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Pretend Play in Middle Childhood:
The Effects of Toy Structure

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A Thesis

in the

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Abstract

Pretend Play in Middle Childhood:
The Effects of Toy Structure

Sylvie de Lorimier

The effects of toy structure on qualitative measures of pretense activity, communication about pretense and social involvement were assessed in children from kindergarten to grade 3. It was predicted that a growing preference for high-structure as opposed to low-structure toys and a decline in fantasy play in middle childhood would coexist with a greater capacity for advanced symbolic representation both in spontaneous play with low-structure toys and in an experimenter-elicited measure of symbolizing ability. In spontaneous play, children engaged in more abstract object transformation with the low-structure toys whereas they showed more remote role enactment, more simultaneous role and object transformations and more negotiation of pretense episodes with the high-structure toys. Contrary to expectations, these effects did not change as a function of grade. Amount and level of social involvement did not increase in the low-structure condition, nor did spontaneous fantasy in the low-structure condition relate to elicited symbolizing ability.

Elicited symbolizing ability was, however, associated with shorter fantasy episodes with the high-structure toys, but not with the low-structure materials. The implications of these findings for our understanding of the evolution of fantasy activity and symbolic skills in middle childhood are discussed.

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Overview

Although the body of literature concerning pretend play in the preschool years continues to grow, relatively little attention has been directed to changes in pretend activities at, and beyond, the age of six. Consequently, Piaget's (1962) contention that pretend play declines and gives way to games-with-rules with the advent of operational thought has gone relatively unchallenged. Yet, there are recent reports that the frequency of pretend play does not change in the elementary school years (Doyle, Bowker, Serbin, Gold & Sherman; under review). Moreover, the dramatic cohesion of pretense has been shown to increase between the ages of 5 and 7 (Forbes & Yablick, 1984), indicating an increase in complexity if not quantity of the activity. These studies cast doubt on the view that by age 6, fantasy drops from the child's repertoire of play activities; some aspects of pretend play (e.g. dramatic complexity) may in fact continue to show advances.

The present study is an attempt to clarify and analyze aspects of the developmental trends in pretend and non-pretend modes of play by focusing on the nature of toy materials children prefer. It is proposed that the changes which occur in the pretend behaviors of 5 1/2 to 9 year-olds are closely tied to the types of toys they like to play with.

A central issue is the contribution of a preference for "realistic" or highly structured toys to any decline in spontaneous pretend play in middle childhood --assuming this theorized decline receives greater empirical support within the present study. Are older children less inclined to pretend because of intellectual maturation or a change in cognitive orientation away from the realm of imagination toward the realm of reality? Are they progressively more attracted to play materials which are less conducive to the exercise of their advanced imaginative processes? These questions highlight the need to examine toy preference and the effects of toy structure on the different features of fantasy activity in middle childhood. While it may mark the beginning of a decrease in the tendency to engage in fantasy enactments (and thus, perhaps, of a change in cognitive style), playing with high-structure materials may also change the nature of pretend behavior when it does occur. Thus, playing with replica or highly structured as opposed to more moderately structured objects may alter the social/nonsocial aspects of pretense, the complexity of symbolic transformations, as well as the incidence of communication about pretend episodes.

The implications of these hypothesized toy-structure effects are twofold. First, as noted above, the structure of the toy context may prove to be a significant factor in determining the incidence of different forms of pretend play

behavior (e.g., social vs. solitary pretense). This is consistent with our knowledge that toys affect play patterns, both pretend and non-pretend (Rubin, Fein & Vandenberg, 1983). Second, and perhaps most important, if it is the case that older children are attracted to toys which elicit less sophisticated forms of pretense, an ability to imagine and pretend may continue to increase beyond age 6 that is rarely expressed in spontaneous play. By manipulating the nature of toys available, the present study permitted investigation of these issues.

Developmental Trends

Pretense is generally defined as behavior of a simulative, nonliteral, or "as if" character; where aspects of the play setting or materials are stripped of their customary meanings and given new ones (e.g.a belt becomes a lion tamer's whip), or where behaviors are taken out of context (e.g. a child simulates going to sleep). Pretending can also involve role playing or a change of identity (e.g. playing Superman or Wonderwoman). In brief, pretense refers to behavior in which either the objects, the setting or the child's identity is transformed.

Piaget (1962) proposed that pretend or symbolic play was a manifestation of the development of the semiotic function:

the ability to understand the relationship between signifier
(symbol) and signified (referent). In this view, growing
intellectual maturity enables the child to move on to an
understanding of collective or shared symbols. As a result,
pretend play becomes increasingly social and collaborative
and then disappears around the age of 6 or 7. According to
Piaget, this age marks a shift in play from the fantastical
to the realistic as thought becomes more logical, and this
leads to a preference for toys which resemble objects in the
real world and games with an identified purpose and preset
rules. Piaget saw pretend, or symbolic play as purely
assimilative, as principally in the service of the ego's need
for mastery over his environment, free from the demands of
accommodation. Symbolization consolidates present schemes
and permits children to achieve a sense of mastery over their
world through the reconstruction of reality for pleasure or
compensatory purposes, in the case where they have had to
deal with a distressing situation. Piaget assumed that as
children become more realistic and cognizant of the external
world, they develop other more accommodation-oriented
interests as well as other affective coping strategies.

This conceptualization has led to the investigation of
the hypothesis that the incidence of pretense follows an
inverted U-shaped function. Although increases in the
overall frequency of social pretend play in the preschool
years are relatively well documented, there is very little

evidence pertaining to its subsequent decline. Eifermann (1971) found that the number of disadvantaged Israeli school children participating in symbolic play decreased to a relatively stable level after having reached a peak in grades 1 and 2. However, Doyle et al. (under review) observed that the frequency of social and solitary pretend play in middle- and lower-class children remained the same from grades 1 to 6.

The connection made by Piaget between changes in play and maturation of cognitive skills has received confirmation in a study by Becher and Wolfgang (1977), who reported that kindergarten children who had reached the concrete operational stage spent less total time in pretend enactment, but that, on the other hand, their play expressed higher levels of symbolic functioning. The latter study points to the possiblity that due to their greater symbolic capacities, older children may display greater ease and rapidity in representing imaginary scenes, characters and objects. Doyle et al.(under review) also observed that for concrete operational children, the duration of pretend episodes was reduced. They argued that the mastery of symbolic operations permitted children to engage in mental rather than overt planning and rehearsal of pretend activities. Thus, while the duration of pretend episodes decreases, the frequency of enactments may remain quite stable throughout the elementary years.

Besides duration, several other aspects of pretense have been found to undergo age-related changes; in particular, object use and role enactment. The use of objects that are realistic in nature (e.g. feeding a doll with a spoon) have been found to increase between the ages of 14 and 19 months (Lowe, 1975; Watson & Fischer, 1977). Gradually, the need for verisimilitude decreases and there is diminished reliance on the immediate physical characteristics of the environment. Between the ages of 2 and 8, children show a growing capacity to pretend with substitutes which are similar, then dissimilar to the represented object, until finally they are capable of representing absent objects by gesture alone --at least within an elicited-play experimental situation (Elder & Pederson, 1978; Fein, 1975; Jackowitz & Watson, 1980; Olszewski & Fuson, 1982; Overton & Jackson, 1973; Pederson, Rook-Green & Elder, 1981 and Watson & Fischer, 1977). Vygotsky (1976) suggested that substitution or tranformational ability precipitates separation of thought from action and of symbol from object, and thus constitutes an important factor in the development of language.

In addition to the age trends described above, the frequency of object transformations has been reported to follow a curvilinear trend from ages 3 to 6, peaking around age 5 and declining thereafter (Cole & LaVoie, 1985; Field, DeStefano & Koewler, 1982). There is some indication that this decline in pretense involving objects continues into the

elementary years (Doyle et al., under review), suggesting a shift away from the concrete toward more ideational forms of pretense activity.

Role enactment, or transformations of identity, has been considered one of the most mature forms of pretense, requiring advanced ideational skills (Fein, 1979; Field et al., 1982; Matthews, 1977). Consistent with this notion, the frequency of character attributions (i.e. the portrayal of a character by active representation) seems to evolve in a linear fashion from ages 3 to 6 (Cole et al., 1985; Field et al., 1982), implying that certain types of fantasy activity are apt to continue to rise into the school years. Furthermore, Connolly, Doyle and Ceschin (1983) found that 5-year-olds engaged in more identity transformations than 4-year-olds, although the only significant increase was in the use of functional identities, where the role referent is non-specific and defined in terms of an activity (e.g., a driver) and where the constraints of a stereotyped role identity (e.g., a doctor) are absent. Indeed, the age-related decline in symbolic play predicted by Piaget (1962) may be more relevant to particular features of pretense such as duration of pretense and object use. Others, such as person fantasy or the overall frequency of pretense may either remain stable or continue to increase, in step with the older child's maturing cognitive capabilities (Doyle et al., under review). These hypotheses are consistent with Forbes and Yablick's

(1984) findings that from ages 5 to 7, the dramatic content of children's fantasy play shifts from a preoccupation with actions and objects to a concern for character elements and psychological motivation.

In several previous observational studies of pretense behavior (e.g. Cole & LaVoie, 1985; Field et al.,1982), the coding scheme for object use and role enactment was primarily based on Matthews'(1977) dichotomous classification of fantasy transformations into material or ideational transformational modes (referring to tangible objects and to imaginary objects, situations or people, respectively). A problem with this scheme is that the ideational mode includes both imaginary object representation and identity transformations, making it difficult to tease apart the separate evolutions of representational activity involving objects and identities. The present study addresses this problem by exploring a range of transformations, from the more concrete to more ideational or abstract forms, within categories of object transformation (including ideational or imaginary object representation) and role enactment. For instance, levels of object transformation include replica use, animation, similar and dissimilar transformations and imaginary object use, while the levels of role enactment involve increasing remoteness from the child's everyday experience (i.e. from a student to an astronaut).

Furthermore, in contrast to earlier studies, our sample includes older children, between the ages of 5 and 9.

Developmental trends in the social context of pretend episodes have also been examined. Specifically, the amount of social versus solitary pretend play has been found to change as a function of age. It has often been reported that pretense becomes increasingly interactive from age 3 to age 6 whereas the amount of solitary pretense reflects little change during the preschool years, hovering at about 1 to 5% of all free play (Rubin, Fein & Vandenberg, 1983). The relationship between these forms of activity in the elementary years remains relatively unexplored. At least one study has shown, however, that from the ages of 5 to 6, social pretend play decreases (from 23 to 16%), whereas solitary dramatic play shifts from a low of between 6 and 11%, to 19% of the total amount of pretense in the same period (Hetherington, Cox & Cox, 1979). Doyle et al. (under review) have also reported a trend for pretend play to become less collaborative and more solitary between the ages of 6 and 11. In view of these findings, Rubin et al. (1983) have suggested that whereas certain forms of fantasy activity appear to follow an inverted "U"-shaped developmental function, the evolution of solitary pretense might follow an upright "U"-shaped function.

Toy Preference and the Effects

of Toy Structure

Due to an increase in cognitive maturity with
increasing age, permitting greater integration of and
accommodation to the outside world, children have been
hypothesized to display a growing preference for
verisimilitude in the toys they play with (Piaget, 1962).
Reports that, compared to 4-year-olds, 5 year-olds already
engage in more frequent replica transformations (i.e. use
substitute objects that are identical to, or miniatures of,
their real-world referents) in spontaneous play are
consistent with this hypothesis (Connolly et al., 1983).
However, results of "playing time" studies, or studies
examining the amount of time spent with a given toy category,
are equivocal. While younger children seem to play longer
with realistic than unstructured toys, (Jeffree & McConkey,
1976), older ones appear to divide their time equally between
toys differing in degree of structure (Pulaski, 1973).
Focusing on personality differences, Pulaski (1970) found
that 5- to 7-year-old children with a high "fantasy
predispostion" preferred moderately structured toys whereas
children with a low "fantasy predisposition" preferred more
realistic toys.

The impetus for this study stems from the expectation
that children in middle childhood would prefer structured to

unstructured toys. This preference would have an impact on several aspects of pretend play, namely, the incidence of high-level object and identity transformations, social participation and the relation of advanced pretense activity to symbolizing ability . In essence, it is proposed that a preference for high-specificity toys is a precursor to the theorized decline in spontaneous pretend play during middle childhood.

The structural aspects of the play environment are expected to take on considerable importance in middle childhood. This period marks the child's entry into the school system, with greater exposure to structured activity as well as a heightened necessity to attend to elements of external rather than inner reality (Singer, 1973). In their recent review of the development of play activities, Rubin et al. (1983) present findings concerning the "pull" of different objects for certain predictable play outcomes. Thus, particular preschool or art work materials such as play-dough, plasticine, clay, or finger paint are mostly associated with nonsocial functional play, whereas dress-up materials, large blocks, and toy cars are most predictive of pretense activity. In short, the freedom in "free play" situations may well be substantially constrained by the types of materials set out for children in the school or home environment.

A problem in most of the studies reviewed is that children were allowed to select their own toy materials. As a consequence, individual toy preference (and an increased propensity to play, in a pretend fashion or otherwise, with certain toys) may have obscured the effects of particular materials. Correcting for this problem, several investigators have directly manipulated the availability of highly versus less structured materials (Jeffree & McConkey, 1976; McGhee, Ethridge & Benz; 1984; Phillips, 1945; Pulaski, 1970). Using a highly structured toy set including realistic dolls (i.e. Barbie and GI Joe) and ready-made costumes (i.e. bride, astronaut), and a moderately structured toy set made up of such objects as blocks, rag dolls and "dress-up clothes", Pulaski (1970) found no differential effect of toy structure on the number of one-minute units of play engaged in from kindergarten to the second grade, but more varied pretend themes with the less structured materials. Jeffree and McConkey (1976) found that younger preschoolers, whose symbolic skills were not as well developed, exhibited more pretense with realistic rather than abstract toys. McGhee et al. (1984) defined low structure as the extent to which wooden forms resembled their realistic or high-structure counterparts (airplane, truck, and cowboy) in shape and detail. They found that low-structure toys elicited more frequent pretend behaviors in 2 1/2- to 5-year-old boys, but that children played longer with the high-structure toys,

except when the unstructured toys were presented first. The authors concluded that preschoolers, despite being more attracted to toys that "look like what they represent", tend to pretend with toys that match their highest level of capacity for pretend, that is, toys which do not necessarily resemble their real-world counterparts.

Some recent studies have provided toys which accentuate the difference between high- and low-structure objects (McLoyd, 1983; McLoyd, Thomas & Warren, 1984; McLoyd, Warren & Thomas, 1984). Indeed, lack of differentiation in the nature and functional specificity of materials in Pulaski's (1970) and McGhee et al.'s (1984) toy sets may have undermined some of the effects of toy structure on pretend behavior. Some of the low-structure toys in these studies may even have appeared as less attractive forms of their highly realistic counterparts. In contrast to these authors, McLoyd (1983) and McLoyd et al. (1984) considered that dress-up clothes and rag dolls were part of the high-structure category. Although not as "scripted" as costumes or as "true to life" as barbie dolls, they nonetheless have a specific function or identity, which constrains the uses a child can make of them. Thus, in these studies (and in study 1 of Einsiedler, 1985), low specificity (and high versatility) of function and identity was the main criterion for inclusion into the low-structure category and it also formed the basis for the choice of low-structure materials in the present

study. For instance, a hat has a primary function of being worn on one's head. However, a splayed lamp shade can be used for a waiter's tray, a grocery basket, a hat... or a lamp shade. It therefore displays versatility (and ambiguity) of identity and function.

With toy sets differentiated in this way, low-structure objects resulted in a greater variety of object substitutions (McLoyd, 1983), and in identity transformations that were more remote from children's everyday experience (McLoyd, Warren & Thomas, 1984) for preschoolers and kindergarten children. On the other hand, high-structure objects were associated with a higher frequency of overall pretense, a greater variety of pretend themes and more instances of object animation or onomatopoeia (e.g. making "vroom" noises with a toy car (McLoyd, 1983)). Pellegrini (1985) demonstrated that the pretend narratives of 5 year-olds were more elaborate and complex than those of 4 year-olds in a context made up of objects with ambiguous functions (e.g. blocks and styrofoam shapes) as opposed to specific functions (e.g. doctors' kit, dolls and pill bottles). The unambiguous or "scripted" materials failed to differentiate between the abilities of younger and older children whereas the "unscripted" materials did. The author attributed his results to the older children's increased ability to pretend independently of props in the environment.

Einsiedler (1985) conducted two studies to investigate the combined and separate influences of two features of play materials, realism and complexity, on elements of fantasy play in ?-to 6-year-old children. The first study showed the combined effect of low realism and low complexity (wooden cubes, sticks, pieces of cloth) to be an increase in the number of object transformations, this effect being more pronounced for older children. When complexity (i.e. the number of elements, specificity of identity or function of the toys) was held constant and only realism was varied in study 2 (the low-structure toys were stylized, less distinctly-shaped counterparts to the miniature figures, animals and houses of the high-structure set), the influence of toy structure was only significant with respect to older children. That is, only the older children engaged in more frequent object transformations with low-realism toys than with high-realism toys. A plausible explanation for this finding is that the low-realism objects in study 2, because of their greater functional specificity, presented a barrier to substitution which was more difficult to overcome for the younger, less symbolically developed children.

The low-realism toys (study 2) also elicited more role playing and less unoccupied behavior in older children, while in both studies, the low-structure sets stimulated more non-fantasy (e.g. building) activity and the high-structure sets

increased object and animal imitation/replica use, regardless of age.

These studies highlight the need for explicit defining criteria in the selection of low structure objects. Beyond adhering to the criterion of low specificity (as was done in study 1 of Einsiedler (1985) and in studies by McLoyd and her colleagues), an effort was also made in the present study to select low-structure toys that could be considered "real" objects in their own right, and not merely less realistic (and perhaps less attractive) but like-shaped versions of the more highly structured toys. Thus objects were chosen which, although they are much less restrictive in the variety of uses they suggest and the play themes they could elicit than facsimiles or replica toys, nonetheless have a specific identity and function in the real world. Examples are chopsticks, a tin cookie box, a long party flute (with the noisemaker removed), and a wicker lamp shade. The rationale for these choices was to create an experimental situation in which evidence of transformational complexity in children's pretend play could not be dismissed as an artifact of the nature of the toys comprising the low-structure toy set. Indeed, low-structure materials such as those used in previous studies are inherently more likely to be used as substitutes for other objects (Ungerer, Zelazo & Kearsly, 1981). This is due to the fact that objects such as sticks, cardboard boxes and styrofoam cartons (besides being rather

uninspiring things to play with) do not suggest any specific dramatic theme; therefore, they must usually be transformed (through similar or dissimilar substitution) in order that they may be assimilated to ongoing fantasies. By including low-structure objects which have a specific identity of their own, however, substitution is no longer a necessity and the objects can conceivably be used to perform their everyday functions (e.g., eating with chopsticks, using the cookie box to store freshly-baked cookies, etc.) in addition to serving as substitutes. The inclusion of real objects thus serves the purpose of allowing for a better match between toy sets in terms of transformational potential.

Little is known about the effects of toy structure or toy specificity on the pretend play behaviors of older children. Of primary interest in this study is the evolution with age of the relationship between toy specificity, maturity of spontaneous pretense and the child's ability to symbolize or gesturally represent absent objects (referred to hereafter as symbolizing ability). The maturity of spontaneous pretense is conceptualized in terms of the time spent engaging in high-level object and identity transformations as well as the time spent engaging in simultaneous object and identity transformations (e.g. a performer singing to an audience with a toy microphone) (Connolly & Doyle, 1984; Elder & Pederson, 1978 and Garvey & Berndt, 1977).

It is suggested that, due in part to their preference for high-structure toys, the degree of transformational complexity observed in the spontaneous play of older children with high-structure toys is an underestimate of their ability to symbolize and transform. That is, if (a) tested for symbolizing ability or (b) placed exclusively in the presence of low-structure toys, older children should display a higher incidence of the more sophisticated forms of object and identity transformations than younger children.

To assess their ability to symbolize, Overton and Jackson (1973) asked 3- to 8-year-old children to pretend to be using six common experimental objects (comb, toothbrush, cup, hammer, knife and scissors) in their usual action context, while the objects were not actually present. For instance, they were instructed to pretend they were combing their hair with a comb, or hammering a nail with a hammer, in the absence of a comb, hammer or nail. Three of the action sequences entailed actions directed toward the self (combing, brushing and drinking) while the remaining three were externally directed (hammering, and two cutting actions). It was predicted that older children would display greater representational capacity in "holding" and "operating" an imaginary object as if it were actually in their hand, while younger children would either be unable to represent the action sequence or would use a body part to concretize the object (e.g. running their fingers through their hair to

represent a comb). The results showed clear support for a developmental sequence of gestural representation. Moreover, they confirmed the authors' expectation that the ability to perform self-directed (SD) actions with imagined objects precedes the ability to perform externally-directed (ED) actions in the developmental sequence.

Unfortunately, Overton and Jackson's test included SD and ED items which were poorly matched in terms of the amount of motor coordination involved or the extent to which they could be considered routinized behaviors in the repertoire of the child (e.g. brushing teeth is much more familiar than hammering a nail). In our modification of the procedure, the items were chosen so that SD and ED actions were comparable on every dimension except for the target of the action (SD or ED). Thus, for example, the SD counterpart to an ED item requiring the child to pretend s/he is writing on a piece of paper with a pen, requires that s/he pretend to write on the palm of his/her hand with a pen.

Correlates of this symbolizing ability were expected to manifest themselves in older children's spontaneous play with low-structure materials, where, for example, they would be more likely to pretend a stick is a horse or even to "ride" an imaginary horse.

A similar line of reasoning applies to the complexity of spontaneous role enactment. That is, the age-related ideational propensity may continue to express itself as a

higher prevalence of the more sophisticated forms of identity transformations. Once again, we propose that factors linked to developmental stage and context (pressures to attend to reality, preference for toy realism), make it less likely that older children would display their more advanced ideational capacities with respect to roles if placed in the presence of toys which suggest precise functions. On the other hand, the presence of toys with relatively ambiguous functions and identities is expected to be more conducive to ideational forms of pretense, in general, and to role enactment, in particular. One line of evidence points to girls engaging in more ideational pretense whereas boys are more object oriented (Matthews, 1977; McLoyd, 1980; Doyle et al., under review). It may therefore be the case that the level of boys' pretense activity with low-structure toys will depend to some extent on whether they find the objects attractive and on how readily they can incorporate them to the roles they like to enact. In other words, toy structure may have different influences on boys and girls due to an observed sex difference in the degree of independence from material supports.

Another manifestation of older children's ability to free themselves from the control of their immediate perceptual environment is the degree of remoteness from personal experience and everyday life exhibited in the roles portrayed (Garvey, 1974; Garvey & Berndt, 1977). Thus, the

enactment of fictional or fantastic roles (Superman, Wonder Woman, pirate) would reflect a more mature form of pretense than the enactment of domestic c occupational roles (mother, doctor, waitress (Saltz, Dixon & Johnson, 1977; McLoyd, Warren & Thomas, 1984; Watson & Boyatsis, under review)). In agreement with previous findings (McLoyd, Warren & Thomas, 1984), it is predicted that low-specificity toys, due to their lack of "realism" and functional specificity, will elicit more complex types of roles (i.e., roles that are more removed from the child's experience). In addition, it is expected that this relation will be stronger as children get older.

Also of interest is the contribution of toy structure to the hypothesized increase in solitary pretense in later childhood years. Indeed, there is limited evidence suggesting that a decline in aspects of social pretense during the elementary school years might coincide with a rise in the amount of solitary pretense (Doyle et al., under review; Eifermann, 1971; Hetherington, Cox & Cox, 1979). In their review, Rubin et al. (1983) speculated that as social pretense gives way to social games with rules, solitary pretend play might be used as a means of "rehearsing" the skills necessary to participate in group game situations.

An alternative view is that older children's preference for highly structured toys promotes the likelihood of solitary pretense while precluding high rates of social

participation. According to this view, low structure toys would increase the probability of social interaction and communication about play activities because of a necessity to establish the identity and possible uses of the toys. On the other hand, perhaps children's knowledge of the uses of highly structured toys may lessen the need for social interaction centered on toy usage while increasing the probability of solitary pretense around these toys. Consistent with these predictions, McLoyd, Thomas and Warren (1984) found that the tendency to remain in a solitary state was lower and the likelihood of shifting to an interactive state was higher in sessions involving low-structure toys. In contrast, children were more likely to engage in solitary play in the high-structure toy sessions.

However, these findings were not limited to pretend play; rather, they applied to all play activities of the children. In an attempt to draw a more specific link between social organization and pretend activities, the present study assessed the amount and complexity of social participation in, and communication about pretend play as a function of toy structure.

Recently, several investigators have payed closer attention to the role of metacommunication (or meta-pretend communication) in the relation between pretend play and social development (e.g., Farver, 1987; Göncü & Kessel, 1984). They placed emphasis on the context for social

negotiation provided by pretense activities as opposed to the play itself. McLoyd, Thomas and Warren (1984) conceived of metacommunication as a message that clarifies how other verbalizations and behaviors should be interpreted, or establishes the appropriateness of behavior in a particular play context. While their findings were not restricted to fantasy play, these investigators reported that metacommunication was much more common in older than in younger triads of children, that it was more frequent among girl- than boy-triads, but that it was unrelated to the type of toy (high or low specificity) present. They also found that metacommunication increased the probability of maintaining an interactive state and that it increased the probability of initiating interaction only when low-specificity toys were present.

According to Bateson (1955), the exchange of metacommunicative signals conveying the message "this is play" is essential to the maintenance of social pretend activity. These signals permit sharing of the fantasy, making pretense actions and transformations mutually intelligible to play partners. In addition, negotiation of pretense is thought to foster social development by providing a context for the management of conflicts which can arise in the process of arriving at a consensus over the shared symbolization of objects, situations and identities (Rubin, Fein & Vandenberg, 1983; Göncü & Kessel, 1984).

As one form of metacommunication, negotiation is concerned with planning of the fantasy episode, description of transformations and the establishment of rules governing pretend behavior and occurs outside the framework of the fantasy. For instance, "Pretend we went camping and this was my sleeping bag (the child points to a piece of red imitation fur)", or "Pretend a skunk came; it was under my hat". Einsiedler (1985) showed that while low-realism-low-complexity materials raised the frequency of negotiation in study 1, this effect was eliminated in study 2 where the toy sets differed only with respect to realism. Thus, it would seem that the key factor responsible for increased metacommunication is not the lack of toy realism but low functional specificity, or the presence of toys which do not suggest any special theme.

The present investigation also examined metacommunication in the form of acknowledgement of pretense activities. That is, a smile, a nod, a laugh, or a comment on the transformations, was also considered metacommunication inasmuch as it conveyed an awareness of the pretend nature of the partner's behavior, a sharing of the fantasy. The amount of social participation in fantasy (specifically, the amount of solitary versus dyadic pretense), its social complexity (the amount of simple social play and complementary or reciprocal play) as well as the two forms of

metacommunication discussed above were all expected to increase in the presence of low-structure materials.

A final focus for this study was the evolution of sex differences in object use and role enactment in middle childhood and the effects of toy structure on such differences. Boys' and girls' differential exposure to sex-role behavior patterns would lead one to expect the expression of sex differences in both the use of objects and the portrayal of roles within fantasy enactments (Maccoby & Jacklin, 1974). However, the evidence concerning the differential incidence of social fantasy play in preschool boys and girls is inconsistent. For instance, some findings suggest that girls engage in a greater proportion of ideational fantasy (role enactment and pretense without any material supports (McLoyd, 1980)), whereas several sources have documented boys' greater incorporation of objects in their fantasies (Matthews, 1977; McLoyd, 1980; Fein, 1981; Doyle et al., under review). However, Cole and LaVoie (1985) failed to corroborate sex differences in ideational play.

A clearer picture begins to emerge when one considers the specific types of roles enacted by boys and girls. Thus, it can be seen that girls have a tendency to enact familial or domestic roles (Sanders & Harper, 1976; McLoyd, 1983), about which they probably share a considerable amount of knowledge. On the other hand, boys seem to prefer roles which are more remote from their experience, e.g. fantastic roles

such as that of an extra-terrestrial (Ceschin, unpublished master's thesis; McLoyd, Warren & Thomas, 1984). In light of this observation, boys' greater use of objects to support their pretend themes, in particular their greater use of substitutes to represent their fictional characters' equipment, may not be surprising. The availability of high- and low-structure toys which do not "pull" for sex-typed themes (i.e. domestic versus more physically intense fantastic themes) should help clarify issues of whether boys and girls differ in the extent to which they engage in abstract transformations of objects and identity.

In summary, if children beyond the preschool years show an increased preference for toys with a specific function and identity, the effects of such toys must be taken into account in analyzing component aspects of fantasy behavior in these later years. Such effects could include less imaginative and mature forms of pretend behavior and lower rates of social interaction, both of which run counter to our expectations concerning the school-aged child's symbolic and social skills.

Theoretical accounts and empirical evidence concerning developmental patterns in the effects of toy structure on the pretend play of young children led to the following hypothesis: Age was expected to interact with toy structure

such that, compared to younger children, older children would display higher levels of object and identity transformation (i.e. more abstract object transformations, more remote roles and more simultaneous object and identity transformations) in the presence of minimally structured materials than in the presence of highly structured materials. In addition, toy structure was hypothesized to affect the social organization of play behavior regardless of age, in that children would exhibit more social pretend play, more literal social activity and less solitary pretend play, higher levels of social interaction and more metacommunication with low-structure objects than with high-structure toys. Other hypotheses pertained more generally to the status of pretend play in middle childhood relative to other forms of play. In particular, evidence supporting the attainment in middle childhood of a more abstract form of thought and increasing symbolic maturity led to these predictions regarding developmental trends: With increasing age, children should display (a) an increased preference for highly structured toys; (b) a decrease in the overall amount of time spent in pretend modes of play; (c) an increase in the amount of time spent playing games-with-rules; (d) a greater capacity to symbolize imaginary objects; and (e) a greater capacity to engage in abstract object and remote identity transformations across toy conditions. In addition, we expected to replicate Overton and Jackson's (1973) finding that the ability to

symbolize objects involved in self-directed acts precedes the ability to symbolize objects in externally-directed acts. Finally, the capacity to symbolize imaginary objects was expected to be positively related to mature forms of spontaneous pretense activity, especially those occurring in the low-structure condition.

Method

Subjects

Thirty-two children from each of grades kindergarten, 1, 2 and 3 participated, with equal numbers of boys and girls in each grade. Children were from both lower and middle socioeconomic (SES) backgrounds, balanced within grade and sex. Within each grade, 8 same-sex, same SES dyads were formed among members of the same class. Friendship status of each dyad was assessed by having teachers in the participants' classes select the three classmates with which a given participant "got along the best" and the three classmates with which the participant "got along the least". An effort was made to balance the number of reciprocal friends (dyads whose members were selected in a mutual fashion by the teacher), non-reciprocal friends (dyads in which one of the children was not one of the three friendship choices of the other, as seen by the teacher), and neutral dyads (dyads whose members were not selected as friends or nonfriends by the teacher) across grade, sex and SES. Nonfriends, or children considered by the teacher as not getting along, were not paired. An analysis of variance of friendship status as a function of grade, sex and SES revealed no significant differences among groups or cells.

Children were fluent in English as reported by parents, and attended Pierre-de-Coubertin elementary school in the

Saint Leonard district of Montreal. Written parental consent was obtained prior to the inclusion of any child in the study.

Materials

The high-structure (HS) toys included replicas or miniature representations of everyday objects (doctor's kit, Playmobil set with ski and space accessories), dress-up materials (e.g., hand bag, felt top hats, jewelry, bow ties, lab coat), and a telephone. The rationale was to provide objects the identity and function of which is unambiguous to 5 1/2 to 9 year-olds. The low-structure (LS) toys were objects whose identity and function are not clearly specified because their referential relationship to "real-world" objects is more ambiguous or less constrained by physical characteristics (e.g. plastic tool box filled with different colored drink mixers, pipe cleaners, small containers etc.; variously-textured and shaped pieces of fabric; a Construx building set). A tossing game with four bean bags provided an opportunity for playing games-with-rules. In selecting the play materials, an effort was made to provide non sex-typed objects within and to equalize the variety, size, number and interest value of toys across HS and LS conditions. (See Appendix A for a complete list of play materials.)

Observational setting and procedures

Each dyad was observed for three sessions in a specially
designated room at the school. In the first session, lasting
24 minutes, the HS toys, the LS materials and a bean-bag
tossing game, representing the games-with-rules category,
were available. In this session, children selected their
toys and thus indicated any preference for structured versus
less structured toys. It was placed first to enable children
to familiarize themselves with and explore the possibilities
of the toy sets.

In session 2, half of the dyads played with the HS toys,
while the other half played with the LS toys. In the third
session, dyads played with the alternate toy set. These two
sessions lasted 20 minutes each.

In each session, the children were introduced to the
playroom and told that they were free to play as they wished
for 20 minutes or so, while the observers worked. The
sessions were recorded on videotape. The observers entered
the observational data directly into hand-held
micro-processors (OS-3 Units; Redmond, Washington), which
automatically record the duration and latency of behavior.
For session 1, the observers alternated between members of
the dyad at 2-minute intervals, yielding 12 minutes of data
per child. During subsequent sessions, half the children
were observed continuously for 20 minutes during the play

session while the other half (the other member of the dyad) was observed from videotape.

Coding categories relevant to the present study included the type of toy used, the occurence, duration and social organization of pretend play and literal activity (i.e. dyadic versus solitary activity) and the level of social interaction (parallel play, mutual regard, simple social play and complementary or reciprocal play (Howes, 1980)) within each play mode. In addition, the occurence and duration of children's involvement in games-with-rules were coded within instances of literal (non-pretend) activity. These games were characterized by the children's mutual acceptance of prearranged rules, a sense of competition, perhaps a keeping of the score, and a winner and a loser (e.g., tag, tossing game, marbles) (Piaget, 1962).

The symbolic properties of social and solitary pretend play were assessed by recording the level of object and identity transformations. Object transformations included, in order of increasing complexity (Elder & Pederson, 1978; Fein, 1975): a) objects as miniature replicas of objects in the real world (e.g. a toy stethoscope), b) animation of objects or onomatopoeia (e.g. making a doll walk or a car go "vroooom"!), c) use of similar substitutes (e.g. a stick for a fishing rod), d) use of dissimilar substitutes (e.g. a handkerchief for a fish) and e) invention of objects (e.g. cradling an imaginary baby). Identity transformation or role

enactments, in order of increasing remoteness from everyday experience (Saltz et al., 1977), were coded as a) within the child's experience (student, patient, child, sister), b) familial (mother, father, aunt), c) occupational (doctor, mailman), d) remote occupational and fictional (rock star, superman), and e) generalized character (e.g. an "old man" or an "angry woman", as indicated by general posture, intonation or expression without clear identification of a specific character).

Metacommunication (or communication about play) was subdivided into occurrences of pretend-play negotiation (including all plans, verbal descriptions and debates pertaining to the context of future or ongoing pretense episodes) and pretend-play acknowledgement, or the responses of children indicating that they have understood the "as if" nature of the other child's behavior (includes looking intently, smiling, laughing, commenting on transformations: "That's a funny witch!", etc.). (see Observation Manual in Appendix B)

Reliability of observational data

From the videotapes, a second coder independently checked the reliability of the primary coder's observations on 20% of the data distributed across sessions. Observer reliability was calculated for each category of observational codes used in the present study, using both Cohen's (1960)

Kappa coefficient, to control for chance agreement, and percent agreement. Percent agreement refers to the percentage of 10-second intervals for which the two obervers agreed on a given code grouping. Observers were trained for approximately 48 hours prior to data collection using videotapes from previous observational studies under the supervision of experienced coders. Once 80% agreement was reached for Mode of play (see Appendix B), practice sessions with tapes of the present study's play sessions were conducted. These sessions involved reliability assessments and group discussions over disagreements and were held weekly throughout the data collection phase to prevent observer "drift" or a departure from preestablished coding criteria.

Individual measure of symbolizing ability (see Appendix C)

A measure of symbolizing ability, based on Overton and Jackson's (1973) test of the level of object representation, was used to assess the child's capacity to represent action sequences with absent or imaginary objects. The test was administered to the children individually in a separate classroom. The observations of free play and the testing of symbolizing ability took place concurrently. Ten sequences of the revised measure were scored according to three categories which have been theorized to follow a developmental trend: No Representation (scored 0); Representation Using a Body Part as the experimental object

(scored 1); and Symbolic Object (scored 2), i.e. the use of hands as if correctly holding or operating the experimental object. Total scores ranged from 0 to 20. Five of the 10 action sequences were self-directed (SD) or performed with the self as target (e.g. eating with a fork), and the other five were externally directed (ED) (e.g. feeding a doll with a fork). To control for SD/ED order effects, the experimenter alternated between SD and ED items. To control for any additional order effects, three scoring sheets were prepared, each one corresponding to a different order of administration of the items. Interjudge reliability, based on the ratings of a second judge for 15 children was .91 for scoring on the SD items, and .99 on the ED items. Pilot testing of a sample of 22 middle- and lower-SES children in a YMCA daycamp and at Lionel Groulx elementary school revealed no ceiling effect for the older age groups of 8- and 9-year-olds. In addition, no significant differences were found between performance on SD and ED items in these age groups.

Results

Data reduction

The variable games-with-rules was dropped from the analyses because of its low frequency (fewer than 50% of the children had non-zero scores on this variable). Hypotheses pertaining to the incidence of games-with-rules could, as a consequence, only be addressed indirectly by assessing differences in the amount of time children spent playing with the bean bag tossing game, a toy which is conducive to rule-governed games.

In view of the high number of object and identity transformation variables and since many dyads did not engage in all of the transformational activities, scores were combined by summing across conceptually related categories. Thus, a measure of time in abstract object transformations was obtained by combining time in similar, dissimilar and imaginary representation of objects, and a measure of time in remote identity transformations was obtained by combining time in occupational, fictional and character roles. In addition, the familial, occupational and fictional role variables were analyzed separately so as to provide a more direct comparison of findings to earlier investigations. Finally, simple social play and complementary or reciprocal social play categories were combined to obtain a measure of high-level social interaction in both pretense and literal contexts, because

they both require active involvement with the partner as a participant in play.

There were interdependencies in the individual-child behaviors coded, e.g. if one child was engaging in social pretend play, invariably, the other child's behavior must also have been coded as social pretense. Therefore, measures describing the spontaneous play activity of each child in the dyad were averaged and the resulting dyad scores (n=64) used as the units of further analysis.

Reliability

Inter-rater reliabilities were computed on 20% of the observation trials by dividing the number of agreements by the total number of agreements and disagreements and by calculation of Cohen's Kappa ($\underline{K}$) (Cohen, 1960). Reliability estimates pertain to groups of codes belonging to related behavior categories, thus implying agreement in the discrimination among codes in a particular group. However, raters were trained to obtain agreement on particular codes. The mean percentage of agreement across all three conditions (mixed-toy, HS and LS) for discriminating among activity modes (social pretense, social literal activity, negotiation, acknowledgement of pretense, solitary pretense, solitary literal activity or other) was 81% ($\underline{K}$ = .66). For discriminating levels of social interaction (high vs. low), the percentage of agreements was 93% ($\underline{K}$ = .81). Raters agreed

on 86% of observations in discriminating concrete object transformations (replica use and animation) from abstract object transformations (similar substitution, dissimilar substitution and imaginary representation) ($\underline{K}$ = .75). Agreement for discrimination of proximal identity transformations (self-experienced and familial roles) from remote identity transformations (occupational and fictional roles) was 83% ($\underline{K}$ = .73). Finally, agreement for discrimination among specific toys in use was 95% ($\underline{K}$ = .92) for both the HS toys and LS toy sets. A summary of reliability estimates is provided in Table 1.

Table 1

Inter-observer reliability for code categories

Code category	% Agreement	Kappa
Activity mode	81.5	.659
Social interaction level	93.4	.809
Object transformation level	86.5	.755
Identity transformation level	82.7	.726
HS toys	94.8	.916
LS toys	95.0	.922

Overview of the analyses

The first set of analyses involved data from HS and LS conditions, and concerned the influence of grade, sex and toy structure --with repeated measures on the toy structure factor-- on measures of communication regarding pretend play, social involvement in play and maturity of transformational activity. As a first step in all repeated measures analyses, the hypothesis that toy structure influences depended on the order of presentation of HS and LS toy sets was tested. Thus, two-way analyses of variance as a function of toy structure and order were performed prior to assessing any other effects in order to establish whether an interaction between these two factors needed to be taken into account in subsequent analyses. This procedure was followed because the relatively small n (64) precluded a valid complete analysis including all four factors of grade, sex, toy structure and order. If a toy structure by order interaction was not found, a three-way analysis of variance was performed involving grade, sex and toy structure and it was assumed that the order factor did not mediate the effects of structure. Where the toy structure by order interaction was significant, three-way analyses were done involving a different combination of factors: grade (4), sex (2) and toy structure (2); grade (4), toy structure (2) and order (2); and sex (2), toy structure (2) and order (2), so as to permit an examination of all three-way interactions of interest. In this case, only those effects that emerged as

consistently significant across the three-way analyses were reported, in order to circumvent an increased probability of Type I error.

Since the two measures of communication, negotiation and pretense acknowledgement, were not statistically related (r =.20, p >.10), they were analyzed via univariate analyses of variance (ANOVA's). Variables pertaining to social involvement were subdivided into quantitative measures (time in social pretend play, solitary pretend play, and literal social activity) and qualitative measures or measures of complex social interaction (high-level social interaction in a pretend context and in a literal context). Multivariate analyses of variance (MANOVA's) were used to analyze the first set of variables. Table 2 presents Pearson correlations for the social interaction variables included in the MANOVA. Since there was wide individual variability in the amount of social pretense and literal interaction engaged in by the dyads, analyses of covariance (ANCOVA's) were performed to partial out these individual differences from the measures of high-level social interaction.

Hypotheses pertaining to the maturity of pretense activity were addressed via measures of the time in abstract object transformations, remote identity transformations and simultaneous object and identity transformations. These variables were clustered in multivariate analyses of covariance (MANCOVA's), with time in social pretend play as

Table 2

Intercorrelations between social involvement variables

	Social literal	Solitary pretense[a]
Social pretense	-.75**	.13
Social literal	___	-.31*
Solitary pretense		___

[a]the logarithmic transformation was used for this variable.

*p <.05

**p <.001

a covariate. The latter was covaried as a way of controlling for individual differences in the amount of pretense engaged in, which could obscure group and cell differences in the qualitative aspects of pretense. Specific identity transformations (familial, occupational and fictional role

enactments) were also analyzed via MANCOVA's, with time in social pretense once again serving as a covariate. Partial correlations among the transformational variables included in these two MANCOVA's are presented in Table 3. Wherever MANOVA's or MANCOVA's were performed, univariate results were only interpreted if the overall multivariate F was significant.

A second set of analyses was performed on data from the mixed-toy condition, in which all three toy categories (high structure, low structure and tossing game) were available, to assess any grade or sex differences in the amount of time spent with each toy category. A repeated measures ANOVA, with toy category as the repeated factor, was used to assess preference for any given toy set.

A final set of analyses concerned scores obtained from the test of symbolizing ability. These were analyzed for effects of grade, sex and target of the action (self-directed or externally-directed). In addition, the relationship of these scores to the spontaneous measures of mature pretense activity and duration of pretense episodes were examined via hierarchical regression analyses in which the prediction of symbolizing ability from the measures of abstract object transformations, remote role transformations, simultaneous identity and object transformations and duration of pretense was assessed.

Table 3

Intercorrelations between transformational variables and
specific identity transformations, adjusted for time in social
pretense (n=61)

Transformational variable	Abstract objects	Remote roles	Roles and objects
Abstract objects	—	.11	-.59**
Remote roles		—	-.04

Identity transformations	Familial	Occupational	Fictional
Familial	—	.35*	.41**
Occupational		—	.38*

Note. A square root transformation of Remote role scores, raw
scores for Roles and objects and logarithmic transformations
of all other scores were used to obtain correlations.

*p <.01

**p <.001

For each analysis, an evaluation was made of the degree to which the data conformed to statistical assumptions of normality, independence among variables in a cluster, and homogeneity of variance and variance-covariance matrices. Results were satisfactory. No univariate outliers were found, however a small number of multivariate outliers (max = 3 per cell (n=8), p < .01) were found. It was judged that these did not pose a threat to the validity of results since the variables involved were skewed in the same direction (Tabachnik & Fidell, 1983). Certain variables (time in negotiation, aknowledgement, solitary pretend play, high-level social interaction in the context of pretense, high-level object transformations, remote roles and duration of pretense) were transformed to correct for skewness and for violations of the homogeneity of variance-covariance assumption. Due to moderate positive skewness, time in remote roles was subjected to a square-root transformation whereas the remainder of the above-mentioned variables were more highly skewed and were subjected to logarithmic transformations. Violations of homogeneity of regression were found in the MANCOVA's on transformational activities. However, since these violations produce negatively biased F tests, significant results can be considered valid. For the regression analyses, residual scatterplots were examined: no major violations of the assumptions of normality, linearity and homoscedasticity were evident.

Amount of social pretense

Since a 2 x 2 ANOVA of time in social pretense as a function of toy structure and order revealed no significant interaction of these two factors, a 4 x 2 x 2 ANOVA was conducted to assess whether the amount of social pretend play varied systematically as a function of grade, sex and toy structure. No significant effects were found. On the other hand, when the same analyses were performed with the frequency (or total number of social pretend episodes) as the dependent variable, as opposed to the total time in social pretense, a significant toy structure by order interaction emerged, $F(1,62) = 5.98$, $p < .05$. (Analysis of variance summary tables are presented in Appendix D.) Tukey's HSD tests revealed that the children engaged in more frequent pretend episodes with LS toys than with HS toys, but only when the HS toys were presented first. Table 4 presents means and standard deviations for this interaction. There were no other significant effects. Thus, results do not support the hypothesis of a decrease in either the total time in social pretense or the frequency of discrete social pretense episodes with age. However, the frequency of pretending does seem to vary as a function of the structure and order of presentation of toys.

Table 4

Mean frequency of pretense episodes as a function of toy
structure and order

Order	High structure		Low structure	
	M	(SD)	M	(SD)
HS -> LS	3.40	(2.69)	4.69	(3.54)
LS -> HS	4.45	(3.00)	3.87	(3.29)

Communication in social pretend play

A two-way ANOVA of pretense negotiation scores was
conducted to investigate toy structure and order effects. A
significant main effect of toy structure was obtained, $F(1,62)$
= 7.39, p <.01. Contrary to expectations, the results
indicated that the children negotiated more when they played
with HS toys than when they played with LS toys (M = 119.84s
vs. 57.02s).

An ANOVA of pretense acknowledgement scores as a function of toy structure and order was performed, revealing a significant interaction of these two factors, $F(1,62) = 8.22$, p <.01. There were no significant main effects. Post hoc comparisons using Tukey's HSD test establish that children acknowledged their partner's pretense less in the presence of HS toys when these were presented first than in any other condition (p <.05). Table 5 displays means and standard deviations for time in acknowledgement as a function of toy structure and order.

In addition, a three-way ANOVA of acknowledgement scores as a function of grade, sex and toy structure yielded a significant sex difference, $F(1,56) = 14.41$, p < .001, with boys engaging in more acknowledgement of pretense than girls ($M = 24.73s$ $M = 13.26s$). No other results were significant.

Amount of social involvement

Differences due to toy structure and order of toy sets in the amount of social involvement in play activities were examined in the context of both pretend and literal play via a two-way MANOVA. Dependent variables included time in social pretend play, time in solitary pretend play and time in literal social activity.

An interaction of toy structure and order was found, $F(3,60) = 3.48$, p < .05; however there were no significant

Table 5

Mean number of seconds of acknowledgement as a function of toy
structure and order

Order	High structure		Low structure	
	$\underline{M}$	$(\underline{SD})$	$\underline{M}$	$(\underline{SD})$
HS -> LS	13.31[a] (20.88)		22.44[b] (20.83)	
LS -> HS	20.33[b] (24.84)		19.90[b] (27.46)	

Note. Means with different superscripts differ significantly
at p <.05

main effects. Univariate $\underline{F}$ tests revealed that the
interaction pertained specifically to the time in solitary
pretend play, ($\underline{F}(1,62) = 5.00$, p <.05, and to the time in
literal social activity, $\underline{F}(1,62) = 7.79$, p <.01. For solitary
pretense, post hoc comparisons using Tukey's tests showed that
children engaged in more solitary pretense with the LS toys
when these were presented second than when they were presented
first (p <.05). There was no difference in the amount of
solitary pretense with HS toys as a function of order. As

regards the amount of literal social activity, Tukey's tests showed that children engaged in less literal social activity with the HS toys when these were presented second than in any other combination of toy structure and order (p <.01). Table 6 shows means and standard deviations for solitary pretense and literal social activity as a function of toy structure and order. No other consistent significant effects emerged from the three-way MANOVA's involving combinations of grade, sex, toy structure and order.

Level of social involvement

In addition to differences in quantity of social involvement differences in the quality or level of social interaction were investigated. ANCOVA's of high-level social interaction in a pretend or a literal context were performed to partial out individual variability in the amount of social pretense or literal social activity.

For socially complex interaction in the context of pretend play, no significant effects emerged from either the two-way ANCOVA, assessing toy structure and order influences, or the three-way ANCOVA, assessing grade, sex and toy structure influences. In the literal context, however, the three-way ANCOVA revealed a significant effect of grade on time in high-level interaction, $F(3,55) = 3.00$, p <.05.

Table 6

Mean number of seconds of solitary pretense and social literal
activity as a function of toy structure and order

Order	High structure		Low structure	
	$\underline{M}$	$(\underline{SD})$	$\underline{M}$	$(\underline{SD})$
Solitary pretense				
HS -> LS	32.09[a,b]	(55.22)	42.34[a]	(68.20)
LS -> HS	52.91[a,b]	(91.30)	31.09[b]	(50.42)
Social literal				
HS -> LS	748.85[c]	(312.49)	726.16[c]	(263.95)
LS -> HS	577.09[d]	(308.45)	768.52[c]	(267.92)

Note. For solitary pretense, post hoc tests were conducted on
transformed means.

[a,b]Means with different superscripts differ significantly at p
<.05.

[c,d]Means with different superscripts differ significantly at p
<.01.

Tukey's tests indicated that both first and third graders engaged in more high-level social interaction in a literal context than kindergartners (p <.05). Means are presented in Table 7.

Transformational activity

A two-way MANCOVA of transformational scores as a function of toy structure and order did not yield a significant interaction of these two factors. Therefore, a MANCOVA of the three measures of high-level transformational activity: time performing remote object transformations, remote identity transformations and simultaneous object and identity transformations, was calculated as a function of grade, sex and toy structure. Time in social pretense was used as a covariate to reduce error variability. In this case, the nature of the measures provided added justification for the use of analysis of covariance. That is, the number of seconds dyads engage in high level transformations is predicated on the number of seconds they spend pretending. Therefore, it is important to obtain a measure of the quality of pretense which is independent of the (previously analyzed) amount of pretending that occurred.

Table 7

Mean number of seconds of high-level literal social

interaction as a function of grade, adjusted for time in

literal social activity

Grade	Social interaction
K	335.94[a]
1	490.21[b]
2	471.84[a,b]
3	572.07[b]

Note. Means with different superscripts

differ significantly at p <.05

A multivariate effect of toy structure emerged, $F(3,53)$ =
60.11, p <.0001. Univariate F tests revealed that all three
transformational variables were significantly affected
(abstract object transformations: $F(1,55)$ = 144.24,
p <.0001; remote identity transformations: $F(1,55)$ = 45.73, p
<.0001; and simultaneous object and identity transformations:
$F(1,55)$ = 50.71, p <.0001) by the toy structure manipulation.
An examination of the means for each variable (see Table 8)

indicates that while dyads engaged in more abstract object transformations with the LS toys than with the HS toys, they made more remote identity transformations and more simultaneous identity and object transformations in the HS condition than in the LS condition.

The MANCOVA also yielded a significant effect of grade, $F(9,129) = 2.17$, p <.05. Univariate tests showed that abstract object transformations was the only variable which contributed to the grade differences, $F(3,55) = 4.51$, p <.01. Tukey's post hoc comparisons revealed that grade 3 children engaged in more abstract object transformations than either grade 2 children or kindergartners, p <.05. Means and standard deviations are shown in Table 9.

In view of the fact that predictions concerning the greater prevalence of remote role and simultaneous identity and object transformations in the LS condition were not confirmed, the possibility that LS materials enhanced the frequency as opposed to the total duration of remote roles and simultaneous transformations was explored as an alternative hypothesis. Thus, a MANCOVA of frequency scores as a function of grade, sex and toy structure was performed, with frequency of social pretense episodes as a covariate. This analysis yielded a significant main effect of toy structure, $F(2,54) = 12.90$, p <.0001. Univariate F tests showed that the toy structure effect pertained both to the frequency of remote roles, $F(1,55) = 26.23$, p <.0001 and

Table 8

Mean number of seconds for each transformational activity as a function of toy condition, adjusted for time in social pretense

	Condition	
Variable	High structure	Low structure
abstract objects	12.59	180.53
remote roles	123.13	59.72
roles and objects	183.10	101.50

Table 9

Mean number of seconds for each transformational activity as a function of grade, adjusted for time in social pretense

	Grade			
	K	1	2	3
abstract objects	76.72[a]	105.36[a,b]	87.14[a]	117.02[b]
remote roles	97.37	80.26	115.62	72.44
roles and objects	153.08	130.40	152.74	132.97

Note. Means with different superscripts differ significantly at p <.05.

of simultaneous role and object transformations, $F(1,55)$ = 4.79, p <.05. Children engaged in more frequent remote role enactments and more frequent simultaneous transformations with HS toys than with LS toys (M= 2.57 vs. 1.28 and 5.90 vs. 3.95, respectively). Therefore, contradicting both initial and alternative hypotheses, the HS toys led to greater total time in remote roles and simultaneous transformations, and to higher frequencies of these variables than the LS materials.

Two-way and three-way MANCOVA's as a function of toy structure and order, and grade, sex and toy structure were also performed on familial, occupational and fictional role enactment scores to explore further the relationship between these factors and specific identity transformations examined in previous studies. Since the two-way MANCOVA did not yield a significant interaction of toy structure and order, only the results of the three-way MANCOVA will be considered. These revealed a significant multivariate effect of toy structure $F(3,53) = 13.11$, p <.0001. The univariate F tests were significant for occupational roles, $F(1,55) = 24.99$, p <.0001, and for familial roles, $F(1,55) = 18.15$, p <.001, but not for fictional roles. Inspection of the means, shown in Table 10, establishes that children engaged in more familial and occupational role enactment with the HS toys than with the LS toys.

A significant main effect of sex, $F(3,53) = 4.98$, p <.01, and an interaction of grade and toy structure, $F(9,129) = 2.21$, p <.05, were also obtained from the three-way MANCOVA. Univariate tests indicated that the sex differences occurred in the enactment of fictional roles, $F(1,55) = 7.77$, p <.01, with boys engaging in more fictional role enactment than girls ($M = 36.37s$ vs. $M = .05s$). The univariate tests also demonstrated that the interaction of grade and toy structure pertained to occupational and fictional roles: $F(3,55) = 4.09$, p <.01 and $F(3,55) = 2.82$, p <.05, respectively.

Table 10

Adjusted mean time in identity transformations as a function
of toy structure and grade (in seconds)

Group	Identity transformation		
	Familial	Occupational	Fictional
High structure	.96	1.13	1.29
Kindergarten	.95	.65	1.17
Grade 1	1.25	1.37	1.48
Grade 2	.77	1.38	1.24
Grade 3	.88	1.14	1.26
Low structure	.77	.71	.77
Kindergarten	.64	.65	.71
Grade 1	.53	.97	.89
Grade 2	.89	.91	.94
Grade 3	1.01	.30	.56

Note. The values are logarithmic transformations of time
scores, permitting a clearer appraisal of the relationship
among the means.

Scheffé tests showed that second and third graders spent more
time enacting occupational roles with the HS toys than with
the LS toys (p <.05), whereas there was no differential effect
of toy structure in kindergarten and grade 1. In addition,
third graders spent more time enacting fictional roles with
the HS toys than with the LS toys (p <.05). No differential
toy structure effects emerged in the lower grades. It was
also apparent from Scheffé tests that, in the presence of HS
toys, occupational roles increased between kindergarten and
the following grades, whereas in the presence of LS toys, they
decreased from grades 1 and 2 to grade 3 (p <.05). No grade
differences were found within toy structure conditions for
fictional roles. Means for these effects are also shown in
Table 10.

Toy preference

To compare the amount of time spent with the different
toy categories (HS toys, LS toys and tossing game) and
investigate grade and sex differences, an ANOVA of time scores
as a function of grade, sex and toy category with repeated
measures on the toy category factor was conducted.
Greenhouse-Geisser conservative F tests were used in case of
violations of the assumption of covariance homogeneity.

A main effect of toy category, $F(1,56) = 45.62$, p <.0001,
revealed a general preference for HS toys over the two other

toy sets as well as a preference for pretense-oriented toys (both HS and LS sets combined) over the tossing game, i.e. the toy inciting to games-with-rules (Scheffé's: p <.01). In addition, an interaction of sex and toy category, $\underline{F}(7,24) =$ 7.41, p <.01, revealed that these findings were truer of girls than of boys. For boys, only the preference for HS toys over the tossing game was significant, p <.01. Relevant means appear in Table 11.

Finally, toy category interacted with grade, $\underline{F}$ (7,56) = 3.13, p <.01, such that kindergarten and grade 1 children preferred the pretense-oriented toys to the tossing game and grade 1 children also preferred the HS toys to the LS toys (p <.01). No significant pattern of preferences emerged in grades 2 or 3. Pairwise comparisons across grades revealed that grade 2 and grade 3 children spent more time with the tossing game than kindergarten and grade 1 children, and that grade 3 children spent less time with the HS toys than grade 1 children (Tukey's: p <.05). Means as a function of toy category and grade are depicted in Table 12.

Symbolizing ability

To compare grades and sexes on their ability to represent absent objects gesturally and to assess any differential effect of directing symbolic action sequences toward the self as opposed to an external object (target of the action

Table 11

Mean number of seconds spent with toys as a function of toy
category and sex

| | Toy category | | |
| Group | HS | LS | Game |

Total sample

| M | 357.80^a | 222.68^b | 91.92^b |
| (SD) | (152.16) | (135.36) | (140.12) |

Boys

| M | 313.72^a | $207.23^{a,b}$ | 151.57^b |
| (SD) | (164.68) | (152.64) | (173.96) |

Girls

| M | 401.88^a | 238.12^b | 32.27^b |
| (SD) | (126.19) | (115.94) | (47.92) |

Note. Means with different superscripts differ significantly
at $p < .01$.

Table 12

Mean number of seconds playing with toys category as a
function of grade

	Toy category		
	HS	LS	Game
Kindergarten			
$\underline{M}$	393.77[a]	246.86[a]	38.98[b]
($\underline{SD}$)	(160.56)	(153.87)	(90.24)
Grade 1			
$\underline{M}$	436.94[a]	192.24[b]	32.85[b]
($\underline{SD}$)	(134.12)	(146.97)	(54.36)
Grade 2			
$\underline{M}$	317.67	225.65	135.35
($\underline{SD}$)	(140.53)	(113.41)	(166.93)
Grade 3			
$\underline{M}$	282.82	225.96	160.49
($\underline{SD}$)	(133.99)	(131.07)	(172.52)

Note. Means with different superscripts differ significantly
at $p < .01$.

sequence), an ANOVA on symbolizing scores was conducted as a function of grade, sex and target of the action. A main effect of grade and a grade by sex interaction emerged as significant, F (3,120) = 14.14, p <.001 and F (3,120) = 3.34, p <.05, respectively. However, in contrast to Overton and Jackson (1973), there was no main effect of target (F (1,120) = 3.72, p >.97), suggesting that self-directed representations are not more easily acquired than externally-directed representations. Table 13 presents mean symbolizing ability scores as a function of grade and sex.

Using Tukey's HSD test for pairwise comparisons, second graders and third graders were found to score significantly higher than first graders and kindergartners on overall symbolizing ability (p <.01), although the two highest and the two lowest grades did not differ significantly from one another. An examination of simple effects for the grade by sex interaction revealed that the grade effect was significant for both boys and girls, F (3,120) = 10.49, p <.0001 and F (3,120) = 7.00, p <.001, respectively, and that there were no significant sex differences within each grade. However two trends emerged: in grade 2, there was a tendency for girls to score higher than boys, F(1,120) = 2.98, p <.10, whereas boys tended to score higher than girls in grade 3, F(1,120) = 2.76, p <.10.

Table 13

Mean symbolizing ability scores as a function of grade and sex within grades

| | Total sample | | Sex | | | |
| | | | Boys | | Girls | |
Grade	M	(SD)	M	(SD)	M	(SD)
Kindergarten	11.03	(2.17)	10.37	(2.12)	11.68	(2.09)
Grade 1	12.16	(2.36)	12.87	(2.78)	11.43	(1.63)
Grade 2	14.19	(3.21)	13.37	(3.20)	15.00	(3.10)
Grade 3	14.84	(3.02)	15.62	(3.36)	14.06	(2.50)

Relationship of symbolizing ability to spontaneous pretense
activity

Separate hierarchical regression analyses were performed
to determine whether individual differences in the performance
of spontaneous pretense activities (abstract object
transformations, remote identity transformations, simultaneous
role and object transformations and average duration of
pretense episodes) were predictive of experimenter-elicited
symbolizing ability. Since a conceptual distinction among the
spontaneous variables is implied by the previous results,
showing differential influences of HS and LS toys on the
various forms of transformational activity, separate
regressions were calculated for each of the spontaneous
variables in both HS and LS conditions.

In these analyses, individual scores were used (n = 128)
because symbolizing ability pertains to the individual child
and could not be averaged over dyads. However, since
interdependencies exist in the spontaneous predictor measures,
the degrees of freedom for error were reduced by one half to
provide more conservative tests of significance.

Three hierarchical regressions were conducted in which
the added prediction of symbolizing ability afforded by each
spontaneous transformational variable over and above that
afforded by grade and time in social pretense were assessed.
That is, in view of the finding that symbolizing ability

increases as a function of grade level, it was assumed that grade level would account for a significant portion of the variance in symbolizing ability scores. Therefore grade level was entered first in the regression equation. Moreover, time in social pretense was entered in step 2 to partial out individual variability associated with the quantity of social pretense.

A fourth hierarchical regression was conducted for the prediction of symbolizing ability from grade level (step 1) and the average duration of pretense episodes (step 2). In this case, total time spent pretending was not partialled out, as it was already entered in duration.

Results of the four regression analyses in the HS condition are shown in Table 14. These include standardized regression coefficients ($\underline{Beta}$), semi-partial correlations ($\underline{sr}^2$), $\underline{R}^2$ and adjusted $\underline{R}^2$ after each step· When considered alone in step 1, grade level accounted for a significant proportion (24%) of the variance in symbolizing ability, $\underline{R}^2$ = .24, $\underline{F}(1,63)$ = 39.31, p <.001. In step 2, time in social pretense did not provide a significant increment in the proportion of explained variance although the prediction equation remained significant overall, $\underline{R}^2$ = .25, $\underline{F}(1,62.5)$ = 20.56, p <.001. The inclusion of time in abstract object transformatioi.з after step 3 of the first regression likewise did not add significantly to the prediction of symbolizing

ability, R^2 = .26, $F(3,62)$ = 14.20, p <.001 (R^2 change = .01, p >.24).

Similarly, in step 3 of the second and third regression analyses, no reliable improvement in prediction was afforded by including either time in remote identity transformations, R^2 = .27, $F(3,62)$ = 15.17, p <.001 (R^2 change = .02, p >.06), or time in simultaneous transformations, R^2 = .25, $F(3,62)$ = 14.16, p <.001 (R^2 change = .01, p >.26).

In the fourth regression involving grade level and average duration of pretense as predictors, the sample size was reduced (from N = 128 to N = 104) because the scores of children who did not engage in social pretense were dropped from the analysis. After step 1, grade level accounted for 19% of the variance in symbolizing ability, R^2 = .19, $F(1,51)$ = 23.51, p <.001. The addition of average duration of pretense in step 2 resulted in a significant increment in the shared variance between predictors and symbolizing ability, R2 = .24, $F(1,50.5)$ = 15.66, p <.001 (R^2 change = .05, p <.05). The relationship was negative, indicating that symbolizing ability scores increased with a decrease in the average duration of social pretense episodes.

Results were similar with data from the LS condition, except that average duration of pretense episodes no longer enhanced the predictability of symbolizing ability over that afforded by grade level. Therefore, the hypothesis that a relationship between spontaneously displayed and elicited

symbolization would be stronger in the LS condition was not
supported.

Table 14

Separate hierarchical regressions predicting symbolizing
ability from grade, amount of social pretense and qualitative
pretense variables in the HS condition

Variable	Beta	sr^2	R^2	Adj.R^2	R^2 change
Step 1[a]					
Grade	.49**	.24**	.24**	.23	
Step 2					
Grade	.49**	.24**			
Social pretense	-.10	.01	.25**	.23	.00
Step 3					
Grade	.46**	.20**			
Social pretense	-.14	.02			
Abstract objects	.10	.01	.26**	.24	.01
Step 3					
Grade	.47**	.22**			
Social pretense	-.26*	.03*			
Remote roles	.22	.02	.27**	.25	.02

[a]Steps 1 and 2 are identical in the first three regressions

*p <.05

**p <.001

Table 14 (cont.)

Variable	Beta	sr^2	R^2	Adj.R^2	R^2 change
Step 3					
Grade	.49**	.24**			
Social pretense	.23	.00			
Roles and objects	-.34	.01	.25**	.24	.01
Step 1					
Grade	.43**	.19**	.19**	.18	
Step 2					
Grade	.44**	.19**			
Duration	-.22*	.05*	.24**	.22	.05*

*p <.01

**p <.001

Discussion

This study was designed to determine the effects of varying toy structure on qualitative aspects of fantasy play, communication about fantasy and social interaction, for children in the middle childhood years. It was also aimed at uncovering developmental trends in pretense behavior, in a spontaneous play situation and an elicited play procedure, as well as their relationship to toy structure and age-related toy preferences.

The prediction that older children would engage in more abstract object and identity transformations with low-structure toys than younger children was not confirmed by the results. That is, interactions of grade and toy structure did not emerge as significant. Instead, children engaged in more abstract object transformations with the low-structure toys regardless of age, and older children engaged in more abstract object transformations than younger children regardless of toy structure. In addition, children also made more remote identity transformations and more simultaneous object and identity transformations with the highly structured toys than with the less structured objects.

Thus it seems that older children are not more likely to display their greater propensity for abstract representation of objects with low-structure materials. These materials "pulled" for abstract transformations across age groups.

Moreover, the low-structure materials' "pull" for abstract transformations does not appear to extend to identity transformations or to a --presumably more complex-- combination of identity and object transformations. On the contrary, the greater prevalence of these activities in the presence of high-structure materials suggests that the enactment of roles, with or without accompanying object transformations, is fostered by the greater evocative power of toys suggesting specific themes and functions. For instance, it might be easier to enact and sustain doctor-patient roles when the doctor's kit is available to remind one of various facets of a doctor's activities.

The possibility was explored that higher-level identity transformations enacted in the low-structure context were of shorter duration due the relative lack of supportive props and that measurements of the frequency of role enactments may have uncovered differential toy structure influences not tapped by measurements of "total time". However, the analysis of frequency scores revealed that, whether or not remote role enactments and simultaneous identity and object transformations were of shorter duration in the ambiguous toy context, they occurred more frequently in the high-structure toy context. This suggests that high-structure materials not only voke longer or more elaborate enactments, but also a greater variety of roles.

As regards the enactment of specific types of roles, the greater incidence of familial and occupational roles in the presence of high-structure toys was consistent with the findings of McLoyd, Warren and Thomas (1984). In the latter study, these roles were considered to require less advanced ideational skills than fantastic or fictional roles because they remain within the realm of children's everyday experience. These results highlight the relatively concrete nature of identity transformations evoked in the high-structure context and their dependence on the thematic characteristics of the objects (e.g. Playmobil figures and miniature skis eliciting a skier's role and the musical instruments inviting a musician's role). However, contrary to the earlier findings, children did not enact more fictional or fantastic roles with the low-structure toys than with the high-structure toys. This discrepancy may be related to the greater availability of popular high-structure toys suggesting fantastic roles (the Playmobil spacemen and robots).

The finding that high-structure toys elicited more occupational roles in older children than in younger children suggests that, as they grow older, children become more interested in the rehearsal and elaboration of roles they might encounter in later life (e.g. doctor, salesman, telephone operator), and that they are more likely to enact these roles with objects that increase the realism of their occupational dramatizations. In contrast, it seems that the

enactment of occupational roles decreases with age in the presence of low-structure toys, highlighting the importance of realistic props in the older child's anticipatory fantasies. On the other hand, third graders also seemed to enact more fictional roles (spaceman, superman) with the high-structure toys than with the low-structure toys. Although this may be attributable to the older child's ability to make remote identity transformations despite the specific nature and functions of the toys, a more parsimonious interpretation is that an intricately detailed spaceship model is more inspiring to the older child because of his greater capacity for accommodation, and that such a prop is more likely to evoke the enactment of favorite fantastic scripts.

Predictions concerning the greater prevalence of social participation, either during fantasy play or during literal social activity, in the presence of low-structure toys were only partially supported. There were no differences in the amount of social pretense in the two toy conditions. The amount of literal social activity was equally high in low-structure and high-structure conditions, except that literal social activity was lower with high-structure toys when these were presented second. Finally, solitary pretense was somewhat higher with the low-structure toys when they were presented second than when they were presented first. Thus although social participation did not increase with ambiguous

toys, it decreased with the high-structure toys presented second.

Previous investigations had found that 3 1/2- and 5-year-olds were less likely to maintain an interactive state of social organization (regardless of play mode) with high-structure toys (McLoyd, Thomas & Warren, 1984) and that high-structure toys, compared to low-structure toys, significantly increased noninteractive pretend play in 3 1/2 year-olds, but not in 5 1/2-year-olds (McLoyd, 1983). Consistent with El'Konin's (1966) view that by the age of 5, children's advanced linguistic skills minimize dependency on objects to communicate symbolic meaning, the absence of a main effect of toy structure in the present findings suggest that, in the elementary school years, social participation during pretense no longer varies as a function of the characteristics of the physical environment. The decrease in children's social participation in literal activities when going from a low-structure environment to a high-structure environment may, in part, reflect a lessened need for consultation among play partners due to greater familiarity with both the situation and the toys.

The greater prevalence of solitary pretense in the second session with low-structure toys defies simple explanation. It may be that, seeing the kinship among toy sets, children turn to solitary pretense activities out of boredom, in the same way they would turn to daydreaming. Alternately, some authors

(Rubin et al., 1983) have suggested that, in middle childhood, the function of solitary pretense is to help children practice skills that will enable them to participate in social games. If children are in fact attracted to such games, the lack of toys explicitly geared to social games-with-rules and the decrease in structure from one play session to the other may have led to a desire to practice social participation skills in the context of solitary fantasy. If this is the case, future investigation is needed to clarify the content of solitary "practice" fantasy in middle childhood.

The lack of a predicted increase in high-level social interaction (simple social play and complementary or reciprocal play) for fantasy play in the low-structure condition is not surprising in light of the absence of structure effects on social pretense. It is probably the case that higher-level interplay and social organization such as that required in the enactment of complementary roles is more likely to occur during sustained sequences of fantasy play. Since total time in social pretense did not vary with toy structure, differences in the complexity of social organization are likely to be undermined as well. Consistent with these findings, McLoyd (1983) also found that cooperative (highly organized) pretend play was unaffected by the structure of objects available. She concluded that, by the age of 5, children's capacity for social organization transcends toy contexts.

The effects of toy structure on meta-pretend communication varied as a function of the type of communication. With respect to negotiation, the results indicate that, contrary to our hypothesis, children engaged in more planning or management of pretense episodes in the presence of highly structured toys than in the presence of low-structure toys. Moreover, children showed fewer signs of acknowledging their partner's pretense activities in a first session with high-structure toys.

Although these findings partly contradict earlier reports of a higher incidence of meta-pretend communication in a low-structure context (Einsiedler, 1985; McLoyd, Warren & Thomas, 1984), their interpretation is elucidated by a closer scrutiny of the measurements of communication. It seems possible that highly-structured toys, because of the specific themes they suggest, foster greater negotiation around the elaboration of familiar scripts (e.g., a visit to the doctor's office). On the other hand, lower pretense acknowledgement in the first session with highly structured toys implies that the specificity of toy materials reduced the ambiguity of transformations and the need to share their meaning with one's partner. When presented with minimally structured toys in the second session, children may have felt the need to seek confirmation from their partners for their recreations of the object and identity transformations enacted in the first session with more highly structured toys. Evidence of the

greater frequency of pretense episodes when the low-structure toys followed the high-structure toys also suggests that children were engaging in briefer but more frequent fantasy recreations in this context. In other words, whereas the ambiguity of minimally structured materials minimized the negotiation cf scripts, it may well have fostered a need for validation of one's transformational attempts.

Based on these considerations, a major reason for the discrepancy between these and previous findings on verbal planning and pretense-related negotiation is probably the lack of differentiation in the present coding system between negotiation statements which establish the "script" for pretense (e.g. "I'm the mother and you're the baby, so you don't talk") and statements which clarify object transformations (e.g. "Say that flute was my magic wand"). Whereas the former type of negotiation is more likely to be elicited in a high-structure context, low-structure toys are more likely to foster the latter type. Unfortunately, such object-focused exchanges may often have been too short-lived to be captured by the present coding system.

Although far from conclusive, the findings indicate that toy structure had a definite impact on the quality of transformational activity and on the nature of communications about pretense. Interestingly, pretense behaviors such as identity transformations and "script negotiation" which, from

a developmental standpoint, have been associated with greater maturity (Cole & LaVoie, 1985; Connolly et al., 1983; Field et al.,1982; Matthews, 1977; Sachs et al., 1980) also seem to be more prevalent in a high-structure context. This would imply that once children reach an age at which a certain level of symbolic mastery is achieved, their pretense with realistic objects involves less object transformations for their own sake and more anticipatory role enactment (drama associated with the rehearsal of adult roles). In addition, it is possible that such anticipatory drama fosters more joint construction and discussion around the shared knowledge of familial or occupational episodes (Garvey, 1977). This observation seems consistent with Forbes and Yablick's (1984) view that between the ages of 5 and 7, children are more concerned with the person-centered elements of dramatic elaboration (psychological characteristics and role-appropriate behaviors) --elements which may prepare them to face the more socially-oriented tasks of middle childhood and adolescence.

The low-specificity toys, which were not uniquely associated with any particular theme, may have made it more difficult for the children to elaborate sociodramatic or person-centered fantasies. However, in this environment, they were more likely to express the advanced transformational skills that were required to incorporate low-specificity objects in a dramatic context. Since the minimally-structured

materials did not elicit more fantastic roles or themes that could be expected to demand more organization-related metacommunication, it stands to reason that the most prevalent form of communication around such toys was the acknowledgement of briefer recreations of previously enacted roles and object transformations.

Aside from the influences of toy structure, the present study also hoped to shed light on developmental aspects of play behavior, namely, age-related changes in toy preference and in symbolic maturity of pretense behavior. With respect to toy preference, it appears that, in the elementary schc¬¹ years, pretense-oriented materials, and especially the highly structured ones, sustained children's interest for longer than a game which is likely to involve competition and preestablished rules. Although an age-related increase of the high-structure preference was hypothesized, this preference was mainly evident in the younger children of our sample and in girls (although boys also showed more interest in the highly structured toys as compared to the game). The lack of variety in the games category precludes any unequivocal conclusion in favor of pretense-oriented materials. However, it is clear that for the ch¹ldren in the lower grades, the pretending toys still have a substantial amount of "holding power".

In contrast to the results of Pulaski (1970, 1973), demonstrating no effect of toy structure on time spent on play for kindergarten children and first graders, first graders in our study preferred more highly structured toys to less structured materials (although no toy structure preferences were observed at a later age). This difference may be attributable to the low differentiation among toy sets in Pulaski's study, where paints and clay were popular in both their high and moderately-structured forms. The shift from no preference to a greater preference for highly structured toys over less structured toys between kindergarten and grade 1 seems consistent with the hypothesis that an orientation toward specificity and structure precedes an emerging interest in more rule-governed games in the middle elementary school years.

Patterns of playing time also varied across grade within toy category, such that a decrease in interest for the high-structure toys between grade 1 and grade 3 seemed coincident with an increase in interest in the tossing game from the lower grades to the higher grades. (Interest in low-structure remained moderately high and constant across grades, presumably because this toy set elicited exploration in this session.) Thus, as children become more oriented toward and accommodating of reality in middle childhood, their acceptance of social convention and formalized rules may be manifested in his attraction to games. Moreover, the waning interest in

high-structure toys does not necessarily indicate decreased preference for realism. Indeed, older children may become more interested in replicating reality by constructing realistic objects rather than accepting already constructed ones (Piaget, 1962).

Contrary to the prevaling notion concerning the development of fantasy play (Piaget, 1962), the findings of this study failed to substantiate an overall decline in social fantasy in the elementary school years. In fact, neither the amount of social pretense nor the frequency of pretense episodes decreased between kindergarten and grade 3, despite earlier findings that a reduction in the duration of social fantasy was associated with the attainment of concrete operations (Doyle et al., under review). This result is partly attributable to the paucity of toys amenable to alternative modes of play. However, earlier studies involving game-oriented toys also failed to report a decline in all fantasy play modes with age (Cole & LaVoie, 1985; Doehring, unpublished master's thesis). Therefore, it seems plausible that a greater emphasis with age on realistic or imitative constructive play and games with rules coexists with an increase in the more reality-oriented forms of fantasy play (e.g., anticipatory role enactment) as well as the exercise of advanced symbolic (e.g., abstract object transformations) and social (high-level interaction) skills. In any case, it is

clear that the development of play styles and play forms
beyond preschool is complex and requires further
investigation.

Consistent with the findings of Overton and Jackson
(1973), symbolizing ability, in the form of gestural
representation of action sequences with imaginary objects, was
found to increase between the lower and the higher grades.
Thus, the capacity to symbolize objects seems to evolve toward
more abstract forms of representation --forms which are more
removed from the concrete or physical characteristics of the
object and closer to an internalized "symbol", derived from
its functional aspects (e.g., the child represents the action
of combing his/her hair as opposed to concretizing the comb's
teeth with his/her fingers).

On the other hand, using an adaptation of Overton and
Jackson's procedure which rendered self-directed actions
comparable to externally-directed actions in terms of their
familiarity and ease of execution, we failed to corroborate
their finding that self-directed representations are more
readily acquired than externally-directed representations. It
seems that when only the target of the action sequence varies
(i.e. the same action sequence is performed toward the self
and toward an external object), the difficulties associated
with the symbolic mediation of external acts is eliminated.
This is in contrast to observations of the spontaneous

pretense activity of preschool children which demonstrate an age-related "decentration" of symbolic play from self-centered acts to other-centered acts (e.g., feeding oneself vs. feeding or talking to one's doll) (Fein, 1981; Lowe, 1975; Watson & Fischer, 1977). It would appear that by the elementary years, children's awareness of their social environment has developed sufficiently to bridge the gap between "decentered" and "self-centered" symbolic activity.

If the development of symbolizing ability moves toward more abstract forms of representation, it should be positively related to the more symbolically advanced or abstract forms of spontaneous fantasy activity. Instead, these findings suggest that any relationship between elicited and spontaneously manifested capacities is largely overshadowed by maturational factors, as reflected in the greater predictability afforded by grade level. Average duration of pretense episodes with high-structure toys was the only spontaneous play measure which transcended the effects of maturation, showing a negative relation to representational capacity. This last finding is consistent with the observations of Becher and Wolfgang (1977) and of Doyle et al. (under review) who reported that in concrete operational children, shorter pretense enactment was associated with higher levels of symbolic functioning as expressed in play. The child's growing capacity for covert manipulations of reality may

diminish the time needed for overt rehearsal and enactment of fantasy transformations. For instance, mastery of symbolic operations may enable the child to "gloss over" a plane trip scene with a few brief sound effects and a statement to his partner such as: "say we landed".

Although performance on the symbolizing task demonstrated that the older child is capable of representing abstract properties of objects, this capacity does not necessarily translate into more abstract or remote spontaneous enactments. The implication is that, in middle childhood, pretense no longer serves as a medium for the exercise of representational skills. Perhaps the older child's fantasy is motivated more by a need to confront real-life affective and social challenges through enactments of preferred themes regardless of their level of abstraction. Future work on themes of fantasy is needed to clarify this issue.

Contrary to expectation, the association between symbolic capacity in observational and experimenter-controlled contexts was no more significant in the presence of low-specificity toys than in the presence of high-specificity toys. Whether or not low-structure toys are more demanding of ideational skills, spontaneous enactment may not be geared to the practice of such skills in the middle childhood years. Alternately, it may be more difficult to sustain high-level fantasy in an ambiguous context and to demonstrate proficiency in the manipulation of symbols. Hence, the absence of a

relationship between symbolizing ability and shorter enactments with low-structure toys.

Reliable sex differences emerged in three different contexts. Boys engaged in more acknowledgement of their partner's fantasy than girls, they enacted more fictional roles than girls, and whereas girls preferred both high- and low-structure toys to the tossing game, boys only preferred the high-structure toys to the tossing game.

The proclivity of boys to enact fictional or fantastic roles has been considerably documented (e.g. McLoyd, 1983; McLoyd, Warren & Thomas, 1984; Sanders & Harper, 1976). This tendency has been linked to a preference for mobility and high levels of physical activity, of a type that is readily incorporated into superman scripts or monster chases. Greater acknowledgement on the part of boys may well be tied to the necessity of making sure your partner is "with you" and shares in the fantasy despite the more ambiguous rules of the fictional script.

In contrast to earlier findings, there were no sex differences in the extent to which object transformations were employed (Matthews, 1977; McLoyd, 1980; Fein, 1981; Doyle et al., under review) or in the propensity to engage in certain types of roles with low- versus high-structure toys (McLoyd, Warren & Thomas, 1984). Boys enacted more fictional roles regardless of toy structure and girls were not more likely to enact familial roles in either toy context. Presumably, the

non-sex-typed nature of the toys provided opportunities for girls to engage in less stereotyped fantasy activity.

As regards sex differences in toy preference, it appears that the girls' attraction to pretense-oriented toys as opposed to games is greater than that of boys. Only the high-structure toys succeeded in capturing the boys' attention longer than the game. A qualitative impression was that boys play with the tossing game was much more competitive and involved than that of girls. We suspect that if more games had been provided, a clear preference for them would have emerged on the part of boys.

In summary, the present study contributes to the pretend play literature in several ways. First, it extends findings concerning the effects of toy structure to school-aged children and points to trends in the evolution of fantasy quality (i.e. identity and object transformations), social activity and communication as the child confronts the cognitive and social challenges of middle childhood. In addition, a clearer delineation of toy structure categories than was found in previous investigations permitted a more reliable assessment of toy structure preferences. Thus although school-aged children's preference for verisimilitude seems to be manifested in their preference for high-specificity, high-structure pretending toys over other type of objects, the present findings indicate that they do not

necessarily respond to the presence of miniaturized or "true
to life" objects by engaging in more social fantasy play or
more socially-organized play. Nor do they necessarily engage
in more symbolically mature forms of transformational activity
with these highly structured toys. In fact, abstract
transformations were more prevalent in the presence of low-
structure toys.

It seems that older children did not show more complex
role enactment or forms of interaction with low-structure toys
because, in this age range, manifestations of representational
capacity and social skills are less likely to vary as a
function of the toy context. In contrast, it is the child's
preoccupation with the roles and situations of the adult world
which govern fantasy activity. In this perspective, high-
structure toys lend themselves more readily to the negotiation
and enactment of occupational and familial scripts, in tune
with reality-oriented concerns. An interesting direction for
future research involves clarification of the nature of
anticipatory scripts enacted by children in middle childhood;
in particular, the role of toy types in eliciting more versus
less stereotypical occupational and familial roles.
Furthermore, longitudinal studies and more stable measures of
spontaneous fantasy are needed to uncover any causal effects
of high-level fantasy and toy context on the development of
symbolic and ideational skills.

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APPENDIX A

List of toys by condition

Session 1

Mixed-toy condition (HS, LS and Game)

High-structure toys	Low-structure toys
701[a]:	711:
Guitar	24 in. party horn with "icicles" on end
Black wig	White imitation-fur hat
White felt hat	Straw lamp shade
Blue denim vest	"Poncho" type vest
2 beaded necklaces	A yard of pink spangle ribbons
2 plastic bracelets	Long string of colored wooden beads
	Two styrofoam cuffs (Japanese apple wrappers)
Pink boa	2 ft.x 5 in. strip of fur
Bow tie	Blue square-shaped scarf

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[a]Observational code

Mixed-toy condition (cont.)

High-structure toys (cont.)	Low-structure toys (cont.)
701 (cont.):	711 (cont.):
Plastic microphone	Large wooden screw with a screw-on knob
Black gloves	Pair of long grey cuffs covered with a net-like fabric
Lab coat	5 ft. x 5 ft. green piece of fabric with a yellow ribbon sewn in curtain-fashion
702: Playmobil set with winter sports accessories and cotton balls	712: Construx set with small cupped-shaped pieces of styrofoam
703: Doctor's kit (small white suitcase containing a stethoscope, a blood pressure gauge, a needle, surgical instruments, etc.)	713: Plastic "tool box" containing variously shaped containers, swizzle sticks, pipe cleaners, eyepads etc.

Mixed toy condition (cont.)

High-structure toys (cont.)	Low-structure toys (cont.)
705: telephone	715: two 7-in.-long
	cardboard cones with
	electrical switches
	and buttons inserted,
	connected by a
	blue phone cord

Game

704: bean bag tossing game

Sessions 2 and 3

Order 1: HS followed by LS / Order 2: LS followed by HS

High-structure condition

701: Guitar

    Black and white felt hats

    2 black wigs

    Blue denim vest

    Black gloves

    Pink boa

    2 bow ties

    4 bracelets

    4 necklaces

    2 plastic microphones

Tambourine

Beard

Leather purse

Leather hat

Shirt with wide sleeves

  and elastic waist

Lab coat

702: Playmobil set with

      winter sports and

      space accessories

703: Doctor's kit

705: Telephone

Low-structure condition

711:

24 in. cardboard party horn with   Triangular fur hat

  "icicles" on end   4 small stretchy

White imitation-fur hat   straps with hooks

Straw lamp shade

"Poncho" type vest   712: Construx set and

One yard of pink and one yard   styrofoam

  of gold-colored spangle ribbons   713: Plastic "tool

Long string of colored beads   box" and

2 styrofoam cuffs   contents

  (Japanese apple wrappers)   (see above)

2 ft.x 5 in. strip of fur   715: Cardboard cones

Blue and yellow square-shaped scarves   switches and

2 large wooden screws with   phone cords

 "screw-on" knobs

Pair of long grey cuffs

 covered with a net-like fabric

5 ft. x 5 ft. green piece of fabric

5 ft. x 3 ft. red piece of imitation fur

 cookie box

4 chopsticks

A yard of long fringed black ribbon

Nylon bag with shoulder strap

Mop head

APPENDIX B

Observation Manual

December, 1986

OBSERVATION MANUAL

Note: Certain observational codes contained in this manual were not included in the present study.

Observational Procedure:

The behavior of children playing in dyads will be videotaped during three sessions lasting 24, 20 and 20 minutes respectively. During session 1, all toy categories (I,II and III_1) will be present. For this sessions, an observer will alternate between the two children at two-minute intervals to obtain 12 minutes of data per child. For sessions 2 and 3, different subsets of toys will be used. One observer will code the behavior of one member of the dyad continuously for the duration of the session. Another observer will code the behavior of the other child from videotape.

Observers will categorize the behavior according to its social or solitary nature, the occurence of pretense or nonpretense (literal) activity and the symbolic features of the pretense activity, e.g. object use and identity transformations. The Observational Systems (OS-3) processing units will record the duration of each observational play code

from the moment it is entered. For 20% of the observations (40/192 20-minute trials), two observers will code the same children to monitor reliability. (The reliability checker will be observing from the videotape.)

PLAY CODES

1) <u>Toys Used</u>. Each category of toy a child is playing with is recorded using a 7XX score. Toy codes are scored before the type of play. The following is a list of the toys that will be used:

        700--No toy

        708--Other (e.g., blackboard,

            garbage can, radio microphones)

Category I: 701--Dressup and entertainment set

            (microphones, guitars, tambourine)

        702--Playmobil

        703--Doctor's kit

        705--Telephone

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[1]The nature of toy categories was not revealed to observers in order to prevent biased observation. Category I refers to HS toys, catgory II refers to LS toys and category III includes the tossing game.

Category II: 711--Dressup materials (pieces of fabric,

            lamp shade, wooden "microphones", etc.)

        712--Construx toy

        713--Objects contained in the "suitcase"

            (small containers, pipe cleaners, etc.)

        715--Cones with switches and phone cord

Category III: 704--Bean bag tossing game

Pretend vs. Non-Pretend, Social vs. Solitary Activity

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

047	negotiation of pretend
046	social pretend play - enactment
048	social pretend play - acknowledgement
146	solitary pretend play
045	literal social activity
145	literal solitary activity
555	interaction with an adult
556	onlooker behavior
557	unoccuppied behavior

2) <u>Definition of Interaction</u>. A social interaction (04X) is
at minimum one initiation-response sequence, i.e. an
initiation which receives a response within 5 seconds. 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), imitation and active, directed smile/laugh and play
behavior 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 ascertain
that the imitation is directed to the other child.

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, a smile, a
frown, compliance with a command, crying, or accepting of an
offered object.

In contrast, solitary activity (14X) does not involve any type of initiation-response sequence. Typically, children will be playing on their own, at a certain distance from their partner (Level of play--Level 1).

3) **Mode of Play**. The social or solitary activity is categorized as literal activity (X45), pretend negotiation (047), pretend enactment (X46), or pretend acknowledgement (048). Note that pretend negotiation and acknowledgement always involve social interaction.

Literal activity (X45). Literal activity 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 involve a transformation of reality. Note that building with blocks and saying "I'm making a house" is literal activity.

Pretend negotiation (047). 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 pretend negotiation are those verbal interactions 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", while speaking as the self). Pretend negotiations or procedural behaviors that are social and verbal are coded as 047.

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).
(Negation of pretend transformations is discussed below.)

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 047. For 047 to be scored the two children must participate in the negotiation of a pretend sequence. When it occurs during the course of a pretend sequence rather than before a sequence, a break in the frame of the pretense must be evident. Negotiations must last at least 5 seconds to be scored.

Pretend enactment (X46). Pretend play enactment 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.

The observer may note the occurrence of social pretend
play (046) 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 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 cars, 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 pretense. However, playing with cars must be accompanied by onomatepoeia such as making car noises in order to be scored X46. The use of miniature objects without any further elaboration in the form of pretend gestures or vocalizations is not scored as pretend. This type of activity is scored as literal play (X45).

Negation of Pretend. These verbalizations may indicate 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"). In these cases, if an 045 has been coded and the target child negates pretend, observers should note that they had 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 what is appropriate at the time.

Note the difference between negations of pretend that completely end the pretend sequence and negations that help the pretend by allowing the children to agree on certain transformations (e.g. Two children are playing house, one uses a pencil as a fork and the other says that it is a knife. The

first child agrees and continues to pretend eating, using the pencil as a knife.) In this case, if an 046 had been coded, the code should not be changed. If these readjustments of pretend last long enough, they may be coded as negotiation because they constitute a break in the frame of pretense.

Pretense acknowledgement (048). 048 is coded when the target child acknowledges another child's pretend activities without engaging in pretend him or herself. Pretend acknowledgement may be indicated by the child's smiling or laughing at a transformation, by the child's commenting about the transformation (e.g. "Hey, you turned the purse into a hat!"), or by a nod. Note that the child who is pretending has to be aware that his or her pretend has been acknowledged for 048 to be coded. The child who is pretending should be scored as 046. Pretend acknowledgement is not the same as onlooker behavior (see below).

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 a distance from his partner.

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, 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 sequences of social activity (either 045 or 046). 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 (1934) 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 <u>close to each other</u>, oriented toward each other (or at least not back to back), and <u>playing with the same type of toy</u> or engaging in the same activity.

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

<u>Level 2--Parallel Play with Mutual Regard/802</u> - 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.

<u>Level 3--Simple Social Play/803</u> - While engaging in the same or similar activity (e.g. same toy, conversing, talking, playing together) each child must direct at least one social bid to the other. Children will generally be engaged in similar activities during 803, but they may also be engaged in different ones. For example, while one child is exploring the dress-up materials and the other playing with the miniature spacemen, they may be engaged in a conversation where there is

social interaction. Observers should not be too strict
concerning the same activity rule in these types of instances.
Social bids include smiling; speaking; positive touching;
offering an object; receiving an object; offering comfort;
helping with a task; taking an object; aggressing or
approaching another child. For example, the two children are
drawing; one child addresses the other and the other offers a
crayon or makes a comment about the drawings. Or, the two
children are playing with action figures and one child takes a
figure and the other child says "Hey, that's mine!". The
interaction must be sustained for more at least 3 seconds and
it typically involves more than 2 turns.

Level 5--Complementary or Reciprocal Social Play/805 - Two
children engage in complementary or reciprocal activities and
each child directs at least one social bid to the other as in
level 3. Complementary or reciprocal activities are ones in
which each child's action reverses the other's, or
demonstrates 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. For an 805 to be scored, the responses made
by the child must be appropriate to the bid made by the first
child. Play that involves turn taking, where the target child

gets at least two turns and his or her playmate(s) get at least one turn, is scored 805.

5) <u>Tone</u>. Tone is the affective quality of the social bids. Positive tone (601) is indicated by such behaviors as giving, sharing, smiling, laughing, touching, verbal agreement, cooperation, and 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, <u>one</u> positive or negative gesture is sufficient to warrant that score. That is, all the changes in tone are scored within the observation intervals.

6) <u>Components of Pretend Play</u>. If the interaction is categorized as pretend play, then the number and type of identity (2XX), object (3XX) and setting (310) transformations used in the play are coded using an adaptation of codes developed in previous research (Connolly, Doyle, & Ceschin, 1983; Connolly & Doyle, 1984; Doyle & Connolly, 1981).

a) <u>Identity Transformations</u> (2XX) - 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). 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 third feature will appear in a separate code and will signify the means by which the role was indicated.

Remoteness: 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 for an occupational role or roles which the child has experienced through others in everyday real life but outside his/her family; such as teacher, busdriver, mailman, or policeman. A score of 24X is given for a fictional where the character personified is one that 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. A score of 25X will indicate generalized human character roles. These roles indicate such characters 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.

When no specific role can be identified, but it is nevertheless clear, from gestural and/or verbal cues, that the child has transformed his/her identity, the behavior is scored as 21X or 22X depending on whether the unspecified character's behaviors or activities are ones the child is likely to have experienced directly (e.g. "Now, I'm going to go see grandma") or through a family member (e.g. "I think I'll drive my car").

Multiplicity: The number of different roles each child simultaneously takes on will be tallied using codes 2X1, 2X2, 2X4, etc. The middle digit of the 2XX code will correspond to the highest level of identity transformation among the roles displayed.

Signification (06X): The roles will also be coded for the means by which the role is indicated (Brady, 1975). Specifically, the use of verbal, gestural, or concurrent verbal and gestural 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.

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 same pretend play episode.

b) Object Transformations (3XX) - The first feature of object transformations to be coded will be the type of object transformations. This will be evaluated according to the similarity of the transformed object to the represented object (Elder & Pederson, 1978). The second feature to be coded will be the multiplicity of objects used in a pretend sequence.

Type of transformation: A score of 31X will be coded if a replica object (a substitute object identical to the represented object) is used as if it were the real object. One example is using a toy oven to cook in or giving a shot with a toy syringe. A score of 32X will be given for the animation of an object or onomatopoeia (e.g., making a Superman doll fly or moving a truck and going "vroom"). A

score of 33X will be designated for the substitution of a toy for 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 substitution 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 judged on the basis of 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.

Multiplicity: The second feature of object use to be coded is the number of objects simultaneously transformed within a pretend sequence (i.e. replica use, animation, substitution and use of imaginary objects). A score of 3X1 will be given if one toy alone is transformed, 3X2 if when two toys are transformed, 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 70X, 312). When a child is pretending with two toys simultaneously but differently (i.e., one as replica and the other as similar substitute), then score the highest order of object transformation and corresponding 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 703 for the blocks, and 332.

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 the same pretend sequence.

c) Setting Transformations (310) - Setting transformations refer to the child's transformation of the playroom into such places as a restaurant, burning house, etc. The transformation must be made explicit either through gesture or verbal description. In other words, merely saying: "We're in the doctor's office" is not sufficient; rather, the child would have to say, for example: "This is the doctor's office", and delineate it gesturally or point to objects which represent the furniture and contents of the doctor's office. The occurrence of such setting transformations will be recorded by using the code 310. Record the end of a setting transformation within a pretend sequence with the 320 code.

7) Components of Literal or Non-Pretend Play. When social activity is categorized as literal (045), it will be further examined for its symbolic features. Three different types of literal social activity 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) <u>Activity talk</u>. 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
even if only one child is talking within a social literal
activity sequence.

b) <u>Conversations and activities</u>. Four different possible
activities are scored. A score of 120 is given 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 tall tales, uses metaphors 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 occur. Examples of teasing are: "you silly goose
bum', 'you bum-bum", "you do pooh-pooh", "you look like Boy
George", or jokes about another child's name. 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 always directed at another child. A score of 123 is recorded when word play accors, 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 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) Social Games with rules (130) are also scored within sequences of literal social play (045). These are games in which 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. Note that any of the conversation scores or activity talk may be coded as part of games with rules.

   A score of 118 will be used to denote the end of any of the above literal activity scores.

PLEASE NOTE: Unless otherwise indicated, all the above

categories are scored when the particular

activities have a duration of 3 seconds or more.

Reminders and special instructions

_____

1 In the first session (preference session), both toy

categories I and II will be available to the children in

addition to the tossing game. For this session only, the

observer will alternate between the two children at two-minute

intervals, yielding a total of 12 minutes of observational

data per child. In the following two sessions, either

category I or II will be available without the tossing game

and the observer will watch a pre-designated child for the

entire 20 minutᵤ session (the other child will be observed

from tape).

2 The 805 code is now scored when children engage in

complementary or reciprocal social play rather than

complementary and reciprocal play. This means that when the

children adopt complementary roles (e.g., doctor-patient, cop-

robber), the 805 code applies whether or not role reversal

occurs (i.e., the doctor becomes a patient and vice versa).

All other aspects of the older definition of 805 still apply,

including the rule that play behavior involving turn taking is coded as 805.

<u>3</u> Always code the highest level of each category.

<u>4</u> If a decision has to be made between coding a literal social interaction and a sequence of solitary pretend play, code the pretense.

<u>5</u> Note all the changes in each category of codes within each observation interval except for role signification (06x). For this category, code only the first indication of each role.

<u>6</u> Note that 122 (teasing) takes precedence over 124 (rough and tumble play).

<u>7</u> 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 the tossing game 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 are no longer talking and rescore th 130 to indicate that they are still playing their game. The codes should be as follows:

705

045

805

601

130

119

<u>118</u>

<u>130</u>

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

<u>8</u> 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

<u>211</u>

<u>061</u>

<u>312</u>

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

9 When one child is given an 048, score the role and object transformations of the child who is pretending. For example, if the target child is watching his friend pretend to be an astronaut and animate the playmobil spaceship, score for the target child:

<div align="center">

702

048

803

601

<u>241</u>

<u>063</u>

<u>321</u>

</div>

10 Object transformations:

           - paper and pencils, chairs, blackboards and chalk, garbage cans and all other objects that do not belong to the toy sets but are used during pretend are not coded as replica objects (31X). They are props. The doctor's kit, telephone and other high-structure realistic objects are coded 31X if they are used as replicas.

           - In a doctor-patient scene where you are observing the patient, you can score a 31X for a

bandage, stethoscope, etc. if the child is looking at the object.

- It is enough for a child to imitate the sound of an object that is not present to code the object as 35X. For example, if a child goes "Buzz...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.

Sequence of Codes

1)7XX

2) 046   3) 80X
4) 60X
5) 2XX
6) 06X
7) 3XX

2) 047   3) 80X
4) 60X

2) 048   3) 80X
4) 60X
5) 2XX
6) 06X
7) 3XX

2) 146   3) 2XX
4) 06X
5) 3XX

2) 045   3) 80X
4) 60X
5) 1XX

2) 145

2) 555

2) 556

2) 557

APPENDIX C

<u>Overton and Jackson Measure</u>

<u>Symbolizing ability</u>:

<u>Administration and Scoring Manual</u>

March 4, 1987

OVERTON AND JACKSON MEASURE OF SYMBOLIZING ABILITY:

ADMINISTRATION AND SCORING MANUAL

(Based on Overton & Jackson, 1973)

ADMINISTRATION

1\ <u>Pretest</u>   The tester and the child are seated at a table, facing each other. The pretest materials are layed out on the table. They include: a comb, a sponge, a pen, a blackboard eraser, a spoon, a fork. The tester first tells the child that he can play with the objects for a little while as s/he writes down the subject information.

a) Identification of objects. Next, the tester says: "We are going to play a game of pretending together but first, I want you to look at the objects on the table and to point to the object I will name." The tester names objects one by one. If the child points to the wrong object, the tester asks: "Are you sure?" If the child answers yes, the tester should finish naming the objects, come back to the missed item and name it again to make sure.

b) Understanding pretend instructions. "Now, we are going to pretend. Are you ready? I want you to pretend that you are a bird." If the tester notes that the child is timid or has trouble getting started, he should gently encourage him/her to say what a bird does and to act it out. As soon as the child initiates pretending, the tester should join in to encourage and reinforce what the child is doing. For the next pretest item, the tester will say: " Now, I want you to show me how you would pretend to hammer a nail into the table, here (points to a spot on the table in front of the child)."

If the child correctly identifies the objects, succeeds in following the pretend instructions and engages in recognizable pretend actions, the tester can go on to the actual test. If one of these conditions is not met, the test is discontinued.

2\\Test   At this point, the tester puts the objects away and tells the child: "Now we are going to play some more pretend games, OK? Let's start." Although the order of the following items alternates between self-directed actions and externally-directed actions, and varies further depending upon whether the tester is using a scoring sheet with order A, B, or C, we will give the instructions for the self-directed items first, and the externally-directed items second:

Self-directed actions

1 - Pretend you are washing your arm with a sponge.

2 - Pretend you are combing your hair with a comb. There is your head (the tester points to the child's head); now comb your hair.

3 - Pretend you are writing on the palm of your hand with a pen.

4 - Pretend you are eating with a spoon.

5 - Pretend you are eating with a fork.

Externally-directed actions

1 - Pretend you are erasing a small blackboard, that is lying flat on the table, with a blackboard eraser.

2 - Pretend you are combing someone's hair with a comb. This is the person's head (the tester holds up his hand; the back of the hand facing the child); now, comb this person's hair.

3 - Pretend you are writing on a piece of paper with a pen.

4 - Pretend you are feeding a doll with a spoon.

5 - Pretend you are feeding a doll with a fork.

SCORING

Scoring is done directly following performance of each action sequence by the child. If the tester is unsure concerning the scoring category of the child's response, he should write a tentative score with a written description of the behavior in order to consult with colleagues after the testing session. The subject's responses are scored according to the following three categories:

1\ No representation or performance of the action sequence. The subject was unable to demonstrate the appropriate action sequence, either because he did not understand what was asked of him or because the action performed was unrecognizable or otherwise different from that requested. Receives a score of 0.

2\ Body-part as object. The subject demonstrated the appropriate action sequence but employed his hand as the experimental object. This can manifest itself in the three following ways:

(a) The hand is shaped to resemble and substitute for the absent object. For example, the subject uses his fingers as the teeth of the comb and runs them through his hair; cups his hand to form the spoon with which he eats or feeds the doll;

the subject uses one or several fingers as the fork's prongs; a finger as the pen; or a fist as the sponge or the blackboard eraser.

(b) The hand "holds" the imaginary object in a realistic manner but it comes into contact with the object that the action is being performed upon (the target of the action) -- thus, undermining the "reality" or "presence" of the imaginary object. For example, the fingers touch the table in the "writing-with-a-pen" sequence, or the "eating"/"feeding a doll with a spoon or fork" sequences. Likewise, if the palm of the hand comes in contact with the surface of the table in the blackboard-erasingsequence, or with the arm in the arm-washing sequence.

(c) The action is performed appropriately with the symbolic object, but the symbolic object is not grasped in a a realistic manner. For example, the subject washes his arm with a sponge, leaving enough room for the symbolic object between the arm and the sponge, but his fingers are extended, thus not in a position of clutching the sponge (If the child does not a space between his arm and his fist - representing the sponge-, code 1a). The same may apply to the representation of the blackboard-erasing sequence. Similarly, the child may engage in the motion of combing his hair without really grasping the comb (e.g. the hand forms a fist).

Behavior falling in one of these three subcategories receives
a score of 1.

3\ <u>Symbolic object</u>. The subject demonstrates the appropriate
action sequence and employs his hand as if correctly holding
and operating upon the experimental object. Receives a score
of 2.

APPENDIX D

<u>Univariate and multivariate</u>

<u>analysis of variance</u>

<u>summary tables</u>

Table D-1

Univariate analysis of variance summary table: Effects of
grade, sex and toy structure (TS) on time in social pretend
play

Effect	MS	df	F	p
Between				
Grade	29930.07	3	.44	.724
Sex	131446.32	1	1.94	.169
Grade x sex	113049.02	3	1.67	.184
Error	67751.07	56		
Within				
TS	15520.73	1	.73	.395
Grade x TS	47732.95	3	2.26	.092
Sex x TS	58099.09	1	2.75	.103
Grade x Sex x TS	10775.34	3	.51	.677
Error	21160.54	56		

Table D-2

Univariate analysis of variance summary table: Effects of toy structure (TS) and order on frequency of pretense episodes

Effect	MS	df	F	p
Between				
Order	.42	1	.03	.868
Error	15.14	62		
Within				
TS	4.11	1	.88	.352
TS x Order	27.91	1	5.98	.017
Error	4.67	62		

Table D-3

Univariate analysis of variance summary table: Effects of toy
structure (TS) and order on time in negotiation

Effect	MS	df	F	p
Between				
Order	.46	1	.31	.580
Error	1.49	62		
Within				
TS	2.12	1	7.39	.008
TS x Order	.84	1	2.91	.09
Error	.29	62		

Table D-4

Univariate analysis of variance summary table: Effects of toy
structure (TS) and order on time pretense acknowledgement

Effect	MS	df	F	p
Between				
Order	.00	1	.00	.951
Error	.60	62		
Within				
TS	.47	1	1.38	.225
TS x Order	2.82	1	8.22	.006
Error	.34	62		

Table D-5

Univariate analysis of variance summary table: Effects of
grade, sex and toy structure (TS) on time in pretense
acknowledgement

Effect	MS	df	F	p
Between				
Grade	.73	3	1.59	.202
Sex	6.58	1	14.41	.0004
Grade x sex	1.02	3	2.23	.094
Error	.46	56		
Within				
TS	.47	1	1.32	.255
Grade x TS	.22	3	.63	.598
Sex x TS	.90	1	2.51	.119
Grade x Sex x TS	.84	3	2.35	.082
Error	.36	56		

Table D-6

Multivariate analysis of variance summary table: Effects of toy structure and order on social involvement variables

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Between effect

Order

  Multivariate $F(3,60)$ = .69

Within effects

Toy structure

  Multivariate $F(3,60)$ = 2.13

Toy structure x order

  Multivariate $F(3,60)$ = 3,48*

Univariate $F(1,62)$	Hypothesis MS	Error MS	F
Literal Social	366794.84	47084.86	7.79**
Solitary pretense	2.02	.40	5.00*
Social pretense	42690.25	22192.32	1.92

*p <.05   **p <.01

Table D-7

Univariate analysis of covariance summary table: Effects of
grade, sex and toy structure (TS) on high-level social
interaction in pretense, with time in social pretense as a
covariate

Effect	MS	df	F	p
Between				
Grade	23.04	3	2.19	.099
Sex	17.57	1	1.67	.201
Grade x sex	18.11	3	1.72	.173
Covariate	5008.71	1	476.33	.000
Error	10.52	55		
Within				
TS	.40	1	.10	.758
Grade x TS	.68	3	.16	.922
Sex x TS	3.41	1	.81	.372
Grade x Sex x TS	4.62	3	1.10	.357
Covariate	1140.62	1	335.49	.000
Error	4.20	55		

Table D-8

Univariate analysis of covariance summary table: Effects of
grade, sex and toy structure (TS) on high-level social
interaction in literal social activity, with literal social
activity as a covariate

Effect	MS	df	F	p
Between				
Grade	312003.40	3	3.00	.038
Sex	39470.74	1	3.80	.056
Grade x sex	169769.77	3	1.63	.192
Covariate	488882.89	1	4.71	.034
Error	103848.89	55		
Within				
TS	3492.09	1	.14	.706
Grade x TS	12718.10	3	.52	.669
Sex x TS	8967.56	1	.37	.546
Grade x Sex x TS	43163.75	3	1.77	.163
Covariate	586220.65	1	24.07	.000
Error	24359.14	55		

Table D-9

Multivariate analysis of covariance summary table: Effects of grade, sex and toy structure on advanced transformational activity, with time in social pretense as a covariate

Between effect

Covariate

   Multivariate $\underline{F}$(3,53) = 358.83***

Grade

   Multivariate $\underline{F}$(9,129) = 2.17* (Pillai's)

	Hypothesis	Error	
Univariate $\underline{F}$(3,55)	$\underline{MS}$	$\underline{MS}$	$\underline{F}$
Abstract objects	1.33	.30	4.51**
Remote roles	33.83	24.86	1.36
Roles and objects	4830.41	4335.46	1.11

Sex

   Multivariate $\underline{F}$(3,53) = 1.30

Grade x sex

   Multivariate $\underline{F}$(9,129) = .98

Table D-9 (cont.)

<u>Within effects</u>

Covariate

   Multivariate $\underline{F}(3,53)$ = 76.60***

Toy structure

   Multivariate $\underline{F}(3,53)$ = 60.11***

Univariate $\underline{F}(1,55)$	Hypothesis <u>MS</u>	Error <u>MS</u>	<u>F</u>
Abstract objects	48.38	.33	144.24***
Remote roles	317.53	6.94	45.73***
Roles and objects	213816.12	4216.44	50.71***

Grade x toy structure

   Multivariate $\underline{F}(9,129)$ = .85

Sex x toy structure

   Multivariate $\underline{F}(3,53)$ = .42

Grade x sex x toy structure

   Multivariate $\underline{F}(9,129)$ = 1.43

*p <.05   **p <.01   ***p <.0001

Table D-10

Multivariate analysis of covariance summary table: Effect of grade, sex and toy structure on identity transformations, with time in social pretense as a covariate

---

Between effects

Covariate

  Multivariate $F(3,53) = 47.95$****

Grade

  Multivariate $F(9,129) = 1.81$

Sex

  Multivariate $F(3,53) = 4.98$**

Univariate $F(1,55)$	Hypothesis MS	Error MS	F
Familial roles	1.36	.36	3.80
Occupational roles	.02	.53	.04
Fictional roles	4.69	.60	7.77**

Grade x sex

  Multivariate $F(9,129) = .79$

Table D-10 (cont.)

Within effects

Covariate

  Multivariate F(3,53) = 23.27****

Toy structure

  Multivariate F(3,53) = 13.11****

Univariate F(1,55)	Hypothesis MS	Error MS	F
Familial roles	8.89	.49	18.15***
Occupational roles	5.73	.23	24.99****
Fictional roles	1.21	.46	2.62

Grade x toy structure

  Multivariate F(9,129) = 2.21*

Univariate F(3,55)	Hypothesis MS	Error MS	F
Familial roles	.17	.49	.36
Occupational roles	.94	.23	4.09**
Fictional roles	1.30	.46	2.82*

*p <.05   **p <.01   ***p <.001   ****p <.0001

Table D-10 (cont.)

Sex x toy structure

  Multivariate $\underline{F}(3,53) = 2.09$

Grade x sex x toy structure

  Multivariate $\underline{F}(9,129) = 1.92$

Table D-11

Univariate analysis of variance summary table: Effects of grade, sex and toy category (toycat) on time spent playing with toys

Effect	MS	df	F	p
Between				
Grade	370.79	3	.58	.629
Sex	.32	1	.00	.982
Grade x sex	287.69	3	.45	.717
Error	637.05	56		
Within[a]				
Toycat	1131181.11	2	45.62	.000
Grade x Toycat	77681.91	6	3.13	.008
Sex x Toycat	183682.03	2	7.41	.001
Grade x Sex x Toycat	33607.46	6	1.36	.242
Error	24796.97	112		

[a]Greenhouse-Geisser conservative F tests were used to calculate within-group effects

Table D-12

Univariate analysis of variance summary table: Effects grade, sex and target on symbolizing ability scores

Effect	MS	df	F	p
Between				
Grade	50.06	3	14.14	.000
Sex	.00	1	.00	.973
Grade x sex	11.83	3	3.34	.022
Error	3.54	120		
Within				
Target	1.13	1	1.12	.292
Grade x Target	1.78	3	1.77	.157
Sex x Target	3.75	1	3.72	.056
Grade x Sex				
x Target	.03	3	.03	.991
Error	1.01	120		