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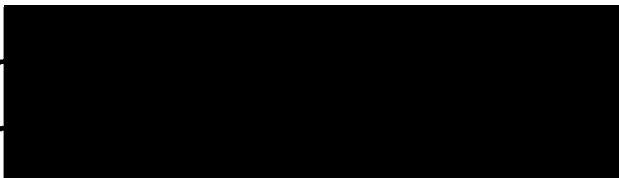
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A METHOD FOR THE INVESTIGATION OF MOTHER-INFANT
INTERACTIONS IN THE DEVELOPMENT OF PRETEND PLAY

by

Cristine Russell

B.A. (Hons.), Simon Fraser University, 1975

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS
in the Department
of
Psychology

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A METHOD FOR THE INVESTIGATION OF
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ABSTRACT

Theorists and researchers agree that pretend play is related to representational and role-taking abilities, but little is known about its emergence in infancy. Piaget (1962) has viewed pretend play as a cognitive activity based on imitation of non-play activities some time after their original occurrence, but not upon specific imitation of adults' pretend play. The Russian researchers El'Konin (1966, 1969) and Repina (1971) have argued that adults must teach pretend play, either by modelling pretend activities or by verbally suggesting that the child pretend. No research has investigated the possible role of maternal behaviours and mother-infant interactions in infant pretend play development. Existing studies of infant pretend play are not longitudinal, and all contain methodological flaws.

This thesis describes a new method for the investigation of mother-infant interactions in cross-sectional or longitudinal studies of pretend play development. A category system for measuring pretend and related behaviours was developed using videotaped observations of 30 mothers and their 12- to 14-month-old infants. Each mother-infant pair was observed during a 15-minute free play session in which conventional toys classified as likely or unlikely to elicit pretend play, and also as male, female, or neutral with regard to sex-stereotyping, were

available. The Mental Scale of the Bayley Scales of Infant Development (Bayley, 1968) was administered as a measure of cognitive development at the age of 20 to 22 months.

The videotaped observations were transcribed, divided into play incidents involving one or both subject partners, and coded according to the category system, which measured the amount and complexity of pretend play and conventional object use demonstrated by each subject partner. Other measures included information mothers expressed about objects, the child's general level of cognitive development, the proportion of play incidents directed by each of the partners, and the degree to which both partners jointly participated in play activities. Two observers independently transcribed, divided, and coded the observations for 20% of the subject pairs. Interobserver reliability measures were 97% for transcription and 79% or 96% for incident division (using a conservative or a liberal measure). Reliabilities for the 14 coding categories ranged from 75% to 89%.

The data obtained were used in an exploratory study of mother-infant interactions. The findings indicate positive relationships between infant pretend play and maternal pretend play suggestions and demonstrations. Joint participation in play activities and the number of recognizable utterances made by the infant were also related to the infant's pretend play score.

Mothers who demonstrated pretend behaviours both at the average level of complexity for infants and at a level slightly above the infants' average level had infants who demonstrated average and above average complexity in their own pretend play, suggesting that mothers may pace the complexity of their play to their infants' emerging abilities.

These and other findings demonstrate the usefulness of this method in studying mother-infant interactions. Ongoing longitudinal research involving the same subject group will provide an opportunity to investigate hypotheses regarding adult facilitation of pretend play development.

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1. INTRODUCTION

The emergence of symbolic play is an important but little-studied area in the cognitive development of children. Despite differences of opinion over the precise function pretend or symbolic play serves, its organization, and the mechanisms involved in its development, most theorists and researchers agree that it is related to the general development of representation and that it may be important in developing social role-taking abilities. It is seen by Vygotsky (1966) as an important precursor of language acquisition, and by others (Piaget, 1962; Sinclair, 1970) as a parallel development stemming from the same emerging cognitive symbolic abilities.

In the Piagetian view (Piaget, 1962), pretend play first appears during the sixth stage of the sensorimotor period, and develops throughout the preoperational period. It is characterized by the acting out of familiar behavioural sequences (schemas) in the absence of the appropriate environmental cues for such sequences. According to Piaget, pretend play is primarily an assimilative cognitive activity carried out for the child's pleasure, and is independent of the process of socialization. In contrast to language, in which the word is seen as an arbitrary "sign" for something which has a shared social meaning, the "symbol" of symbolic play is seen as

egocentric, very possibly having meaning only for the individual child. Symbolic play follows, and is based on, the development of deferred imitation. The child must be capable of imitating his own and others' non-play activities some time after their original occurrence in order to act out schemas in the absence of appropriate cues.

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 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.

The Russian researchers El'Konin (1966, 1969) and Repina (1971) have viewed symbolic play as an important aspect of the process of socialization which does not develop spontaneously, but must be taught directly, or at least by verbal suggestion. Initially, children must be specifically shown that one object may be substituted for another in play or that one person may

assume the role of another. Only after a period of deferred imitation of pretend play behaviours does the child generalize and spontaneously act out new pretend sequences.

These and other assertions about the nature and emergence of pretend play have stimulated research aimed primarily at providing descriptions of the order in which pretend behaviours of increasing complexity occur, and the approximate ages at which these behaviours tend to emerge. With some exceptions, most of the research has examined the behaviour of children in the two- to twelve-year age range (e.g. Franklin, 1973; Garvey and Berndt, 1975; Jackson, 1974; Overton and Jackson, 1973). Relatively little research in this area has studied children as young as twelve months, the approximate age at which one might expect to find the emergence of pre-symbolic and possibly symbolic play (Piaget, 1973). However, the existing studies present a reasonably consistent picture of the order in which early symbolic behaviours evolve, of some of the stimulus properties likely to elicit pretend in different age groups, of sex differences in early pretend play, and of the relationship between pretend and the conventional use of objects.

Sequence of Pretend Play Development

Inhelder and her colleagues (Inhelder, Lezine, Sinclair & Stambak, 1972; Sinclair, 1970) have published preliminary results

from a longitudinal study of play involving children aged 10 to 41 months. In what is perhaps the most thorough, careful work in this area to date, the researchers used both longitudinal and cross-sectional data in identifying stages in the development of pretend. They found little pretend play in the 12- to 16-month-old age group, with the exception of the appearance of activities related to feeding oneself at about 15 months (e.g. putting an empty cup to the mouth and pretending to drink). Other self-related activities (e.g. grooming) did not appear until approximately 21 months. The emergence of self-related pretend play was followed at approximately 16 to 19 months by the use of "animate" toys (dolls, teddy bears) as passive partners in activities (for example, a child hugging a doll). Between 19 and 26 months, activities in which "animate" toys were used as active partners were numerous (for example, putting a doll on a toilet, then removing it and examining its shorts). The use of substitute objects (e.g. a stick used as a doll) appeared at about 22 months, and at about 24 months the children both treated animate toys as active agents in their own right (e.g. putting a mirror in a doll's hand "so she can see herself") and referred to absent objects (e.g. pretending to pour imaginary water over a doll's head from an empty cup).

Lowe (1975), using 12- to 36-month-old subjects, also found a progression from self-related pretend behaviours (with eating

behaviours preceding grooming ones) to doll-related behaviours in which these toys took on first passive, then active roles. Fein (1974) found the same general pattern, with realistic toys (e.g. dolls) used as if animate, then substitutions of unrealistic for realistic objects (e.g. a stick used as if it were a doll), and finally the use of imaginary objects, which are in reality absent (e.g. banging with an imaginary hammer, or talking to an imaginary person).

Fenson, Kagan, Kearsley & Zelazo (1976) reported that "symbolic or symbolic-like acts" were essentially absent in their 7- and 9-month old subjects, present in about half of their 13-month-old subjects, and exhibited by all subjects at 20 months. Since they analyzed data obtained using only a toy tea set as stimulus material, and no dolls or other materials were available, the results probably apply only to self-directed pretend activities involving eating, and are thus consistent with Inhelder's and Lowe's findings.

Watson and Fischer (1976), in a study of 14-, 19-, and 24-month-olds, found evidence for an invariant progression through the following steps: 1) use of self as agent; 2) use of animate toy as passive agent; 3) use of substitute as passive agent; and 4) use of animate toy as active agent. Not only was the sequential emergence of these steps substantiated, but it was

also found that children's frequency of performing these behaviours declined in a "first in - first out" manner. As children produced behaviours at the higher levels, they stopped producing behaviours at the earlier levels in the same sequence in which they had acquired them.

In summary, research conducted by several workers of varying theoretical persuasions using different research methods has produced a surprisingly consistent picture of the sequence in which pretend play develops. Although most authors cite the Inhelder et al. (1972) study, their reference sections include few references to each other's work. Nonetheless, none of the research cited here seems contradictory, when allowances have been made for the use of subjects of differing ages, and for the use of different stimulus materials. Initially (13 to 16 months), infants perform pretend behaviours with themselves as agents. Behaviours related to eating appear first, with self-related grooming and other behaviours appearing later. Next, at about 16 to 19 months, "animate" toys such as dolls and stuffed animals are used as passive partners in the child's activities. At about 19 to 22 months, animate toys come to be used as active partners. The use of substitute objects appears shortly thereafter, and at about the same time or a little later, the child comes to use animate toys as active agents, and uses imaginary objects or people in play.

Stimulus Properties

Another question that has been empirically studied concerns the degree of "realism" of stimulus objects likely to elicit pretend behaviour in children of different ages. Fein (1974) has provided an extensive discussion of the concept of "realism" or "prototypicalness" in such stimulus objects. She has proposed three stages in the development of pretend play: (1) a stage in which highly prototypical objects are chosen to represent other objects (e.g. dolls are treated as though animate); (2) a stage in which stimulus objects possessing "core properties" of prototypical objects are used to represent the prototypical objects (e.g. a stick is substituted for a doll); and (3) a final stage in which the addition of a productive process allows the generation of stimulus events from the decomposition and coding of prototype representations (e.g. a totally absent "imaginary" object or person is used in play). Fein has compared the later appearance of "producing" (imaginary) objects with that of production in language, which follows comprehension. In a study of 20- and 26-month-old children, she found that highly prototypical objects elicited more pretending than did less prototypical ones.

Garvey and Berndt (1975), studying children aged 3 to 5.5 years, also found a progression from highly prototypical to less

prototypical object use in pretend. They commented: "From an earlier stage where objects are used in a manner predictable on the basis of their perceptual or manipulative properties, the child moves on to relate objects according to processes that are less clearly perceptually determined and finally to transform present objects or even to invent objects for use in a pretend episode" (p.11). They also found that stimulus objects applicable to caretaking or domestic activities (dolls, dishes, etc.) elicited pretend play earlier than did objects applicable to the depiction of other, more varied situations external to the home (e.g. street scenes, etc.).

Other research has confirmed the finding of a progression from highly prototypical to less prototypical stimulus object use. Franklin (1973), who asked 4-year-olds to enact certain pretend situations (e.g. "Pretend that you are in the kitchen making something to eat") using either realistic or non-realistic play materials, found that for all situations, the tendency to follow instructions was greater with the realistic materials. Pulaski (1973), studying 4- to 8-year-olds, found that these older children produced a greater variety of pretend behaviours when the stimulus materials were less realistic. Repina (1971) also reported that younger children engaged in pretend play far more readily with highly realistic play materials, while older children pretended more with unrealistic materials. Thus, it

would appear that a definite progression from the use of highly prototypical to less prototypical stimulus objects is generally found in the development of symbolic play.

Sex Differences

Findings on sex differences are not so clear-cut. Some authors (El'Konin, 1966, 1969; Inhelder et al., 1972; Overton & Jackson, 1974; Repina, 1971; Watson & Fischer, 1976) have not reported differences, although only Watson and Fischer reported specifically testing for such differences. Fein (1974) reported that no sex differences were found in early (self-directed) forms of pretend play, but that more and earlier pretend involving role transformations (child assumes "mother" role in feeding dolls, etc.) was found in female children than in males. This difference was found only in play with highly prototypical toys, and was related to dolls and caregiving materials. Fein has suggested that this effect (found at 20 to 26 months) is the result of adult modelling and of differential reinforcement of "sex-appropriate" behaviour by caregivers. Since Fein's "highly prototypical" stimulus materials included only small numbers of "male-appropriate" or "neutral" toys, and larger numbers of "female-appropriate" toys, and since she did not mention any measures taken to control for this imbalance in her analysis, the finding may be an artifact of the experiment.

Lowe (1975) found female subjects ahead of males in doll-related activities, especially grooming, and found that while both sexes were equally likely to place dolls in a "feeding" situation by 36 months, far more girls than boys actively "fed" the doll. Lowe also reported that boys were ahead in pretend play using trucks, and that only boys were found to "fix" the trucks or to "put gasoline" in the vehicles. Garvey and Berndt (1975) reported that their 3- to 5.5-year-old subjects took on "sex-appropriate" roles (girls as mothers, etc.) at all ages.

It seems possible that the sex differences reported by Fein (1974) and Lowe (1975) may be related to the predominance of "female-appropriate" toys used as stimulus materials in their studies. However, since both Franklin (1973) and Garvey and Berndt (1975) reported a progression from the representation of caretaking or domestic activities to the representation of activities removed from the home (e.g. street scenes), it may be that domestic activities, because of familiarity, are the easiest for children to enact. Differential reinforcement by caregivers, or other aspects of sex-role development, may thus favour the earlier development of pretend play in female children.

Pretend Play and the Conventional Use of Objects

Another question of interest is that of the relationship between the emergence of pretend play and the child's acquisition of information about the proper or conventional uses of objects. Inhelder et al. (1972) examined the relationship between "clearly interpretable" acts involving the conventional use of objects, and acts involving "make-believe". They 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-month-old subjects, who exhibited no pretend play by their criteria, applied action patterns indiscriminately to objects. Any action pattern could be applied to many objects, and any object could elicit many different action patterns. Their 16- to 19-month-old subjects, who exhibited self-related pretend play and used "animate" toys as passive partners, were able to use one or more objects adequately (e.g. wiping with a cloth, leafing through a book looking at the pictures, etc.). By 19 to 26 months, the children in their study had discovered the objects' functions and properties, and had begun to classify objects according to function. These subjects used animate toys as active partners, used substitute objects, and symbolized absent "imaginary" objects. Inhelder and her colleagues 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, author's translation)

Fein (1974) also studied the relationship between pretending and relating objects to one another between 12 and 18 months, and found that "pretending is consistently associated with activities which indicate that the child is using the spatial and physical characteristics of objects" (p. 11). She stated that the child must first have constructed "stable internal representations of familiar objects and activities" in order to select the appropriate stimulus properties in pretending with objects. She commented that in pretend: "In a sense, the child is merely expressing what he knows about how an object can be used...detached from the practical context in which he typically uses it" (p.12).

El'Konin (1966) viewed the acquisition of socially correct methods of using objects as a precondition for the development of pretence involving role-playing. For him, the proper use of objects is socially learned through interaction with adults. He commented: "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). Although these researchers may disagree regarding the manner in which correct object use is acquired, it is clear that they all view this acquisition as a necessary precondition for the development of pretend play.

Summary and Rationale for the Present Research

Existing research on early pretend play has provided information on the sequence in which particular behaviours appear and on some of the properties of stimuli likely to elicit pretend play in different age groups. Sex differences have been found, and the development of pretend play has been correlated with the development of conventional object use. Both Fein (1974) and Inhelder et al. (1972) have suggested possible links between stages in the emergence of symbolic play and stages in the acquisition of language, and have proposed that this area receive further investigation. However, with the exception of the Russian studies (El'Konin, 1966, 1969; Repina, 1971) cited earlier, no researchers have directly examined the question of how pretend play comes about.

Is it, as the Piagetians suggest, a spontaneously occurring stage in cognitive development? Or is it a socially learned

behaviour that must be "taught" to the child, directly or indirectly, by others? Is the development of symbolic play linked to the overall amount of cognitive stimulation the child receives, or to the child's overall rate of general cognitive development? Is there a relationship between the degree to which the child receives information about and demonstrations of the conventional use of objects, and the degree to which the child exhibits pretend behaviours? All of these questions are concerned with the possible learned aspects of pretend play, and involve the role of caregivers, in its development. If pretend play is important either to cognitive development, social development, or both, the questions are of practical importance.

If adult stimulation is necessary to the development of pretend play, or even if it is non-essential but has a facilitating effect, this information would be of benefit to the caretakers of infants. Parents, day care workers, and others should know that by actively encouraging pretend-related activities, they may facilitate the development of symbolic representation and/or social role-taking abilities. Several authors (Bateson, 1972; Ross, Goldman, & Hay, 1976) have suggested that play in general is important in the acquisition of "meta-rules" regarding social communication. Pretend play may also be one of the earliest forms of human creative behaviour.

The present research concerns the development of a method for investigating the role of caregivers (specifically mothers) in the development of pretend play in infancy. While existing studies have identified parameters of interest in the development of pretend play, they suffer from methodological inadequacies, and almost none have been designed to investigate the possible role of maternal behaviours. Following a review of the methods used in these studies, the development of a new method for investigating the interaction of maternal and infant behaviours in the development of pretend play will be outlined, and the results of a preliminary study (part of a longer longitudinal investigation) using this method will be reported.

2.7 PRETEND PLAY RESEARCH

Research Aims

The aim of the present research was to develop a method for the investigation of relationships between several maternal and infant behavioural variables throughout the period of infancy in which pretend play emerges. While the primary variables of interest were pretend play behaviours (or verbal suggestions regarding pretend play) on the part of both infants and mothers, other variables possibly related to the emergence of pretend play have also been included. One of these was the degree to which mothers and infants physically demonstrate or verbally indicate information about the conventional uses of objects, including playthings (El'Konin, 1966; Fein, 1974; Inhelder et al., 1972). Other variables of interest were the child's general level of cognitive development, and the degree to which both mothers and infants express information about the names and physical properties (e.g. colour, texture, size, quantity) of objects.

Since the intended use of the method was to investigate relationships between these variables both at one point in time, and over time (e.g. between early maternal behaviours and later infant behaviours), the method was designed for use in both cross-sectional and longitudinal studies. Thus, the behavioural

categories developed for both maternal and infant play had to include the range of such behaviours likely to be found from the age at which infants begin to produce pretend or pre-pretend behaviours to the age at which such behaviours are well-established.

It was necessary to develop a new research method (both applicable to cross-sectional and longitudinal designs, and including new behavioural categories) for two reasons. First, almost no research has been carried out into possible mother-infant interactions in pretend play development, and thus no suitable methods exist for such studies. Second, most of the existing studies of infants' pretend play suffer from various methodological defects. After a discussion of these two points, the development of the present research method will be presented.

Mother-Infant Interactions in Pretend Play Development

El'Konin (1964, 1966, 1969) and Repina (1964) have emphasized the role of adult modelling and verbal direction in the emergence of both pretend play and the conventional use of objects (which they and others (Inhelder et al., 1972; Fein, 1974) consider to be a precondition for the emergence of pretend). El'Konin reported that "the socially developed methods of using definite objects ... are found only in the joint

activity of the child with adults" (1966, p.233), and that initially a learned way of using a particular object cannot immediately be transferred by the child to another object.

Later, according to El'Konin, children begin to transfer these actions to other playthings, and also begin to be able to produce actions, using objects, learned through "mere observation" of adult activities. Finally, the generalization of these activities progresses to the point where the child no longer requires specific highly prototypical objects, and can perform actions involving substitutions of less prototypical objects, or the use of absent, "imaginary" objects.

The studies upon which these conclusions were based are not reported in any detail in English translations of the Russian literature, and there have been few attempts at replication or further investigation by Western researchers. Watson and Fischer (1976) employed a design in which adult models demonstrated different types of pretend play to infant subjects. However, the intent of this procedure was to elicit imitations of these behaviours on the part of the infants as a means of collecting observations on the infants' levels of pretend play development. The models were assistants of the experimenters, and the study was not designed to investigate aspects of adult-child interaction in pretend play. In all of the other

previously-cited studies of infant pretend play, mothers or other adults were present only to prevent stranger or separation anxiety, and were instructed not to initiate any activities and to respond to the infants as little as possible. Thus, no research methods have been developed for the investigation of maternal variables and mother-infant interactions in this area.

The idea that adults may facilitate the development of pretend play skills has received some research attention with older, preschool children. Smilansky (1968) trained nursery school teachers to stimulate sociodramatic play in disadvantaged preschoolers. She found that this stimulation increased the children's subsequent sociodramatic play. Smilansky suggested that such play is encouraged and directly taught by middle class parents, but often not by lower class parents. Rosen (1974) replicated Smilansky's findings, and reported that disadvantaged children who had received training in sociodramatic play improved significantly over controls on measures of cooperative group problem-solving behaviour and role-taking skills. Saltz and Johnson (1974) reported similar findings, with disadvantaged preschool children who had received training in "thematic-fantasy play" scoring higher than controls on several measures of social and cognitive development. Because these studies involved preschoolers rather than infants, they provide little information about the normal development of pretend play from infancy.

However, their findings suggest that pretend play can be taught to children by adults, lending a small measure of support to the contentions of El'Konin (1966, 1969) and Repina (1971). Their methods, however, are not applicable to infant studies.

Methodology in Existing Studies

Any investigation of infant pretend play requires careful consideration of several methodological problems. Initially, there is the need for an adequate definition of pretend play, and following from this, an adequate means of operationalizing the definition through the formation and measurement of behavioural categories. An appropriate research design (longitudinal or cross-sectional) must be chosen, and a technique for collecting data (structured experimental, free-play observation, etc.) must be devised. Appropriate stimulus materials must be used, and there must be an adequate method of recording the data (by using observers present during the experimental sessions, videotaping observations, etc.). Adequate controls must be considered, and if observers are used, interobserver reliability must be calculated. The data must be analysed using appropriate statistical techniques.

Existing studies of infant pretend play, as a group, suffer from methodological inadequacies in all of these areas.

Individual studies all contain a flaw in at least one of these areas, and most of them contain several. The methods used in several studies will be presented with regard to each of the areas outlined above, rather than presenting individual reviews of each study's methods. In addition to a criticism of these methods on the basis of their adequacy for the purpose of investigating their authors' own hypotheses, their usefulness in a study of mother-infant interactions will also be considered.

Definition of Pretend Play

Piaget (1962) defined pretend play as the acting out of familiar action schemas in the absence of the appropriate environmental cues. This was illustrated with the example of a child who placed a cloth to the side of her head, closed her eyes, and "pretended" to go sleep. The element of substitution of one object (cloth) for another (pillow) is important to his definition of pretend; an earlier example in which the same child closed her eyes after placing a pillow (appropriate cue) against her head was categorized as an earlier stage on the road to full symbolic play. Piaget's definition also stressed an element of awareness on the part of the child that s/he is pretending. Piaget emphasized the "playful" character of the child's behaviour during pretend play, noting that children smiled or laughed while engaged in these activities.

Since it required that appropriate environmental cues be absent, Piaget's definition classed as pretend play only those behaviours involving substitutions, imaginary objects, or the carrying out of physical activities related to body functions out of context (e.g. pretending to go to sleep). Piaget did not consider pretend play occurring with playthings such as dolls, toy dishes, etc., and thus his definition is not appropriate to play situations in which such toys are used. His requirement that the child be aware of the pretend nature of his actions may be empirically tested in older children who can talk (i.e. one may question them about their activities), but is impossible to apply in investigating infants' pretend play. The subjectivity of gauging whether the child is displaying a playful quality during play actions renders this aspect of his definition somewhat useless in research as well.

Researchers have made various attempts to define pretend play. Sinclair (1970), for example, defined it as "all those activities that can be interpreted as 'acting as if'" (p. 122). Garvey and Berndt (1975) 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). Fein (1974) has carried the concept of transformations further by devising a typology of transformations in pretend, defining a transformation as "the process which...permits one object...to be used as if it were

another" (pp.6-7). It is obvious that such operational definitions are not clear-cut, and leave much room for subjective interpretation of whether or not the child is in fact pretending. As Fenson et al. (1976) commented: "the distinction [between pretending and simple learned associations] is easier to make semantically than empirically" (p. 235).

Researchers have tended to avoid the question of definition, and to rely instead on the presentation of behavioural categories which they then discuss as though these obviously represented pretend play. For example, Fenson et al. (1976), who investigated three types of play, provided independent definitions, as well as examples, of "relational acts" and "sequential acts". However, they avoided defining "symbolic acts", stating instead that "symbolic acts included eating (but not mouthing or chewing), drinking, pouring, stirring, and spooning (presumably imaginary substance) from one container to another" (p. 233). The only stimulus material provided was a toy tea set. Other researchers who have provided behavioural categories but no independent definitions include Lowe (1975) and Watson and Fischer (1976).

The problem of definition, as Weisler and McCall (1976) point out, is a general one in the area of exploration and play, and is certainly not confined to pretend play. Their comments on

the state of theory in play research in general are, however, as applicable to the area of pretend play as to any other area in the field:

The lack of comprehensive theoretical guidance with respect to play makes reviewing this literature extremely difficult. In the absence of a single accepted definition of play, there is almost no uniformity concerning what behavior(s) constitute play and no systematic study of a common set of parameters. Further, although a modern literature is emerging, most of the work is old and not up to today's scientific standards. (p. 499)

Weisler and McCall suggest that while the lack of consistent definitions should not prevent research in the area, researchers should nonetheless persevere in attempts at definition, rather than throwing their hands up in despair.

The problem of definition is important in that it is the theoretical definition of pretend play that leads (or at any rate, should lead) to the selection of behavioural criteria for its measurement in research. In the absence of a solid theoretical definition which may readily be translated into operational terms, it is necessary at the very least to use conservative behavioural criteria and to exercise caution in generalizing from the results of the research. This problem is even more acute in infant research than in research involving older children. Interpreting and measuring complex behaviour in subjects who cannot talk and whose motor coordination is still

developing requires extreme caution, if data based on subjective inference are to be avoided.

Identifying Pretend Behaviour in Infants

Pretend play is an activity that most adults seem to think is readily identifiable, at first thought. A child is pretending if she "feeds" a doll imaginary food, but not if she herself eats real food, or if she dances to the music of a record player. However, since it is the element of fantasy in the child's thoughts that differentiates pretend from other types of play for most adults, their assessments are usually based on inference about what the child is thinking, or what the child "intends" in performing an act. It may, however, be just as plausible to assume that the child putting a toy spoon to a doll's mouth is merely using the objects "doll" and "spoon" appropriately, and is demonstrating only a learned association between these two objects. On the other hand, the child may be pretending to eat cake while she eats her peas and carrots, or she may be pretending to be a ballerina while she dances to her records.

With children above the age of about three, the researcher has several techniques available to supplement subjective inference in assessing whether a child is pretending. One is to instruct subjects to pretend, then to assess their responses

using clear-cut criteria for carrying out the activity. Overton and Jackson (1973), for example, gave three- to six-year-old subjects instructions such as to comb their hair with a comb, with no real comb present. Responses were scored according to whether the child gave no performance of the action sequence, used a body part (e.g. finger) as if it were the required object, or performed the activity as if correctly holding the required object.

Another technique is to question the child about her behaviour, and/or to note her spontaneous comments while performing the activity. Garvey and Berndt (1975), for example, transcribed the conversation of previously acquainted children aged 34 to 67 months while the children played together in pairs. Although some utterances could not be reliably classified, the authors were able to categorize several types of communication indicating pretend play, or transitions to and from a state of pretend play.

Such techniques, however, are not applicable to research with infants. Here the researcher is forced to use explicit behavioural criteria, or run the risks of subjective interpretation. Most of the existing research in this area relies rather heavily on subjective inference. For example, Inhelder et al. commented that: "Beyond a certain point, the

observer no longer hesitates to interpret the infant's intentions, because he seems to have acquired an exact knowledge of the use of the object, or because he integrates it into a very evident 'make-believe' activity" (p. 199, author's translation). Nonetheless, Sinclair (1970), reporting the results of the same study, stated that only at the oldest level of the age range from 12 to 26 months were observers able to agree on categorization of children's activities.

Fenson et al. (1976), who measured the frequency of "symbolic or symbolic-like acts" in infants aged seven to twenty months, commented that: "Probably some of these responses did not involve a symbolic component (i.e. the child may not have been pretending to drink imaginary liquid but may have put a cup to his mouth because of a learned association between cup and mouth)" (pp. 234-5). Watson and Fischer (1976), who presented their 14- to 24-month-old subjects with adult models demonstrating different types of pretend behaviour, measured the infants' frequency of subsequent imitations of the modelled acts as well as the frequency of "spontaneous pretending". These scores were treated as measures of the infants' levels of pretend play development, although it might be argued that the imitation scores measured nothing beyond the infants' willingness to imitate adult actions.

To sum up, it is extremely difficult to assess whether an infant is pretending. The need for some inference on the part of observers may be to some extent unavoidable. However, researchers in this area have been too willing to ignore the problem altogether or to minimize its importance. They have too often assumed that the infant behaviours they observe are or are not pretend, a problem which stems in part from the lack of generally accepted definitions. If their measurements were based on clearcut, well-elaborated behavioural criteria, or if they discussed their findings with more attention to the limitations of subjective inference, the problem would be less serious. However, behavioural category systems are, by and large, crude; and results are discussed as though they represent solid assessments of pretend play.

Categories of Pretend Play

All researchers in the area of early pretend have used some type of category system for scoring pretend and related play behaviours. Various features of a particular study limit the categories that may be constructed. The definition of pretend (implicit or explicit) is an initial constraint. The choice of stimulus materials also affects the range of behaviours likely to be produced. Several studies in this area have used a relatively small number of stimulus objects, and categories that attempt to

exhaust the range of pretend behaviours possible with these objects have been constructed.

Lowe (1976) presented subjects with four sets of miniature toys, one of which contained a doll, spoon, cup, saucer, comb and brush. The scoring categories used were behaviours such as "feeds doll", "feeds self", "grooms doll", etc.. Fenson et al. (1976) analyzed only data involving the use of a toy tea set, and the behavioural categories used were eating, drinking, pouring, stirring, and spooning. In the Lowe study, the behaviours most likely to be produced involved functional uses of the stimulus objects in conjunction with either the doll or the child's own person. In the Fenson study, the most likely behaviours were functional object uses related to the child's person. Nonetheless, Lowe's aim was to investigate the development of "representational play", and Fenson et al. discussed the emergence of "symbolic acts". In both cases, however, their category systems related only to the available stimulus materials, and did not exhaust the possible range of pretend behaviours.

Watson and Fischer (1976) presented their subjects with adults modelling pretend behaviours classified according to the following categories: 1) use of self as agent, 2) use of passive other agent, 3) use of passive substitute agent, and 4) use of

active other agent. Subsequent imitative and spontaneous acts by their subjects were scored with reference to the same four categories. Their research was designed to test the theory that these four types of pretend play emerge in an invariant sequence, and also drop out of children's pretend play repertoires in the same sequence. However, the category system did not allow for other types of behaviours found by other researchers in the sequence of pretend play development (e.g. use of imaginary objects). The system also lumped together in one category behaviours which may emerge at different times (e.g. self-related feeding behaviours, which appear to precede self-related grooming behaviours, would both be classified as "use of self as agent"). Although the system may have been adequate for investigating the authors' hypothesis, it is not adequate for a more general study of the emergence of pretend play.

Another factor influencing the construction of categories is the age of the subjects used in the study. Category systems developed for use with children over the age of two or three years are generally inapplicable to the study of pretend play in infancy, since they include complex behaviours unlikely to be found in infants, and exclude early forms of pretend and pre-pretend play.

All of the category systems so far considered are not particularly useful for studying the development of pre-pretend and pretend behaviours throughout infancy. Either they are not applicable to this age range, they do not cover the entire range of behaviours that have been identified in the emergence of pretend, or they are specific to the stimulus materials used in the study and do not organize behaviours into larger cohesive units. Two of the existing studies of pretend play provide category systems which are broader and appear to be more applicable to the range of pretend behaviours found in infants.

The 1972 study of Inhelder and her colleagues (also reported by Sinclair, 1970) is one of these. They initially categorized infant behaviours as either clearly interpretable or non-interpretable. The interpretable acts were further subdivided into: 1. activities that indicated knowledge of the properties of the objects themselves (e.g. smooth, soft, noisy); 2. activities in which the infant introduced some organization to the objects (further subdivided into spatial arrangements and conventional, functional usage of objects); and 3. "make-believe" activities. The ~~make-believe~~ or pretend activities were further subdivided into: a) self-related pretend activities such as pretending to sleep); b) use of animate toys as passive partners; c) use of animate toys as active partners (e.g. puts doll on toilet then examines its shorts); d) use of

animate toys as agents in their own right (e.g. puts mirror in doll's hand "so she can see herself"); and e) use of substitution or of imaginary, absent objects. Scoring within these categories was accomplished with the use of subcategories formed by listing all activities "possible" with the stimulus objects available.

This category system provides something of a basis for further studies, since it covers the identified range of infant pretend behaviours, and also includes categories related to conventional object use. However, few details of the system are provided in the published reports, and the foregoing account of the system was produced by piecing together information from Inhelder et al. (1972) and Sinclair (1970). Reliability figures were not provided, and Sinclair noted that intercoder agreement was low with younger infants.

Fein (1974) employed a quite different approach to the development of categories. She conceptualized pretend play as the execution of a series of transformations, defining a transformation as the process mediating the selection of one (less prototypical) object or person to be used as though it were another (highly prototypical) object or person. She identified three types of transformation, involving substitutions of: (1) person for person (child as if mother); (2) thing for person (doll as if baby); (3) thing for thing (stick as if doll, or

shell as if cup). Fein theorized that the difficulty of pretending (reflected in the age at which the behaviour emerges) increases with the number of substitutions involved. Thus, according to Fein, a self-directed feeding behaviour using a miniature toy cup involves only one transformation - thing (toy cup) for thing (real cup). It should appear earlier than a behaviour in which a doll is "fed" from an empty toy cup, which involves three transformations - person for person (child as if mother), thing for person (doll as if baby), and thing (toy cup) for thing (real cup).

Fein's system of transformations also provides a partial basis for the development of an adequate category system for studying pretend play throughout infancy. It may be a useful adjunct to Inhelder and her colleagues' (1972) category system, since theirs ignores the factor of role transformations ("person for person"). However, Fein's system ignores the quality of role transformations; i.e. it would accord equal weight to the transformations "person for person" and "thing for person" in the child's use of animate toys as passive partners, active partners, or active agents. In fact, use of animate toys as active agents could be seen to involve only one transformation (thing for person), since in that situation the child assumes no role, but acts as the animator of the doll, which is accorded a role.

Thus, the system is not consistent with the identified sequence of emergence of pretend behaviours, since active agent use appears later than passive or active partner use; and Fein's theory that the difficulty of pretend play increases with the number of substitutions carried out is probably untenable. Furthermore, it is unclear whether Fein, in her own research, used the transformation system as an organized system of categories. Although she provided few details of her research method, making it difficult to know exactly what categories were used, she did state that pretend was measured as "the frequency with which the child's activity resembled a functional behaviour but occurred in the absence of the necessary materials or social context" (p. 21). Presumably other, finer behavioural categories were used, then classified according to the transformations involved. Despite the lack of clarity, her identification of the role transformations involved in pretend, as well as the general idea of transformations, are useful.

In summary, the existing category systems are inadequate for an investigation of the development of pretend throughout infancy, although Inhelder and her colleagues' (1972) and Fein's (1974) work is useful for the development of a new category system. Furthermore, none of the existing category systems were designed to measure maternal as well as infant pretend and pretend-related behaviours. Such an undertaking requires the

development of categories which extend the range of behaviours beyond those found in infancy, and also the development of a method of categorizing behaviours involving mother-infant interaction, rather than just behaviours involving the infant subjects. Furthermore, these category systems (with the exception of Inhelder and her colleagues') were developed for use in cross-sectional rather than longitudinal studies, and thus are not generally applicable to studies involving either sort of research design. In the next section, this and other aspects of the research designs used in existing studies will be considered.

Research Design

The existing studies of infant pretend play were (with the exception of Inhelder et al., 1972) cross-sectional studies with subjects seen at some segment of the age range between 7 and 36 months. Inhelder et al. followed seven of their 60 subjects longitudinally, observing these subjects every one or two months between the ages of 10 and 24 months. No full scale longitudinal investigations of infant pretend play have been carried out. Thus there is a need for longitudinal validation of the findings of the existing studies.

All of the existing studies employed a design in which several groups of subjects of different ages were observed, and

differences between their scores on various pretend play categories were analyzed. Fein (1974), Inhelder et al. (1972) and Fenson et al. (1976) also measured functional, non-pretend use of the stimulus materials. Although some of the researchers (Fenson et al., 1976; Watson & Fischer, 1976) reported using appropriate tests of statistical significance, two (Lowe, 1975; Inhelder et al., 1972) reported only frequencies and ages at which the majority of the subjects demonstrated particular behaviours. Fein (1974) reported very few methodological details, and did not describe the data analysis.

Most of the studies of infant pretend play employed observational techniques in a free-play setting. Subjects were observed playing with the stimulus materials for periods of approximately 15 minutes. Lowe (1975) presented four different sets of materials in the course of each session, and did not precisely time the sessions, so that their length ranged from 15 to 30 minutes. Watson and Fischer (1976) initially presented their infant subjects with adults modelling pretend behaviours with objects, then observed free-play sessions with the same stimulus materials. Although Watson and Fischer criticize the use of free-play sessions alone on the basis that they are unlikely to elicit much pretend behaviour, the findings of other researchers in the area do not seem to bear this out. Pilot research carried out in the present study indicated that infants

demonstrate considerable pretend and pre-pretend in a free-play setting, especially while playing with their mothers.

Observation in a free-play setting seems the most appropriate technique for studying pretend at this age, since instructing or questioning infants is not feasible. The stimuli and the method of recording and scoring the data vary from study to study.

Stimulus Materials

Most of the existing studies used conventional toys as stimulus materials. Lowe (1975), for example, used dolls, toy dishes, doll furniture, and a miniature comb, brush, blanket and pillow. Penson et al. (1976) used only a toy tea set. Fein (1974) used dolls, trucks, telephones, cups, pots and spoons. Inhelder et al. (1972) used functional objects (mirror, hairbrush, etc.), toys like dolls and books, and "objects of indeterminate function" (paper, cloth, etc.). None of these studies appear to have deliberately included objects unlikely to elicit pretend play. While it is appropriate to use only toys likely to elicit pretend in investigating the pretend play abilities of infants (i.e., to maximize the likelihood that infants will pretend), non-pretend type toys should be included if the aims of the study involve examining differences between

infants whose usual rates of pretend play vary. Doing so would more accurately sample the subjects' usual play behaviours, since the inclusion of non-pretend toys would allow the subjects to choose pretend or non-pretend activities in relation to their usual play preferences.

In none of the studies was there a deliberate attempt to equalize the quantity of male- and female-stereotyped toys, although both male and female subjects participated in all of them. Since Fein (1974), Garvey and Berndt (1975) and Lowe (1975) reported sex differences, and since these may have been due to the predominance of female sex-stereotyped toys used (dolls and caregiving equipment), it seems important to balance the quantity of "male" and "female" toys. Thus, if sex differences were found, they could be analyzed in terms of the types of toys involved, and the question of whether such differences were due to the stimulus materials provided or to other factors (such as socialization) could more readily be investigated.

In general, a small range of stimulus materials has been used in existing studies, and careful consideration has not been given to providing a balance of toys conventionally considered "appropriate" for each sex, or to providing materials both likely and unlikely to elicit pretend play. Also, consideration should

be given to choosing stimulus materials which involve minimal ambiguity in interpreting the child's actions with them. Toy telephones, for example, lead to ambiguity in interpretation. Is the infant who holds the receiver to his head and says "Hi" pretending to carry out a conversation on a "real" phone with an imaginary person? Or is s/he merely carrying out an action s/he has previously seen carried out with toy telephones - i.e. putting the receiver to one's ear and saying "Hi"? The problem may not ever be entirely avoided. However, some objects involve more interpretation difficulties than others, and this should be considered in choosing stimuli.

Scoring and Intercoder Reliability

Infant pretend play research obviously requires attention to the problem of definition, a well-planned research design, carefully chosen stimulus materials, and a well-designed behavioural category system. Nonetheless, its validity ultimately rests on the degree to which observers accurately record and agree on the observed behaviours. Because pretend play cannot be measured without some recourse to subjective inference, the only available test of scoring validity is that of intercoder reliability. Despite the fact that all research in this area involves observations of play behaviour coded according to potentially subjective category systems, the issue of

intercoder reliability has received almost no attention in the literature.

Fein (1974) and Lowe (1975) did not mention reliability figures of any sort, and it is impossible to tell whether or not they computed intercoder agreement. Fenson et al. (1976) positioned two observers behind one-way glass. However, one of them coded duration directly, using an event recorder, while the other taped the sessions using an audio recorder. No reliability figures were given, and from their account it would seem that none were calculated. In none of these studies were the sessions videorecorded.

In three of the existing studies, videotape was used, and some effort was made to calculate scoring reliability. Garvey and Berndt (1975) reported that sessions were videotaped, and speech was transcribed. Data not involving speech were coded directly from the videotapes, and "subjected to test of intercoder agreement". However, no figures were given, and the method of calculating reliability was not stated. Inhelder et al. (1972) used two observers, one in the experimental room and one behind one-way glass. Intercoder agreement figures and the method used to arrive at them were not stated, although Sinclair (1970), reporting the same study, stated that observers did not consistently agree in scoring the behaviour of the younger

infants. Inhelder et al. reported that videotape recordings were made in the latter part of the study, and recommended that this be done in future studies in this area.

Watson and Fischer (1976) videotaped observations, then scored the data directly from the tapes, using an event recorder. They reported interrater reliability figures in the 80's and 90's, using Pearson product-moment correlations. This study is the only one in which videotape was used, reliability figures were reported, and the method of calculating reliability was given. However, since only four broad categories were used, their findings do not provide any assurance that observers generally agree in categorizing a broad range of infant pretend behaviours.

The use of videotape seems highly important, since pretend play involves complex events often occurring in a rapid sequence. The method of calculating intercoder agreement is also important, since different methods result in more or less "inflated" estimates of agreement. (This point will later be discussed in more detail.) The findings of the existing studies (with the exception of Watson and Fischer) are of somewhat questionable validity, since the problem of reliability has not been accorded the attention it requires. These studies (except for Garvey and Berndt, 1975) involve observations of infants playing alone. The

problem of accurate and reliable scoring is even more acute in research involving two play participants, because both actions and interactions must be scored.

None of the existing research methods are appropriate for use in studies of mother-infant play interaction. Not only did most of them suffer from methodological inadequacies; they have also been designed only for studies of infants' behaviour, and cannot be used to measure maternal behaviour, or interactions between mother and infant. Portions of some of the existing methods and the findings of some of these studies were, however, useful in developing a new research method.

3. THE DEVELOPMENT OF A RESEARCH METHOD

After pilot observations, a preliminary system of behavioural categories was developed. Observations of 30 mother-infant pairs were videotaped in a free-play situation using appropriate stimulus materials. The videotapes were transcribed, and each transcript divided into play incidents. Each incident was then scored in accordance with the category system, and intercoder agreement was calculated for each category. The final category system consisted of those categories for which adequate intercoder reliability was obtained. The steps in this procedure will be described in detail, then the category system will be presented.

Pilot Observations

Three infants aged 14, 15, and 18 months were observed in a free-play situation with their mothers. Two of these sessions were videotaped for subsequent study. A variety of stimulus materials was used in these sessions, providing a basis for decisions about which materials produced the least ambiguity in interpreting actions carried out with them. The pilot observations demonstrated that sufficient pretend play and demonstrations of object use occurred to justify the use of a free-play situation in obtaining data. It was also observed that

whereas the two younger infants displayed relatively little pretend play, their mothers demonstrated a considerable amount. Thus, it was decided that observations of infants in the 12- to 14-month age range would be an appropriate starting point for observing mother-infant pretend play interactions. A preliminary system of categories was devised, and observations were then collected from a sample of sufficient size to allow further development of the category system. Each mother-infant pair in the sample was observed during a 15-minute free-play session which was recorded on videotape.

Method of Collecting Observations

Subjects.

Subjects were 30 infants, 12 males and 18 females, and their mothers. They were drawn from a file of volunteers contacted at local maternity wards at the time of their children's births, and from respondents to advertisements in a daily newspaper and on a radio station. There was no remuneration for participation in the study. All of the infants were cared for at home by their mothers, thus minimizing the likelihood of a great deal of exposure to other caregivers or models. Twenty-eight of the infants were firstborns, while two of them had one older sibling. The infants' mean age when tested was 12.8 months, with a range

of 12.1 to 14.6 months. The mothers' ages ranged from 19 to 34 years, with a mean age of 28.3 years. Mean ages for boys and girls, and for mothers of boys and girls, did not vary significantly .

Mothers' educational levels ranged from high school graduation to M.A. level. Most had some technical or university training. Fathers' educational and occupational levels varied more widely. Occupations ranged from truck driver and welder to lawyer and research physicist, and education from Grade 9 to PhD. Both parents were present in all families, all fathers were employed, and in none of the families were the mothers engaged in employment outside the home.

Equipment.

The play sessions were conducted in a 10' by 15' carpeted playroom on campus. A Fairchild video camera (Model TC 177), equipped with a Cosmincar 12.5 mm. lens, was positioned in one corner of the room. A 3 ft. high partition separated the camera area from the 9' by 10' section of the room in which the mother and child played within camera range. An Altec Lansing omnidirectional microphone (Model 6506) 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 15-minute sessions was timed using a Gralab universal timer (Type 171).

The playroom contained a chair, a low table, and an assortment of play materials initially arranged in a standard manner on the carpet. The play materials were conventional toys, chosen for their likelihood to elicit pretend play. These toys were categorized as either male or female on the basis of the likelihood of their being perceived as sex-stereotyped play materials. A further group of neutral toys, both unlikely to elicit pretend play and likely not to be stereotyped as particularly suitable for one or the other of the sexes, was included. Three small dolls were also used. Twenty adults were asked to rate the toys used in the study as either male, female, or neutral in terms of sex-stereotyping. Their ratings unanimously agreed with the division into male, female, and neutral categories listed below. The dolls were judged to be female-stereotyped. Since they were included because they could be used in conjunction with either male or female toys, they have been treated as a separate category. The toys used were:

<u>Male</u>	<u>Female</u>	<u>Neutral</u>	<u>Dolls</u>
car	bed, crib	abacus	adult male
motorcycle	blanket	nesting cups	adult female
schoolbus	table, chairs	ball	female child
hammer	bathtub, toilet	shapebox	
screwdriver	muffin tin	books	
nail, screw	rolling pin	puzzle	
	spatula, spoon		

The car, motorcycle, schoolbus, and all of the female toys were fairly realistic miniature replicas of ordinary functional objects. The hammer and screwdriver were approximately the same size as their functional counterparts, but were made of brightly-coloured plastic. The nail and screw were also of coloured plastic, but were very large. The dolls, made of flexible plastic, were on a scale such that they could be placed on the furniture or inside the vehicles. Thus, all of these toys were clearly distinguishable as play objects (rather than ordinary, functional objects) on the basis of miniaturization, enlargement, colouring, and/or material of construction.

The Mental Scale of the Bayley Scales of Infant Development (Bayley, 1968) was used as a measure of general cognitive development for the infant subjects. The Mental Scale was administered approximately 8 months after the date of the initial

session, following participation in a similar play session. Some subjects were judged too restless to complete the Bayley test after this session, so that only 20 scores were obtained. The Mental Scale was administered in the standard manner in a room adjacent to the playroom.

Procedure.

Each mother-infant pair was observed and videotaped during one 15-minute free-play session in the playroom. Upon their arrival, the mothers were informed that they were participating in a study investigating the development of play in infancy. They were not informed that the object of the study involved pretend play, cognitive development, sex differences, or information exchange between mother and child. On entering the playroom, the mother was shown the videocamera and one-way mirror, and asked to keep herself and her infant within camera range. She was then instructed: "Play with your child, as you normally would, for 15 minutes". The experimenter informed the mother that if she wished to terminate the session for any reason, she could do so by verbal request, since the experimenter would be able to hear her from the next room. The experimenter then left the playroom, and timed and videotaped the session from the adjoining room.

Transcription of Videotapes

An initial attempt was made to code data directly from the videotapes. This procedure proved to be unworkable. Because of the complexity of the interactions between mothers and infants, it was impossible to accurately analyze and record behaviours directly. Therefore, detailed transcriptions of the subjects' behaviour and verbalizations related to the variables of interest were made. Six of the 30 videotapes (20% of the total) were independently transcribed by the experimenter and another observer. The two observers' transcripts were then combined to produce six joint transcripts, with any disagreements in observation resolved by reviewing the tapes together and reaching consensus on the behaviours in dispute.

The reliability of transcribing the taped observations was calculated by totalling the number of lines in the six joint transcripts and calculating the percentage of lines on which both 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. 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 course of play) in either transcript, or

the failure to note an uninterpretable vocalization by an infant in either transcript were not counted as disagreements. The joint transcripts totalled 1889 lines, and there were disagreements on 50 of them. The percentage agreement by lines was 97.35%, a rate sufficiently high to justify the transcription of the remaining videotapes by the experimenter alone.

Division into Incidents

Although most of the variables of interest were measured using frequency counts which could be obtained using time sampling techniques, that strategy was rejected in favour of using "incidents" involving one or both members of the subject pairs as the unit of analysis. Spontaneous free-play involves complex sequences of behaviours that must be interpreted in relation to one another. Arbitrary time units artificially break up these sequences, making it difficult to analyze them. Therefore, the transcripts were divided into incidents based on activities carried out by the mother, the infant, or both.

An incident was defined as any one of several types of behavioural sequence. The types were not mutually exclusive, and were intended only as guidelines for incident division. Where an activity involved several types of sequence, the largest possible category was used in delineating an incident. For example, if a

pretend play suggestion or other verbalization occurred in the course of an activity in which some toys were used in conjunction with others, only one incident (the largest one, in which toys were related to one another) was delineated, and the suggestion or verbalization was included within it. However, suggestions or verbalizations occurring in isolation could also be delineated as incidents in and of themselves. Thus, incidents varied as to duration and amount of content.

The types of behavioural sequences identified as incidents were: (1) A play sequence using a toy or group of toys that were related to one another in the course of play (e.g. a game of catch; a sequence in which dolls were given rides in vehicles and put to bed using doll furniture; etc.). (2) A sequence in which toys were handled, but no functional "play" activities were carried out with them (e.g. a subject held an object, then put it down; the mother handed the infant a toy without comment, and the child dropped it; etc.). (3) A non-play sequence in which the mother and infant interacted, or where one or the other carried out a non-play activity (e.g. the mother wiped the child's nose; the child shifted position, knocking over some toys, and the mother picked them up, etc.). (4) A verbalization by the child, mother or both in which information about toys or objects in the immediate environment was conveyed (e.g. using objects' names, describing use, describing physical properties or

similarities to other objects, etc.). (5) A verbalization suggesting that a play activity be carried out, regardless of whether or not the suggestion was subsequently acted upon (e.g. the mother said "Let's give the dolly some lunch. Can you feed the dolly?", etc.). (6) A simple game that may or may not have made use of the stimulus materials (e.g. tickling, "This Little Pig", peekaboo, singing a song, etc.).

Six transcripts (20% of the total) were divided into incidents independently by the author and the second observer who had transcribed some of the videotapes, after the second observer received training (on other transcripts) in incident division. In order to find out if there were differences in incident division reliability for transcripts with which the second observer was familiar or unfamiliar, three of the joint transcripts prepared earlier were used, as well as three transcripts prepared by the experimenter alone.

The problem of calculating reliability for incident division presented some difficulty. Adequate techniques exist for calculating the agreement of a group of people in dividing a stream of behaviour into events, by examining the variance of division points around points where breaks are frequently made (Newtson, 1976). However, such techniques cannot be used when there are only two raters because of the extremely small sample

size. There are many possible ways of calculating percentage agreement, none of which seems entirely satisfactory, because they either over- or under-estimate agreement.

One method is to count as agreements all lines of a transcript on which both observers agreed either to make a break or not to make a break. This technique is too liberal, because there are far fewer lines at which a break is made than lines at which no break is made. Nonetheless, all lines receive equal weight. Another possible method is to calculate agreement by breaks. Using this method, agreement is calculated as the percentage of the total breaks made by one or both observers on which both agreed to make a break. This technique is too conservative, since no weight is given to all of those lines on which the observers agreed not to make a break.

The problem of devising an adequate technique for calculating incident division reliability is worthy of further effort. However, it was handled in this study by calculating both the liberal (agreement by lines) and conservative (agreement by breaks) reliability figures. 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 of the observers). The rate of agreement calculated by lines was 96%; agreement by breaks was

79%. There were very small differences in the agreement rates on transcripts with which the second observer was previously familiar or unfamiliar. The three transcripts previously transcribed by the second observer totalled 867 lines. There were 212 breaks made by one or both observers, and 41 disagreements. Agreement by lines was 95%, and agreement by breaks was 81%. The three transcripts transcribed only by the experimenter, with which the second observer was previously unfamiliar, totalled 1005 lines. There were 182 breaks made by one or both observers, and 39 disagreements. Agreement by lines was 96%, and agreement by breaks was 76%. The remaining 24 transcripts were divided into incidents by the experimenter alone. The transcripts were then scored according to the category system.

Category Reliability

Six transcripts, three of which had been transcribed and divided into incidents by both observers, and three of which had been previously transcribed by the experimenter only, were scored by both observers. The second observer was first trained in the category scoring procedure, using other transcripts. The transcripts were scored incident by incident, and percentage agreement was calculated. Incidents were scored if they contained any material that could be coded according to the

category system. Incidents that had no categorizable content were not scored. Each incident retained had a possible score or scores in each of the categories used.

Agreement was calculated for each category as the percentage of incidents on which both observers had assigned the same score for that category. Thus, incidents that only one observer had scored produced a disagreement in each category where a non-zero score was assigned. Incidents scored by both observers produced disagreements in each category where the scores were not the same. There were no significant differences in agreement for transcripts with which the second observer was familiar or unfamiliar. The agreement-rates for the fourteen categories retained in the final category system ranged from 75% to 89%. (Reliability figures for each of the final categories are presented in the next section, where the category system is described.) The remaining transcripts were scored by the experimenter using the final system of categories for which adequate reliability had been obtained.

The category system

The final set of categories allows the measurement of several behaviours on the part of both mothers and infants, using the play incident as the unit of analysis. Each category was

scored separately for the mother's behaviour and for the infant's behaviour during each incident that contained categorizable content. Incidents involving handling of objects only; the execution of simple action schemas such as banging, mouthing, or throwing; verbalizations unconnected with the play situation or with objects immediately present; and simple games such as "peekaboo" were not scored. Each of the categories used are presented below, with their reliability figures and the rationale for their inclusion, where appropriate.

(1) Toys used. The toys used in the course of each incident were coded separately for each member of the subject pair. Only those toys that actually figured in the play activity of the sequence were scored. Toys that were handled only, or were banged, mouthed, or thrown indiscriminately were not scored. (This rule did not apply to appropriate banging with the hammer, mouthing of the spoons or cups, and throwing of the ball.) Reliability figures for this category were 88% for mothers and 83% for children.

(2) Repeat. Incidents were scored as repeats if the content and toys used did not substantially differ from those of an earlier incident. Incidents with substantially different content (using the same toys in a different way, using different toys in the same way, or using different toys in a different way) were

not scored as repeats. This category was scored separately for mothers and infants. Thus it was possible for an incident to be scored as a repeat for one of the subject partners, but not for the other, if one of the partners repeated earlier behaviour but the other did not. The reliability figures for this category were 87% for mothers and 80% for infants.

(3) Director of incident. This category was scored in each incident for the partner (mother or infant) who set the pace, or determined what the major content of the incident would be. Where this was ambiguous, the category was scored for the partner who initiated the incident by picking up a toy or verbalizing. Reliability figures for this category were 89% for mothers and 86% for infants.

(4) Suggests pretend play. This category was coded in incidents where one partner verbally suggested that the other carry out a pretend-type behaviour, whether or not the other partner carried out the suggestion. (If the other partner did carry out a pretend act in response to the suggestion, that response was coded elsewhere for that partner.) The category included commands, demands, and requests as well as suggestions. If more than one suggestion was made in the course of an incident, the actual number of suggestions was scored. The reliability figure for this category was 76% for mothers. Both

coders agreed that none of the infant subjects (all of whom demonstrated no language use more complex than one-word utterances) made any suggestions.

(5) Information about objects (other than their use). This category was scored for either partner if s/he used the name of any object in the immediate environment (other than the mother's or infant's name), or indicated physical properties of the object (colour, shape, size, texture, quantity, or other attributes such as noisy, fast, etc.). When more than one such piece of information was expressed in the course of an incident, the actual number of occurrences was scored. Duplicate information (using the same name twice, counting the same objects twice, etc.) was given only one score for an incident. This category was intended as a measure of the general amount of information the mother made available to the child, and to some extent, of the verbal information that the child was able to express. The reliability figure for mothers was 85%. Few of the children made recognizable verbal utterances of any sort on the transcripts used to calculate reliability. Of the seven one-word utterances spoken by the two children who used any language, the two coders agreed on six.

Categories 6 and 7.

Category 6 (Use of objects) and Category 7 (Substitutions and actions with "as if" qualities) were the only two categories for which mutually exclusive choices were made in scoring the content of an incident for any one partner. Category 6 measured conventional object use, and Category 7 measured pretend play. Although objects were almost always used conventionally in pretend play (e.g. a doll was placed at the toy table and chairs, thus using the doll and toy furniture correctly) these behaviours were scored only under category 7 in order to avoid confounding the scores in the two categories. Thus, "conventional object use" involved the toys unlikely to elicit pretend, or appropriate non-pretend uses of the toys likely to elicit pretend. If, however, a subject partner carried out two behaviours in the course of an incident, one that demonstrated conventional object use only, and another that involved pretend play, both categories were scored and a note was made of which category referred to which of the objects used in the incident.

(6) Use of objects. This category was used to score behaviours that demonstrated knowledge of the socially-defined use of objects, or in which objects were used in a clearly unconventional manner. Either partner's behaviour was scored as conventional if his or her object use indicated at least some

familiarity with the proper use of the object. It was scored as unconventional only if the use made of the object was clearly unlike the ordinary, conventional use. As previously noted, banging, mouthing, and throwing were not scored as unconventional uses, but were scored as conventional where these actions were appropriate for the object with which they were performed. Reliability figures for this category were 85% for mothers and 75% for infants.

(7) Substitutions or actions with "as if" qualities. This category was composed of nine subcategories, any or all of which could be scored for either partner in an incident. The subcategories were formed drawing upon the research findings cited earlier regarding the sequence of behaviours found in the development of infant pretend play (Fein, 1974; Fenson et al., 1976; Inhelder et al., 1972; Lowe, 1975; Sinclair, 1970; Watson & Fischer, 1976). Fein's (1974) concept of transformations was also used to some extent. The subcategories form a list of behaviours which, in combination, may be used to describe any of the types of pretend found by researchers in the area of infant pretend play. Each of these subcategories represents a particular kind of transformation which may be carried out using the stimulus materials in the experimental setting, or which may be carried out without the use of any props. The subcategories are:

1. Inanimate object treated as if animate.
2. Miniature object treated as if it were a real, functional object
3. One (non-miniature) object treated as if it were another object
4. Substitution of self-action for the action of an object treated as if animate (e.g. animation of dolls)
5. Substitution of self-made sound for object- or animal-made sound (e.g. "talking" for a doll, making an engine noise while pushing a truck, etc.)
6. Using an "imaginary" substance or object as if it were there, in conjunction with stimulus objects (e.g. eating imaginary food from a spoon, making motions as if covering up a doll without a real blanket, etc.)
7. Acting as if an "imaginary" person, object, or substance were present and real, without making use of other (real) stimulus objects in the sequence (e.g. talking to an imaginary person, banging an imaginary hammer on an imaginary nail, etc.)
8. Carrying out a body activity out of context (e.g. pretending to blow one's nose or to go to sleep)
9. Assuming a clearly-defined role other than one's own social roles (e.g. playing fireman, nurse, etc.).

The following examples illustrate the combination of these subcategories to form pretend behaviours which have been identified in infancy:

(a) Self-oriented feeding behaviour using a toy spoon: subcategory 2 (miniaturization) + subcategory 6 (use of imaginary substance in conjunction with objects).

(b) Use of a toy doll as active partner by putting the doll to bed: category 1 (inanimate as if animate) + category 2 (miniaturization - doll furniture).

(c) Use of doll as active agent by "walking" it across the floor: category 1 (inanimate as if animate) + category 4 (substitution of self-action for "animate" object action).

Reliability figures for the entire category were 86% for mothers and 89% for infants.

In summary, the category system outlined above may be applied to the behaviours of each member of the mother-infant pair in each play incident. They provide information on which toys were used, whether or not the action of an earlier incident was repeated, which subject partner directed the incident, whether a suggestion was made to carry out a pretend behaviour, whether or not comments were made about the properties of immediately present objects, and whether or not each subject partner carried out specified pretend or pre-pretend behaviours. The precise instructions for coding with the category system may

be found in Appendix A. Appendix B contains a sample transcript, showing incident division and scoring for that session. Combinations of these categories may be used to form many variables of interest in the investigation of mother-infant interactions in the development of pretend play.

Use of the Category System

This system may be used in either cross-sectional or longitudinal studies of mother-infant play interactions, and categories or combinations of categories may be used to form the appropriate variables for particular studies. In general, the system was developed to investigate the kinds of stimulus materials used by mothers and infants, the frequency with which particular kinds of play are directed by mothers or infants, the frequency of maternal verbal suggestions that the child pretend, the degree to which mothers and infants express information about objects and their properties, the frequency with which mothers and infants demonstrate conventional or unconventional object use, and the degree to which mothers and infants display pretend or pre-pretend behaviours. In longitudinal studies, relationships between these maternal and infant variables at different points in time may be investigated. In addition, the relationships between these variables and demographic or other variables measured may be examined.

The toys used as stimulus materials in the present study have been identified as male, female, or neutral with respect to sex-stereotyping, so that sex differences in play, if found, may be examined with respect to the type of stimulus materials used by each sex. Since Bayley Mental Scale scores were obtained, correlations between play or object use and a measure of general cognitive development may be examined.

Many different combinations of the categories to form variables are possible, depending upon the purposes of the study in which they are used. The research study reported in the next chapter provides examples of the formation of variables from the categories, although not all of the possible category combinations are used as variables in the study.

4. AN EXPLORATORY STUDY OF MOTHER-INFANT PRETEND PLAY INTERACTIONS

In a survey of the literature, no studies investigating mother-infant interactions in pretend play and related behaviours were found. The present study used data obtained in the course of developing the category system to explore possible relationships among several maternal, infant, and mother-infant interactional variables. The purposes of the study were to test the usefulness of the previously described research method and to provide leads for generating hypotheses in future longitudinal research. Because of the exploratory nature of the study, there were no formal a priori hypotheses, although it was expected that the amount and complexity of the infants' pretend play would be positively related to the amount and complexity of their mothers' pretend play, and to the number of verbal pretend suggestions made by their mothers. Other variables possibly related to pretend play development were formed using the category system, and interrelationships between all of the variables were explored.

Methods

The subject group, stimuli, equipment and procedure outlined in the last chapter were used in collecting the data. Thus, the results of this study were based on 30 videotaped 15-minute

observations of mothers and their 12- to 14-month-old infants in a free-play setting.

Measures Used

The category system was used to obtain measures on the following variables:

Sex of the infant subjects.

Bayley score. The scores obtained by infant subjects on the Mental Scale of the Bayley Scales of Infant Development (Bayley, 1968), a measure of general cognitive development.

Joint participation. A measure of the degree to which mothers and their infants jointly participated in play interactions (as opposed to only one partner engaging in an activity) was formed by calculating the proportion of the number of incidents in which both partners displayed categorizable behaviours to the total number of incidents.

Direction by mother. A measure of the degree to which mothers directed or determined the content of play incidents (as opposed to direction of play by their infants) was formed by calculating the proportion of total incidents in which the mother was the director.

Information expressed by mother. The scores obtained by mothers in category 5, which represented the number of times mothers expressed information about objects' names and physical properties. Scores obtained in this category in incidents where books were used were excluded from the totals. Because books usually elicit the use of objects' names by mothers, it was thought that data collected during their use would not accurately reflect the mothers' usual rate of providing general information to their infants.

Repeats by mother. This score represented the number of times mothers repeated the content of an earlier play incident in the course of a session.

Mother's conventional object use. The number of times mothers used objects in a conventional manner (in activities other than pretend play) in the course of a session.

Mother's Unconventional object use. The number of times mothers used objects in an unconventional manner (in activities other than pretend play) in the course of a session.

Mother's pretend play. The number of times mothers performed activities classified under category 7 (Substitutions and actions with "as if" qualities) in the course of a session, regardless of the specific content.

Mother's pretend suggestions. The number of times mothers verbally suggested that their infants carry out a pretend play activity in the course of a session.

Repeats by child. The number of times infants repeated the content of an earlier play incident in the course of a session.

Child's utterances. The number of times infants uttered recognizable words in the course of a session.

Child's conventional object use. The number of times infants used objects in a conventional manner in the course of a session.

Child's unconventional object use. The number of times infants used objects in an unconventional manner in the course of a session.

Child's pretend play. The number of times infants performed activities classified under category 7 (Substitutions and actions with "as if" qualities) in the course of a session, regardless of the specific content of the activity.

In addition to investigating relationships among the variables listed above, relationships between the types of pretend play exhibited by mothers and their infants were examined separately. The following types of pretend play (identified in previously cited research by Fein, 1974; Inhelder et al., 1972; Lowe, 1975; Sinclair, 1970; and Watson & Fischer, 1976) were measured:

Self-related feeding. Use of the cooking utensils and nesting cups as if they were real, functional objects, with accompanying motions indicating that an imaginary substance was being eaten or drunk.

Self-related body activity. Pretending to carry out a body activity such as sleeping or blowing one's nose out of the normal context.

Miniaturization only. Use of miniature toys as if they were their real, functional counterparts, with no further pretend-type activities accompanying the miniaturization. (E.g. pushing a truck and saying "vroom", or stirring a spoon in the muffin tin. Placing dolls in the truck as drivers, or feeding dolls with the muffin tin and spoon, were not included in this type.)

Passive animate partner. Performing pretend activities, using an inanimate object as if it were animate, in which the "animate" toy acts as a passive partner (e.g. feeding a doll or putting it to bed).

Passive animate agent. Using an inanimate object as if it were animate, where the "animate" toy is the agent of the activity, but does not actually perform motions or talk, etc. (e.g. placing a doll in a truck as the driver, then pushing the truck and saying "vroom"; or saying "The dolls are eating lunch" after seating them at the table, etc.).

Active animate agent. Pretend activities in which an inanimate toy, used as if it were animate, performs motions, talks, etc. (e.g. "walking" a doll across the floor, saying "Here comes the mommy"; "talking" for a doll; or "barking" for a dog while making it "jump around").

Substitutions. Activities in which one object (a non-miniature) is substituted for another, different object (e.g. using tiny plastic shapes as food in a muffin tin, etc.).

The preceding types of pretend play are arranged according to research findings regarding the order of their appearance in the emergence of pretend play (Inhelder et al., 1972; Lowe, 1975;

Sinclair, 1970), with the exception of "miniaturization only". This type of play has not been treated consistently in studies of the sequence of pretend play development, and there is some question as to whether it is pretend. It has been included in the sequence of the present typology at the point where it logically appears to fit in terms of complexity. Whether or not it should properly be termed pretend, it is obviously a closely related activity at the least, so has been included in the typology of pretend play.

Scoring

Scores for all variables other than the pretend play types were formed using the category system in the manner described above. Scores for the types of pretend play were formed by assigning each subject's various combinations of scores on the subcategories of category 7 (Substitutions and actions with "as if" qualities) to the corresponding pretend play type. Each subject received only one score for each type of pretend play s/he demonstrated in the course of a session, regardless of the number of times s/he demonstrated that type of pretend. Thus, these scores measured occurrence or non-occurrence, rather than frequency of occurrence. Table I shows the combinations of category 7 subcategories produced by subjects in this study.

Results

Because of the distributions of scores on the variables and the ordinal nature of most of the measures, nonparametric statistics were used in all data analyses.

Correlational analyses

Correlations between all pairs of the following variables were carried out using Kendall's tau: Bayley scores, joint participation, direction by mother, information expressed by mother, repeats by mother, mother's conventional object use, mother's unconventional object use, mother's pretend play, mother's pretend suggestions, repeats by child, child's utterances, child's conventional object use, child's unconventional object use, and child's pretend play. Bayley scores were available for only 20 of the 30 infant subjects, so the analyses involving Bayley scores were based on 20 paired observations. All other correlations were based on 30 paired observations.

Of the 98 correlation coefficients obtained, 29 were significant at a level of .05 or less. With such a large number of correlations performed, it is probable that some coefficients

were significant by chance. The findings reported below represent significant correlations for which the magnitude of the coefficient was relatively large. The full matrix of correlations is presented in Table II. The amount of pretend play exhibited by infants was positively related to the amount of pretend play exhibited by their mothers ($\tau = .55, p < .001$) and to the number of verbal suggestions to pretend made by their mothers ($\tau = .48, p < .001$). The infant pretend play measure was also positively related to the joint participation measure ($\tau = .37, p < .01$) and to the amount of information mothers expressed about objects' names and physical properties ($\tau = .43, p < .001$). The amount of conventional object use by infants was not significantly related to the infant pretend play score.

The mothers' pretend play scores were positively related to the number of verbal pretend suggestions they made ($\tau = .51, p < .001$), to the amount of information they expressed about objects' names and physical properties ($\tau = .30, p < .01$), and to the joint participation scores ($\tau = .38, p < .01$). The number of verbal pretend suggestions made by mothers correlated positively with their information scores ($\tau = .58, p < .001$) and their joint participation scores ($\tau = .31, p < .01$) as well.

The Bayley scores were positively related to the joint participation score ($\tau = .31, p < .05$) and negatively related to the mothers' amount of conventional object use ($\tau = -.30, p < .05$). They were not significantly related to any other variables. The mothers' amount of conventional object use was positively related to the proportion of play incidents directed by mothers ($\tau = .27, p < .05$) and to the infants' amount of conventional object use ($\tau = .26, p < .05$).

The joint participation score was negatively related to the proportion of incidents directed by mothers ($\tau = -.32, p < .01$) and positively related to the mothers' information score ($\tau = .32, p < .01$). It was also positively related to the number of recognizable words spoken by infants ($\tau = .39, p < .01$).

Sex differences

The Mann-Whitney U test (two-tailed) was used to analyze sex differences on all of the variables mentioned above. Mothers of boys used objects in a conventional manner significantly more frequently than did mothers of girls ($U = 1.96, p < .05$), and

their male infants also used objects in a conventional manner significantly more frequently than did the female infants ($U = 3.00, p < .01$). Mothers of boys also repeated earlier activities more frequently than did mothers of girls ($U = 2.57, p < .05$). There were no other significant sex differences. Table III summarizes these analyses.

Type of pretend play

Table IV shows the types of pretend play exhibited by mothers and infants. Of the 30 infants tested, 17 demonstrated one or more play behaviours of the "miniaturization alone" type. The numbers of infants demonstrating self-related feeding, passive animate partner, passive animate agent, and active animate agent ranged from 2 to 5. None of the infants performed actions involving substitutions. Twenty of the mothers demonstrated "miniaturization alone", and 20 demonstrated "passive animate agent". The numbers of mothers demonstrating self-related feeding, passive animate partner, active animate agent, and substitutions ranged from 4 to 8. None of the mothers and only one of the infants demonstrated self-related body activities. Thus, the modal type of pretend play for infants was "miniaturization alone", while for mothers the modal types were "miniaturization alone" and "passive animate agent". These data are summarized in Table IV.

A chi square analysis with Yates's correction was carried out to analyze differences between the types of pretend play exhibited by infants whose mothers either did or did not perform pretend activities at both the average level of infant pretend play and a level somewhat more complex than the infants' average level. Of the 13 mothers who performed activities involving "miniaturization alone" as well as activities involving "passive animate agent" at least once (level M+), 12 (92%) had infants who demonstrated pretend play at the level of "miniaturization alone" or higher (level C+). One infant (8%) did not (level C-). Of the 17 mothers who did not perform activities both at the "miniaturization alone" and "passive animate agent" levels (level M-), six (35%) had infants who demonstrated pretend play at level C+, and 11 (65%) had infants who did not (level C-). The difference in the pretend play levels demonstrated by infants whose mothers' pretend play levels were M+ and M- was significant at the .01 level (chi squared = 7.74, d.f. = 1, p < .01).

Discussion

The findings of this study support the position that infants' pretend behaviour is related to the pretend behaviour and verbal pretend suggestions of their mothers. While the correlational nature of the relationships does not allow

conclusions regarding causality, the findings suggest that longitudinal research hypothesizing relationships between early maternal and later infant pretend behaviours may be worthwhile. The infant pretend behaviours observed in this study were probably largely directly imitative of the mothers' behaviours, because the mothers were present and active while infant behaviour was observed. Future longitudinal research in which the final infant criterion measures will be taken while the infant plays alone will allow the assessment of relationships between maternal behaviours and later infant pretend play independent of direct imitation. Nonetheless, performance even in direct imitation of the mothers' behaviour may be seen as an indicator that the infant is capable of carrying out pretend activities.

The finding that infant pretend play was related to the joint participation measure and to the amount of information mothers expressed about objects' names and physical properties suggests that the opportunity to interact meaningfully with adults in play and exposure to information from adults about objects in the immediate environment may facilitate pretend play development. The finding that mothers' demonstrations of pretend play and verbal suggestions that their infants pretend were also related to joint participation and maternal information scores strengthens this position. However, joint participation,

increased information from mothers, and infant pretend play may all be features of increasing maturation. Even though the infant subjects' ages were within approximately two months of each other, it is likely that some were more developmentally advanced than others, as the range of Bayley scores (80 to 145) would indicate. In fact, only one of these variables, joint participation, was related to the Bayley scores. Infant pretend play, maternal pretend play and pretend suggestions and maternal information scores were all uncorrelated with the Bayley scores. It is possible that joint participation, a reflection of the infants' increasing ability to interact with others, leads to greater exposure to learning experiences in a large number of areas, including pretend play. The other variables, however, appear to be related independent of the infants' level of cognitive development. Again, longitudinal research will provide a more adequate means of investigating the issue.

The relationship between mothers' and infants' levels of pretend play is of particular interest, in that it suggests that mothers may pace the level of their own play both to their infants' current and emerging play levels.

The finding that infants' pretend play was not related to their conventional object use is not surprising, given the nature of these two measures. Conventional object use was scored only

if the activity carried out with the objects did not involve pretend play, in order to avoid confounding the two variables. However, all of the infants' pretend play actions might also be considered to be instances of conventional object use as well, since they involved using toys (dolls, toy vehicles, toy furniture, etc.) in a proper, conventional manner. Most of the object use scored as conventional involved toys unlikely to elicit pretend play, such as a ball, shapebox, abacus, and nesting cups. Thus, a possible explanation for this finding is that the infants who displayed the most pretend play favoured the toys likely to elicit pretend, and consequently used relatively few of the toys whose use was most likely to be scored as conventional. Therefore, the finding does not seem to contradict Fein's (1974) and Inhelder and her colleagues' (1972) findings, and El'konin's (1966) contention that the proper use of objects is related to pretend play. Rather, it may be seen as a result of the mutually exclusive nature of the two categories in this study.

A similar explanation may apply to the finding of a negative relationship between Bayley scores and the mothers' amount of conventional object use. Mothers whose children were at a lower cognitive developmental level (as measured by the Bayley) may have favoured the toys unlikely to elicit pretend in playing with their infants. Since the infants' conventional object use was

positively related to their mothers' conventional object use and to the proportion of play incidents directed by mothers, it may be that although this variable (as measured in this study) is not related to pretend play, its development in infants is also facilitated by maternal behaviour. Again, longitudinal research will provide a better technique for investigating this question.

The joint participation measure reflects the degree to which mother-infant dyads engaged in interactive play rather than performing independent activities. This variable was related to the mothers' information scores and the number of recognizable words spoken by infants. Joint participation and maternal information scores were also related to infants' and mothers' pretend play scores. It may be that informative mothers who encourage interaction by engaging in activities that interest their infants and responding to the children's choice of activities are the most likely to facilitate both speech and pretend play development.

There were no sex differences found in any of the variables involving pretend. Since both male- and female-stereotyped stimulus materials were used in this study, both boys and girls and their mothers had access to toys considered socially appropriate for the infants' sex. It is possible that earlier findings of sex differences favouring females in infant pretend

play (Fein, 1974; Lowe, 1975) resulted from the preponderance of female-stereotyped toys used in the studies. The present study found that male infants and their mothers demonstrated more conventional object use than did female infants and their mothers, and that mothers of boys repeated earlier activities more frequently than did mothers of girls. These findings are difficult to interpret, both because the aims of the research did not include the investigation of sex differences on these variables, and because recent reviews and criticisms of the general area of sex differences have pointed out the general instability of findings in this area (Maccoby & Jacklin, 1974). One possible explanation is that mothers of infants may have perceived the "neutral" toys (the use of which was most likely to be scored as conventional in this study) as male-stereotyped. Although a group of adult raters judged these toys to be neutral, they were university students and not parents of infants. This possibility may be investigated in longitudinal research by asking the mothers to rate the "sex-appropriateness" of the toys at the conclusion of the study.

This study has demonstrated that the research method may be used fruitfully in an investigation of pretend play and related variables. However, it must be borne in mind that the research was of an exploratory nature only, and that the findings are best viewed as sources of hypotheses for future longitudinal research.

5. FUTURE RESEARCH

The research method presented here may be used to reliably categorize pretend play and related behaviours on the part of infants and their mothers. The exploratory study carried out using this method has demonstrated that variables derived from the category system may be used to investigate mother-infant play interaction. However, a study carried out with infant subjects at only one age cannot examine the nature of mother-infant interactions throughout the course of pretend play development.

The observations reported here are the first of a series of three longitudinal observation sessions carried out with the same subject group. Ongoing research will allow investigation of the relationships between pretend play and other variables over the course of time. The second session, identical to the first, was conducted when the infant subjects' ages were between 20 and 22 months. A third session is planned when the children reach the age of 32 to 34 months. In this final session, the children will be observed playing alone, as well as with their mothers, thus allowing an examination of the relationship between maternal and interactional variables at earlier ages and the children's spontaneous, undirected play at the final age.

The ongoing research will also allow the development of a scale of pretend play complexity based on the behaviours produced by the infants at the three successive ages. The development of such a scale will facilitate investigation of the hypothesis, based on the present research, that mothers whose children are most advanced in pretend play gear the level of their own play to their infants' current and emerging abilities.

Although the category system has adequate intercoder reliability for the first set of observations, reliability must be established at later ages. The category system may be expanded to include more complex types of pretend that were not found at the first age, such as the substitution of verbal statements for pretend actions (e.g. "Let's say I'm the daddy and I just gave the baby a bath"). Smilansky (1968) noted these and other complex pretend behaviours in older children's sociodramatic play. In light of the sex differences for conventional object use found in the present study, the subject mothers will be asked upon completion of the study to rate the "sex-appropriateness" of the toys used as stimuli, to check the possibility that their assessments differ from the classifications used here.

The findings of the present study suggest that infants' pretend play is positively related to their mothers' pretend

behaviour and suggestions and to the maternal information score, as well as to the amount of joint participation in play. It is predicted that these relationships will hold over time, and that scores on these variables at earlier ages will be predictive of children's pretend play at the final age. Although such longitudinal research cannot provide conclusive evidence regarding causality, positive findings in these areas would provide support for El'Konin's (1966, 1968) and Repina's (1971) contentions that pretend play is learned as a result of adult modelling and verbal suggestions. While no relationship between pretend play and conventional object use was found in the present study, a more fine-grained analysis of conventional object use will be carried out, and the possibility of a relationship between these variables at later ages will be examined. At any event, it is hypothesized that the positive relationship between mothers' and infants' conventional object use will hold over time.

Although in the present study no attempt was made to distinguish infant pretend acts that were direct imitations of maternal acts from spontaneous infant pretend acts, the category system allows the discrimination of these two types of behaviour. This distinction will be made in future research to allow investigation of the effects of direct imitation.

The statistical techniques used in the present study are adequate for exploratory purposes, but correlations do not provide a powerful enough tool for the analysis of the data collected during the ongoing longitudinal study. The use of a variety of multivariate techniques including panel correlation, factor analysis, and discriminant analysis is contemplated.

APPENDIX A:

Categories and Scoring Procedure

Categories

1. Toys

- | | |
|---------------------|--------------------|
| 1. car | 11. muffin tin |
| 2. motorcycle | 12. rolling pin |
| 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 |

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.

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.

4. Suggests pretend play:

0 - no

1 - yes

One partner suggests that the other carry out a pretend-type behaviour (includes commands, demands, requests). Score whether or not the other partner carries out the suggestion.

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

0 - no

1 - yes (or score the actual number of pieces of information expressed if more than one)

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 (any reference to an object's similarity to another object, present or absent - e.g. "You have one of these at home", or "These are like daddy's tools"); (4) indicates quantity (counts, or says "a lot" or "just a few", etc.).

6. Use of object:

1 - indicates conventional use

2 - indicates clearly unconventional use

Score only when the activity does not involve pretend play. Conventional use is any use which indicates some familiarity with the socially-defined use that is ordinarily made of an object. Score unconventional use only if the usage clearly shows no such familiarity with ordinary usage (e.g. piling the furniture on top of the dolls, putting the screwdriver in bed, etc.). Appropriate banging, throwing, and mouthing are scored as conventional usage; inappropriate banging, throwing, and mouthing are not scored at all.

7. Substitutions or actions with "as if" qualities:

- 1 - inanimate object treated as if animate
- 2 - miniature object treated as if real, functional object
- 3 - one object treated as if it were another (non-miniatures)
- 4 - substitution of self-action for "animate" object action
- 5 - substitution of self-made sound for object- or animal-made sound
- 6 - acting as if an imaginary substance or object were there, in conjunction with other, real stimulus objects
- 7 - acting as if an imaginary person, object, or substance were there, without making use of other, real stimulus objects as props
- 8 - carrying out a body activity out of context
- 9 - assuming a clearly-defined role other than one's own social roles

Notes:

1. E.g. using a doll as a baby, making the dog puzzle walk around or bark, etc..
2. Any case where a toy that is a miniature of a full-sized, real object (or, in the case of tools, an enlargement) is used as the real object would be used (e.g. cars, hammer and nail, furniture, cooking utensils). Do not score for doll use or use of dog puzzle as a dog; these receive a score for #1.

3. Substitution of one object for another, excluding substitution of miniature for real objects. (Substitution of a "miniature" for something else, e.g. a screwdriver for a doll, would be scored.)
4. Cases where the subject partner makes motions attributed to an "animate" object (e.g. making a doll "walk", etc.).
5. Cases where the subject partner makes sounds attributed to an "animate" or "inanimate" object (e.g. saying "vroom" while pushing a car, "crying" or "talking" for a doll, etc.).
6. Cases where the subject acts as if an imaginary object were present, in conjunction with other real objects (e.g. drinking imaginary substance from a cup, making motions as if covering up a doll without an actual blanket, etc.).
7. Cases where the subject acts as if an imaginary object were present, in the absence of real objects used as props (e.g. talking to an imaginary person, banging an imaginary nail with an imaginary hammer, etc.).
8. Cases where some normal body activity is carried out without the appropriate context (e.g. pretending to blow one's nose or to go to sleep, etc.).
9. Assumption of a clearly defined role such as nurse, mommy, fireman, etc.. Role assumption must be made explicit; i.e., merely "caring for" the doll without saying "I'm the mommy" would not qualify.

Procedure for Scoring

1. Read the incident. If no categorizable behaviour occurs, do not enter the incident on the scoresheet. Make a separate list of such incidents not scored. Be careful not to exclude incidents categorizable under 4 or 5 (verbal suggestions or information). Only incidents in which objects are merely handled or verbalizations unrelated to play are made are not scored.
2. Score the mother's behaviour during the incident first. If the mother plays no categorizable part in the incident, draw a line through the spaces for categorizing her behaviour. Then score the child's behaviour for the incident. If the child plays no categorizable part in the incident, draw a line through the child's spaces.
3. Always score each category for each subject separately. If one of the subject partners receives any scores, categories 1, 2, and 3 must be filled in. Then score categories 4, 5, 6, and 7 where appropriate. One, two, or three categories may be used, depending on content. Score the child only for what s/he actually does, regardless of what the mother may have said, done, or suggested.

4. Some of the behaviours in categories 4, 5, 6, and 7 may be carried out more than once in the course of an incident, with different content. For categories 4 and 5, score the actual number of behaviours. For categories 6 and 7, write down the subcategories used followed by the number of times that subcategory was used with different content in parentheses, with a note showing which toys were used in each instance.

APPENDIX B

Sample Transcript Showing Incident Division and Scoring

The following text contains the transcript of a videotaped observation of one mother-infant pair during the 15-minute free-play session. The infant subject was a boy aged 13.1 months. The transcript has been divided into incidents which have been numbered consecutively. The categories that received non-zero scores for each of the subject partners are noted after each incident, with the actual scores in parentheses. The total scores received for each category and for the types of pretend play observed are presented at the end of the transcript.

Transcript

1. Mo. puts dolls on chairs; says: "The mommy. There's the mommy sitting at the table. And here comes the daddy". Mo. "walks" doll up to the child doll which is seated on a chair; says: "And daddy says 'Baby, hi! Give daddy a kiss!"; touches adult doll to child doll. Ch. vocalizes; spins abacus beads; picks up doll; vocalizes. Mo. says: "Daddy!". Ch. hugs doll. [Scores for mother: Toys (9, 14); Director (1); Info (4); Substitution (1,2,4). Scores for child: Toys (14); Substitution (1).]

2. Ch. shakes abacus; vocalizes; spins beads. Mo. makes no response. [Scores for mother: none. Scores for child: Toys (15); Director (1); Use (1).]

3. Ch. mouths screw; touches nesting cups with it. Mo. says: "Gonna put it in there? Look!"; hides one cup under another; says: "What's in there?". Ch. stacks cups. Mo. builds tower with cups. Ch. puts some cups on tower. [Scores for mother: Toys (16); Director (1); Use (1). Scores for child: Toys (16); Use (1).]

4. Ch. mouths rolling pin; knocks over tower. [Scores for mother: none. Scores for child: none.]

5. Ch. looks at mirror. Mo says: "Who's that little boy in the mirror with a rolling pin sticking out of his mouth?"; removes rolling pin. [Scores for mother: Director (1); Info (3). Scores for child: none.]

6. Mo. says: "Oh, look!"; shows child muffin tin and spoon. Ch. examines spoon; puts it to his mouth. Ch. puts spatula to his mouth. Mo. says: "That's like a spoon". Ch. puts spoon in car; pulls it out. Mo. says: "That's a car." Ch. mouths spatula; picks up motorcycle. Mo. says: "That's a

tricycle". [Scores for mother: Toys (13, 2); Director (1); Info (2). Scores for child: Toys (13); Use (1).]

7. Ch. touches schoolbus. Mo. says: "It's the bus. Let's close the door and open the door. [Demonstrates.] That's a bus. That's a door. That's a window. You open the door". Ch. opens door. Mo. says: "Now close the door." Ch. rolls car. Mo. says: "There goes the bus!"; pushes the bus toward ch.; says: "Vroom! Here comes the bus"; rolls bus again. Mo. says: "Go get the bus". Ch. gets bus; rolls it to mo.. Mo. and ch. roll bus back and forth. Ch. knocks bus upward into his face. Mo. says: "Uh-oh! The bus came and went bang on your face". Ch. overturns bus. Mo. says "Uh-oh! The bus fell over. The bus had an accident". [Scores for mother: Toys (2); Director (1); Info (3); Use (1); Substitution (2,5). Scores for child: Toys (20); Use (1).]

8. Ch examines spatula; puts it to his mouth several times. [Scores for mother: none. Scores for child: Toys (13); Repeat (1); Director (1); Use (1).]

9. Ch. stirs spoon around in nesting cup. [Scores for mother: none. Scores for child: Toys (13, 16); Director (1); Use (1).]

10. Mo. stacks nesting cups; says: "Put this in here".
 Ch. stacks cups. [Scores for mother: Toys (16); Repeat (1);
 Director (1); Use (1). Scores for child: Toys (16); Repeat (1);
 Use (1).]

11. Ch. returns to bus; tries to remove spoon. Mo. says:
 "Is your spoon in the bus? Why don't you open the door of the
 bus and get the spoon out?". Ch. opens door with mo.'s help;
 gets spoon; puts it to his mouth. [Scores for mother: Toys (2);
 Info (3). Scores for child: Toys (2, 13); Repeat (1); Director
 (1); Use (1 - bus + 1 - spoon).]

12. Mo says: "Look, here's a dog"; pulls dog puzzle across
 floor. Mo. says: "Come see the dog. Dog goes "Woof, woof".
 Ch. says: "Woof". Mo. says: "That's right. That's what a
 dog says". Ch. handles puzzle; it falls apart. Mo. says:
 "Uh-oh! The dog fell apart. Let's put the dog back together
 again"; puts puzzle together. Ch. says: "Woof!". Mo. says:
 "Yeah. There's the dog's face" [touches it]. Mo. hands ch. a
 piece; says: "Put it back." Ch. tries to put pieces together;
 vocalizes. Mo. says: "Dog. Nice dog". Ch. bangs puzzle
 pieces together. [Scores for mother: Toys (20); Director (1);
 Info (2); Use (1). Scores for child: Toys (20); Use (1).]

13. Mo. holds hammer out to ch.; says: "This is a hammer. You go 'bang, bang' with a hammer". Ch. shakes hammer in air. Mo. says: "That's right, except you're supposed to bang on something"; puts cup on floor; points to it; bangs cup with hammer. Ch. bangs cup with hammer. [Scores for mother: Toys (4); Director (1); Info (1); Use (1). Scores for child: Toys (4); Use (1).]

14. Child pulls puzzle apart; tries to put it together; then bangs pieces together. Mo. says: "Dog fell apart". [Scores for mother: Toys (20); Repeat (1); Info (1). Scores for child: Toys (20); Repeat (4); Director (1); Use (1).]

15. Mo. opens book; says: "Look, book. Look, there's some hands [points]. Where are your hands?". Ch. touches book. Mo. says: "Hands, hmm?". Ch. turns pages of book. Mo. points; says: "Look, look; there's a doll. And there's hands on the doll. And a truck, and hands on the truck. Here's feet [points]; see the feet?". Mo. leafs through book. [Scores for mother: Toys (19); Director (1); Info (5); Use (1). Scores for child: Toys (19); Use (1).]

Total scores for this session: Mother: Toys (9, 14, 16, 13, 2, 16, 13, 20, 4, 20, 19); Repeat (2); Director (9); Suggests

(0); Info (34); Use - conventional (6) - unconventional (0);
Substitution (2). Subcategory combinations for substitution:
(2,5), (1,2,3). Scores for child: Toys (14, 15, 16, 13, 2, 13,
13, 16, 16, 13, 20, 4, 20, 19); Repeat (4); Director (5);
Suggests (0); Info (0); Use - conventional (12) - unconventional
(0); Substitution (1). Subcategory combinations for
substitution: (1). Incidents not scored: (1).

APPENDIX C:

Tables

Table I. Assignment of category 7 subcategory combinations
(pretend play behaviours) to pretend play types

<u>Pretend Play Type</u>	<u>Subcategory Combinations</u>
(1) self-related feeding	(2, 6)
(2) self-related body activity	(8)
(3) miniaturization alone	(2, 5) (2) (5)
(4) passive animate partner	(1)
(5) passive animate agent	(1, 2) (1, 6) (1, 2, 3) (1, 2, 5) (1, 2, 6) (1, 2, 5, 6)
(6) active animate agent	(1, 4) (1, 5) (1, 2, 4) (1, 4, 5)
(7) substitutions	(3) (1, 2, 3)

Table II. Correlation coefficients for pretend play and related variables (Kendall's tau)

	<u>B</u>	<u>JP</u>	<u>MD</u>	<u>MI</u>
Bayley				
Joint Participation	.3130*			
Mo. Direction	-.1596	-.3191**		
Mo. Information	.0865	.3182**	-.0726	
Mo. Repeats	-.0535	.1189	.0280	.0519
Mo. Convent. Use	-.3075*	-.1594	.2732*	.1223
Mo. Unconvent. Use	.0316	.0055	.1656	-.1452
Mo. Pretend Play	-.1079	.3855**	-.0122	.3000**
Mo. Suggestions	-.1647	.3110**	-.0148	.5801***
Ch. Repeats	.0587	.1673	-.1930	.0776
Ch. Utterances	.1934	.3914**	-.2288	.2923*
Ch. Convent. Use	.0276	.2083	-.3212**	.2376*
Ch. Unconvent. Use	-.2611	-.0123	-.0667	.0400
Ch. Pretend Play	.0580	.3718**	-.1443	.4253***
	<u>MR</u>	<u>MCU</u>	<u>MUU</u>	<u>MPP</u>
Mo. Convent. Use	.2828*			
Mo. Unconvent. Use	.0083	.0865		
Mo. Pretend Play	.2376*	.0558	-.0232	
Mo. Suggestions	.0648	.0826	-.0825	.5111***
Ch. Repeats	.4830***	.0826	.0277	.0513
Ch. Utterances	.4758***	.1613	.0886	.1531
Ch. Convent. Use	.1281	.2628*	.0229	.0554
Ch. Unconvent. Use	.0174	.2246	.0943	.2283*
Ch. Pretend Play	.2374*	-.0370	-.0121	.5529***
	<u>MS</u>	<u>CR</u>	<u>CU</u>	<u>CCU</u>
Ch. Repeats	-.0050			
Ch. Utterances	.2015	.3822 **		
Ch. Convent. Use	.0896	.2600*	.1303	
Ch. Unconvent. Use	.0792	-.1813	-.1588	.2533*
Ch. Pretend Play	.4812***	.2977*	.2628*	.1652
	<u>CUU</u>			
Ch. Pretend Play	-.1514			

Note. Correlations for Bayley with all other variables based on $N = 20$. All other correlations based on $N = 30$.

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

Table, III. Summary of Mann-Whitney U-tests (two-tailed)
for sex differences

<u>Variable</u>	<u>U</u>	<u>p</u>
Bayley	0	n.s.
Joint participation	.66	n.s.
Direction by mother	.18	n.s.
Information expressed by mother	1.73	n.s.
Repeats by mother	2.57	.05
Mother's conventional object use	1.96	.05
Mother's unconventional object use	.08	n.s.
Mother's pretend play	1.32	n.s.
Mother's pretend suggestions	1.50	n.s.
Repeats by child	1.50	n.s.
Child's utterances	.41	n.s.
Child's conventional object use	3.00	.01
Child's unconventional object use	1.37	n.s.
Child's pretend play	1.27	n.s.

Note. N = 30. Female n = 13; male n = 17. On all variables where there were significant differences, males scored higher.

Table IV. Number of mother and infant subjects demonstrating at least one instance of pretend play types

<u>Pretend Play Type</u>	<u>Mothers</u>		<u>Infants</u>	
	<u>N</u>	<u>%age</u>	<u>N</u>	<u>%age</u>
Self-related feeding	6	20	4	13
Self-related body activity	0	0	1	3
Miniaturization alone	20	67	17	57
Passive animate partner	8	27	5	17
Passive animate agent	20	67	5	17
Active animate agent	6	20	2	7
Substitutions	4	13	0	0

Note. Based on total of 30 mothers and 30 infants. Percentages do not add to 100 because subjects scored in one or more categories.

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