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The Developmental Significance of Negotiation in the  
Social Pretend Play of 5 1/2 to 7 1/2 Year-Olds:  
Relations to Social and Cognitive Skills

Peter Doehring

A Thesis  
in  
The Department  
of  
Psychology

Presented in Partial Fulfillment of the Requirements  
for the Degree of Master of Arts at  
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## ABSTRACT

### The Developmental Significance of Negotiation in the Social Pretend Play of 5 1/2 to 7 1/2 Year-Olds: Relations to Social and Cognitive Skills

Peter Doehring

Based on a review of the research on negotiation with peers about social pretend enactment, and on the theories of development of Bruner, Fischer, Vygotsky, and Piaget, it was expected that the occurrence of such negotiation in children 5 1/2 to 7 1/2 years of age would be a significant indicator of cognitive and social skills. The spontaneous play of 118 boys and girls from kindergarten and grade one was observed, and the occurrence, duration, and maturity of their social interactions and their choice of pretend and non-pretend activities (including negotiation) were noted. Results suggested that children who negotiate demonstrate more sophisticated behavior in the pretend domain than children who do not negotiate, particularly with regard to cognitive skills. Other findings suggested that children who negotiate may develop a better capacity to understand and regulate their own behavior. These results also underscore the importance of investigating the significance of brief negotiation, and of examining the relation of negotiation to sex, and to the complexity of pretend scripts.

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Empirical studies of the social pretend play of young children have increased tremendously over the past two decades. One of the reasons for this increase is the importance attributed to pretend play in cognitive and social-cognitive development by theorists such as Piaget (1962), Vygotsky (1966), and, more recently, Fein (1979).

According to Piaget (1962), pretend play first appears between 12 and ~~18~~ months of age and becomes more complex and more social with increasing age. This form of play is thought to decrease as the child begins to master concrete operational skills between 6 and 8 years of age (Piaget, 1962). Most of the research has, however, focussed on pretend play in children up to 6 years of age. Pretend in children 5 to 8 years of age is one of the most neglected topics in cognitive development (Watson & Fischer, 1977). Further research is required to demonstrate the decrease hypothesized to occur around 6 to 8 years of age.

Empirical research has substantiated that pretend play becomes more social with increasing age during the preschool years, and that it is social and not solitary pretend which is more often associated with changes in social and cognitive skills (Connolly & Doyle, 1984; Johnson, 1976). Since pretend play is thought to be an important precursor to concrete operational thought (Piaget, 1962), research with children 5 to 8 years of age may provide clues as to how pretend play prepares the child for such thought.

Social pretend play includes both pretend enactment and meta-pretend communications, that is, conversations about that enactment (Bateson, 1955; Goncu & Kessel, 1984). The enactment of social pretend involves the actual 'acting out' of a pretend sequence with another child or children, and thus occurs within the pretend or 'as if' mode of play. For example, the child who is pretending with a partner that he or she is a doctor or that a broom is a horse is involved in the enactment of a social pretend sequence.

Meta-pretend communications involve communications about the nature of social pretend enactment, communications which either prepare the child for an upcoming pretend sequence or modify an ongoing sequence. For example, the child who discusses with a play partner what kinds of things he or she can do when pretending to be a doctor is involved in communicating the nature of a pretend sequence to his or her partner.

Most of the research thus far has been concerned with the enactment of social pretend sequences. Social pretend enactment has been associated with the development of representational skills, creativity, self-control, popularity, and social and verbal skills (Connolly & Doyle, 1984; Connolly, Doyle, & Reznick, in press; Doyle & Connolly, under review; Piaget, 1962; Singer, 1973; Smilansky, 1968; Smith & Syddall, 1978; Vygotsky, 1966). With increasing age, pretend enactment has been found to



become more complex (e.g. Connolly & Doyle, 1984; Garvey & Berndt, 1975; Watson & Fischer, 1977, 1980).

Relatively little research has been concerned with meta-pretend communications, especially with children older than 5 years of age. The number of recent publications in this area attests, however, to a growing interest in this aspect of pretend play. In general, meta-pretend communications have been found to increase in both frequency and quality between three and six years of age (Garvey & Berndt, 1975; Gearhart, 1983; Goncu & Kessel, 1984).

While pretend enactment is a phenomenon of established importance in early childhood, the developmental significance of meta-pretend communication is less clear. Meta-pretend communication has been hypothesized to reflect greater social (Giffin, 1984) and cognitive skills (Fein, 1979; Nicolich, 1977; Piaget, 1962), though no research thus far has clearly examined these relationships. In addition, few attempts have been made to differentiate amongst various kinds of meta-pretend communications.

The present study is concerned with the relation of one kind of meta-pretend communication - explicit meta-pretend communications - to aspects of cognitive and social-cognitive development in children 5 1/2 to 7 1/2 years of age. In this paper, we will first review existing research and theory pertaining to the possible developmental significance of meta-pretend communications, describing some

dimensions along which these communications may be conceptualized as well as some of the underlying skills. A possible model for the process by which pretend play may facilitate development in general - and certain classes of skills in particular - will then be described. Predictions regarding the developmental significance of explicit meta-pretend communication generated from the review of the existing literature and from the previously described model will then be outlined in the rationale for present study.

The significance of meta-pretend communications  
for development: Integrating theoretical  
and empirical approaches

#### Meta-pretend communication: Definition and dimensions

Meta-pretend communications - or, what has been previously referred to as "metacommunication" in pretend play<sup>1</sup> - refers to any message that clarifies how other verbalizations and behavior should be interpreted or that

---

<sup>1</sup>. Although the term 'meta-communication' has been that used in all of the literature to date, I consider the term 'meta-pretend communication' to be more accurate, since I believe that the message that is being communicated in these cases is probably a more general one - i.e. "everything that we do is now in the pretend mode" (that is why it should be a meta-pretend communication). The term 'meta-communication' denotes something different - i.e. "everything that we communicate now must be interpreted in the pretend mode." I have, therefore, chosen to use the term meta-pretend communication in this paper, and assume that it captures what previous writers have (imprecisely) described as meta-communication.

establishes the appropriateness of behavior in a particular play context (McLoyd, Thomas, & Warren, 1984). In essence, these messages clarify the mode (i.e. pretend or non-pretend) of the play in general and/or the mode in which specific messages in the play are to be understood. Such messages may, for example, announce an intention to pretend (e.g. "I'll be the doctor and you be the patient") or clarify a transformation in an ongoing sequence (e.g. "This spoon is a thermometer").

Meta-pretend communications may be usefully conceptualized along two non-independent dimensions: (a) embedded versus explicit communications, and (b) verbal versus non-verbal communications.

Embedded meta-pretend communications are those whose message is implicit to the content of a given communication, or those which carry a message via the way in which they are communicated. Bateson emphasizes in his classic paper on metacommunication in play (Bateson, 1955) that all play communications carry the implicit message that all subsequent messages are to be understood in the non-literal mode. He then explores the significance of the ability of very young children (and of many animals) to pick up these "meta-play" communications.

Embedded meta-pretend communications may also be conceptualized along another dimension - that is, they may be either verbal or non-verbal. For example, a child may

say to his partner, "It's time to feed you, baby." In this case, the discrepancy between the verbal content of the communication and the reality of the situation carries the implicit message, "Let's pretend". A child may also say to her play partner, "I'm going to beat you up", in an artificially deep voice and with her stomach in and chest out. Though in this case the verbal content of the communication could be very real, the child's exaggerated non-verbal gestures carry the message, "Let's pretend." In both cases, meta-pretend communication is embedded in the enactment of pretense. In the former, the message is embedded in the verbal content while in the latter, it is embedded in the child's non-verbal gestures.

Meta-pretend communications may also be explicit. For example, a child may also say to her play partner, "I'll be the mother and you be the baby". In this case, the message "Let's pretend" is explicit in that it occurs prior to, or outside of, pretend enactment. The occurrence of explicit meta-pretend communication is often even more clearly marked by the phrase "Let's pretend" and the use of the past tense (Garvey, 1984). Explicit meta-pretend communication can likely only be verbal; an example of explicit but non-verbal meta-pretend communication is difficult to imagine. It is generally regarded as being much more sophisticated than embedded meta-pretend communication, in part because it is not used by younger children (Bateson, 1955; Garvey, 1984;

Giffin, 1984).

It is important to note that the occurrence of implicit and explicit meta-pretend communication may imply the use of different skills. For example, the child who 'sends' an implicit meta-pretend message needs no skills or understanding beyond that which is required for pretend enactment, since the act of pretending itself conveys the message. The skills to 'understand' such a message may also be minimal, if appropriate responding to the message is sufficient to suggest an 'understanding'. On the other hand, the child who explicitly announces a desire to pretend must possess a broader understanding of the act of pretending. These points will be elaborated on later in the paper.

In the present study, explicit meta-pretend communication will be referred to as negotiation, while the term meta-pretend communications will refer to both embedded and explicit meta-pretend communications.

#### Research and theory on the nature and developmental significance of meta-pretend communication

The distinction between meta-pretend communication and enactment in play has been conceptualized in terms of script theory (Schank & Abelson, 1977; Garvey, 1977; Garvey & Berndt, 1975), as text versus context (Rubin, Fein, & Vandenberg, 1983; Schwartzmann, 1978; Sutton-Smith, 1979;

1983), and as play framing behavior (Bateson, 1955; Matthews, 1977; 1978).

In script theory (Schank & Abelson, 1977), behavior is guided largely by scripts, or cognitive structures representing a person's understanding of events in a familiar context. Once a script has been agreed upon by all the participants in a social pretend play episode, it can be used to generate the sequence of transformations which constitute pretend enactment (Garvey, 1977; Garvey & Berndt, 1975). In this view, meta-pretend communication may serve to specify the content (i.e. the script) as well as the mode of the play (i.e. pretend or literal).

According to Sutton-Smith (1983), metacommunication sets the context of pretend enactment while pretend enactment represents the text. It has been similarly viewed as providing a frame for play behavior (Goncu & Kessel, 1984). Meta-pretend communication thus directs the players to the "meaning and the potentially varied and complex levels of meaning" (Sutton-Smith, in Goncu & Kessel, 1984; p. 8). In addition, negotiation may help to clarify disagreements over particular transformations during social pretend enactment (Giffin, 1984; Matthews, 1977).

Several investigators have suggested that meta-pretend communications merit more study. For example, a recent review of the pretend play literature concluded that, "it

would be worthwhile for psychologists to examine the development of negotiations and communications regarding pretense (Rubin, Fein, & Vandenburg, 1983, p.76). The recognition of metacognitive skills as an integral aspect of higher mental functioning (see Flavell, 1977) also highlights the potential importance of meta-pretend skills.

Meta-pretend communication has been considered to be significant for cognitive development. According to Piaget (1962) and Fein (1975), the ability to announce a pretend role may signify a significant structural change in the development of symbolic play, an intention to symbolize and thus a greater cognitive awareness of the symbolic nature of the play activity. In addition, an increase with age in the frequency of negotiation prior to and during pretend enactment may be indicative of the decreasing dependence on external stimuli for enactment (Nicolich, 1977) and increasing dependence on internal action patterns (Garvey & Berndt, 1975). That is, with increasing age the child's pretend may be guided by more ideational, predetermined plans, which must be discussed and agreed upon, rather than stimulated by the symbolic potential of the objects played with (Matthews, 1977; Cole & Lavioe, 1985).

If the increased use of meta-pretend communication signifies a greater cognitive awareness of the symbolic nature of social pretend enactment, then this increased symbolic capacity should be evident in social pretend

enactment as well as in non-pretend activities. More symbolically complex pretense may, for example, be characterized by multiple and simultaneous role and/or object transformations (Connolly, Doyle, & Ceschin, 1983; Fein, 1975; Overton & Jackson, 1973; Watson and Fischer, 1980) as well as by role and object transformations that require a greater disregard of physical and/or functional reality (Elder & Pederson, 1978). Increased symbolic skills in the non-pretend domain may also be demonstrated - for example, by more mature Piagetian conservation skills (Golomb & Cornelius, 1977) or by a greater recognition of the arbitrary relationship between a word and its referent (Ben-Zeev, 1977; Vygotsky, 1966). While researchers have demonstrated a relationship between pretend enactment and conservation skill level (Golomb & Cornelius, 1977) and have suggested a link between social role enactment and representational skills (Fischer, 1980; Watson and Fischer, 1980), the relationship between negotiation and symbolic skills has yet to be examined.

Meta-pretend communication - and in particular, negotiation - may also be related to the development of social skills. It may, for example, determine the 'frame' (e.g. Goffman, 1974) that is crucial for social interaction. Negotiation has been recognized as important to group fantasy activity (Rubin, Fein, & Vandenberg, 1983) and described as integral to the enactment of social pretend



episodes (Giffin, 1984). Perhaps negotiation is important to the enactment of social pretense in that it provides an explicit frame for social interaction which participants can more easily control and modify according to their desires, thus leading to more complementary and personally satisfying social pretense. The fact that negotiation correlates positively with peer popularity (Doyle & Connolly, under review) provides some support for this point.

If negotiation contributes to more complementary and satisfying social pretend enactment, and if an increase in social pretense is regarded as a significant development in preoperational cognitive and social skills (Piaget, 1962), then negotiation may indeed play a role in the development of preoperational skills by facilitating social pretense. The findings thus far are inconclusive - while Doyle and Connolly (under review) found negotiation to be positively correlated with social pretend enactment, Sachs, Goldman, Chaille, and Seewald (1980) found no such correlation. If negotiation contributes to the development of social skills, its effects are likely to be similar to those of social pretend enactment - e.g. resulting in social interactions that show greater reciprocity (Rubin, Maioni, & Hornung, 1976) and play involvement, and that are longer lasting and more enjoyable (Connolly, Doyle, and Reznick, in press).

A number of sources suggest that meta-pretend communication becomes more explicit with age. Up until the

age of three, pretend enactment is structured using only embedded meta-pretend communication (Corsaro, 1979; Fein, Moorin, & Enslein, 1982; Garvey, 1974; Garvey & Berndt, 1975; Rubin, Fein, & Vandenberg, 1983). Between three and six years of age, negotiation becomes increasingly more frequent (Farver, 1987; Gearhart, 1979; Goncu & Kessel, 1984; Field, Stefano, & Kowler, 1982; McLoyd, Thomas, & Warren, 1984; Sachs, Goldman, & Chaille, 1984).

The relative frequency of transformations accompanied and unaccompanied by negotiation in children three to six years of age is unclear. Garvey and Berndt (1975), for example, reported that three-, four-, and five-year olds were more likely to negotiate than to engage in embedded verbal meta-pretend communications. Goncu and Kessel (1984), however, found that three- and four-year olds were far more likely to simply begin pretending without explicitly stating their intentions. Most researchers have obtained results similar to those of Goncu and Kessel - namely, that children between the ages of three and five are more likely to initiate their play by pretending than by discussing how to pretend (McLoyd, Thomas, & Warren, 1984; Genishi, 1983; Stockinger-Forys & McCune-Nicolich, 1983).

It is unlikely that the increase in the amount of negotiation with age simply reflects the greater complexity of object and identity transformations - i.e. negotiation does not become more frequent because children become less

likely to understand the increasingly complex transformations of their play partners. In their research in the development of social role play, Watson and Fischer (1980) found that after 4 1/2 years of age, the roles children are capable of enacting (as demonstrated in an elicited pretend procedure) were significantly more complex than those which they demonstrated in their spontaneous pretending. This gap between the skills demonstrated in elicited pretend play and those observed in spontaneous pretend play continued to widen with increasing age.

On the other hand, the increase in the amount of negotiation may be associated with development of more coherent pretend scripts with age. An increase in the organization and communicability of pretend scripts has been noted both generally (Goncu & Kessel, 1984) and with respect to certain scripts - e.g. children's pretend conversations (Garvey & Berndt, 1975), cooking and baking (Nelson & Seidman, 1984), and doctor-patient role-play (Sachs, Goldman, & Chaille, 1984).

The increase in the frequency of negotiation may also reflect a greater capacity for the understanding of the intentions of play partners. For example, very young children may fail to understand that pretense can be social and its transformations shared (Fein, 1979). While children three to five years of age often refer to their own activity when pretending (Garvey & Berndt, 1975), children become

more likely to refer to their partner's activity with increasing age (Garvey & Berndt, 1975; Goncu & Kessel, 1984). By five or six years of age, children negotiate the content of shared scripts with their partners (Farver, 1987; Gearhart, 1979). That a greater understanding of the intentions of others may be occurring is not unlikely if it is linked to the decline in egocentrism demonstrated in a number of areas of functioning (e.g. Piaget, 1932; Selman, 1976).

An increase in the amount of negotiation is also consistent with the finding that, as children get older, they become more comfortable with 'crossing the boundary' between pretend and non-pretend play. That is, explicit meta-pretend communication or negotiation entails stepping outside the frame of the pretend role (Giffin, 1984; Matthews, 1977, 1978). In a study by Fischer-DiLalla and Watson (1985) with children 3 to 6 years of age, the older children were found to be more tolerant of breaks in the enactment of a pretend sequence - that is, they were better able to maintain or resume the theme of a social pretend episode despite interruptions. Similarly, increased utilization of negotiation may reflect a greater ability to cross back into the pretend mode at will, once the script has been clarified.

The developmental shift towards an increased use of negotiation in social pretense is, however, unlikely to be

associated with more sophisticated verbal and/or communication skills. Although girls tend to negotiate more frequently than boys (Field, Stefano, & Kowler, 1982; McLoyd, Thomas, & Warren, 1984), they do not typically have better developed verbal skills than boys at this age (Maccoby & Jacklin, 1974). Therefore it seems likely that increased verbal competence does not contribute to the increase in negotiation with age.

In summary, the research to date suggests that negotiation becomes more frequent with age from 3 to 5 years of age. This change may be associated with better cognitive abilities, the greater coherence of pretend scripts, more sophisticated social skills, and a better differentiation of fantasy from reality, though not with greater verbal or communicative competence, or with the increased complexity of identity or object transformations. The links between negotiation and social and cognitive development, though suggested by various theoretical viewpoints, have yet to be demonstrated empirically.

The role of play in cognitive and social development:

Pretense as a medium in the process of development

The possible role of play in cognitive and social development has long been recognized by researchers in psychology. Nonetheless, researchers of play and pretend

play are rarely clear regarding how these modes of behavior are involved in the process of development. For example, does play cause development, or does it merely facilitate or reflect it? It is crucial that the hypothesized relationship between pretend play and development be made explicit if any predictions are to be made regarding patterns of pretending and sequences of cognitive and/or social skill development. In the section which follows, a model for the role of play in development is briefly outlined, based primarily on the writings of Jerome Bruner and Kurt Fischer. This model is then used to generate some predictions regarding the relation of negotiation to the development of social and cognitive skills.

According to Bruner (1972; 1973), play serves two important functions. By minimizing the consequences of one's action, play (a) permits learning in a less risky situation, and (b) provides an excellent opportunity to try combinations of skills that would never be tried if there were functional pressures to behave in a way that ensured one's immediate survival. Play is thus a kind of exercise in which the repeated use of certain combinations of skills eventually consolidates them into a single, complex skill. Once consolidated, new skills can be freed from the play context and used in non-play contexts. For example, monkeys given the opportunity to play with objects have been found to be more likely to use these objects in a constructive way

in subsequent tasks - e.g. using sticks to pull termites from their nests - than monkeys who have been denied this opportunity (in Bruner, 1972).

Bruner's conception of the role of play in skill development - that is, that it supports a repeating cycle involving the consolidation of existing skills and their subsequent combination into new and more complex skills - was originally used to describe gross and fine motor development in animals and humans (Bruner, 1972). However, since the child is also presumably consolidating and combining mental as well as motor schema in play (Bruner, 1972), play may also provide an opportunity for the development and generalization of more complex mental schema. Bruner's ideas regarding the function of play are also relevant to play which occurs in the pretend mode. Pretend play provides, however, more opportunities for experimentation than non-pretend play since it involves the non-observance of greater range of real-world constraints. In addition to the release from functional pressures provided by play in general (e.g. the need to behave in such a way as to ensure one's survival), the pretend mode frees the child from pressures to respond in ways which are physically and socially appropriate to his current environment. For example, a 5 year-old boy who pretends that he is a baby and then proceeds to suck on a spoon as if it were a bottle is, (a) disregarding primary functional

pressures by not behaving in such a way as to increase his chances for survival, (b) disregarding the functional pressures of physical reality by pretending that the spoon is a bottle, and (c) disregarding the functional pressures of social reality by not behaving in an age-appropriate manner. Thus, if play is important to development because it provides an opportunity to experiment freely with new combinations of skills, then pretend play is the ideal medium for development because its explicit disregard of a greater range of functional pressures allows the child to experiment with all kinds of behaviors.

The above discussion regarding the potential developmental significance of pretend play is based on Bruner's conceptualization of the importance of play in general. These conclusions are, however, also consistent with what has been written on pretend play by other major theorists. For example, pretend play has been considered to involve the consolidation of old information rather than the acquisition of new information (Piaget, 1962). Pretend play has also been described as helping to exercise developing skills (Vygotsky, 1966).

Bruner's model for the role of play in development can be complemented by his own (Bruner et al, 1966) views on the stages of representational development, and by Kurt Fischer's skill theory of development (Fischer, 1980). Fischer's model focusses on the development of skills, i.e.



the development of the individual's ability to control transactions between himself and his environment. Skills can be interrelated to one another, with different classes or domains of skills being defined by the characteristics which they share.

Fischer's model also accounts for discrepancies in the child's ability to demonstrate a skill in different contexts. Since skills are controlled transactions with an individual's environment, variations in the environment can account for the failure of a child to demonstrate the same ability in a different environment. This is a possible explanation for the phenomenon of horizontal decalage (Fischer, 1980).

In accordance with Bruner's model, skill development is characterized by a repeating cycle in which individual skills are first consolidated, then experimented with in different combinations, and finally integrated (or, in Bruner's terminology, "modularized") into a new, more complex skill which itself must then be consolidated, etc.. Development can, of course, also occur via generalization within domains of skills.<sup>1</sup> In the case of pretend play, the skills include the self and object transformations

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1. It is apparent that defining a skill in terms of a transaction with a specific environment raises the important question of how generalization occurs. Fischer does not adequately discuss this, but it is my belief that generalization occurs as the skill becomes more abstractly represented.

undertaken by children in the course of pretend enactment. This view of the development of pretend skills has been supported both conceptually and empirically - that is, role and object transformations which are complex or which involve multiple simultaneous transformations are associated with increasing age and social-cognitive maturity (e.g. Connolly & Doyle, 1984; Fein, 1975; Overton and Jackson, 1973; Watson and Fischer, 1980). For example, it has been found that the skills of transforming oneself into a doctor and of transforming a pen into a needle must be mastered before being able to enact a sequence in which a 'doctor' pretends to give a shot to a 'patient' (see Watson and Fischer, 1980). Similarly, objects which differ from their imagined referents along several physical dimensions are more difficult to pretend with than those which physically resemble their imagined referents (Elder & Pederson, 1978).

The role of play in development can also be better understood by making reference to Bruner's stages in the representation of specific objects, and in representational development in general (Bruner et al, 1966). The representation of objects is viewed as proceeding through three stages:

1. During the stage of enactive representation (from birth through the first year), the "identification of objects depends not so much on the nature of the objects encountered as on the actions evoked by them"

(Bruner et al, 1966, p.12).

2. During the stage of ikonic representation, the child "is finally able to represent the world to himself by an image or spatial schema that is relatively independent of action" (Bruner et al, 1966, p.21).

Although not mentioned by Bruner, we might also expect schemas to be temporally organized - in essence, temporally-organized schema correspond to the scripts described by Schank and Abelson (1977).

3. During the stage of symbolic representation, the child can represent his world with schema that are completely independent of action.

Though Bruner developed his model to describe development in children under the age of five, it is not unreasonable to extend this model by metaphor to cover skill development in older children and in adults. Though Bruner was describing sensori-motor development in the infant, action or enactment may be equally crucial to later cognitive development - for example, Saltz, Dixon, and Johnson (1977) found that the effects of pretend play tutoring were only evident in those children who participated in pretend enactment. One can talk of a "knowing by doing" as being analogous to enactive representation, and of a "knowing by thinking about doing"

as being analogous to ikonik or symbolic representation.<sup>1</sup> Though the "doing" of older children and adults may involve sequences of motor behavior that are themselves symbolically represented, this does not necessarily mean that they can readily "think about what they do". In fact, recent research suggests that adults often do not readily understand why they do what they do (Bowers, 1987), and tend to misattribute much of their behavior (e.g. Nisbett and Wilson, 1977). In the present paper, "knowing by doing" will be referred to as enactive knowledge, while "knowing by thinking about doing" will be referred to as ikonik knowledge.<sup>2</sup>

One can conceivably combine Fischer's model of the sequence of skill development with Bruner's sequence of representational development into a single model similar to that briefly described by Fischer (1980). In this model, the developmental cycle of skill development is repeated in

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1. I have chosen the term 'ikonik representation' for the lack of a better one. The fact that negotiation involves the use of language does not necessarily denote the presence of a symbolic knowledge (Bruner, 1966; Vygotsky, 1966). Negotiation may therefore be 'ikonik' in that it involves more than an enactive but less than a symbolic knowledge.

2. The distinction between 'knowledge' and 'representation' may be, in a certain sense, an arbitrary one since both draw on information encoded in past encounters with the environment. Knowledge, representations, and skills are, in another sense, interdependent in that all three can be inferred from the same overt behavior. Perhaps representations may be thought of as units of knowledge as individual cells are to living tissue.

each stage of representational development. Though this model implies two independent processes in development, the distinction between the process of skill development and the process of representational development more probably reflects two ways of viewing a unitary process too complex to be captured by any single model.

To return to the play of young children, the opportunities for the flexibility of action which play provides are initially very important. As enactive representations of objects become more stable and complex, they may themselves begin to become integrated into ikonic representations. As these ikonic representations themselves become stable and integrated with one another, they presumably become more internalized and independent of action. When this occurs, play may be expected to become more ideational since flexibility of thought - i.e. thought that is relatively independent of action - becomes feasible.

In summary, play - and in particular, pretend play - is viewed as contributing to development by providing an ideal medium for the experimentation with sets of skills, and modularization of these sets of skills into single complex skills. Modularization may be thought of as resulting in stable representations of skills that become progressively independent of enactment. The process of consolidating, combining, and integrating individual skills into new and

more complex ones occurs in each stage of their representational development, and this process can be extended by metaphor to describe skill development in older children and in adults.

The implications of the model outlined above are complex and perhaps beyond the scope of the present paper. They include implications for the role of play in development, for the developmental significance of negotiation, and for the development of the concept of pretense. Several of these implications will be tested empirically in the present study: 1

1. If play - and in particular, pretend play - is the ideal medium for the experimentation with and development of cognitive and social skills, we might expect the skills observed in the child's pretend play to present a higher level of cognitive and social development. Given this, and given the model of skill development proposed by Kurt Fischer (1980), we would expect that social and cognitive

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<sup>1</sup> Though negotiation (and, to a lesser degree, implicit meta-pretend communication) can also be seen as having implications to the development of specific social skills, I have chosen to explore its significance for more general development. This choice was made for the sake of brevity and does not reflect a belief that the social aspect of negotiation is not relevant - indeed, the possible significance of negotiation for social development is clear from the review of the literature. Moreover, some of the implications to be presented here can be readily extended to generate implications for the development of specific social skills.

skills exhibited in the pretend mode would be better developed than those observed to occur in non-pretend behavior.

2. The notion that skills develop within domains before being generalized to other domains suggests that the child gradually acquires a conceptual understanding of pretense as a result of specific non-literal transactions with the environment that are of greater variety and complexity. If this is so, then no great knowledge of pretense beyond that which is required for enactment need be inferred to explain the occurrence of individual transformations. For example, the very young child who plays with a stick as if it were a horse does not need to understand what it is to pretend... he or she need only play with the stick as if it were a horse. Such a view is also consistent with the view that the child does not initially have an understanding of the act of pretending that is independent of enactment.

This view contrasts with that implied by Bateson (1955) - namely, that the act of playing with a partner (and by extension, pretending with a partner) can occur only if the child can recognize the more sophisticated message 'This is play'. The assumption that the child needs to possess a broader understanding of the act of playing, - or, for that

matter pretending - may be unnecessary.<sup>1</sup> In this view, the occurrence of implicit meta-pretend communication is not developmentally significant since the act of transforming a single object itself requires only an enactive knowledge on the part of the 'sender', while only a primitive understanding of the behavior is required by the receiver to respond with analogous behavior.

3. Given the view of enactive and ikonic knowledge outlined above, negotiation is developmentally significant in that it implies that the child possesses more than an enactive knowledge of pretense since he or she can think (and talk) about pretending instead of simply pretending. This statement must be qualified, however, in the light of the point made above - namely, that no global understanding of the act of pretending is needed for pretend enactment to occur. Likewise, negotiation does not in and of itself imply a conceptual understanding of the act of pretending

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<sup>1</sup>. This view implies a primitive or subconscious understanding of the sender's behavior by the receiver. The process of communication implied is analogous to the process of 'thinking by analogy' proposed by Griffiths (1935) and the Buhlers (C. Buhler, 1935; K. Buhler, 1930) except that in this case it would be an 'acting by analogy'. Despite our inability to explain the process, such a view makes common sense - for example, we can say that two things are similar long before we know how they are similar. A similar process is no doubt involved in the generalization of skills to other domains... unfortunately, this process is beyond our present understanding, and as scientists we often tend not to fully accept the existence of processes which we cannot adequately explain.



since negotiation about a single pretend transformation requires only that the children can label that behavior as such. Thus the child who begins to negotiate does not necessarily possess radically superior skills than the child who does not - he may only demonstrate this skill in certain contexts. For this reason, the developmental significance of negotiation depends on the variety and complexity of the transformations around which it occurs.

4. If the skills observed in the child's pretend play represent a higher level of his or her cognitive and social development, then we would also expect the skills observed in the pretense of children 5 to 7 years of age to contain the components of the skills evidenced in the play of older children - namely, play involving games with rules. Many similarities between negotiation and games with rules are evident and suggest a relationship between them.

Negotiation accompanying social pretend enactment may provide a possible transition from social pretend enactment unaccompanied by negotiation - especially that involving role-playing - to play dominated by games with rules. According to Vygotsky (1966), games with rules and social pretend enactment involving role-playing are both similar and different, as is evident in the following passage:

The imaginary situation already contains rules of behavior, although this is not a game

with formulated rules laid down in advance. The child imagines herself to be the mother and the doll the child, so she must obey the rules of maternal behavior... (and) only actions which fit these rules are acceptable to the play situation... If play were structured in such a way that there were no imaginary situation, what would remain? The rules would remain.

Just as we were able to show... that every imaginary situation contains rules in a concealed form, we have also succeeded in demonstrating the reverse - that every game with rules contains an imaginary situation in a concealed form. The development from an overt imaginary situation and covert rules to games with rules and a covert imaginary situation outlines the evolution of children's play from one pole to the other.

(Vygotsky, 1966, pp. 9-10)

Negotiation about role enactment may thus represent a transitional state, a shift of the child's focus in which the imaginary nature of the situation and/or the rules which govern role enactment are explicitly stated. The explicit verbal labelling of the imaginary nature of the situation or of the rules governing play enactment may be important in developing both insight into and control of the child's behavior (see Vygotsky, 1962)...

Negotiation about social pretend enactment also bears a strong resemblance to the discussions about the rules of games documented by Piaget (1932) in several ways. First of all, both are concerned with more than enactment - they involve focussing on the process of play and the rules governing its enactment. Both are therefore meta-play behaviors and thus may serve to consolidate the skill of playing, so that the skills can be recalled in thought without the support of action. This view is consistent with Vygotsky (1962), who described how explicit verbal labelling of his own behavior and that of others may help to develop the representation of that skill. Second, both emerge after the child has already demonstrated a capacity to play according to the 'rules'. For example, the coordinated social pretense involving role enactment requires some ability to understand the intentions of a play partner and some consensus on the rules (e.g. what constitutes role-appropriate behavior), as does any games with rules in which turn-taking is evident. In this way, both negotiation and the discussions described by Piaget may signify the realization that these rules are not immutable laws but are due to mutual consent.

Finally, both the ability to negotiate a pretend script and to play games with rules require temporally-organized schema of events that are stable and relatively independent of enactment (i.e. at least ikonically represented). If

they are not, then plans to pretend cannot be made explicit prior to their enactment. Likewise, the rules of a game could not be discussed prior to its enactment nor could they be sustained throughout their enactment.

### The Present Study

As stated previously, the goal of this project was to explore the significance of negotiation for the development of social and cognitive skills. Children in grades kindergarten and one (between 5 1/2 and 7 1/2 years of age), from disadvantaged homes, were observed playing in groups of four. The occurrence and duration of pretend and non-pretend play and their characteristics were noted.

Measures of social skills obtained from the observational data included the mean duration of social interactions, and the proportion of social play that involved more complementary social interaction. Cognitive skills were inferred from the symbolic complexity observed in spontaneous social pretense, expressed as a proportion of the time spent in social pretense to control for individual differences in the amount of social pretense. Cognitive skills were also assessed individually for each child in terms of; (a) Piagetian conservation skills, (b) verbal symbol substitution skills (Ben-Zeev, 1977), and (c) elicited social role understanding (Watson and Fischer, 1977, 1980).

### Predictions of the Present Study

Several predictions regarding the developmental significance of negotiation follow directly from the implications outlined above:

1. Since negotiation is an indicator of cognitive development, negotiators were expected to be older than non-negotiators.

2. Since the use of negotiation may signify an increased ability to conceptualize rules, and thus is an index of cognitive development, negotiators were expected to play games with rules more than non-negotiators.

3. Since play - and in particular pretend play - is presumed to be an ideal medium for the development of cognitive and social skills, the difference in skill level between negotiators and non-negotiators was expected to be more pronounced for skills in the pretend domain than it would be for skills in the non-pretend domain. Additional support for the above prediction comes from the view that negotiation indicates better-developed pretend skills.

4. Negotiators were expected to possess better-developed social skills and better-developed cognitive skills than non-negotiators, in both their spontaneous and as elicited activities. This prediction is consistent with the conclusions derived from the review of the literature on meta-pretend communication and with the implications of the

model outlined for the skill development.

There are three alternative explanations, however, for the occurrence of negotiation. These are as follows:

1. Negotiation occurs because the child's play partner does not understand object and/or identity transformations occurring in the pretend sequence. If, for example, the purpose of negotiation was to clarify complex pretend transformations, then it might be expected to result in generally longer pretend sequences, since such sequences would be less likely to terminate prematurely if the transformations involved were made clear to both children. Similarly, if the purpose of negotiation is to clarify baffling pretend transformations, then sequences accompanied by negotiation should involve more complex transformations than those which are not accompanied by negotiation. However, as outlined in the review of meta-pretend communication, because the pretend capacities children demonstrate in their spontaneous pretend play are less complex than those of which they are actually capable (Watson & Fischer, 1980), social pretense accompanied by negotiation is expected neither to involve more complex transformations nor to be of longer duration than that which is unaccompanied by negotiation. By comparing, in the same children, the social and symbolic quality of pretend sequences accompanied by negotiation with that of pretend sequences not accompanied by negotiation, individual

differences in the capacity to pretend were controlled.

2. The negotiators are simply those children who like to talk.

3. Increases in negotiation simply reflect an increase in the amount of time spent in social pretend play.

## Method

### Subjects

Of the 184 children whose parents were contacted by letter, 121 consented to participate, yielding an acceptance rate of 66%. Three children moved away from the school in mid-year, leaving a total of 118 participants; 51 from kindergarten (27 boys and 24 girls) and 67 from first grade (32 boys and 35 girls). All children in kindergarten and grade one whose parents gave written consent participated. These children ranged from 5 1/2 to 7 1/2 years of age (mean age = 78 months) at the beginning of the study, were from lower and lower-middle S.E.S. backgrounds (mean Hollingshead (1975) score = 30), and attended a large French elementary school in suburban Montreal.

### Observational Procedures

The children came in groups of four to a separate room in the school equipped with specific toys. Toys were selected to maximally stimulate social pretend play, appeal to both sexes, and permit both pretend and non-pretend play. Included were a limited selection of both high and low realistic toys (e.g. building blocks, pieces of material, playmobile figures of both sexes, board games, a play doctor's kit, etc) from which the children could select according to their preferences.

The groups of four children were homogeneous as to



grade and sex so as to provide a reasonably natural playgroup structure for children this age (e.g. Etaugh, Collins, & Gerson, 1975), with some flexibility in the choice of play partners and size of the play group.

Each child attended the observation sessions three times, with group membership and toys varying across sessions (see Appendix A for a list of the toys). The observations of each child were summed across the three visits, with an average of 7 partners ( $SD = 1.14$ ) to maximize their representativeness of the child's behavior.

During each session, groups were introduced to the playroom and told that they would be free to play for approximately 30 minutes while the observers would be busy doing work. The observers sat at a table at one end of the playroom. Each child was observed by two observers working in rotation for a total of five separate two-minute periods per session. A total of 30 minutes of observations per child was obtained across the three play sessions.

The data were entered directly into OS-3 hand-held micro-processors (Observational Systems, Redmond, Washington), and were subsequently transferred to a microcomputer. The OS-3 units internally record the latency and duration of behavior.

#### Observational Codes

Using a continuous recording procedure, observers noted

the occurrence and duration of different categories of behavior. Those categories of interest to the present study included (a) the mode of play, (b) level of social interaction, (c) quality and number of role transformations occurring in social pretense, (d) quality and number of object transformations occurring in social pretense, and (e) the nature and duration of non-pretend activities.

Three modes of play were relevant to the present study; social pretense, social non-pretense, and negotiation about social pretense. Social interaction required at minimum one initiation-response sequence to be noted. Non-pretend play was coded when the play involved treating objects and people according to common and appropriate use. Pretense was coded whenever imaginary properties were assigned to objects or settings, and/or whenever imaginary roles were adopted.

Pretend negotiation was defined as:

...preparatory or procedural behaviors and negotiation related to social pretend play, explicit mention of a pretend transformation, or negation of it... Negotiations that are not about pretend, such as deciding how to count the points in a tossing game or discussing who will use which peg in a snakes and ladders game, are not coded as negotiation. For negotiation to be scored, two children (or more) must participate - i.e. with explicit acknowledgement of the other's statement

- in the negotiation of a pretend sequence. This negotiation has to last at least five seconds to be scored. (Doyle, Ceschin, & Busque, 1985, p.2-3)

Thus, in the present study, negotiation of a pretend episode which lasted more than 5 seconds was coded. In practice, this meant that negotiation which consisted of one statement and a response was usually not coded, since it typically lasted less than 5 seconds.<sup>7</sup>

The levels of social interaction noted were: (a) parallel play, (b) parallel play with mutual regard, (c) simple social interaction, and (d) complementary and reciprocal social interaction (see Howes, 1980; Parten, 1933). Simple parallel and parallel play with mutual regard were later grouped together as low level social interaction, and simple social and complementary and reciprocal were grouped as high level social interaction.

The occurrence, duration, quality, and number of single or simultaneous role and object transformations in social pretense were noted using codes adapted from previous research (Connolly and Doyle, 1984). Object transformations involved the assignment of imaginary properties to an object, and included (in order of increasing sophistication): (a) replica use of an object, (b) animation

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7. Note that all behaviors of interest to the present study were required to last at least 5 seconds to be coded.

of an object, (c) transformation of an object into one with similar physical characteristics, (d) transformation of an object into one with dissimilar physical characteristics, and (e) use of an imagined object. The set of transformations including (c), (d), and (e) above were grouped together and described as remote object transformations. The simultaneous transformation of two or more objects was also noted.

Role transformations involved the enactment of an imaginary role by the child. The remoteness of the roles enacted from the child's everyday experience was noted, since the enactment of remote roles is viewed by some (e.g. Garvey & Berndt) as suggesting greater cognitive skills. The levels of role remoteness used were (in order of increasing remoteness) (a) roles which the child might have experienced him or herself (e.g. brother, student, etc), (b) roles the child might have seen enacted within his or her family (e.g. father, mother, pet, etc), (c) roles the child might have seen enacted in his or her daily experience (e.g. doctor, truck driver, teacher, etc), or (d) roles that the child might have seen enacted only in the visual or print media (e.g. astronaut, superhero, etc), or that are imaginary. Categories (c) and (d) were grouped together as remote roles. The occurrence of simultaneous role and object transformations was also noted.

The activities noted in non-pretend social interaction

included the occurrence and duration of activity talk and of games with rules. Activity talk was scored when a child was talking about his or her present activities or surroundings. Games with rules were scored when children who were playing together accepted prearranged rules, adjusted to them, and controlled their actions and reactions within given limits. There also had to have been a sense of competition amongst the children, a specific goal to the game, a keeping of score, and a winner and a loser.

The present study was part of a larger study concerned with the role of social class and motivational factors in the amount and quality of social pretend play. Although only those observational codes relevant to the present study are described in this section, all of the codes used in the larger study are described in detail in the Observational Manual (Doyle, Ceschin, & Busque, 1985) in Appendix B.

Six observers (the author, two research assistants, and three undergraduate students) were trained on using all of the observational codes during twice-weekly meetings (1 1/2 hours long) over a period of 6 months, by an observer well-trained in the use of the present observational procedure. The trainees observed and coded video-taped segments of groups of children engaged in spontaneous play. Inter-observer reliability was assessed after each two-minute segment and disagreements were resolved by discussion.

A total of 30 minutes of observations per child was

obtained across the three play sessions. Reliability was assessed either by having a third observer present at the session who observed simultaneously with one of the two observers, or by having the two observers watch the same children simultaneously for the last four minutes of the session. Reliability was assessed throughout the data collection for 11.4% of the intervals in each session.

#### Individually Administered Measures

##### Goldschmidt and Bentler (1968) Concept Assessment Test

A French translation of an adaptation of the Goldschmidt and Bentler Concept Assessment Test (1968), Form B, was used to assess concrete operational skills (see Appendix C for a complete scoring and administration manual).

Seven conservation tasks were administered in the following order: two-dimensional space, number, substance, continuous quantity, weight, discontinuous quantity, and volume. On each task, the child was asked (a) whether amounts of substance remained the same after as compared to before a transformation, and (b) why these amounts did or did not remain the same. Each task therefore received two scores: (a) whether or not the child gave the correct answer, and (b) whether the child's explanation of his or her answer was correct, partially correct, or incorrect. These two scores were summed across all the tasks

administered to yield a total score, which could range from 0 to 28. Higher scores on this measure suggest superior conservation skills.<sup>1</sup> Inter-scorer agreement on the scoring of individual items was 98%, based on an independent second scoring of 20% (n=24) of the protocols. Test-retest reliability, collected on this measure by re-testing 71 of the children 9 months later, was .542,  $p < .001$ .

#### Ben-Zeev (1977) Verbal Symbol Substitution Task

A French version of Ben-Zeev's (1977) verbal symbol substitution task was included to assess symbolic skills in the verbal realm (see Appendix D for a complete scoring and administration manual). This task, adapted from Vygotsky (1966), consists of seven items in which the child is required to substitute one meaningful word for another, usually within a fixed sentence frame. The first two items require the child to recognize that a word can be substituted for another instead of being immediately tied to its referent. Example: "You know that in English this is named airplane (experimenter shows toy airplane). In this game its name is turtle... Can the turtle fly?" (Correct

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<sup>1</sup>. Doyle, Beaudet, and Aboud (in press), established 3 levels of task difficulty: number and area; discontinuous quantity, substance, weight, and continuous quantity; and volume, in that order. The co-efficient of reproducibility of the data was .93 and of scalability was .81 on a subsample of 73 children in kindergarten to grade 3.

answer: Yes). The remaining items require the substituted word to violate obligatory grammatical selection rules of the language, e.g. the word "clean" must be substituted for the word "into" as in "The doll is going clean the house".

The answers to the questions were scored as correct, partially correct, or incorrect. A total score, ranging from 0 to 22, was obtained for each child by summing across all of the questions. A high score indicates superior performance on this measure. Inter-scorer agreement on the individual items was 99%, based on a second independent scoring of 20% (n=24) of the protocols. Test-retest reliability, collected by re-testing 71 of the children 9 months later, was .59 (p .001).

#### Watson and Fischer (1980) Elicited Pretend Procedure

A French translation of Watson and Fischer's (1980) elicited assessment of role understanding was used to examine the complexity of the child's elicited pretense (see Appendix E for the complete administration and scoring manual). In this procedure, stories ranging from single representations of an active agent to the intersection of social roles for three agents were modelled by the experimenter using dolls representing a doctor, a child patient, a nurse, and a mother. Each modelled story was followed by an imitative story from the child. The 20 to 30 minute session was videotaped.



An adaptation of the scoring criteria based on Fischer's (1980) skill theory of development was used. The tapes were scored for the highest skill level demonstrated (Fischer, 1980; Watson & Fischer, 1980), with possible scores ranging from 4 to 14. Higher scores indicated superior performance on this task. Inter-scorer agreement for the highest skill level demonstrated was 84%, based on an independent second scoring of 20% (n=24) of the protocols by a second person. When disagreements did occur, the highest levels indicated by the two scorers usually differed by no more than one. Test-retest reliability, collected on this measure by re-testing 71 of the children 9 months later, was .105, reflecting the high proportion of children who reached ceiling on the task when re-tested.

### Procedure

Observation sessions were conducted over a 4 1/2 month period. Individual tasks were given over a 6 month period, beginning at the same time as the observations. The tests were given in the following order; Goldschmidt and Bentler Concept Assessment Test, Ben-Zeev Symbol Substitution Task, and Watson and Fischer Elicited Pretend Procedure. Two trained, bilingual research assistants administered the measures in French in three separate, individual testing sessions. The testers were unaware of the children's play performance. All of the data was collected between

November, 1985 and May, 1986.

## Results

### Reliability of observations

Inter-observer reliability was calculated within code category (e.g. mode of play, level of social interaction) on approximately 11.4% of the observations, in terms of agreement on coding each 10 second time unit. The percent agreement and Cohen's (1960) kappa coefficient, which controls for the possibility of chance agreement, for each code category are presented in Table 1. Eighty percent agreement and a Cohen's kappa above .6 are considered good. Kappas between .4 and .6 are adequate (Bakeman & Gottman, 1986).

### Preliminary analyses of dependent variables

Results of evaluation of assumptions of normality and homogeneity of variance for all observational and test data were satisfactory, except in two instances. For negotiation group, grade, and sex combinations, there were wide variations in the sample sizes of individual cells. In addition, since many of the children never played games with rules, the distribution of the proportion of non-pretend social play involving games with rules was positively skewed ( $p < .01$ ). The large size of the present sample makes it less likely, however, that this skewedness realistically affected the analysis (Tabachnik & Fidell, 1983).

Table 1

Inter-observer Reliability for Code Categories

Code Category	% Agreement	Cohen's kappa
Mode of Play	80.0	.658
Level of Social Interaction	85.3	.572
Non-Pretend Activities	86.3	.601
Role Transformations	72.5	.466
Object Transformations	69.6	.355

Since discriminant function analyses are particularly sensitive to outliers, univariate outliers were identified within groups (e.g. negotiators and non-negotiators). Those data greater than three standard deviations from the group mean were recoded to three standard deviations (Tabachnik & Fidell, 1983). Subsequent evaluation of the assumptions of singularity, multicollinearity, normality, and homogeneity of variance-covariance matrices revealed no threat to the validity of multivariate analysis, except in one instance. The range of sample sizes for negotiation group x grade x sex cells (see Table 2) make it unlikely that the data are similarly distributed and call into question interpretations of three-way interactions. For this reason, three-way interactions of negotiation group, grade, and sex will not be discussed. It should be also noted that, for all multivariate analyses, the degree of intercorrelation amongst predictor variables was examined to ensure that the use of such techniques was justified.

The four measures of the symbolic complexity of observed social pretense were examined to potentially reduce the number of variables in the principle analyses. The four measures included the proportions of spontaneous social pretense involving (a) simultaneous role and object transformations, (b) remote roles, (c) multiple object transformations, and (d) dissimilar object transformations. Correlations amongst the four measures as well as with

Table 2

Sample Sizes of Negotiation Group by Grade by Sex Cells

Negotiation Group	Sex	Grade	
		K	1
Negotiators	Boys	12	15
	Girls	16	18
Non-Negotiators	Boys	16	17
	Girls	6	18

individually administered measures of elicited cognitive skills revealed that all four measures were moderately to highly related,  $.33 < r < .94$  (see Table G-1). The proportion of social pretense involving simultaneous role and object transformations was finally chosen as the measure of the symbolic complexity of spontaneous social pretense because of its importance in prior research and theory (Connolly & Doyle, 1984).

#### Negotiation as a grouping factor

Preliminary analyses revealed that the distribution of the amount of time spent in negotiation was markedly skewed because one-third of the children did not negotiate. Since this invalidated analyzing negotiation as a continuous variable, children were divided into two groups on the basis of time in negotiation - the negotiators were those children who engaged in at least 15 seconds of negotiation, while the non-negotiators were those children who engaged in less than 15 seconds of negotiation. The mean amount of negotiation for negotiators was 82 seconds, and for non-negotiators was 2 seconds. There were 27 male negotiators, 33 male non-negotiators, 34 female negotiators, and 23 female non-negotiators.

#### The analyses performed in the present study

The analyses performed in the present study may be divided into three categories; (a) those which tested.

predictions regarding the relation of negotiation to social and cognitive development, (b) those which explored alternative explanations for the occurrence of negotiation briefly discussed in the introduction, and (c) those which explored the possibility that effects of grade and sex contribute to the significant relations of negotiation to social and cognitive development.

#### Analyses which tested the predictions

To test the first prediction - that negotiators would tend to be older than non-negotiators - a three-way ANOVA was performed. In this ANOVA, negotiation group, grade, and sex were the independent variables and age in months was the dependent variable. To test the second prediction - that the negotiators would spend more time playing games with rules - another three-way ANOVA was performed. In this ANOVA, amount of time spent playing games with rules was the dependent variable and negotiation group, grade, and sex were the independent variables.

These analyses of variance revealed that negotiators were not significantly older than non-negotiators, means for both = 78 months,  $F(1, 110) = 1.18$ , n.s., nor did more of their non-pretend play involve games with rules, means for both = .07,  $F(1, 117) = .04$ , n.s. (For ANOVA summary tables, refer to Tables F-1 and F-3 in Appendix F.)

To test the third and fourth predictions, discriminant



function analyses were performed on different sets of dependent measures to determine if negotiators could be accurately differentiated from non-negotiators. These discriminant function analyses were used to answer two questions; (a) could negotiators be reliably distinguished from non-negotiators on the basis of the set of dependent variables?... and (b) was one subset of dependent variables better at predicting group membership than another?

It was predicted that the difference in skill level between negotiators and non-negotiators would be more pronounced for the set of four pretend skills than it would be for the set of four non-pretend skills. A discriminant function analysis was performed using the set of four pretend skills, while another was performed using the set of four non-pretend skills. The measures of pretend skills included (a) performance on the Watson and Fischer (1977; 1980) elicited pretend procedure, (b) the proportion of social pretend play involving simultaneous role and object transformations, (c) the mean duration of social pretend interaction, and (d) the proportion of social pretend play involving higher-level social interaction. The measures of non-pretend skills included (a) performance on a measure of Piagetian Conservation skills (Goldschmidt & Bentler, 1968), (b) performance on the Ben-Zeev (1977) test of verbal symbol substitution skills, (c) the mean duration of non-pretend social interactions, and (d) the proportion of non-pretend

social play involving higher-level social interaction. For both analyses, negotiation group was the grouping variable.

Negotiators were significantly different from non-negotiators on the basis of pretend skills,  $\chi^2(109) = 9.33, p < .05$ . (see Table 3). The correlations between predictor variables and the discriminant function suggests that the proportion of social pretense involving simultaneous role and object transformations and performance on the Watson and Fischer procedure are responsible for distinguishing between negotiators and non-negotiators. Inspection of the means presented in Table 4 also show that negotiators demonstrated superior performance on the Watson and Fischer procedure than non-negotiators, means = 11.09 vs. 10.48,  $F(1, 107) = 5.37, p < .05$ . Negotiators also spent a greater proportion of their social pretense engaged in simultaneous role and object transformations (mean = .40) than did non-negotiators (mean = .31),  $F(1, 109) = 4.74, p < .05$ , but a negotiation group by grade by sex ANOVA on the proportion of social pretense involving simultaneous role and object transformations revealed that this main effect is accounted for by a significant negotiation group by sex interaction,  $F(1, 109) = 4.74, p < .05$  (see Table 5). This interaction is due to the performance of the girls negotiators, who engaged in simultaneous role and object transformations proportionately more often than any other group (see Table 6).

Table 3

Discriminant Function Analysis of Measures of Pretend Skills  
for Negotiators and Non-Negotiators<sup>a</sup>

Predictor variable	Correlations of predictors with discriminant function	Pooled within-group correlations amongst predictors <sup>b</sup>		
		ROLOBJ	PSOCINT	DURPRET
WFSCOR <sup>c</sup>	.374	.275 *	.197 *	.210 *
ROLOBJ	.382		.143	.128
PSOCINT	-.056			-.147
DURPRET	-.108			

\*  $p < .05$

<sup>a</sup>df = 4, 109

<sup>b</sup>df = 1, 113

<sup>c</sup>WFSCOR - Highest level demonstrated in the Watson and Fischer procedure; ROLOBJ - Proportion of social pretense involving simultaneous role and object transformations; PSOCINT - Proportion of social pretense involving high-level social interaction; DURPRET - Mean duration of episodes of social pretense

Table 4

Group Means for Negotiators and Non-Negotiators on Measures of Pretend Skills

	Negot.	WFSCOR <sup>a</sup>	ROLOBJ	PSOCINT	DURPRET
Non-Negotiators. ( <u>n</u> =54)		10.48	.31	.80	60.4
Negotiators ( <u>n</u> =61)		11.09 <sup>b</sup>	.40 <sup>c</sup>	.80	56.9

<sup>a</sup> WFSCOR - Highest level demonstrated on the Watson and Fischer procedure; ROLOBJ - Proportion of social pretense involving simultaneous role and object transformations; PSOCINT - Proportion of social pretense involving high-level social interactions; DURPRET - mean duration of episodes of social pretense

<sup>b</sup>  $F(1,113) = 3.17, 10 > p < .05$

<sup>c</sup>  $F(1,113) = 5.36, p < .05$

Table 5

Analysis of Variance Summary Table: Proportion of Social  
Pretense Involving Simultaneous Role and Object  
Transformations by Negotiation Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	.27	4.74 *
Grade	1	.00	.01
Sex	1	.52	11.41 **
2-way Interactions			
Neg. x Grade	1	.03	.67
Neg. x Sex	1	.21	4.70 *
Grade x Sex	1	.00	.00
3-way Interactions			
Neg. x Grade			
x Sex	1	.02	.04
Error	109	.05	

\*  $p < .05$ \*\*  $p < .001$

Table 6

Mean Proportion of Social Pretense Involving Simultaneous  
Role and Object Transformations, Separately for Negotiators  
and Non-Negotiators, and for Boys and Girls

Sex	Negotiation Group					
	Negotiators			Non-Negotiators		
	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>
Boys	.28a	.18	27	.27a	.20	33
Girls	.50b	.21	34	.32a	.26	23
Overall	.40	.22	61	.29	.22	56

a,b Means with different superscripts differ significantly  
according to Scheffe's test, with  $\alpha = .05$ .

Pooled within-group correlations among the four predictors are also shown in Table 3. Of the 6 correlations, 3 are significant at  $\alpha = .05$ . Performance on the Watson and Fischer procedure correlated positively and significantly with the other three dependent measures; the proportion of social pretense involving high-level social interaction, the mean duration of episodes of social pretense, and the proportion of social pretense involving simultaneous role and object transformations,  $r$ 's (113) = .197, .210, and .275,  $p < .05$ . These indicate that children who demonstrate superior performance on the Watson and Fischer procedure are more likely to spend a greater proportion of their social pretense in high-level social interaction, are more likely to have a greater proportion of their social pretense involve simultaneous role and object transformations, and are more likely to engage in longer sequences of social pretense.

Negotiators could not, however, be significantly discriminated from non-negotiators based on measures of their skills in the non-pretend domain,  $\chi^2(108) = 2.94$ , n.s. (see table F-6). Thus, the discriminability of negotiators from non-negotiators on the basis of the set of pretend skills was markedly superior to that provided by the set of non-pretend skills, supporting the third prediction.

The fourth prediction was that negotiators would tend to have better-developed cognitive and social skills than

non-negotiators. A discriminant function analysis was performed on the social skills, including (a) the mean duration of social pretend interactions, (b) the mean duration of non-pretend social interactions, (c) the proportion of social pretend involving higher-level social interaction, and (d) the proportion of non-pretend social play involving higher-level social interaction.

To test the prediction that negotiators possess better-developed cognitive skills than non-negotiators, their performance on measures of cognitive abilities was examined via another discriminant function analysis. These measures included (a) the proportion of social pretend play involving simultaneous role and object transformations, (b) the highest level demonstrated on the Watson and Fischer Elicited Pretend Procedure, (c) the total score on the Ben-Zeev Verbal Symbol Substitution Task, and (d) the total score on the test of Piagetian conservation skills.

Discriminant function analyses revealed that the performance of negotiators was not significantly different from non-negotiators on measures of cognitive skills,  $\chi^2(109) = 6.42$ , n.s., or on measures of social skills,  $\chi^2(111) = 3.40$ , n.s. (see Tables F-7 and F-8).

In summary, of the six analyses which tested the principle predictions, only the discriminant function analysis of the measures of pretend skills revealed a significant difference between negotiators and non-



negotiators. This supported the prediction that negotiators demonstrate superior abilities in the pretend domain, and that the difference between negotiators and non-negotiators is more marked in the pretend domain than it is in the non-pretend domain.

#### Analyses which explored alternative hypotheses

A repeated measures multivariate analysis of variance comparing, in the same children, the social and symbolic quality of pretend sequences accompanied by negotiation with that of pretend sequences not accompanied by negotiation, was used to explore the possibility that the purpose of negotiation was to clarify complex transformations. In addition to the within-subjects factor of type of sequence (with or without negotiation), grade and sex were included as between-subjects factors in the MANOVA. Scheffe post-hoc tests were conducted to establish which inter-group differences were responsible for the significant results obtained (note: all post-hoc comparisons in the present study were conducted using the Scheffe test).

Sequences of social pretend play accompanied by negotiation were those in which any negotiation occurred during the same two minute observation interval. Sequences with no negotiation were those two minute intervals in which no negotiation occurred. These two types of social pretend sequences were compared within the same children to control

for individual differences in the frequency of negotiation and social pretense.

The social quality of these sequences was examined by comparing the mean duration of social pretend interactions in each. The symbolic complexity of the pretense in these two types of sequences was examined by comparing in each the proportion of social pretense involving simultaneous role and object transformations. Since this analysis was primarily concerned with the possible effects of the type of sequence, only main effects of type of sequence and its interaction with grade and/or sex are presented here.

With the use of Wilks' criterion, a significant main effect for the type of social pretend sequence,  $F(2, 44) = 14.93$ ,  $p < .001$ , and a significant interaction of type of sequence and grade,  $F(2, 44) = 4.97$ ,  $p < .01$ , was obtained. and for grade and sex,  $F(2, 44) = 2.40$ ,  $p < .05$ . Finally, a trend towards the interaction of grade and sex was also noted,  $F(2, 44) = 2.74$ ,  $.10 < p > .05$  (see Table 7 for a summary of these results).

To investigate the relative contribution of each variable to the main effect of type of sequence and its interactions with grade and sex, univariate analyses of variance were performed on the two dependent variables with the same set of independent variables. A summary of the significant main effects of type of sequence and its interactions with grade and sex are also presented in Table

7.

Examination of the results of the univariate ANOVAs suggests that the significant main effect of type of sequence is largely due to a significant difference between the mean duration of episodes of social pretense (see Table 7). Episodes of social pretense accompanied by negotiation tended to be shorter (mean = 40.02 seconds) than those sequences unaccompanied by negotiation, means are 40.02 and 63.15 seconds (see Table 8).

The significant univariate interaction between type of sequence and grade on the proportion of social pretense involving simultaneous role and object transformations,  $F(1, 49) = 9.29$ ,  $p < .01$ , accounts for the significant type of sequence by grade interaction observed in the multivariate analysis,  $F(2, 44) = 5.08$ ,  $p < .01$  (see Table 7). For kindergarten children, sequences of pretend unaccompanied by negotiation were significantly more likely to involve simultaneous role and object transformations (mean = .52) than, for the same children, sequences which did not involve negotiation (mean = .28). The mean complexity was also greater than either kind of sequence for grade 1 children (see Table 9).

To explore the possibility that increased negotiation simply reflected an increase in the total amount of social pretend play, a three-way ANOVA was performed on the total amount of time spent in social pretend play. In this ANOVA,

Table 7

Analyses of Variance Summary Table for Type of Sequence,  
Grade, and Sex: Effects Involving Type of Sequence

Source	Dependent variables	df	Mean Square	F
Type of Sequence (TS)	All DV's	2,44	15.26	14.93 **
	DUR046a	1,45	13075.80	29.91 **
	ROLOB	1,45	.11	1.84
TS x Grade	All DV's	2,44	5.08	4.97 *
	DUR046	1,45	643.53	1.54
	ROLOB	1,45	.53	9.29 **
TS x Sex	All DV's	2,44	.05	.51
TS x Grade x Sex	All DV's	2,44	.86	.84

\*  $p < .01$

\*\*  $p < .001$

<sup>a</sup>DUR046 - mean duration of episodes of social pretense;  
ROLOB - proportion of social pretense involving simultaneous role  
and object transformations

Table 8

Mean Duration of Social Pretense Within Sequences  
Accompanied and Unaccompanied by Negotiation

Type of Sequence	<u>M</u>	<u>SD</u>	<u>n</u>
With Negotiation	40.02	21.65	49
Without Negotiation	63.15	20.94	49

in which negotiation group, grade, and sex were the independent variables, no significant difference in the total amount of social pretense engaged in by negotiators and non-negotiators, mean = 458 vs 415 seconds,  $F(1, 110) = 2.34$ , n.s. Negotiation did interact, however, with sex,  $F(1, 110) = 4.27$ ,  $p < .05$  (see Table 10). Girl negotiators spent significantly more time engaging in social pretense (mean = 425 seconds) than girl non-negotiators (mean = 278 seconds), and significantly less time in social pretense than boy negotiators (mean = 501 seconds) (see Table 11).

To explore the possibility that the negotiators simply talked more, a three-way ANOVA was performed on the amount of time spent in Activity Talk, with negotiation group, grade, and sex as the independent variables. Negotiators differed from non-negotiators in the proportion of their non-pretend play involving activity talk,  $F(1, 110) = 12.67$ ,  $p < .005$  (see Table 12). Inspection of the means presented in Table 13 indicates that negotiators spent much more of their non-pretend social interaction talking about their current activities or surroundings (mean = .26) than did non-negotiators (mean = .18).

Analyses which explore the relations between  
negotiation group, grade, and sex

Three-way ANOVAs (Grade X Sex X Negotiation Group) were performed on each of the eleven dependent measures described

Table 9

Mean Proportion of Social Pretense Involving Simultaneous  
Role and Object Transformations Within Sequences Accompanied  
and Unaccompanied by Negotiation, and Separately for Each  
Grade

Type of Sequence	Grade			
	K ( <u>n</u> =21)		1 ( <u>n</u> =28)	
	<u>M</u>	SD	M	SD
With Negotiation	.28a	.31	.29a	.27
Without Negotiation	.52b	.25	.36a	.25

a,b Means with different superscripts differ significantly,  
according to Scheffe's test, with  $\alpha = .05$ .

Table 10

Analysis of Variance Summary Table: Amount of Time Spent in  
Social Pretense by Negotiation Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	142925	2.34
Grade	1	67746	1.11
Sex	1	698291	11.46 **
2-way Interactions			
Neg. x Grade	1	43334	.71
Neg. x Sex	1	260392	4.27 *
Grade x Sex	1	95314	1.57
3-way Interactions			
Neg. x Grade x Sex	1	21087	.34
Error	110	60921	

\*  $p < .05$

\*\*  $p < .001$



Table 11

Mean Amount of Time Spent in Social Pretense, Separately for  
Negotiators and Non-Negotiators, and for Boys and Girls

Negotiation Group	Sex					
	Boys			Girls		
	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>
Negotiators	501 <sup>a</sup>	272	27	425 <sup>b</sup>	232	34
Non-negotiators	511 <sup>a</sup>	260	33	278 <sup>c</sup>	216	24

a,b,c Means with different superscripts differ significantly  
 according to Scheffe's test, with  $\alpha = .05$ .

Table 12

Analysis of Variance Summary Table: Proportion of Social  
Non-Pretend Play Involving Activity Talk by Negotiation  
Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	.21	12.67 ***
Grade	1	.05	2.92 +
Sex	1	.03	2.01
2-way Interactions			
Neg. x Grade	1	.03	1.50
Neg. x Sex	1	.03	2.01
Grade x Sex	1	.08	4.85 **
3-way Interactions			
Neg. x Grade			
x Sex	1	.13	4.69 *
Error	110	.02	

+ .10 <  $p$  > .05

\*  $p$  < .05

\*\*  $p$  < .005

\*\*\*  $p$  < .001

Table 13

Mean Proportion of Non-Pretense Social Play Involving  
Activity Talk, Separately for Negotiators and Non-  
Negotiators

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Group

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	<u>M</u>	<u>SD</u>
Negotiators ( <u>n</u> =61)	.26	.13
Non-Negotiators ( <u>n</u> =57)	.18	.14

---

above to explore the inter-relationship of grade and sex with negotiation group. The purpose of these analyses was to aid in the interpretation of the significant differences obtained in the discriminant function analyses, and to help determine fruitful directions for future research. Since these analyses were primarily concerned with the possible effects of the type of sequence, only main effects of negotiation and its interactions with grade and/or sex will be noted. (For summaries of all exploratory analyses, see Tables G-5 to G-15 in Appendix G.) In addition,  $F$  values for non-significant findings will not be provided because these analyses do not test specific predictions or rule out specific alternative hypotheses.

Though significant sex by negotiation group interactions were evident on measures of social skill, no consistent relationship was noted between the two variables. For example, the negotiation group  $\times$  sex interaction was significant for mean duration of episodes of social pretense,  $F(1, 109) = 6.47, p < .05$ . (see Table G-5). This finding reflected the tendency of boy non-negotiators to engage in episodes of significantly greater mean duration (mean = 64 seconds) than did boy negotiators (mean = 53 seconds) (see Table G-6). In addition, a significant negotiation group by sex interaction was obtained when the mean duration of episodes of non-pretend social play was examined,  $F(1, 109) = 4.16, p < .05$  (see Table G-7). In

contrast to the previous finding during pretend play, non-pretend social interactions of girl non-negotiators tended to be significantly longer than those of any other group (Table G-8). No main effects of negotiation or interactions with grade or sex were noted for the proportion of social pretense or non-pretense involving high-level social interaction (Tables G-9 to G-11).

Finally, no main effects of negotiation group were noted on the test of Piagetian conservation skill or on the test of verbal symbol substitution skill, while the main effect noted on the Watson and Fischer elicited pretend procedure has already been discussed. No interactions of negotiation group with grade or with sex were noted on any of these measures. (See Tables G-12 to G-15.)

## Discussion

The major goal of this study was to assess the developmental significance of negotiation for social and cognitive skills in children 5 1/2 to 7 1/2 years of age. It will be recalled that, based on the review of the literature on meta-pretend communication and on the implications of a model outlined for skill development, children who negotiated were expected to (a) be older, (b) play more games with rules, (c) evidence better skills in both the pretend and non-pretend domains (and more so in the former), and (d) evidence better social and cognitive skills than non-negotiators.

In this study, the developmental significance of negotiation was much more circumscribed than had been predicted. It demonstrated no relationship to social skill development or to skill development in the non-pretend domain. In addition, children who negotiated did not tend to be older, nor did they play more games with rules. The occurrence of negotiation was associated, however, with some of the cognitive skills involved in social pretend enactment. Children who negotiated were more likely to enact cognitively complex pretend transformations in their elicited pretense and, to a lesser degree, in their spontaneous pretense. The latter finding was, however, only true for girls - while the spontaneous social pretense of

girl negotiators tended to be symbolically more complex than that of either boy negotiators or girl non-negotiators, no significant difference was obtained when boy negotiators and boy non-negotiators were compared.

The findings of the present study do not, however, support two of the alternative explanations for the occurrence of negotiation. Since negotiators do not engage in more social pretend enactment than non-negotiators, the occurrence of negotiation does not simply reflect an increase in the amount of social pretense. In addition, the finding that sequences of social pretense accompanied by negotiation did not involve cognitively more complex transformations than those unaccompanied by negotiation suggests that negotiation does not simply occur because one child fails to understand the role and/or object transformations of a partner. In fact, sequences of social pretense accompanied by negotiation were significantly shorter rather than longer in duration than those unaccompanied by negotiation. They also tended to be symbolically less complex, especially for kindergarten children. Both of these findings contrast with what would be expected if this alternative explanation of the occurrence of negotiation were supported. Thus, it is likely that the occurrence of negotiation is significant in and of itself and not because it reflects other behaviors.

The negotiators did, however, tend to talk much more

about their non-pretend social activities than did non-negotiators. While this may suggest that the occurrence of negotiation simply reflects a child's verbosity, an alternative and intriguing explanation for this finding is available. Perhaps activity talk and negotiation are analagous behaviors in the pretend and non-pretend domain in that both often involve explicit verbal descriptions of his or her own activities. In accordance with the views of Vygotsky (1962), such descriptions may increase the child's conscious awareness of his or her own activities, and serve as a crucial step in the internalization of action patterns.

Both activity talk and negotiation may therefore help the child to plan and guide his or her own behavior towards a recognized goal, and to realize that one's own behavior can be consciously controlled. If this is true, then these activities may also contribute indirectly to the realization that interactions with others can be similarly subjected to conscious control - i.e. they may help to dispell the belief, described by Piaget (1932), that rules of social conduct are immutable laws.

Such a view of negotiation and activity talk cannot, unfortunately, be adequately tested in the context of the present study. Nevertheless, the relationship of these two activities in relation to one another and to the development of social-cognitive awareness merits future research.

The analyses exploring the relation between



negotiation, grade, and sex revealed that negotiation group was generally a significant factor in and of itself, one whose effects in the present study did not tend to simply reflect an interaction with sex or with grade. The symbolic complexity of spontaneous pretense was, however, an exception - girl negotiators engaged in symbolically complex social pretend play proportionately more often than any other group. An interpretation of this finding is not readily available from the present literature and may have to await further research on the differential effects of toys on the quality of social pretense enacted by boys and girls (discussed in greater detail on below).

While interactions of negotiation group with sex independent of main effects of negotiation group were obtained on measures of the social maturity of their play; no consistent pattern emerged. For example, girls who negotiated spent significantly more time in social pretense than those who did not, while the difference between boys who negotiated and those who did not was insignificant. On the other hand, boy non-negotiators tended to engaged in the longest episodes of social pretense, while girl non-negotiators tended to maintain non-pretend social interaction for the longest period of time.

These exploratory analyses suggest the need to consider grade and sex effects in future research, either by (a) continuing to include them as factors in analyses involving

negotiation group, and (b) by examining them in relation to other aspects of the quality of pretend and non-pretend play. For example, previous (as yet unpublished) research in our lab suggests that the kinds of toys available may affect the relative frequency and quality of pretend and non-pretend play differently for boys and girls. These effects may account for some of the interactions of negotiation group with sex described above.

Certain aspects of the present design may make it difficult to speculate on the developmental significance of negotiation based on the results obtained. First of all, the inability to treat negotiation as a continuous variable weakens the ability of this design to provide support for the developmental significance of negotiation by rendering it incapable of examining differences between children who negotiated a little and those who negotiated alot. This is not to say that the distinction between negotiators and non-negotiators is not a valid one. The requirement that children negotiate for at least 15 seconds in order to be classified as negotiators virtually ruled out two kinds of potential misclassification - namely: (a) classifying children as negotiators whose 'negotiation' had been mistakenly coded; and (b) classifying children as negotiators only because they were able to briefly acknowledge - but unable to sustain - the meta-pretend communication of a partner. Nonetheless, potentially

valuable differences amongst the group of children classified as negotiators could not be explored.

In addition, the failure to take note of brief negotiation - e.g. that which lasted less than five seconds - may have also weakened the power of the present design to provide support for the developmental significance of negotiation. In fact, the frequency of negotiation noted in the present study is surprisingly low when compared to the findings of other researchers (e.g. Sachs et al, 1980), who coded utterances not necessarily lasting 5 seconds. It is not unlikely that brief negotiation, omitted in the present study, is of significance, since the ability to translate plans into immediate action (thus avoiding the overt response required for negotiation to be noted in the present coding scheme) implies a sophisticated capacity to understand the intentions of a play partner.

The developmental significance of negotiation for cognitive skills in the pretend domain may also be difficult to ascertain because of the relative reliance on measures of spontaneous pretense. As mentioned in the Introduction, the research of Watson and Fischer (1980) comparing elicited and spontaneous measures of pretend ability suggests that the quality of pretense observed in spontaneous play does not accurately reflect the child's true capacities. The fact that the measure of elicited pretend skills revealed a significant difference between negotiators and non-

negotiators while the measure based on observation of their spontaneous pretense provided inconsistent results is consistent with the findings of Watson and Fischer. Other elicited pretend procedures are in fact available for children of this age (e.g. Overton and Jackson, 1973) and perhaps the use of these and other elicited pretend procedures are necessary to establish true differences between the pretend skills of negotiators and non-negotiators.

It is also crucial that the relation between the quality of pretend scripts and the occurrence of negotiation be considered. While no support was found for the hypothesis that negotiation occurs because children do not understand the role and/or object transformations of a partner, the possibility that children negotiate because they do not understand the script proposed by a play partner was not explored. Pretend scripts may require better developed pretend skills in that object and/or role transformations must not only be enacted, they must be incorporated into an understandable storyline. Thus children who demonstrate comparable pretend skills when role and/or object transformations are examined may possess different skills when their pretend scripts are examined. It is important to examine pretend scripts in relation to negotiation in that negotiation around pretend scripts may be more similar to discussions of games with rules than

negotiation around specific transformations (see p.25).

Less than optimal inter-observer reliability might have also weakened the present study by introducing greater random variance into the observational data. In fact, F-ratios less than 1.0 were obtained in several analyses involving observational variables, suggesting that extreme within-group variation may have reduced the power of these analyses to detect significant inter-group differences.

Most importantly, it is very difficult to establish the significance of negotiation for social and cognitive development by merely correlating its frequency with the frequency of occurrence of other behaviors. The role of negotiation in the development of specific episodes of social pretense and non-pretend social interactions must be examined via a sequential analysis of such interactions - that is, an examination of the social interactions and social pretense preceding and following negotiation. Such an analysis would, for example, better establish the significance of negotiation for social skill development by allowing us to examine whether it reflects or contributes to increased understanding of a play partner's intentions and to reciprocity in their social interactions. A sequential analysis of individual episodes of social pretend interaction would also allow us to consider how negotiation may facilitate the sharing of transformations and/or pretend scripts.

In conclusion, the findings of the present study suggest that negotiation is related to the development of cognitive skills in the pretend domain. In addition, its correlation with non-pretend activity talk suggests a possible relation to conscious awareness and control over one's own behavior, a relation which merits future research. The findings also underscore the importance of examining possible sex differences, across a variety of toy sets, in the occurrence of negotiation, and their relation to the symbolic complexity of spontaneous social pretense and the maturity of their social interactions. Future research should also examine the relation of negotiation to the development of pretend scripts and elicited pretend skills, and should include briefer episodes of negotiation than in the present study. Finally, experimental designs involving a sequential analysis of negotiation during specific episodes of social pretense may help us to better understand its role in the development of social skills and of more sophisticated social pretend scripts.

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## APPENDIX A

Toy Lists by Session



## TOY LISTS BY SESSION

Session 1

Medical kit

Telephone

White jacket

Paper and pencils

Luna Park construction toy

Snakes and Ladders game

Dress-up materials (oven mitts, leg warmers, purses, scarves, hats, work gloves, hard hats, vests, straw hat, shovel, swim goggles)

Gardening and Construction Playmobil sets

Bean Bag tossing game

Session 2

Medical kit

Telephone

White jacket

Paper and pencils

Luna Park construction toy

Snakes and Ladders game

Dress-up materials (oven mitts, leg warmers, purses, scarves, hats, leather gloves, wigs, leather and top hats, boas, pieces of material)

Entertainer materials (microphones, guitars,  
tambourines)

Space and Ski Playmobil Set

### Session 3

Dress-up materials (work gloves, hard hats, vests,  
straw hat, shovel, swim goggles, leather gloves, wigs,  
leather and top hats, boas, pieces of material))

Gardening and Construction Playmobil sets

Bean Bag tossing game

Entertainer materials (microphones, guitars,  
tambourines)

Space and Ski Playmobil Set

## APPENDIX B :

Observation Manual for Play Sessions

February 25, 1986

### **OBSERVATION MANUAL FOR PLAY SESSIONS**

These observations will record data relevant to the following categories during the 1-minute observation periods:

- 1) The occurrence and duration of social interaction versus solitary activity.
- 2) The occurrence and duration of non-pretend versus pretend social interaction.
- 3) The frequency of specific components of pretend and non-pretend social interactions.

#### Observation Procedure:

There will be 4 children to observe for each of three sessions lasting 20 minutes each. In each session, two observers will observe the children in rotation for a total of 5 1-minute observations per child per observer. The observers will note the pretend or non-pretend nature of any social interaction which occurs, the duration of such interactions and specific symbolic features of the pretend interaction, eg. object use and identity transformation. On every fourth session, a third observer will watch the child simultaneously with one of the two observers to monitor

reliability.

### PLAY CODES

1). Toys Used. Each category of toy a child is playing with is recorded using a 7XX score. Toy codes are scored before the type of play. Toy codes are as follows:

700--No toy

701--Dressup, Dentist, Entertainer,  
and Garden and

Construction paraphernalia

702--Playmobil

703--Construction Toys

704--Tossing Games

705--Board Games

706--Paper activities

707--Stuffed Animals

708--Other

### Pretend and Non-Pretend Social Interactions

During the observation periods, the following mutually exclusive and exhaustive codes are used to indicate the occurrence of pretend and non-pretend social interactions:

047 social negotiation of pretend

046 social pretend play - enactment

146 solitary pretend play

045 non-pretend social interaction

145 non-pretend solitary play  
 555 interaction with an adult  
 556 onlooker behavior  
 557 unoccupied behavior

## 2) Definition of Interaction.

A social interaction (04X) is at minimum one initiation-response sequence, i.e. an initiation which receives a response within 5 seconds (adapted from Greenwood, Walker, Todd & Hops, 1979). An initiation is defined as any attempt to engage another child in social interaction. This refers to any bid for attention, leadership attempt or behavior specifically directed towards a peer in order to elicit a response. Physical gestures (offer toy, wave, show), deliberate physical contact (touch, pat, hit), verbal directives or requests (ask, command, comment on), play behavior, imitation and active, directed smile/laugh are included. Play behavior includes contacting someone with a toy, e.g. zooming an airplane around another child's head, or contacting someone else's toy such as taking a toy which another child is using or was using and is still in the vicinity of. Imitation can be regarded as an initiation attempt if it is immediate and if the peer is in the vicinity. In order to assume that an initiation has occurred, it must be possible for the observer to identify the target to whom it is directed.

A response is defined as any acknowledgement by the target of the social bid directed toward him. All behaviors described under initiations could also serve as responses. In addition, a response may be indicated by a look, smile, frown, compliance with a command, cry, or acceptance of an offered object.

### 3) Mode of Play.

The social interaction is categorized as literal (045), pretend enactment (046), or pretend negotiation (047).

Pretend play refers to any activity which involves the transformation of identity, setting, object, action plan or of the child's actual situation. Pretend transformation involves attributing to the objects, setting, people or materials, properties other than those which they actually possess. These features of the environment are treated in an "as if" fashion rather than literally. Such transformations can range from simple animation of miniature objects, such as making a car go "vroom", to more complex assumptions of different role identities, e.g. being a mommy, a doctor, or Batman.

Literal play involves treating objects, people, etc. according to common and appropriate use. This includes exploring the environment and verbal or non-verbal behavior which does not transform. Note that building with blocks and saying "I'm making a house" is literal activity.

The observer will note the occurrence of social pretend play based on the occurrence of planning and/or enactment. In order to score social pretend play (046), the children must share the theme of the pretend sequence, minimally sharing the same toys (see definition of parallel play) or sharing a more explicit theme.

Pretend planning (047) includes preparatory or procedural behaviors and negotiation related to social pretend play, explicit mention of a pretend transformation, or negation of it.

a) Preparatory or procedural behaviors and negotiation are those behaviors concerned with the nature of the pretend sequence being set up. These may include invitations to engage in social pretend play (e.g. "let's play space ship"), offering a prop (e.g., "here's your ray gun"), clarification of rights (e.g. "you have to sit here") and discussion of roles (e.g. "the captain holds the wheel"). Pretend negotiations or procedural behaviors that are social and verbal are coded as 047. That is, for 047 to be scored two children (or more) must participate verbally in the negotiation of pretend.

b) Explicit mention of the transformation may include specific mention of the partner's or child's role or plan of activity, as well as mention of the transformation or invention of an object. They are distinguished from enactment by being spoken in the child's usual voice,



without exaggerated gesture or affect (e.g. "That's the baby's bed" and pointing to a table).

c) Negation of Pretend. These verbalizations suggest that the child was pretending by indicating the termination of pretend (e.g. "No, I'm Jake now"), by denying the existence of an imaginary object (e.g. "you don't have money there"), or by reaffirming the reality status of an object (e.g. "that's not a bed; that's a table"). If an 045 has been coded and the target child negates pretend, observers should note that they have missed something and they should be more alert. If an 046 was coded and the target child negates the pretend, the play code should be changed to an 045.

Pretend (X46) may be indicated by any overt representation of vocal quality (whining, change in pitch), content of speech (scolding, "I shot a big lion", "Hello, I'm the doctor. How are you today"), physical gestures (waving), attitudes (anger), acts or actions (ironing), when put forth by the pretender as characteristic of an adopted identity, or appropriate to a play situation resulting from a particular transformation. Enactment thus includes ongoing pretend dialogue, and animation of toys and objects.

Appropriate toy use of miniature replicas of real objects (such as toy cans, dolls, irons, etc.) is sometimes difficult to score as pretend enactment or literal play. Appropriate toy use in the context of any assumed identity.

(e.g., riding a bike and making machine noises, setting the table with toy dishes) is considered pretend.

However, playing with cars must be accompanied by a further animation such as making car noises in order to be scored. The use of miniature objects without any further elaboration in the form of pretend gestures or vocalizations is not scored as pretend.

Interaction with an adult (555). 555 is scored whenever the target child engages in an interaction with one of the adults present in the room. For 555 to be scored, the interaction should be so intense or last so long that it disrupts the play. An interaction that lasts less than 10 seconds is not usually enough to be scored as a 555.

Onlooker behavior (556). 556 is scored whenever the target child watches others play but does not enter into the activity. Typically, the child stands at the fringes of a group of children s/he is watching.

Unoccupied Behavior (557). 557 is recorded whenever the target child is not playing in the usual sense, but watches activities of momentary interest, plays with his/her own body, gets on and off chairs, follows the teacher or merely glances around the room.

#### 4) Level of Play.

Level of play will be coded according to an adaptation of the peer play scale (Howes, 1980). Changes in the level

of play are scored within observation intervals. A 5-second rule applies for recording level of play; that is, a given level of play must last at least 5 seconds to be recorded.

Level 1 Parallel Play/801 - Two children are engaged in similar activities (e.g. playing with the same toy or doing the same activity, such as looking out the window) but do not engage in eye contact or social behavior. This is essentially Parten's classic definition of parallel play. The children are playing beside but not with each other. For example, two children might be drawing side by side, each absorbed in his/her own activity. This level of play (with no social behavior) is similar to 14X (solitary play). The distinction between these two codes will be made according to two criteria:

a) Code 04X, 801 when the children are close to each other, oriented toward each other (or at least not back to back), and playing with the same toy or doing the same thing.

b) Score 14X when the children are far apart or not sharing the same toy or activity.

Level 2 Parallel Play with Mutual Regard/802 - The children are engaged in the same or similar activity (as in level 1) but they engage in mutual regard (i.e., two children look over to each other's activity at different times) or in eye contact and are aware of each other. For example two children who are drawing look at each other or

one makes a comment (not necessarily directed at the other child) and the other looks up. Or, child 1 looks over at child 2 and then child 2 looks over at child 1.

Level 3 Simple Social Play/803 - While engaging in the same or similar activity (e.g. same toy, conversing, talking, playing together) each child must direct a social bid to the other. Children will generally be engaged in similar activities during 803, but they may also be engaged in different activities. For example, while one child is exploring the dress-up and the other is drawing, they may be engaged in a conversation where there is social interaction. Observers should not be too strict with the same activity rule in these types of instances. Social bids include smile, speak, positive touch, offer an object, receive an object, offer comfort, help with a task, take an object, or aggress, approaching another child. For example, two children are drawing and one child addresses the other and the other offers her a crayon. Or, two children are playing with action figures and one child takes a figure and the other child says "Hey that's mine".

Level 5 Complementary and Reciprocal Social Play/805 - Two children engage in complementary and reciprocal activities and each child directs a social bid to the other as in level 3. Complementary and reciprocal activities are ones in which each child's action reverses the others', demonstrating awareness of the role of the other. Examples

include tossing a ball back and forth; chasing the other and then being chased; one child moves a truck from the block structure to the shelves where the second child loads the truck with blocks; playing hunter-hunted, doctor-patient, cops & robbers, etc. All types of turn-taking behavior fall under this level of play. For an 805 to occur, there must be a reversal of the two children's roles (i.e., the first child chases the second and then the first child is chased by the second).

#### 5) Tone.

Tone is the affective quality of the social interaction. Positive tone (601) is indicated by such behaviors as giving, sharing, smiling, laughing, touching, verbal agreement, cooperation, verbal support. Neutral tone (602) is scored when no indication of mood is shown by the child, and when his interactions are very matter-of-fact. Negative tone (603) is indicated by such actions as hitting, hostile deliberate pushing, name-calling, strong denials or refusals, negative commands, crying, grabbing toys, etc. Unlike other scoring categories, where we are interested in describing the prevailing attributes, when scoring the tone of the social interaction, one positive or negative gesture is sufficient to warrant that score. That is, all the changes in tone are scored within the observation intervals.

## 6) Components of Play-Pretend.

If the interaction is categorized as pretend, then the number and type of identity (2XX), object (3XX) and setting transformations used in the play are coded using an adaptation of codes previously developed and used in our research (Connolly, Doyle, & Ceschin, 1983; Connolly & Doyle, in press; Doyle & Connolly, 1981).

a) Identity Transformations - Three features of the children's identity transformations will be coded to determine their degree of elaboration and symbolization. First, the role enacted will be coded with regards to its remoteness from the child's realm of experience (Saltz, Dixon, & Johnson, 1977). A score of (21X) is used if the role enacted is one the child has had a chance to experience him/herself in real life, such as student, patient, child, sibling, etc. A score of (22X) is given for a familial role the child has experienced through others, such as mother, father, aunt, etc. This score is also coded for taking on the role of a common pet, e.g. dog, cat. A score of (23X) is given if the role enacted is one the child has experienced through others in everyday real life but outside his/her family; such as teacher, busdriver, mailman, and policeman. Also, (23X) will indicate generalized human character roles. These roles indicate such roles as "pretty lady", "bad guy", "sexy woman", and "angry man" without clear identification of a specific character (i.e. doctor,

musician, etc.). These roles are signified by primping behavior, a posture, a tone of voice or expression. A score of (24X) is given if the role enacted is one the child cannot likely experience in reality but has heard of or seen through television or stories. Such roles include Superman, Star Wars, Mr. T., astronaut, explorer, monster, robots, etc. Also code a 24X when the child takes the role of an animal he or she is not likely to own. A score of 24X will also designate imaginary characters the children make up that are likely without any basis in previous experience in reality or through T.V., stories or books.

The second feature of identity transformations that will be scored is the multiplicity of roles simultaneously adopted by each character (e.g., whether a "daddy" is also a "worker" and a "husband"). The number of different roles each character is transformed into will be tallied using codes 2X1, 2X2, 2X4, etc. For each transformation of the role, the code will be entered.

If a child changes from enacting one role to another (i.e., first pretends to be a policeman and then a doctor), within the same pretend sequence, the role codes (2XX and 06X) must be coded again to indicate this change, even though there is no change in the type of role enacted.

A score of (200) is given whenever the target child ends a particular identity transformation and is without a role within the pretend play episode.

The roles will also be coded for the means by which the role is indicated (Brady, 1975). Specifically, the use of gesture, verbal, gestural and verbal signification of the roles will be coded in a separate 06X code. A score of (061) is given if the signification is verbal; a score of (062) will be given if the signification is gestural; and a score of (063) is given if the signification is both verbal and gestural.

b) Object Transformations - the number and kind of object transformations will first be coded according to the similarity of the transformed object to the represented object (Elder & Pederson, 1978). A score of (31X) will be coded if a replica object (a substitute object identical to the represented object) is used. One example is using a toy oven to cook in. A score of (32X) will be given for the animation of an object (e.g., moving a truck and going "vroom", making a Superman doll fly). A score of (33X) will be designated for the transformation of a similar object, such as pretending a stick is a gun, a small dish is a cookie, or a large piece of cloth is a cape or a coat. A score of (34X) will be recorded for the transformation of a dissimilar object, such as pretending a block is a car, or pretending a block is animated by making it talk, drink or walk. Similarity is based strictly on the objects' physical characteristics. A score of (35X) will be coded for those instances when a child invents an imaginary object, or uses



gestures to signify an absent object.

The second feature of object use to be coded is the number of objects simultaneously used within pretend (i.e. replica, animated, transformed and imagined objects). A score of (3X1) will be given if one toy alone is used, (3X2) if when two toys are used, etc. For example if a child uses both a stethoscope and needle at the same time, s/he will get a score of 3X2. If the child is using both objects in a similar manner (e.g., as replicas), then score the toy of major focus with respect to the type of object use and toy code (e.g., the scores would be 312, 7XX). When a child is pretending with two toys simultaneously but differently (i.e., one as replica and the other as transformed similar), then score the highest order object use and related toy code. For example, if a child is using a toy iron to iron clothes and a big block as an ironing board, then score 332, 703 for the blocks.

There is no need to record the object transformation code again for instances where a child changes toy but continues with the same type of transformation. This change will be picked up by the change in the toy code (70X).

A score of (300) will be given if there is a shift from object use to no object use during pretend.

c) Setting Transformations - Setting transformations refer to the child's transformation of the playroom into such places as a restaurant, burning house, etc. The

occurrence of such setting transformations will be recorded by using the code (310). Note the end of a setting transformation within a pretend sequence with the (320) code.

7) Components of Play - Literal or Non-Pretend.

The categorization of social interaction as literal (045) will also be examined for its symbolic features. Four different types of literal social interaction may occur: a) activity talk (talk about the children's present activity); b) conversation about hypothetical or real but not present objects and events; c) games with rules.

a) Activity-Talk. This category (119) is scored when a child is talking about his/her present activities or surroundings. The talking must last a minimum of 5 seconds to be scored as a (119). Note that activity talk can be scored if only one child is talking within a social literal play sequence

b) Conversations. This category is scored (120) when a child is making a comment, comparison or explanation related to real events things or people outside the present situation, but does not adopt a role or pretend with or without an object. A score of (121) is recorded when a child talks about imagined events outside the present situation. For example, if a child tells stories and tall tales, uses metaphor or talks about hypothetical events

(e.g., If I were an astronaut....). A score of (122) is given when playful teasing, (verbal or physical) or mock insults occurs. Examples of teasing are: "you silly goose bum", "you bum-bum", "you do pooh- pooh", or jokes about another child's name ("Hey everyone, Jack looks like Boy George"). Physical teasing may be poking a child on the shoulder or in the stomach, playing with their hair, trying to put a funny hat on them, etc. Teasing also includes tossing little objects at other children and waiting for a reaction or pretending not to have done it. These teases are directed at the other child. A score of (123) is recorded when word play occurs, as when children pick a word and make it rhyme, sing-song it, repeat it over and over, play with it. A score of (124) will indicate rough and tumble play. This score is given in those instances where there is actual play attack or fighting, punching and falling or rolling on the floor. It may include tickling.

c) Games with rules (130) is scored when a child is playing with other children and accepts prearranged rules, adjusts to them, and controls his/her actions and reactions within given limits. In games with rules, there must be a sense of competition between the children, a specific goal to the game, a keeping of score, and a winner and a loser. Games with rules include such sports as baseball, and games such as tag, board games, marbles, etc.

d) A score of (118) will be used to denote the end of

any of the above literal activity scores.

PLEASE NOTE: All the above play categories are scored only when the particular pretend transformations have a duration of 3 seconds or more.

### Reminders

- 1) Always code the highest level of each category.
- 2) Note all the changes in each category of codes within each observation interval except for the signification of role (06X). For this category, code only the first indication of each role.
- 3) Object transformations: Paper and pencil, chairs, blackboards and chalk, garbage cans and tables used during pretend are not coded as replica objects (31X). They are props. A doctor's kit, dress-up and miniature toys (toy oven for example) are coded as (31X).
- 4) In a doctor-patient scene where you are observing the patient, you can score a (31X) for a bandage, syringe, etc. if the child is looking at the object.
- 5) It is enough for a child to imitate the sound of an object that is not present to code the object a (35X). For example, if a child goes "Buzzz...There's the school bell, let's go" or "Dring, dring. Bob, get the telephone", score

35X if no such objects were used. Note the difference between the imitation of the ringing of an imaginary telephone which gets scored 35X and the imitation of the ringing of a toy telephone which gets scored 32X.

6) Play behavior that involves turn taking is coded 805.

7) If children go from pretend to negotiation back to pretend within the same observation interval and take on the same roles when they get back into pretend, you must code the roles and objects over again. For example:

046

803

601.

211

061

312

047

046

211

061

312

Note that there may be some changes in these or in other categories and that they would be coded as such.

8) Note that 122 (teasing) takes precedence over 124 (rough and tumble play).

9) When 130 is accompanied by activity talk or some conversation (119-123), scoring a 118 would end both the

talking and the games with rules. If only one of these activities ends, remember to rescore the other activity after the 118. For example, if children are playing snakes and ladders as well as talking about the game, they would receive a 130, 119. If they stop talking but go on playing the game, you must code a 118 to indicate that they no longer are talking and rescore the 130 to indicate that they are still playing their game. The codes should be as follows:

705

045

805

601

130

119

118

130

If the 130 is not rescored, it will be assumed that the children no longer are playing the snakes and ladders game.

10) Referring specifically to certain toys,

- If the Kermit puppet is used as a patient or as any other human character, code the transformation as 33X.
- If cotton is used as snow, code the transformation as 33X also.
- If a child takes on the role of a skier, code the role a 23X.

- Functional roles (those that are indicated by an action, without any talk or facial expression, such as eater, server; or chaser, chased) are to be coded 21X or 22X depending on the remoteness from the child's own experiences. They are not coded as 23X (generalized character roles).

## APPENDIX C

Scoring and Administration Manual for the  
Goldschmidt and Bentler Concept Assessment Kit



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# CONCEPT ASSESSMENT KIT—CONSERVATION

Marcel L. Goldschmid and Peter M. Berman

## RECORDING FORM FORM B

SUBJECT NUMBER \_\_\_\_\_

NAME \_\_\_\_\_ DATE \_\_\_\_\_

DATE OF BIRTH \_\_\_\_\_ AGE \_\_\_\_\_ SEX \_\_\_\_\_

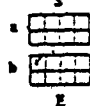
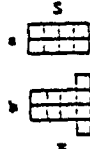
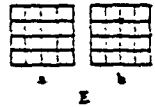
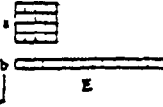
SCHOOL \_\_\_\_\_ GRADE \_\_\_\_\_

EXAMINER \_\_\_\_\_

COMMENTS \_\_\_\_\_

SCORES			
Task	Observer	Explanation	Total
A			
B			
C			
D			
E			
F			
Total			



### (A) TWO-DIMENSIONAL SPACE

ITEM	DIRECTIONS	VERBAL INSTRUCTIONS	RESPONSE	SCORE
<p>I. 2 equal rectangles</p> <p>S</p>  <p>E</p>	<p>Build 2 rectangles, each with 8 blocks of wood, saying:</p> <p>When finished, ask:</p> <p>If the subject says they are both the same, say: and go on to (II).</p> <p>If he says they are not the same, say: Demonstrate to subject by pointing that they are the same, then, when S agrees, go on to (III).</p>	<p>Regarde ce que je fais</p> <p>Est-ce qu'il y a autant de bois ici que là, ou est-ce que l'un en a plus?</p> <p>Où ils sont tous les deux parallèles</p> <p>Regarde, celui-ci est aussi gros que celui-là. Tu vois, ils sont tous les deux parallèles.</p>		
<p>II. 2 unequal rectangles</p> <p>S</p>  <p>E</p>	<p>Take 2 additional blocks, saying:</p> <p>Then, say:</p> <p>Record. Then ask:</p> <p>Record, and say:</p>	<p>Regarde, je place ces blocs ici</p> <p>Maintenant dis-moi s'il y a autant de bois que là ou est-ce que l'un en a plus?</p> <p>Pourquoi?</p> <p>Maintenant, passons à autre chose</p>	<p>Same <input type="checkbox"/></p> <p>a has more <input type="checkbox"/></p> <p>b has more <input type="checkbox"/></p>	
<p>III. 2 equal squares</p> <p>S</p>  <p>E</p>	<p>Build 2 squares with 16 blocks of wood each, saying:</p> <p>When finished, ask:</p> <p>If the subject says they are the same, continue with (IV).</p> <p>If the subject says they are not the same, say: Demonstrate to subject by pointing that they are the same, then, go on to (IV).</p>	<p>Regarde ce que je fais</p> <p>Est-ce qu'il y a autant de bois ici que là, ou est-ce que l'un en a plus?</p> <p>Regarde, celui-ci est aussi gros que celui-là. Tu vois, ils sont tous les deux parallèles</p>		
<p>IV. square &amp; single line</p> <p>S</p>  <p>E</p>	<p>Then, take the blocks from the right square and build a single line with all 16 blocks, saying:</p> <p>When finished, ask:</p> <p>Record, then ask:</p> <p>Record.</p>	<p>Regarde ce que je fais</p> <p>Maintenant, est-ce qu'il y a autant de bois ici que là, ou est-ce que l'un en a plus?</p> <p>Pourquoi?</p>	<p>Same <input type="checkbox"/></p> <p>a has more <input type="checkbox"/></p> <p>b has more <input type="checkbox"/></p>	

Hold on blocks

\*When saying the first underlined word, point to (a), when saying the second underlined word, point to (b). Follow this procedure for all underlined words.

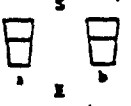
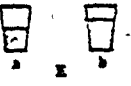
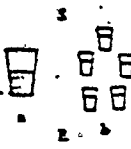
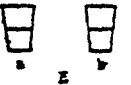
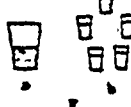
(B) NUMBER *Conservation of #*

ITEM	DIRECTIONS	VERBAL INSTRUCTIONS	RESPONSE	SCORE
I. Parallel egg-cups & eggs  S  a ○○○○○○ b  E	Place 6 egg-cups in a straight line about 4 inches apart. Parallel to these, stand 6 eggs in corresponding position, also in a straight line, saying:  When finished, say:  Remove eggs from cups.	Regarde ce que je fais  Maintenant, j'aimerais que tu places chacun de ces oeufs dans le coquetier à côté		
II. eggs vs. egg-cups  S  a ○○○○○○ b  E	Restore the two lines of eggs and cups, but spread out cups (6 inches apart) and move eggs closer together (2 inches apart), saying:  Then, ask:  Record, then ask:  Record.	Regarde ce que je fais  Maintenant, y a-t-il autant d'oeufs que de coquetiers ou est-ce qu'il y a plus d'une sorte?  Pourquoi?	Same <input type="checkbox"/> a has more <input type="checkbox"/> b has more <input type="checkbox"/>	

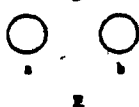
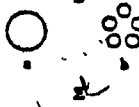
## (C) SUBSTANCE

<i>A white ball as big as an egg</i>				
I. 2 equal balls  S  a ○ ○ E	Make two equal balls of play-doh (each 3 oz.), saying:  If the subject says they are both the same, go on to (II).  If the subject says one ball is larger, say:  Continue to adjust the two balls until the subject says they are the same.	Ici nous avons deux boules de plastiline. Il y a une même quantité de plastiline dans chaque boule. Elles sont toutes les deux pareilles. Est-ce qu'il y a autant de plastiline dans cette boule que dans celle-là ou est-ce que l'une est plus?  Rendons-les pareilles. J'en enlève un peu de celle-ci et je l'ajoute à celle-là.  Maintenant, est-ce qu'il y a autant de plastiline dans celle-ci que dans celle-là?		
II. ball vs. pancake  S  a ○ ○ E	Flatten one ball into a pancake (4 inches in diameter - use ruler), saying:  When finished, ask:  Record, and ask:  Record.	Regarde ce que je fais. Tu vois, je transforme cette boule en galette.  Maintenant, est-ce qu'il y a autant de plastiline ici que là, ou est-ce que l'une en a plus?  Pourquoi?	Same <input type="checkbox"/> a has more <input type="checkbox"/> b has more <input type="checkbox"/>	

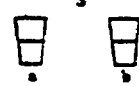

## (D) CONTINUOUS QUANTITY

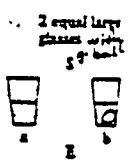
ITEM	DIRECTIONS	VERBAL INSTRUCTIONS	RESPONSE	SCD
I. 3 large glasses 	Place the two large glasses filled with an equal amount of water (150 ml) before the child, saying: Then, ask: If the subject says they both have the same amount, go on to (II). If the subject says one has more, adjust the water level, saying: Then, ask: Continue to adjust the water in the two glasses until he says that they both have the same.	Tu vois, nous avons deux verres remplis avec une même quantité d'eau. Est-ce qu'il y a autant d'eau dans ce verre que dans celui-là, ou est-ce que l'un en a plus? Rends-les pareils. Tu vois, je verse un peu d'eau de ce verre dans celui-là. Maintenant, est-ce qu'il y a autant d'eau dans ce verre que dans celui-là, ou est-ce que l'un en a plus?		
II. 2 unequal glasses 	Pour 25 ml of water from an extra glass into large glass a right, remove the extra glass, but leave it on the table, saying: Then, ask: Record, and ask: Record.	Regarde ce que je fais. Tu vois je verse un peu d'eau de ce verre dans celui-là. Maintenant, est-ce qu'il y a autant d'eau dans ce verre que dans celui-là, ou est-ce que l'un en a plus? Pourquoi?	Same <input type="checkbox"/> a has more <input type="checkbox"/> b has more <input type="checkbox"/>	
III. large glass vs. 5 small glasses 	Pour water from the large glass (which has more water) into the five little glasses, saying: When finished, ask: Record, and ask: Record.	Regarde ce que je fais. Maintenant, dis-moi, est-ce qu'il y a autant d'eau dans ce verre que dans tous ces petits verres réunis ensemble, ou est-ce qu'en côté en a plus? Pourquoi?	Same <input type="checkbox"/> a has more <input type="checkbox"/> b has more <input type="checkbox"/>	
IV. 2 equal large glasses 	Place the two large glasses filled with an equal amount of water (150 ml) before the subject, saying: Then, ask: If the subject says they both have the same amount, go on to (V). If the subject says one has more, adjust the water level, saying: Then, ask: Continue to adjust the water in the two glasses until he says they both have the same.	Tu vois, ici nous avons deux verres remplis avec une quantité égale d'eau. Est-ce qu'il y a autant d'eau dans ce verre que dans celui-là ou est-ce que l'un en a plus? Rends-les pareils. Tu vois, j'en verse un peu de ce verre dans celui-là. Maintenant, est-ce qu'il y a autant d'eau dans ce verre que dans celui-là ou est-ce que l'un en a plus?		
V. large glass vs. 5 small glasses 	Pour the water from the large glass into the five small glasses, saying: Remove empty glass, but leave it on the table, and ask: Record, and ask: Record.	Regarde ce que je fais. Est-ce qu'il y a autant d'eau dans ce verre que dans tous ces petits verres réunis ensemble, ou est-ce qu'en côté en a plus? Pourquoi?	Same <input type="checkbox"/> a has more <input type="checkbox"/> b has more <input type="checkbox"/>	

## (E) WEIGHT

ITEM	DIRECTIONS	VERBAL INSTRUCTIONS	RESPONSE	SCORE
<p>I. 2 equal balls</p> <p>S</p>  <p>E</p>	<p>Make two equal balls of play dough (each 3 oz.), saying: <i>Les deux boules sont aussi pesantes l'une que l'autre.</i></p> <p>Give the balls to the child, and say: (Be sure that the subject picks up the balls and weighs them in his hands.)</p> <p>If the child says they weigh the same, go on to (II).</p> <p>If the subject says one weighs more, say:</p> <p>Give ball back to subject and ask:</p> <p>Continue to adjust the two balls until he says they weigh the same.</p>	<p>Est-ce qu'une boule est aussi pesante que l'autre, ou est-ce qu'une des boules est plus pesante?</p> <p>Rendons-les parallèles. J'en enlève un peu de matière et l'ajoute à celle-là.</p> <p>Maintenant sont-elles parallèles, est-ce qu'une boule est aussi pesante que l'autre?</p>		
<p>II. ball vs. 3 little balls</p> <p>S</p>  <p>E</p>	<p>Make the right ball into 3 little balls of approximately the same size, and arrange them in a circle, saying:</p> <p>When finished, ask: (Do not allow the subject to pick up the balls.)</p> <p>Record, and ask:</p> <p>Record.</p>	<p>Regarde ce que je fais. Je vais changer cette boule en petites boules.</p> <p>Maintenant dis-moi, est-ce que cette boule est aussi pesante que toutes ces petites boules réunies ensemble ou est-ce qu'une d'elles est plus pesante?</p> <p>Pourquoi?</p>	<p>Same <input type="checkbox"/></p> <p>a has more <input type="checkbox"/></p> <p>b has more <input type="checkbox"/></p>	

## (F) DISCONTINUOUS QUANTITY

<p>I. 2 equal large glasses</p> <p>S</p>  <p>E</p>	<p>Place the two glasses, filled with an equal amount of U corn (150 ml), in front of the child, saying: (Level the surface in both glasses.)</p> <p>If the subject says they both have the same, go on to (II).</p> <p>If the subject says one has more, say:</p> <p>Continue to adjust the corn in the two glasses until he says they both have the same amount, before going on to (II).</p>	<p>Tu vois ici deux verres remplis d'une quantité égale de maïs. Est-ce qu'il y a autant de maïs dans ce verre que dans celui-là ou est-ce que l'un en a plus?</p> <p>Rendons-les parallèles. Tu vois je verse du maïs de ce verre dans celui-là.</p> <p>Maintenant dis-moi, est-ce qu'il y a autant de maïs dans ce verre que dans celui-là ou est-ce que l'un en a plus?</p>		
<p>II. large glass vs. tall glass</p> <p>S</p>  <p>E</p>	<p>Pour le corn from the large glass into the tall glass, saying:</p> <p>When finished, say:</p> <p>Record, and ask:</p> <p>Record.</p>	<p>Regarde ce que je fais. Tu vois je verse le maïs de ce verre dans ce cylindre.</p> <p>Maintenant dis-moi, est-ce qu'il y a autant de maïs dans celui-ci que dans celui-là ou est-ce que l'un en a plus?</p> <p>Pourquoi?</p>	<p>Same <input type="checkbox"/></p> <p>a has more <input type="checkbox"/></p> <p>b has more <input type="checkbox"/></p>	

(G) VOLUME	Verbal Instructions	Response
1.	<p>Tu vois nous avons 2 verres remplis avec une même quantité d'eau.</p> <p>Est-ce qu'il y a autant d'eau dans ce verre que dans celui-là...</p> <p>SAME AS (C)1.</p>	
<p>2.</p> 	<p>Regarde ce que je fais.</p> <p>Tu vois, je mets une balle de golf (ou une pierre) dans ce verre</p> <p>Maintenant, est-ce qu'il y a autant d'eau dans ce verre que dans celui-là ou est-ce que l'un en a plus?</p> <p>Pourquoi?</p>	<p>same _____</p> <p>a has more _____</p> <p>b has more _____</p> <p>⊗</p>
3.	<p>Regarde ce que je fais.</p> <p>J'enlève la balle de golf (ou la pierre) et j'enlève un peu d'eau de ce verre</p> <p>Maintenant, dis-moi s'il y a autant d'eau dans ce verre que dans celui-là ou si l'un d'eux en a plus.</p> <p>Oui, celui-là a plus d'eau.</p> <p>Regarde, celui-là a plus d'eau que celui-ci.</p> <p>Tu vois.</p>	
4.	<p>Regarde ce que je fais.</p> <p>Je mets la balle de golf (ou la pierre) dans ce verre. (Is the water level higher?)</p> <p>Est-ce qu'il y a autant d'eau dans ce verre que dans celui-là ou est-ce que l'un en a plus?</p> <p>Pourquoi?</p>	<p>same _____</p> <p>a has more _____</p> <p>b has more _____</p>

Conservation Test Scoring (short form -  
adapted from Goldschmidt and Bentler)

The conservation test is made up of the following:

1. Two-dimensional space
2. Number
3. Substance
4. Continuous quantity
5. Weight
6. Discontinuous quantity
7. Volume

Only the last item in each task is scored;

For **behavior**: the child is given a score of 2, if s/he gives the correct response, or a score of 0, if s/he gives an incorrect response.

For **explanation**: a child's response can be scored 0, 1 or 2. A score of 2 is given if the response fully explains the concept of conservation:

e.g. 1. Invariant quantity: "You did not add or subtract anything"; "they were the same before and you did not change the weight (volume, number, etc.)"; "it is the same number as before."

2. Compensation: "This glass is taller, but it is also thinner."

3. Reversibility: "If we put this back into this glass, it would be the same"; if we made this back into a ball, it would be the same."

## APPENDIX D

Ben-Zeev Verbal Symbol Substitution Task:

Administration and Scoring Manual

(French translation by Katia Maliantovich)



## BEN-ZEEV SYMBOL SUBSTITUTION TASK: ADMINISTRATION MANUAL

Maintenant, on va jouer à un jeu. Dans notre jeu, il y a des choses qui vont avoir un nouveau nom. Je vais te donner un exemple: En français on dit "visage" (E points to S's face), n'est-ce pas? Dans notre jeu, on va appeler ça "pied". Quand on parle de ça (E points to S's face again), on dit "pied".

Comment ça s'appelle?..... (pied)

Est-ce qu'un pied a des yeux?.....(oui)

C'est bien, bravo.

1) On va commencer le jeu. En français, tu sais que ça (E holds up pencil) s'appelle un "crayon". Dans notre jeu, on va appeler ça "papier". Comment ça s'appelle?.....(papier). Dans notre jeu, ça s'appelle "papier".

A) Est-ce que je peux écrire avec le papier?.....(oui)

B) Est-ce que je peux écrire sur le papier?.....(non)

C) Pourquoi-pas? (or if answer is yes, Comment?)

2) En français, tu sais qu'on appelle ça un "avion" (E shows toy plane), Dans notre jeu, on va appeler ça une

"tortue". Comment ça s'appelle?.....(tortue). Dans notre jeu ça s'appelle "tortue".

A) Est-ce que la tortue peut voler?.....(oui)

B) Comment la tortue vole-t-elle?.....(avec ses ailes)

3) Tu vois ce que je fais? (E crumbles paper). En français, ça s'appelle "froisser". Dans notre jeu, ça s'appelle "courir". Comment dis-tu ce que je fais?.....(courir). Dans notre jeu, chaque fois que nous disons "courir", ça veut dire froisser.

A) Montre-moi comment courir.....(S crumbles paper)

B) Comment dis-tu "Il froisse le papier".....("Il court le papier".)

C) Qu'est-ce qu'on veut dire quand on dit courir  
.....(froisser).

N.B. If child does not understand "froisser",  
substitute "chiffoner".

4) Bon. Dans notre jeu, au lieu de dire "ils" on va dire "macaroni". Comment dis-tu: "ils"?.....(macaroni).

A) Comment dis-tu: "Ils sont de bons enfants"?.....

("Macaroni" sont de bons enfants).

B) Qu'est-ce qu'on veut dire quand on dit

"macaroni"?.....(Ils).

5) Dans ce jeu, au lieu de dire "je", on va dire "spaghetti". Comment dis-tu "je"?.....(spaghetti).

A) Comment dis-tu "Je suis grand(e)"?.....("Spaghetti"  
suis grand(e)).

B) Qu'est-ce qu'on veut dire quand on dit "spaghetti"?.....(On veut dire "je").

6) Bon. Dans ce jeu, la façon de dire "frappe" c'est de dire "mauve". On ne dit plus "frappe", on dit "mauve" à la place. Comment dis-tu "frappe"?.....(mauve). C'est bien. "Frappe" se dit "mauve" dans notre jeu. Maintenant, penses-y bien:

A) Cette poupée-ci s'appelle Marie. Celle-ci s'appelle Charles. (Marie is a big cylinder, Charles is a small cylinder) Qu'est-ce que Marie fait à Charles (E makes Marie hit Charles)?.....(Marie "mauve" Charles).

B) Quand Marie "mauve" Charles, qu'est-ce qu'y arrive à Charles?

C) Qu'est-ce qu'on veut dire quand on dit on dit "mauve"?.....(frapper)

7) Dans ce jeu, la façon de dire "dans" ou "dedans" c'est

de dire "propre". Comment dis-tu "dans"  
 "dedans"?.....(propre). Dans notre jeu qu'est-ce que  
 "propre" veut dire?.....(dans ou dedans). C'est bien. Dans  
 notre jeu, "dans" ou "dedans" se dit "propre".

- A) Tu vois cette poupée(cylinder)? Tu vois cette maison  
 (paper)? Dis-moi où va la poupée?.....(La poupée va  
 "propre" la maison).
- B) Est-ce que la maison devient plus propre, plus  
 sale, ou si elle reste pareille quand la poupée fait  
 ça?
- C) Pourquoi?

#### BEN-ZEEV SYMBOL SUBSTITUTION TASK: SCORING MANUAL

- Question 1. A) yes = 1  
 B) no = 1  
 C) correct explanation = 1

A correct explanation includes such answers  
 as "because this (points to the pencil) is  
 the paper" or "because it's really a pencil  
 even if we call it a paper".

**NOTE:** In some instances, the child may receive a point for a  
 "yes" answer in B) if the explanation in C) indicates that  
 s/he has understood the transformation. For example, a

child who, in B), says that you can write on the "paper" and in C) says that you would have to use another "paper" should get the points for his or her answers.

Question 2. A) yes = 1

B) correct explanation = 1

A correct explanation includes anything that refers to parts of a plane, such as wings, engines, jets.

Question 3. A) crumbles paper = 1

B) Il court le papier, Il court, Il courir le papier = 1

Overinclusiveness (Il court froisse le papier) and just saying the verb (courir, court) get a 0.

C) froisser, froisse = 1

If the child actually crumples the paper, give a 0.

Question 4. A) Macaroni sont de bons enfants =

Change in verb (e.g. Macaroni est de bons enfants), overinclusiveness (Macaroni ils sont de bons enfants), or second try

correct = 1

B) ils = 1

It is not a good answer if the child repeats the entire sentence, i.e. "Ils sont de bons enfants".

Question 5. A) Spaghetti suis grand(e) = 2

Change in verb (e.g.. Spaghetti sont grand(e)s), overinclusiveness (Spaghetti je suis grand(e)) and second try correct = 1

B) je, moi = 1

It is not a good answer if the child repeats the entire sentence, i.e. "Je suis grand/e".

Question 6. A) Marie mauve Charles, Elle mauve Charles, Elle mauve, Marie mauve, Elle le mauve = 2

Overinclusiveness (e.g. Marie mauve frappe Charles) or second try correct = 1

B) Any answer that indicates a proper reaction to having been hit = 1

For example: Il pleure, Il a mal, Il se fache, Il la frappe, Il se sauve

C) frapper, frappe = 1

faire mal = 0

- Question 7. A) La poupee va propre la maison, La poupee propre la maison, Propre la maison = 2  
Overinclusiveness (e.g. La poupee va propre dans la maison) or second try correct = 1  
B) reste pareille, reste propre = 1  
C) correct explanation = 1

A correct explanation includes anything that clearly indicates that the child understands that the doll only walked into the house and does not dirty it.

NOTE: In questions 4, 5, 6 and 7, a second try is considered correct ( = a score of 1) if the child gives any of the possible answers that are acceptable to receive a score of 1 or of 2 in the first try.

## APPENDIX E

Watson and Fischer Elicited Pretend Play Procedure:

Scoring and Administration Manual



# WATSON AND FISCHER ELICITED PRETEND PLAY PROCEDURE:

## SCORING AND ADMINISTRATION MANUAL

Prepared by: Peter Doebling, June 5, 1986 Based on the manual prepared by M.W. Watson and by K. Fischer, and adapted by Flavia Ceschin (Feb. 23, 1986).

### Background

The Watson and Fischer Elicited Pretend Play Procedure was derived from two research articles on the development of pretend play using human figures (Watson and Fischer, 1977; 1980). Although the authors have themselves compiled a scoring manual based on the two studies (see Ceschin, 1986), differences between the present scoring procedure and that used by the original authors required modifications to the scoring manual.

This manual will combine Watson and Fischer's descriptions of the steps in the developmental sequence of social role-taking ability with more specific descriptions of types of behaviors which characterize these steps. In addition, examples of specific behaviors which typically occur in the child's enactment of the stories will be included.

The present manual will also incorporate Watson and

Fischer's skill-theory derivation of the developmental sequence of agent use of social roles (Watson and Fischer, 1980) into the scoring criteria. This is based on Fischer's skill theory of development described in Fischer (1980).

### **Rationale**

In the Watson and Fischer Elicited Pretend procedure, a story involving one or more dolls is modelled by the tester. The child is then asked to enact a story of the same type. The stories vary in complexity, from a single doll performing several actions (eating, sleeping, washing) to the most complex story, involving a doctor/father/husband interacting with his wife and his daughter.

At first glance, the present procedure may seem to be a test of the child's memory - the child who can correctly remember all was said and done by the dolls will repeat the story and 'pass' at that level. In such a modelling task, it is assumed that a more complete understanding of roles and role relationships is necessary for the information presented to be accurately remembered. For example, in the story involving a doctor/father interacting with a patient/daughter (Story D in the present manual), the younger child may lack the understanding that two roles can exist within the same agent.

The ability to demonstrate two roles within the same

agent is a complex ability. It involves; a) recognizing that a single agent can have two roles, b) being able to recognize the behaviors appropriate to each role, c) being able to 'store' roles with their appropriate behaviors in memory, and d) at the point of recall, being able to coordinate all of these elements when enacting the story. In essence, it is a memory task but one which reflects the child's capacity for the analysis of roles and their components. The degree to which these roles have been successfully analysed and organized can be inferred from the degree of coordination present at the moment of synthesis, or when the story modelled by the tester is enacted by the child.

We can better appreciate the child's abilities if we look at an example of a younger child attempting to enact Story E, involving a doctor/father interacting with a patient/daughter. Although children may be able to recognize that a single person may have several social roles, their capacity for the organization of the information presented in the story may be insufficiently developed. Thus, when they attempt to recall the story, the two roles will not exist independently in their minds and so, many times the agent will clearly be a doctor (since that is the more behaviorally salient role in this story) while behaviors appropriate to the father role are ambiguous or, in some cases, completely absent.

Younger children may pause while enacting a story and may then state that they are unable to recall what occurs next. These children may have understood the story when it was modelled but because they lack the capacity to efficiently organize the roles and their behavioral components, they are unable to retrieve these components at the moment of recall. Oftentimes they will then proceed to quickly end the story in a way that is consistent with the events of the story but not with the roles of the agents involved.

In the design of their procedure, Watson and Fischer have taken steps to minimize the memory component involved. First, they have attempted to equalize the duration of all of the stories (they are all approximately 60 to 80 seconds in length). In addition, the instructions to the child are to enact a story of the same type- thus the child is led to understand that he need not recall all of the events which occur in the story but only those which convey the essence of the characters and events which occur.

#### **Criteria for developmental levels**

**NOTE:** We have not included the criteria for Levels 1 to 3 because of the age range of the children being tested in the present studies, namely 5 to 9 years.

Level 4: Active Other Agent --- Story A and all other stories

The child has a doll act alive and animate in doing things and in causing things to happen. A child must show the doll as being an active and animate agent (or source of action) This step does not involve actual role playing but only pretending and the representation of independent agents. The child must have the doll clearly perform at least one of the following behaviors: the doll must walk, talk, pick up things, act as if it is independent and has a will of its own, or act as if it is alive.

Level 5: Active Substitute Agent --- Any Story

This level is not modelled in the present procedure. It has the same criteria as Level 4 as well as the use of a substitute agent (e.g. a block) in place of the doll.

Level 6: Behavioral Role --- Story B, and all other stories

The child has a doll do several actions typically related to a recognized role. A child must use a doll in a specific and recognizable role. He or she must demonstrate this usage by having a doll act out a role in terms of its specific and prescribed behaviors.

It is important that the doll carry out the prescribed behaviors and not the child. For example, for a doctor behavioral role to be demonstrated by a doll, the child must

correctly orient the doctor doll towards the patient doll and have the doctor doll carry out the appropriate behaviors on the patient (e.g. give a shot to the patient). If the child fails to correctly orient the doll towards the patient or gives the shot himself (instead of having the doctor doll giving the shot), this is not scored as a behavioral role. If, on the other hand, the child makes an attempt to have the doctor doll administer the shot (i.e. brings the needle to the doctor doll and then puts the doll down), this is scored as a behavioral role if the other criteria are fulfilled.

In addition, the child must perform at least two prescribed behaviors (prescribed behaviors are typical and stereotyped) that are appropriate to the role or perform one prescribed behavior and explicitly label the behavioral role.

Typical prescribed behaviors for the doctor role include giving shots or medicine, examining a patient with an otoscope, taking the temperature with a thermometer, saying something such as "Drink this medicine.", or "Lie down on the bed". Typical prescribed behaviors for the patient role include lying down on the bed in preparation for an examination, drinking medicine given by the doctor, or saying something such as "I don't feel well.", or "Will this hurt?". Typical prescribed behaviors for the father or husband role include kissing his daughter or wife, or

addressing them as "darling" or "dear".

Explicit labelling of a doctor role may involve saying "I am a doctor" or "I must examine this patient". Explicit labelling of a patient role may involve saying such things as "Doctor, I am not feeling too well - could you help me?", or "Doctor, will this medicine make me better?". Examples of behaviors appropriate to the doctor and patient roles are also presented in Story B (Appendix A). Explicit labelling of a father role may involve saying something like "Who is this at the door? It is my darling daughter.", or simply addressing the other doll as "daughter". Similar criteria apply for husband, wife, mother, and daughter behavioral roles.

It is important to make clear why two prescribed behaviors or one prescribed behavior and clear labelling of the role is necessary for Level 6 to be scored. Prescribed behaviors vary in the degree with which they are appropriate to a specific role. For example, an adult male doll kissing an adult female doll, or addressing her as "Darling", is appropriate behavior for a 'husband', a 'brother', and a 'friend' role. An adult male doll giving medicine from a bottle to an infant female doll is appropriate for a 'father' as well as for a 'doctor' role. A doll which is the recipient of a shot from a 'doctor' doll may either be appropriately fulfilling the 'patient' role (by sitting still while the medication is being administered), or it may

simply be the object on which the doctor acting. Ambiguous behaviors such as these must be accompanied by behaviors more specific to the roles represented if that role is to be prescribed to the agent involved. Requiring that two such role-appropriate behaviors be demonstrated reduces the likelihood that specific roles will be assigned to agents when only ambiguous cues are present.

#### Level 7: Shifting Behavioral Roles -- Story C and all others

A child has two dolls do several actions typically related to two different recognizable roles. The same criteria for Level 6 (Behavioral Role) apply to Level 7 but now involve two dolls instead of one.

Level 7 is distinguished from Level 8 (Social Role with One Complementary Role) by the number or quality of social role interactions. For example, in Story C (Doctor - Patient), the patient may say "Doctor, will you help me?" and then will sit on the bed. The doctor gives the patient medicine from a bottle and asks her to drink some, which she does. The doctor then says, "You will be o.k. now." In this case, a social role interaction occurs when the patient drinks from the bottle offered by the doctor (see Level 8: Social Role with One Complementary Role). No other social role interaction occurs, and so the child's story cannot be scored at Level 8. The agents have, however, each fulfilled the criteria for Level 6 (Behavioral Role), and so Level 7



(Shifting Behavioral Roles) is scored.

The child may also simply shift from one one behavioral role to the other. For example, the child may pick up the patient doll and carry out two prescribed behaviors (such as saying, "Doctor, I am sick", and then sitting down in the bed), and then pick up the doctor doll and carry out two more prescribed behaviors (such as giving her medicine and saying "This will make you better"). This would also be scored as Level 7.

In both of the cases described above, there are some indications that the agents are responding in role-appropriate ways to the other's actions, and in a sense, fulfilling the requirements for Level 8 (Social Role with One Complementary Role) described below. We cannot, however, be sure that the child is actually inter-coordinating the two behavioral roles. It is conceivable that that child is only partially inter-coordinating these two roles (as in the first example), or is simply enacting one role and then shifting his focus to the second (as in the second example). This inter-coordination of behavioral roles in complementary agents will be referred to as 'Simultaneity', and it is a criterion which is also important in determining the complementarity of two roles to one agent, and the intersection of several roles in the same agent.

According to Fischer (1980), the ability to

inter-coordinate two 'skills' (in this case, two social or two behavioral roles) represents a marked increase in the child's capacity for the analysis of skills into their component parts, and sets the stage for the re-combination of these skills into more complex configurations at the next level in the skill hierarchy. The concepts of 'inter-coordination' and 'focusing' and their place in the hierarchy of skill development (from Watson and Fischer, 1980) is presented in Appendix C.

Level 8: Social Role with One Complementary Role --- Story C, as well as stories D, E, and F.

The child has one doll play a specific role and respond and take account of another dolls needs, requests, and behaviors in a recognized, complementary way to the first role. All of the requirements for Level 6 (Behavioral Role) apply to Level 8. In addition, the dolls must interact at least twice or interact once with explicit labelling by one agent of the other's role.

An interaction is defined as an appropriate response, either verbal or non-verbal, to what the doll in a complementary role does or says. The rationale for these requirements is the same as that for the criteria for Level 6. The behaviors to which the dolls must respond in a complementary way to are identical to those described in the criteria for Level 6. Thus Level 8 is identical to Level 6.

except that the role-appropriate behaviors of one agent are in response to the role appropriate behaviors of another agent. Examples of role-appropriate interactions for doctor, patient, nurse, father, mother, daughter, husband, and wife are presented in stories C, D, E, and F, in Appendix A.

Level 9: Shifting Social Roles with One Common Agent. --

Stories D & F

In this step, the child has a doll in one role take account of the actions and verbalizations of two different dolls in recognizable complementary roles. The criteria for Level 8 apply to all pairs of complementary social roles (in Story D, these include Doctor-Patient, Doctor-Nurse, and Nurse-Patient). That is, for a social role and its complement to be scored, the dolls must interact twice, or once with explicit labelling by one agent of the other's role.

It is also important to note that several combinations of role-complementary interactions can occur which fulfill the requirements for this level - these are Doctor+Nurse and Doctor+Patient, Doctor+Nurse and Nurse+Patient, and Doctor+Patient and Nurse+Patient.

This level is given when the criterion of 'simultaneity' for Level 10 (Social Role with Two Complementary Roles) has not been met - that is, there is insufficient evidence that the child is simultaneously

maintaining and inter-coordinating the social roles of the three agents. In some cases, the child may demonstrate a lack of role inter-coordination by having one doll interact with one complement, and then with its other complement. For example, the interactions in a story may progress as follows; D+P, D+P, D+N, D+N.

It is also possible that a child's story progresses D+P, D+N, D+P, D+N, or D+P, D+N, D+N, D+P without involving an inter-coordination of the three social roles. In these cases, the child's story evolves slowly, haltingly, and with difficulty. Pauses of more than 5 seconds may, for example, occur during the shift in focus to another role.

#### Level 10: Social Role with Two Complementary Roles - Stories

##### D & F

In this level, the child has a doll in one role take account of two different dolls' actions and verbalizations in recognized complementary roles and integrates both complements into the story. The agent or character in the first role must play the same role when interacting with each of its complements. In story D, for example, the doctor remains a doctor while integrating his relations with the complements of patient and nurse in the story.

In order for the child to pass at this level, his story must fulfill all the criteria for Level 9. In addition, the child must be able to maintain all three roles

simultaneously and inter-coordinate them. He may demonstrate this by being able to switch easily from one role-complement to another in enacting his story. For example a story in which there are two clear social role interactions between the Doctor and Nurse, the Doctor and Patient, and the Nurse and Patient, will almost always require a smooth inter-coordination of roles (the exceptions occur when the story proceeds either very haltingly and slowly, or when dolls interact with their complements sequentially - for example, D+N, D+N, D+P, D+P, N+P, N+P).

Simultaneity or inter-coordination is said to occur in any story in which successive interactions involve a smooth switch from one social role complement to another - for example, D+P, D+N; N+P, D+P, D+N. So long as these switches occur smoothly and without difficulty, such a story would be scored at Level 10. Also note that, as in this example, the criteria for Level 8 need not be fulfilled for all **three** possible social roles with their complements (in this case, only one Nurse+Patient interaction occurred). Level 10 can even be given to a story with the following series of interactions - D+P, D+N, D+P, D+N - if such a story proceeds **very** quickly and without difficulty.

Level 11: Shifting Social Roles for the Same Agents --

Stories E & F

A child has two agents each play two separate roles.

The two sets of roles the the two agents play are complementary. This level should be scored when all the criteria for Level 12 are met (see Level 12: Intersection of Two Social Roles Within the Same Agent), except that the sets of roles are not inter-coordinated within an agent. For example, the sequence of interactions in the child's enactment of Story E may proceed as follows; Father+Daughter, Father+Daughter, Doctor+Patient, Doctor+Patient. In other cases, the child's story may proceed very slowly and with great difficulty and so will be scored at Level 11, even though the sequence of interactions may, for example, be F+D, D+P, D+P, F+D.

Level 12: Intersection of Two Social Roles Within the Same Agent -- Stories E and F

At Level 12, the child has one doll relate to another doll in two complementary roles in such a way that all four roles are explicitly demonstrated. Each doll must play two separate roles while remaining the same agent or character (e.g. one doll can be both a doctor and a father and still be thought of as the same individual).

The criteria for each set of complementary social relations (e.g. in Story E, Father+Daughter and Doctor+Patient) are the same as for Level 8. In addition, the child must be able to smoothly inter-coordinate the two

sets of complementary social relations. This is the criterion of simultaneity. The child must indicate that he can handle the two roles and their interactions with complements in a simultaneous manner by being able to switch from one role-complement relation to the other and back again while maintaining the same agent or character in the two roles.

Simultaneity can be demonstrated in two ways. The child may switch from one role-complement relation to the other several times, smoothly and without hesitation. The sequence of interactions in such a story may proceed as follows; Father+Daughter, Doctor+Patient, Father+Daughter, Doctor+Patient, or Father+Daughter, Doctor+Patient, Doctor+Patient, Father+Daughter. The first sequence is more strongly indicative of simultaneity than the second because of the greater number of switches involved. Thus only in extreme circumstances - e.g. in the case of a **very** slow and halting story, in which the child pauses at one point for more than 8 seconds - might the first sequence not be considered to indicate simultaneity. Under less extreme circumstances (e.g. a story which includes a pause of more than 5 seconds during a switch to a new set of role-complement relations), the second sequence might also not be indicative of simultaneity. On the other hand, the sequence Father+Daughter, Father+Daughter, Doctor+Patient, Doctor+Patient would not, under any circumstances, indicate

simultaneity.

The child may also demonstrate simultaneity when there is one instance of each kind of social role interaction (e.g. in Story E, one interaction each between the Father and Daughter, and between the Doctor and Patient) as well one statement by one doll acknowledging the dual roles of the other doll (See Appendix A, Stories E and F for examples of such statements). In this case, as in other, the story must proceed smoothly and without undue pauses.

#### Level 13: Shifting Social Role Intersections with One Common

##### Agent -- Story F

At his level, a child has a doll in two roles relate sequentially to two different dolls in complementary roles. In other words, the child must have a doll act out two different social role intersections.

The difference between Level 13 and Level 14 is that the criteria for both social role intersections have not been completely filled. For example, statements indicating the following social roles and social role intersections may occur at this level; Husband/Father talks to Wife/Mother. Doctor/Father talks to Patient/Daughter, and then Father talks to Daughter (See Appendix A; Story F for examples of these statements). In this case, the Father role has been amply demonstrated (by three different statements) but neither the Husband nor the Doctor role has been



sufficiently demonstrated, since only one interaction relevant to each has occurred. Had another Doctor+Patient or Husband+Wife interaction occurred in this story, it would have been scored at Level 14.

Note that the story described above (the version scored as Level 13) differs from those scored at Level 12 in that a greater number of social roles occur within the same agent. It is, however, possible to score Story F at Level 12, if the criteria for that level (and only that level) have been fulfilled.

Level 14: Intersection of Three Social Roles for the Same Agent -- Story F

At this level the child demonstrates three roles in one doll by having that doll interact with two other dolls in role-complementary ways. To do this, the criteria for Level 12 must be demonstrated for two different sets of complementary social role relations. For example, a child may demonstrate the intersection of both Husband and Doctor, and of Father and Doctor.

Additional General Criteria

1) Any roles may be used to prove that a child can pass a step. The roles need not be limited to the modelled in the stories.

2) Not all pretending is scored as role playing. To have a scorable role-playing story, the child must have a doll be a specific other person or role. For example, a child pretending to have a doll eat is not role playing; but pretending to have a doll be a mother as she cooks, washes, and comforts her children, all in the same story, is role playing.

3) At a minimum, a role must include a pretense at being a specific other person or recognized role, as demonstrated by explicit labelling or prescribed behaviors. For example, a child may say, "This is the doctor" or use the doctor doll to perform typical doctor actions of giving shots and medicine to a patient, and so forth.

4) To be scored at any level, a role and role intersections must involve human roles only. For example, a child playing the role of a dog will not be scored as a step in role playing. We are only interested in human social understanding.

5) If a child shows any behaviors that are clearly inappropriate for the behavioral or social expectations of the particular role being portrayed, that constitutes a failure of that step in role playing. These role-inappropriate behaviors bring into question the child's understanding of the role being portrayed.

6) If the child shows any inconsistencies in his or her social interactions or use of agents (dolls) in roles, that

constitutes a failure of that step of role-playing. For example, a child has a doctor doll treat a patient and later asks that patient to take care of him because he is sick. The child has shifted the same character from being a doctor to not being a doctor.

7) Each role-playing story must be scored at one level in the sequence. Although a story may fulfill the criteria for several levels, only the highest level should be scored.

#### Criteria for Directly-, Partially-, and Non-imitative Stories

For a story to be judged directly-imitative, all the elements of the child's story must be present in the story modelled by the adult. These elements include the social roles involved, the nature of the illness and of the doctor's examination, and the kind of medicine administered.

For a story to be judged partially-imitative, the child must change at least one of the more important elements of the story. These more important elements include the social roles involved (e.g. Uncle instead of Father), the nature of the illness (e.g. a broken arm instead of a tummyache), the nature of the examination (e.g. examining the patient's nose and throat instead of taking her temperature), and the kind of medication administered (e.g. a shot instead of

orally-administered medicine).

For a story to be judged non-imitative, the child must change the elements of the story in such a way as to radically change the theme of the story - e.g. a story which no longer involves a 'doctor' theme.

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### Appendix A

#### Stories Used in the Watson and Fischer Procedure

**Note;** The following codes are used to label agents and their actions;

Da - Daughter

M - Mother

Do - Doctor

N - Nurse

F - Father

P - Patient

H - Husband

W - Wife

'+' denotes a social role interaction between two agents - for example, Do+P denotes a social role interaction between a Doctor and a Patient.

'(E)' is used to denote an interaction in which the other agent's role is explicitly labelled.

'/' means that these two roles exist within a single agent - for example, H/D+W/M means that one agent is acting as a Husband and a Doctor towards another agent acting as both a Wife and Mother.

**Note;** this kind of interaction only occurs when

one agent acts in a complementary way to the one of the other's roles and explicitly labels the other's second role.

Story CLabels

Patient: Doctor, I'm really sick. Can you help      Do+P(E)

Doctor: Well, I think I can.

What is wrong?

Do+P

Patient: I have a tummyache

Doctor: Well, let me look down your throat at your      Do+P  
stomach. Say 'aah'. (Doctor uses thermometer  
to look down patient's throat).

I know what kind of medicine you need. Here,      Do+P  
take this. (Doctor gives patient medicine -  
she takes it.)

Patient: Will that make me better, Doctor?

Do+P(E)

Doctor: Sure. Your stomach ache will go away now.

### Story D

Patient: Doctor, I'm sick again

Do+P(E)

Doctor: What's wrong this time, little girl?

Do+P

Patient: I've got an earache.

Doctor: An earache? Well, let me get the nurse to  
help me. Nurse, will you come in here?

Do+N(E)

(Nurse walks in.)

Nurse: Yes, Doctor?

Doctor: Will you help me with this little girl?

Do+N

Nurse: Sure

(To Patient) What's wrong?

N+P

Patient: I've got an earache

Doctor: Let me check her ears first. (Doctor checks  
Patient's ears with otolaryngoscope.)

Do+P

All right, Nurse, will you give her some  
medicine for her ears? (Nurse puts medicine

Do+N(E)

N+P

in Patient's ears)

Patient: Will I get better now?

N+P

Nurse: Sure, the doctor said the medicine would make  
you better.

Story E

Doctor: I don't have any more patients today.

F+Da(E)

There's my daughter, my little girl.

I wonder what she is doing here

Daughter: Hello, Daddy.

Father: Hi, Honey. What's wrong?

F+Da

(Father kisses Daughter)

Daughter: I'm sick, Daddy. Can you help me?

Do/F+P/Da

Doctor: Sure I can. I'm a doctor and I know  
what is wrong. You need a shot



Patient: Will it hurt?

Do+P

Doctor: Just a little bit, Honey. (Doctor gives  
Patient a shot with the syringe.)

Daughter: Ouch.

F+Da

(Father kisses Daughter)

Father: That's all right, Honey. It won't hurt

F/Do+Da/P

any more. I'll tell you what: After

dinner tonight, we can watch TV together.

Daughter: Daddy, I'm so glad you're a doctor and can  
make me well.

### Story F

Doctor: I don't have any more patients (Ding Dong)

Well, it's my wife and my little girl, my  
my daughter.

Hello dear. What are you doing here?

(Husband and Wife kiss)

H/F+W/M

Wife: I brought our little girl because she's sick,  
and we don't have any more medicine at home.

Since you are a doctor, I thought you could help her. Do/F+W/M

Father: So you are sick, Honey?

Do/F+P/Da

Daughter: Yes, Daddy. I don't feel very well.

Can you help me?

Doctor: Yes, because I'm a doctor

Take this medicine (Doctor gives Patient  
some medicine.) I'll tell you what, after  
dinner tonight, you had better take some  
more medicine.

Do+P

Daughter: Will it make me better, Daddy?

F+Da(E)

Father: Sure it will.

Mother: Can you come home now Dear? I have dinner  
cooking, and we're hungry. (Mother touches  
Daughter.)

H+W

Father: Yes, we will all go home now. (All dolls  
leave together.)

## APPENDIX F

Summaries of tests of predictions:

Tables F-1 to F-8

Table F-1

Analysis of Variance Summary Table: Age in Months by  
Negotiation Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	29.63	1.18
Grade	1	4939.78	196.75 **
Sex	1	9.63	.30
2-way Interactions			
Neg. x Grade	1	2.14	.09
Neg. x Sex	1	.36	.01
Grade x Sex	1	16.41	.65
3-way Interactions			
Neg. x Grade			
x Sex	1	103.60	4.12 *
Error	103	25.11	

\*  $p < .05$

\*\*  $p < .001$

Table F-2

Mean Age in Months for Each Negotiation Group, Grade, andSex

Negotiation Group	Grade					
	K			1		
	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>
Negotiators						
Boys	70.0	4.6	12	85.0	5.1	15
Girls	71.6	3.3	14	84.6	8.9	16
Non-negotiators						
Boys	70.9	4.2	16	81.8	3.3	15
Girls	67.8	1.9	6	84.8	4.3	17

Table F-3

Analysis of Variance Summary Table: Proportion of Non-  
Pretend Play Involving Games with Rules by Negotiation Group  
(Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	.00	.04
Grade	1	.01	.65
Sex	1	.01	1.38
2-way Interactions			
Neg. x Grade	1	.00	.47
Neg. x Sex	1	.01	1.49
Grade x Sex	1	.00	.03
3-way Interactions			
Neg. x Grade			
x Sex	1	.00	.00
Error	110	.01	

Table F-4

Summary Table for Discriminant Function Analysis of Measures  
of Pretend Skills for Negotiators and Non-Negotiators<sup>a</sup>

Predictor variable	Correlations of predictors with discriminant function	Pooled within-group correlations amongst predictor variables <sup>b</sup>		
		ROLOBJ	PSOCINT	DURPRET
WFSCORC	.374	.275 *	.197 *	.210 *
ROLOBJ	.382		.143	.128
PSOCINT	-.056			-.147
DURPRET	-.108			

\*  $p < .05$

<sup>a</sup>df = 4, 109

<sup>b</sup>df = 1, 113

WFSCOR - Highest level demonstrated in the Watson and Fischer procedure; ROLOBJ - Proportion of social pretense involving simultaneous role and object transformations; PSOCINT - Proportion of social pretense involving high-level social interaction; DURPRET - Mean duration of episodes of social pretense

Table F-5

Group Means for Negotiators and Non-Negotiators on Measures of Pretend Skills

	Negot.	WFSCOR <sup>a</sup>	ROLOBJ	PSOCINT	DURPRET
Non-Negotiators	( <u>n</u> =54)	10.48	.31	.80	60.4
Negotiators	( <u>n</u> =61)	11.09 <sup>b</sup>	.40 <sup>c</sup>	.80	56.9

<sup>a</sup> WFSCOR - Highest level demonstrated on the Watson and Fischer procedure; ROLOBJ - Proportion of social pretense involving simultaneous role and object transformations; PSOCINT - Proportion of social pretense involving high-level social interactions; DURPRET - mean duration of episodes of social pretense.

<sup>b</sup>  $F(1,113) = 3.17, 10 > p < .05$

<sup>c</sup>  $F(1,113) = 5.36, p < .05$



Table F-6

Summary Table for Discriminant Function Analysis of  
Differences Between Negotiators and Non-Negotiators on  
Measures of Non-Pretend Skills<sup>a</sup>

Eigen- value	Canonical correlation	Wilks Lambda	$\chi^2$	Level of Significance
.027	.161	.973	2.94	.71

/ adf = 5, 108

Table F-7

Summary table for Discriminant Function Analysis of  
Differences Between Negotiators and Non-Negotiators on  
Measures of Cognitive Skills

Eigen- value	Canonical correlation	Wilks Lambda	$\chi^2$	Level of Significance
.060	.238	.943	6.42	.17

adf = 4, 109

Table F-8

Summary Table for Discriminant Function Analysis of  
Differences Between Negotiators and Non-Negotiatorsd on  
Measures of Social Skillsa

Eigen- value	Canonical correlation	Wilks Lambda	$\chi^2$	Level of Significance
.030	.172	.970	3.40	.49

adf = 4, 111

## APPENDIX G

Summaries of exploratory analyses and tests  
of alternative hypotheses - Tables G-1 to G-15

Table G-1

Correlations Amongst Measures of Symbolic Complexity of  
Spontaneous Pretense<sup>a</sup>

	RROL <sup>b</sup>	ROBJ	MOBJ
ROLOB	.94 *	.34 *	.33 *
RROL		.41 *	.36 *
ROBJ			.71 *

\*  $p < .001$

<sup>a</sup>  $N = 118$

<sup>b</sup> all of these behaviors are expressed as a proportion of the total amount of time spent in social pretense; ROLOB - amount of time in social pretense involving simultaneous role and object transformations; RROL - amount of time in social pretense involving the enactment of remote roles; ROBJ - amount of time in social pretense involving remote object transformations; MOBJ - amount of time in social pretense involving multiple object transformations

Table G-2

Analyses of Variance Summary Table for Type of Sequence,  
Grade, and Sex: Effects Involving Type of Sequence

Source	Dependent variables	df	Mean Square	F
Type of	All DV's	2,44	15.26	14.93 **
Sequence (TS)	DUR046 <sup>a</sup>	1,45	13075.80	29.91 **
	ROLOB	1,45	.11	1.84
TS x Grade	All DV's	2,44	5.08	4.97 *
	DUR046	1,45	643.53	1.54
	ROLOB	1,45	.53	9.29 **
TS x Sex	All DV's	2,44	.05	.51
TS x Grade				
x Sex	All DV's	2,44	.86	.84

\*  $p < .01$

\*\*  $p < .001$

<sup>a</sup>DUR046 - mean duration of episodes of social pretense;  
ROLOB - proportion of social pretense involving simultaneous role  
and object transformations

Table G-3

Analysis of Variance Summary Table: Mean Duration of Social Pretense Within Sequences Accompanied and Unaccompanied by Negotiation (Seq.), and Between Grade and Sex

Source	df	Mean Square	F
Between effects			
Grade	1	1496.28	3.66 +
Sex	1	458.91	1.12
Grade x Sex	1	2287.61	5.59 *
Error	45	408.96	
Within effects			
Seq.	1	13075.86	29.91 **
(Grade) x (Seq.)	1	673.53	1.54
(Sex) x (Seq.)	1	27.35	.06
(Grade x Sex) x (Seq.)	1	165.90	.38
Error	45	437.17	

+ .10 < p > .05

\* p < .05

\*\* p < .001

Table G-4

Analysis of Variance Summary Table: Proportion of Social Pretense Involving Simultaneous Role and Object Transformations Within Sequences Accompanied and Unaccompanied by Negotiation (Seq.), and Between Grade and Sex

Source	df	Mean Square	F
Between effects			
Grade	1	.02	.25
Sex	1	.99	11.03 *
Grade x Sex	1	.02	.23
Error			
Within effects			
Seq.	1	.11	1.84
(Grade) x (Seq.)	1	.53	9.29 *
(Sex) x (Seq.)	1	.05	.93
(Grade x Sex) x (Seq.)	1	.08	1.47

\*  $p < .005$



Table G-5

Analysis of Variance Summary Table: Mean Duration of  
Episodes of Social Pretense by Negotiation Group (Neg.),  
Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	338	.96
Grade	1	225	.64
Sex	1	108	.03
2-way Interactions			
Neg. x Grade	1	685	1.94
Neg. x Sex	1	2283	6.47 *
Grade x Sex	1	3195	9.05 **
3-way Interactions			
Neg. x Grade x Sex	1	106	.30
Error	109	353	

\*  $p < .01$

\*\*  $p < .05$

Table G-6

Mean Duration of Episodes of Social Pretense, Separately for  
Negotiators and Non-Negotiators and for Boys and Girls

Negotiation Group	Sex					
	Boys			Girls		
	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>
Negotiators	53.49a	20.02	27	59.63	18.97	34
Non-Negotiators	63.82a	21.67	33	55.05	23.42	23

a,b Means with different superscripts differ significantly  
 according to Scheffe's test, with  $\alpha = .05$ .

Table G-7

Analysis of Variance Summary Table: Mean Duration of  
Episodes of Social Non-Pretend Play by Negotiation Group  
(Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	743	3.70 +
Grade	1	682	3.39 +
Sex	1	1187	5.90 *
2-way Interactions			
Neg. x Grade	1	434	.22
Neg. x Sex	1	837	4.16 *
Grade x Sex	1	39	.20
3-way Interactions			
Neg. x Grade x Sex	1	9	.05
Error	109	201	

+  $.10 < p < .05$

\*  $p < .01$

Table G-8

Mean Duration of Episodes of Social Non-Pretend Play,  
Separately for Negotiators and Non-Negotiators, and for Boys  
and Girls

Sex	Negotiation Group					
	Negotiators			Non-Negotiators		
	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>
Boys	58a	25	27	58a	21	33
Girls	60a	29	34	69b	27	23
Overall	59	26	61	63	24	56

a,b Means with different superscripts differ significantly  
 according to Scheffe's test, with  $\alpha = .05$ .

Table G-9

Analysis of Variance Summary Table: Proportion of Social  
Pretense Involving High Level Social Interaction by  
Negotiation Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	.00	.002
Grade	1	.29	8.95 **
Sex	1	.15	4.67 *
2-way Interactions			
Neg. x Grade	1	.02	.60
Neg. x Sex	1	.00	.02
Grade x Sex	1	.01	.36
3-way Interactions			
Neg. x Grade x Sex	1	.00	.04
Error	109	.03	

\*  $p < .05$

\*\*  $p < .005$

Table G-10

Analysis of Variance Summary Table: Proportion of Non-  
Pretend Social Play Involving High Level Social Interaction  
by Negotiation Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	.04	1.52
Grade	1	.00	.05
Sex	1	.05	1.99
2-way Interactions			
Neg. x Grade	1	.00	.94
Neg. x Sex	1	.09	3.40 +
Grade x Sex	1	.03	1.18
3-way Interactions			
Neg. x Grade			
x Sex	1	.08	3.17
Error	109	.03	

+ .10 < p > .05

Table G-11

Mean Proportion of Non-Pretend Social Play Involving High Level Social Interaction, Separately for Negotiators and Non-Negotiators, and for Boys and Girls

Negotiation Group	Sex					
	Boys			Girls		
	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>
Negotiators	.78a	.32	27	.69b	.40	34
Non-Negotiators	.69b	.35	33	.71b	.32	23

a,b Means with different superscripts differ significantly according to Scheffe's test, with  $\alpha = .05$ .

Table G-12

Analysis of Variance Summary Table: Highest Level  
Demonstrated on the Watson and Fischer Procedure by  
Negotiation Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	16.84	5.37 *
Grade	1	32.44	10.35 **
Sex	1	1.21	.38
2-way Interactions			
Neg. x Grade	1	2.10	.67
Neg. x Sex	1	.09	.03
Grade x Sex	1	17.86	5.70 *
3-way Interactions			
Neg. x Grade	1	.01	.01
x Sex	1	.01	.01
Error	107	3.14	

\*  $p < .05$ \*\*  $p < .005$



Table G-13

Mean Highest Level Demonstrated on the Watson and Fischer  
Procedure, Separately for Negotiators and Non-Negotiators

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Negotiation Group

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	<u>M.</u>	<u>SD</u>
Negotiators ( <u>n</u> =61)	11.09	1.72
Non-Negotiators ( <u>n</u> =54)	10.48	1.98

---

Table G-14

Analysis of Variance Summary Table: Total Score of the Ben-Zeev Symbol Substitution Task by Negotiation Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	.50	.03
Grade	1	392.07	24.85 *
Sex	1	.24	.02
2-way Interactions			
Neg. x Grade	1	31.28	1.98
Neg. x Sex	1	5.59	.35
Grade x Sex	1	17.49	1.11
3-way Interactions			
Neg. x Grade x Sex		.39	.03
Error	107	15.77	

\*  $p < .001$

Table G-15

Analysis of Variance Summary Table: Total Conservation Score  
by Negotiation Group (Neg.), Grade, and Sex

Source	df	Mean Square	F
Main effects			
Neg.	1	7.73	.14
Grade	1	1786.90	33.20 *
Sex	1	99.30	1.85
2-way Interactions			
Neg. x Grade	1	11.51	.21
Neg. x Sex	1	.00	.00
Grade x Sex	1	34.64	.64
3-way Interactions			
Neg. x Grade			
x Sex	1	.78	.15
Error	107	53.82	

\*  $p < .001$