u>	<u>MI1</u>
Mo. Verbal Org. 3	.39a					
Mo. Elaborat. Init. 3	.42b	.81d				
Joint Participation 1	.04	.24	.21			
Mo. Directiveness 1	.03	-.15	-.06	-.56c		
Mo. Information 1	.20	.31	.24	.50b	-.20	
Joint Participation 2	.10	.33	.11	.27	-.14	-.06
Mo. Directiveness 2	-.07	-.05	.17	.00	.18	.07
Mo. Information 2	.20	.22	.14	.15	-.23	-.38a
Joint Participation 3	.11	.40b	.45b	.11	.01	.08
Mo. Directiveness 3	.19	-.19	-.22	-.20	.09	.07
Mo. Information 3	.22	.43b	.29	.14	-.15	.24

Part 2 (Cont'd)

	<u>JP2</u>	<u>MD2</u>	<u>MI2</u>	<u>JP3</u>	<u>MD3</u>
Mo. Directiveness 2	-.23				
Mo. Information 2	.20	.33			
Joint Participation 3	.16	.35a	-.12		
Mo. Directiveness 3	.06	.08	.17	-.11	
Mo. Information 3	.21	.23	.52c	.07	.29

- a $p < .10$
- b $p < .05$
- c $p < .01$
- d $p < .001$

Part 3: Correlations Between Child and Maternal/Interactional Variables

	Ch. Obj. <u>Use 1</u>	Ch. Sym. <u>Pl. Amt 1</u>	Ch. Sym. <u>Pl. Comp. 1</u>	Ch. Obj. <u>Use 2</u>
Mo. Sym. Pl. Sugg. 1	.44b	.36a	.49b	.20
Mo. Obj. Use 1	.61c	.46b	.47b	.37
Mo. Sym Pl. Amt 1	.51b	.57c	.74d	.27
Mo. Sym. Pl. Comp 1	.51b	.34b	.55c	.26
Mo. Sym Pl. Sugg. 2	.64d	.62c	.45b	.70d
Mo. Obj. Use 2	.16	.25	.29	.65d
Mo. Sym. Pl. Amt 2	.13	.22	.29	.62c
Mo. Sym. Pl. Comp. 2	.40a	.29	.33	.55c
Mo. Obj. Use 3	.22	.08	.08	.01
Mo. Sym. Pl. Amt. 3	.27	.22	.13	.20
Mo. Sym. Pl. Comp. 3	.22	.01	.33	.26
Mo. Themes Init. 3	.42b	.43b	.24	.12
Mo. Verbal Org. 3	.40a	.23	.21	.40b
Mo. Elaborat. Init. 3	.39a	.21	.14	.25
Joint Participation 1	.50b	.37a	.56c	.14
Mo. Directiveness 1	-.24	-.17	-.33	-.16
Mo. Information 1	.65d	.28	.30	.15
Joint Participation 2	.25	.12	.38a	.53c
Mo. Directiveness 2	.04	.09	.00	.12
Mo. Information 2	.31	.32	.14	.52c
Joint Participartion 3	.15	.11	.21	.28
Mo. Directiveness 3	-.16	-.10	.07	.02
Mo. Information 3	-.01	.22	.29	.23

Part 3 (Cont'd)

	<u>Ch. Sym.</u> <u>Pl. Amt 2</u>	<u>Ch. Sym.</u> <u>Pl. Comp. 2</u>	<u>Ch. Obj.</u> <u>Use 3</u>	<u>Ch. Sym.</u> <u>Pl. Amt 3</u>
Mo. Sym. Pl. Sugg. 1	.38a	.07	.32	.33
Mo. Obj. Use 1	.35a	.28	.50b	.37a
Mo. Sym. Pl. Amt. 1	.26	.42b	.53c	.46b
Mo. Sym. Pl. Comp. 1	.37a	.39a	.45b	.38a
Mo. Sym. Pl. Sugg. 2	.80d	.48b	.18	.16
Mo. Obj. Use 2	.59c	.54c	-.16	-.07
Mo. Sym. Pl. Amt. 2	.67d	.59c	.19	.06
Mo. Sym. Pl. Comp. 2	.57c	.82d	.30	.23
Mo. Obj. Use 3	.18	.28	.90d	.51b
Mo. Sym. Pl. Amt 3	.11	.29	.72d	.95d
Mo. Sym. Pl. Comp. 3	.17	.26	.52c	.70d
Mo. Themes Init. 3	.30	.29	.51b	.21
Mo. Verbal Org. 3	.49b	.13	.55d	.77d
Mo. Elaborat. Init. 3	.26	.14	.47b	.69d
Joint Participation 1	.01	.23	.19	.33
Mo. Directiveness 1	.02	-.05	.07	-.17
Mo. Information 1	.22	.00	.31	.23
Joint Participation 2	.46b	.43b	-.01	.12
Mo. Directiveness 2	-.11	.03	.10	.04
Mo. Information 2	.54c	.29	.13	.09
Joint Participation 3	.05	.10	.24	.37
Mo. Directiveness 3	.27	-.13	-.19	-.52c
Mo. Information 3	.30	.12	.42b	.42b

Part 3 (Cont'd)

	Ch. Sym. <u>Pl. Comp3</u>	Ch. Ver. <u>Org. 3</u>	Ch Theme <u>Init. 3</u>	Ch. Elab <u>Init. 3</u>
Mo. Sym. Pl. Sugg. 1	.41b	.31	.22	.27
Mo. Obj. Use 1	.29	.12	.12	.20
Mo. Sym. Pl. Amt. 1	.42b	.40b	.28	.42b
Mo. Sym. Pl. Comp. 1	.46b	.32	.14	.31
Mo. Sym. Pl. Sugg. 2	.27	.35a	.17	.14
Mo. Obj. Use 2	.18	.12	-.03	-.08
Mo. Sym. Pl. Amt. 2	.23	.19	.22	.16
Mo. Sym. Pl. Comp. 2	.41b	.31	.23	.19
Mo. Obj. Use 3	.37a	.19	.38a	.43b
Mo. Sym. Pl. Amt 3	.62c	.64d	.69d	.72
Mo. Sym. Pl. Comp. 3	.94d	.62c	.66d	.78d
Mo. Themes Init. 3	-.02	.00	-.28	.03
Mo. Verbal Org. 3	.45b	.67d	.48b	.70d
Mo. Elaborat. Init.	.35a	.54c	.25	.55d
Joint Participation 1	.49b	.44b	.27	.42b
Mo. Directiveness 1	-.46b	-.54c	-.25	-.36a
Mo. Information 1	.34a	.13	.05	.13
Joint Participation 2	.12	.30	.16	.22
Mo. Directiveness 2	-.02	.02	.07	.03
Mo. Information 2	.17	.28	.07	.11
Joint Participation 3	.29	.24	.18	.35
Mo. Directiveness 3	-.08	-.28	-.39a	-.26
Mo. Information 3	.38a	.34a	.26	.32

- a $p < .10$
 b $p < .05$
 c $p < .01$
 d $p < .001$

Part 4: Correlations Between Variables not in P.C. Analyses

	<u>Ch. Info</u> <u>2</u>	<u>Ch. Info</u> <u>3</u>	<u>Total</u> <u>Incid. 1</u>	<u>Total</u> <u>Incid. 2</u>
Ch. Information 2				
Ch. Information 3	.11			
Total Incidents 1	.19	.04		
Total Incidents 2	.18	.06	.02	
Total Incidents 3	-.33	-.16	-.13	-.21
Maternal Education	.13	.00	.29	-.43b
Ch. Bayley Score	.46b	-.04	-.37	-.08
Peabody PVT	.31	-.43b	.23	.19

Part 4 (Cont'd)

	<u>Total</u> <u>Incid. 3</u>	<u>Maternal</u> <u>Educatn.</u>	<u>Bayley</u>
Maternal Education	-.10		
Bayley	-.15	.27	
Peabody PVT	.09	.09	.55c

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