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A DEVELOPMENTAL STUDY OF SYMBOLIC PLAY: THE ESTABLISHMENT OF SYMBOLIC REFERENCE, REPRESENTATIONAL MODES, AND PLAY MATERIALS

by

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Abstract

A DEVELOPMENTAL STUDY OF SYMBOLIC PLAY: THE ESTABLISHMENT OF SYMBOLIC REFERENCE, REPRESENTATIONAL MODES, AND PLAY MATERIALS

by

Darel Manocherian Benaim

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This developmental study refines description of imaginative activities in the realm of symbolic play. The modulating influence of the structure of the play materials is examined. Toy structure is treated as a relative dimension, realized in two sets of play materials. Maximally structured play items include literal and realistically detailed replicas of objects and persons familiar to the child. A minimally structured set includes three-dimensional objects which globally approximate the form of the corresponding realistic toy. These signifiers are less detailed and vary randomly in color, size, and material. By integrating the analysis of developmental trends in symbolic play with the study of the impact of toy structure, our understanding of a critical source of variation, as well as of the complexity of this behavior is enhanced.

The central concerns of this research include the impact of age and toy structure upon three domains of symbolic play activity. The first is play maturity, evaluated by rating behavior on a scale derived from Piaget's (1951) description of the evolving structural complexity and integration of play. Another issue is the nature of the correspondence

underlying symbol formation. We refer primarily to the physical resemblance mediating between the external form of the symbolic object chosen, and that which it represents. Four types of relationships on which symbolic reference may be based are differentiated. These categories were derived from Werner and Kaplan's description of the ontogeny of representation. A third aim is to systematically study the diverse media by which representational activity may be expressed within a single task situation. Patterns are examined in the deployment of verbal-linguistic and motor-gestural modes defined by Franklin (1970).

To present a more differentiated view of the "flavor" of the play segments, two additional issues are explored, though they are not primary foci of this study. The first is variation in latency, a measure of the time required to initiate a symbolic play sequence. The thematic content of the children's narratives is examined as well, as it was assumed that the stories offered a wealth of information as to the culture of childhood.

The 72 children who were observed included 24 of each of the three sampled ages: 4, 6, and 8 years. An equal number of boys and girls were drawn from at least two classrooms at all grades. Subjects were observed individually in each of the two treatment conditions. The order of presentation was counterbalanced. The minimally and maximally structured play tasks were administered in sessions at least two weeks apart. During the 10-minute observation sessions, time-sampled behavior ratings were made by the investigator while a second observer continuously and in great detail described the flow of the child's behavior by means of a written protocol. For those measures not scored during the play episode (verbal-linguistic representational modes and thematic content

of the narratives), evaluation was based on independent and conjoint analysis by the investigator and the observer, of the direct observation records and protocols.

The data from both the observations and subsequent ratings were approached in the following ways. Multifactorial analyses of variance with repeated measures were done to determine the main and interaction effects of age, sex, order of presentation, and structure of playthings upon the various indices of symbolic play activity (Armor & Coach, 1972; Nie et al., 1975). Order of task presentation was deleted from the analyses following an initial scan of the data, as no significant main effects were ascribable to this factor. Post hoc Scheffe tests were applied to the data to determine the significance of the differences between group means. Chi-square tests were done to uncover systematic variation in the elaboration of the themes. The interdependence of the criterion measures was assessed via intercorrelations between scores, and principal components factor analyses.

A complex and multidimensional pattern of age-related behavior differences emerged as the play episodes in both conditions were analyzed. Age was a significant variable with respect to most of the behaviors assessed. Across both conditions, there was a consistent increase in the complexity and integration of play constructions over age. With regard to the establishment of symbolic reference, all groups of children relied most heavily on symbols based on overall External Similarity. It was not surprising that the use of Subjective Correspondences decreased with age, while Linguistic Representation increasingly dominated play symbolism over age. Consistencies over age were more compelling than differences in the area

of representational modes. A significant age effect was obtained only in relation to Dramatic Play Actions, which decreased developmentally. Play content varied as a function of age, too. Consistent increases were recorded in the number of stories told (especially by the girls), the extent of verbalization, and the number of themes represented. Significant age and sex differences were tapped in relation to some themes.

The results indicated that the minimally and maximally structured toys had significant impact upon the symbolic play of children between 4 and 8. At the same time, behavior was strikingly stable across conditions. This was demonstrated in the profiles summarizing the clusters of variables comprising each dependent measure. The highly structured materials consistently elicited more complex play than did the less structured props. The following behaviors were also observed more frequently in the maximally structured context than in play with the minimally structured toys: correspondences based on External Similarity and Linguistic Representation, Role Language and Dramatic Play Actions, more verbalization and thematic diversity. The minimally structured toys, on the other hand, generated "more" of these behaviors than did the others: correspondences based on Feature Selection and Subjective Factors, Structuring Actions, and longer Latencies, particularly for the youngest subjects.

These results are interpreted in relation to cognitive-developmental theory. The focus is on the increasing complexity and progressive internalization of symbolic play activity over age. It is concluded that the structure of play materials is a critical contextual factor, the influence of which must be considered in evaluating this complex behavioral domain. Implications for the future research as well as optimal selection of toys are considered.

CONTENTS

LIST OF TABLES

INTRODUCTION

Imagine, if you will, a 6-year-old boy intently radioing messages to outer space from a hat-box transmitting center. Or, a 4-year-old girl admonishing her naughty doll to finish dinner in tones strikingly like those of mother. In the past one might have dismissed these symbolic play behaviors as trivial. Our interest has of late been heightened, however, as cognitive-developmentalists have come to ascribe a major formative role to this aspect of the symbolic function. Specifying the criteria defining symbolic play remains a challenge. In part this stems from the tenuous line separating play from adaptive functioning, as well as from the problem of operationalizing the "playful" orientation of the child at play. For the purposes of the present study, symbolic play is defined as representational activity which involves make-believe, as-if, or pretend elements. Two structural criteria must be met. First, there must be a dissociation of means from ends (in the sense that the behavior is engaged in for its own sake, rather than goal-directed). The second requisite is symbolic transformation, expressed in the utilization of representational form or symbol, the meaning of which is derived from its correspondence to that which is represented (Piaget, 1951; Werner & Kaplan, 1963).

The study of symbolic play has generated a wealth of theoretical and empirical formulations. In recent years there has been a flurry of activity in this area by experimentally oriented investigators. Nonetheless, within the cognitive-developmental tradition on which this

study is based, rigorous, well-focused observational or experimental studies conducted with subjects beyond the preschool age are rare. Though provocative, the heuristic power of much of the current literature is limited by methodological weaknesses or distortions which render results inconclusive or ungeneralizable. In addition, formulations about the cognitive aspects of symbolic play have rested mainly on phenomenological descriptions of development. There is little systematic research addressed to the nature of the symbols which are the core of this activity.

Three coherent foci are identifiable in the literature, two of which are central to the present study. The first is concerned chiefly with the elucidation of universal developmental sequences and trends. The works of Piaget (1951, 1969), Werner (1957; Werner & Kaplan, 1963) and El'Konin (1971) are representative of this tradition. The study of the effective stimulus environment is the focus of a second orientation. These studies are operational approaches to issues raised in the theoretical works. The interest is in unravelling "critical" dimensions in the child's play world which limit, enhance or otherwise modulate the subject's behavior. Gramza's (1973) attempt to measure the influence of color, complexity and spatial position of toys is an example of this sort of work. Other studies in this tradition include those of Pulaski (1973), Franklin (1970), and Switzky, Haywood, and Isett (1974), all of whom varied aspects of the structure of play material. An extensive investigation by Fein (1973) explored selected social as well as physical dimensions of the play milieu. Though not of direct relevance to the present study, mention must be made of a third trend in play

research which has recently become quite prevalent. Numerous comparative and play-training studies have been addressed to social class differences in symbolic play and general representational activities. Included here are studies by Smilansky (1968), Fink (1976), Freyberg (1973), and Saltz and Johnson (1974). Attempts are made to minimize cognitive variability among samples by subjecting disadvantaged children to play-training techniques. The underlying assumption that "improvement" in symbolic play generalizes across cognitive functioning is a thorny one, which warrants further investigation.

The broad area of interest in this study is the development of imaginative play during the period from 4 to 8 years of age. It is assumed that a comprehensive description and analysis of this behavior is possible only if its many facets are jointly considered. Therefore, our attention is addressed to the following aspects of symbolic play. First, an attempt is made to evaluate the developmental status of play constructions by deriving observational categories from Piaget's (1951) description of the structural complexity and integration of this activity.

A second major concern is the nature of the correspondence underlying symbol formation at different ages. We refer primarily to the physical resemblance mediating between the external form of the symbolic object chosen (vehicle, or signifier), and that which it represents (referent, or signified). Clearly, the type of relationship constructed depends upon how the child construes the resemblances as well as on the form itself. It is assumed that the correspondence, or resemblance mediating the symbolic relationship may be based upon:

(1) the subjective influence of the motor and/or affective attitude of the subject, (2) overall external similarity, (3) feature selection, or (4) Representation in which language is the vehicular medium. The categories for this analysis are based on Werner and Kaplan's (1963) description of the ontogeny of representation. Though not exhaustive, they permit differentiation among play symbols the children construct.

Third, patterns in the deployment of verbal-linguistic and motor-gestural modes are examined. It has been documented that representational activity may be expressed via a number of diverse media within a single task situation. The observation categories were adapted and selected for relevance from the list compiled by Franklin (1970). The verbal-linguistic modes included role language (dialogue, or dramatic impersonation), and onomatopoesis. Structuring actions (arrangement of the play props) and dramatic play actions (enactive movement of materials) comprised the nonverbal means of manifesting symbolic reference.

Two additional facets of symbolic play are systematically explored, though they are not primary concerns of this investigation. The first is latency, and the movement into experimentally induced symbolic play. The latency measure consists of the number of 15 second time sampled intervals elapsing between exposure to play materials and the beginning of clearly identifiable representational activity. Those observing symbolic play in naturalistic settings have consistently remarked upon the fluidity with which the child moves between the worlds of adaptation to reality and symbolic play. It is recognized

that the flow of child play "on demand" may vary importantly from that occurring spontaneously.

The second is thematic content of the children's narratives, an area which to date has chiefly been the domain of clinically oriented psychology. Here was assumed that the stories reflect the child's organization of his experience, as well as phase-specific interests and concerns. The following quantitative measures were derived from the transcripts of the children's narratives as well: (1) number of stories, (2) verbal fluency, (3) overall number of themes, thematic diversity.

The impact of age, sex and play materials upon each of these variables was examined. Play materials comprise a critical and little studied aspect of the play stimulus field. The olistic assumption that activity is dependent upon its context, and responses anchored to the stimulus situation, suggests that variation in play objects is a likely source of differential response. This investigation explores the influence of play materials, varied in their degree of structure, upon symbolic play constructions. Though both Piaget and Werner elaborately describe the evolution of symbolism, to date there are limited experimental data addressed to developmental variation in the effect of minimally or maximally structured play props.

Structure has been variously conceptualized in the literature. Definitions tap dimensions ranging from stimulus complexity to number of alternate play uses suggested by the materials. Assuming that symbol formation is influenced by the qualities of the available vehicles,

clearly defined physical features of the materials constitute variation in the present study. In the present study, degree of structure is treated as a relative dimension, realized in two differing sets of materials:

I. Maximally structured toys: Including realistic, literal representations of familiar objects or persons:
   A. Form: Three-dimensional, detailed, parts of the whole sharply articulated
   B. Material: Various materials chosen to maximize realism
   C. Color: As occurring in nature
   D. Size: Miniature, size relationships among objects correspond to those in real world

II. Minimally structured toys: Including less realistic, figurative representations of familiar objects or materials.
   A. Form: Three-dimensions, somewhat diffuse and global, simplified to corresponding geometric form
   B. Material: Randomly varied
   C. Color: Randomly varied
   D. Size: Randomly varied

In summary, the intention of the present study was to refine developmental description and analysis by integrating it with the study of experimental variables likely to prove relevant to behavior differences. It was hoped that so doing might broaden our appreciation of symbolic play and yield information useful to the specification of rules underlying observed behavior patterns.

Review of the Literature

As we turn to the symbolic play literature, two approaches are of particular relevance to the present study. The first is concerned chiefly with the definition of symbolic play, and those developmental trends which characterize the growth process. The research falling within the second tradition focuses on the impact of specific variables upon selected play behaviors. The investigators' treatment and interpretation of observed differences is a central issue here. Two basic forms of explanation emerge. The first is that observed differences express variation in actual cognitive competence; the second is that differences reflect a universal human intellect, influenced by various conditions of study, life, and culture. With these issues in mind, we turn first to that literature directed at the unravelling of universals in symbol formation.

The most comprehensive structural description of the ontogenesis of play is offered by Piaget (1951, 1969). For Piaget, there is an invariant and universal sequence of cognitive structures comprised of three developmental stages, each extending the preceding one, reconstructing it on a higher level, and surpassing it. Symbolic play is a representational modality. It occurs when assimilation predominates in its continual interplay with accommodation; when reality is molded to the whim of the cognizer, with a lesser concern for a precise adjustment to that reality. The criteria by which Piaget differentiates play from nonludic activity do not allow for clear distinction between the two. Rather, he stresses that the tonality of

an activity is more or less playful depending upon the spontaneity, affect, and purpose of the player, as well as the primacy of assimilation over accommodation.

Symbolic play is one of the manifestations of the semiotic function. This implies the representative evocation of an object or event not present, and presupposes the formation and use of differentiated signifiers (Piaget & Inhelder, 1969). The period of representational intelligence extends from about 2 to 7 years of age. But symbolic play peaks between 3 and 6. After this, it appears to become progressively less distorting, more logical and adaptive. Play acquires rules, or adapts symbolic imagination to reality in the form of spontaneous constructions which imitate reality. At the same time, egocentric thought is interiorized, in the form of fantasies and related private events.

The presence of symbolic play indicates that intelligence has developed beyond the stage of pure empiricism. This is made possible by the child's creation of a symbolic language modifiable according to his needs. In every ludic symbol, one may identify a "sui generis combination of distorting assimilation which is the basis of play, and a kind of representational imitation, the first providing what is signified and the second being the signifier of the symbol" (Piaget, 1951, p. 102). Thus, the symbols, prefigured in deferred imitative behaviors (images) related to the absent object or person, are not used to accurately picture reality. For Piaget, the signifier is only "more or less" related to that which it represents. The signified is evoked through the intermediary of an object vaguely comparable to

it, and to which the qualities of the signified object are attributed. Clearly, assimilation predominates in the relation between signifier and signified, since the former may be assimilated to the latter without apparent external similarity; and even within the symbol itself, since it is not purely imitative but depends upon a substitute of some kind (Piaget, 1951, pp. 280-282).

During this developmental phase the symbol is progressively elaborated and organized. Gradually, it loses its distorting ludic quality, and approximates a straightforward, imitative representation of reality. As play develops, it is possible to differentiate various types of symbols, from those most personal, egocentric, and farthest removed from their "signs," to those converging on the conceptual sign, without being identified with it (Piaget, 1951, p. 88).

Piaget's data consist largely of observations of his own children, with varying degrees of experimental intervention, painstakingly described. Unfortunately, there is no basis at present for assessing the extent to which these findings may be generalized. Piaget's méthode clinique lends itself neither to replication, nor statistical analysis. In the present study, observational categories amenable to experimental investigation were derived from Piaget's groundbreaking ontogenetic description.

Lezine's (1972) longitudinal study of the transition from sensorimotor to symbolic functioning embodies the spirit of empirical work in the Piagetian tradition. Lezine's aim was to document the acquisition of the underlying representative structures in child play from the earliest age possible. Using a "free games situation" in a day nursery,

observations were made of the manipulative and sensori-motor activity of 76 children from 9 to 40 months old. Subjects were placed for 15 minutes in the experimental lab, with 15 objects in a predetermined array before them. Extensive behavior analysis was done by an observer close to the child, and two behind one-way screens. Observation records were submitted to minute statistical analysis. A major contribution of this study is the elaboration of two types of knowledge requisite to the semiotic function: "one concerning the properties of objects, the other the coordination of actions before they give signs of mental representation or substitution of a signifier for the absent object" (p. 12). Lezine's work is a rich source of normative data, generating many hypotheses.

Though widely accepted, Piaget's theory of universal developmental sequences has been challenged in the literature. Smilansky (1968), for example, contends that Piaget's data are culture-bound. Comparing the sociodramatic play of advantaged and disadvantaged Israeli children, she found that most of her underpriveleged subjects did not participate in this kind of play at all. Rather, growth proceeded from motor play, to rule games, without the symbolic activity assumed to mediate between these. In both sociocultural strata, the symbolic play observed in girls was more mature than that of the boys. Lacking a scaled evaluation instrument, Smilansky was able to report only general observations, based on the presence or absence of the main elements of sociodramatic play. In addition, a bias was built into these data as classroom observations were done randomly, whenever the experimenter spotted an "interesting" specimen. Inferences were

made as to the social class differences in childbearing practice as they influence the ability to integrate or elaborate concepts. The Developmental Play Scale utilized in this study makes it possible to assess symbolic play from the standpoint of structural complexity. Evaluation on this basis yields more information than an unordered listing of the component behaviors.

The results of Eifermann's (1970) extensive observational study of play between 6 and 14 years dispute at once the contentions of Piaget and Smilansky. Among her subjects, symbolic play development peaked between 6 and 8. Piaget indicates that during this period, symbolic play is transformed or internalized, largely disappearing from the observer's view. The data also clearly indicated more symbolic play in disadvantaged children over 5 than in their middle-class counterparts. Eifermann's approach is valuable in that it permits the testing of specific developmental hypotheses. Careful sampling in multiple settings with many observers was done. This study is weakened by the fact that data consisted of holistic judgments, "pigeon holing" the entire play sequence into one category or another. Thus the rich variation in the subjects' behavior is not reflected in the data. These challenges to long-held assumptions regarding developmental sequence point to the importance of examining those contingencies which may determine the discrepant results.

An early normative study by Markey (1935) warrants mention. Using categories similar to those later proposed by Piaget, Markey sought developmental trends in imaginative play of children between 22 and 50 months of age. Play was defined as the use of " . . .

objects, materials, activities and situations as though they had properties or attributes other than those which they apparently seemed to possess" (p. 10). Taken at face value, Markey's findings indicated that the amount of symbolic play increased with age, corroborating Piaget's description of this period. Interestingly, shifts in the type of play symbols created at different ages were reported. Early symbols were constrained by what the child believed were the real-life uses of the materials. Older subjects applied play symbols more freely, particularly with relatively unstructured materials. These findings as to the changing influence of the play materials run counter to Piaget's assertion that the young child's play symbol is more egocentric and less an imitative construction than that of the older child. Markey's data must be interpreted with considerable caution. The reported correlations are contaminated to an unknown degree by the influence of verbal competence, as ratings were based solely on the subject's verbalizations, regardless of the child's actual manipulation of the materials.

Werner(1957; Werner & Kaplan, 1963), like Piaget, emphasizes orderly and directional change in mental functioning. He shares with the early evolutionary theorists his concern with change across species, as well as within the human species. To account for these phenomena, Werner appeals to the orthogenetic principle of development: " . . . organisms are naturally directed towards a series of transformations, reflecting a tendency to move from a state of relative globality and undifferentiatedness towards states of increasing differentiation and hierarchic integration" (1963, p. 7). Though Werner adheres to a

concept of overall unilinearity of change, he contends that the context of which an activity is part will influence its final developmental form.

In Werner and Kaplan's (1963) account, symbol formation derives from schematizing and formbuilding activity. Development is portrayed as the increasing distancing and differentiation among a tetrad of elements: the object of reference, the symbolic vehicle, the addressor and the addressee. This process is interwoven with the ongoing integrative systemization of the symbolic forms. Each of the principal components of the symbol situation undergoes developmental transformation: ". . . the addressor matures, the addressee changes from parents to peers to generalized others, the referents become increasingly complex and abstract, and the symbolic vehicles are of an increasingly conventional and communal nature" (1963, p. 40). To fully account for symbol formation, one must conjointly consider the changes both within and between components.

Though difficult to "concretize" or operationalize, Werner and Kaplan's description of the directional change in the symbol constellation is a provocative source of hypotheses as to critical task dimensions. The evolving vehicle-referent correspondence is of primary interest here. In brief, Werner and Kaplan maintain that "when a symbolic vehicle represents a referent, the vehicle structure functions to 'reveal' or 'depict' through some sort of correspondence or analogy, the connotational structure of the referent" (1963, p. 15). Analogy is not "given objectively," but is established through an intentional act, by which a vehicular form is systematically constructued to represent

a referent. An exception to this is the protosymbol, which directly "presents" a meaning rather than "represent" it. In any case, correspondence is achieved when both pattern and object are embedded in an organismic matrix regulated by schematizing activity. Such representation may rest on the establishment of an inner, dynamic similarity between vehicle and referent, without this similarity being apparent to an observer who regards solely the external, geometric-technical properties.

Immature forms of symbolic reference are assumed to be mediated by substantive resemblances between vehicle and referent based on the physiognomic properties of various symbolic stimuli. These subjective responses reflect the child's inability to separate its own affective experience from that of the object. Their meanings are highly individual, lacking in the stable connotation necessary for communication to others. Development is characterized by a progressive diminution in tangible substantive and qualitative correspondence between the two entities. This increased "distance" is also reflected in a lessening of the egocentricity and idiosyncrasy characteristic of early symbols. Generally speaking, the meaning of the referent is decreasingly bound to a concrete external form, " . . . and eventuates in an invariant inner structure distinct from the ever varying appearances which an object presents to perception" (1963, p. 48). Thus a negotiated correspondence with the inner form of the symbol takes the place of external similarity. Interesting also is Werner's (1957a) notion that as the child develops, he is increasingly attentive to details, and to correspondences that are less global, and more differentiated.

Consequently, the cognitively more advanced child is capable of formulating more schematic symbolic constructions, based on formal properties, or relationship-of-parts-within the whole. Experimental manipulation of the kinds of materials provided as symbolic vehicles for children at various ages would allow us to explore the complex relationships between age, playthings, and the quality of symbolic reference.

Commenting briefly on the development of symbols in play, Werner and Kaplan (1963) observed an increasing trend towards an autonomous domain of playful representation, separated from the sphere of serious action. Vehicles employed are increasingly distinct in form and context of execution from the contents they depict. This is demonstrated in the growing separation of the properties of the vehicle from those of the referent. This trend is coupled with increasing realism in the play content. Play themes become "less 'subjective', fantastic', 'idiocyncratic', and more directed towards the depiction of events and objects from everyday life" (p. 94).

Reviewing the Soviet psychologists' contributions, El'Konin (1969, 1971) stressed the formative role played by both language and imitation of significant adults. Two forms of symbolism are essential to symbolic play. These include (1) assumption by the child of a role, with activities designating appropriate behaviors, and (2) substitution of one object for another.

Relying primarily on the experimental work of Fradkina (1946), El'Konin (1971) noted that during infancy the child's activity is inseparable from the object with which it is assimilated. As representation develops, the child is increasingly able to make this separation,

and transfer, or generalize, actions to new objects. This observation echoes Piaget's description of the projection of symbolic schemas onto new objects. By the third year, there occurs a widening of the sphere of objects substituting for one another. The demand becomes minimal that the substitute object serving as play symbol resemble the substituted object. These contentions interestingly parallel Werner and Kaplan's (1963) notions of disembedding and distancing between vehicle and referent. El'Konin did not speculate as to the course of this developmental trend beyond age 3. He saw the child's relationships with significant adults as governing this growth process. Wishing at once to be independent and to participate in the activities of adults, the child resolves these contradictory tendencies by playing the role of an adult or producing adult activities. Thus symbolization in play may function to simulate human activity or social relationship.

We turn now to a second major approach to the study of play. Issues that are raised by the theorists are here approached operationally, as investigators ask how stimulus variables enhance or limit symbolic play behavior. Franklin's (1970, 1973) comparative study of non-verbal representation in lower and middle-class preschoolers attempted to integrate the understanding of group differences with systematic exploration of a potential source of the diversity in performance. The underlying assumption was that the establishment of symbolic relationships between entities is facilitated by greater similarity. To test this, subjects were asked to enact two pretend situations with two sets of corresponding materials to serve as signifiers. Differing in degree of imposed structure, one was a set of

realistic toys, while the other involved wooden pieces roughly approximating the realistic toys in size and shape. Subjects were instructed as to the theses they were to enact. While this may not affect the complexity or integration of the child's play symbols, it is likely that presentation in a thematic grouping (also done by Fietelson, 1973; and Fein, 1973) may limit the variety of symbols created. The minimally and maximally structured materials in the present study closely approximate the dimension Franklin employed in her work. To avoid an additional external restraint on behavior, the objects are presented without a predetermined theme, in a grouping allowing the child to develop many themes.

In analyzing her data, Franklin distinguished between nonrepresentational and representational use of play props. Behavior was globally classified on several scales in respect to levels and modes of representational activity, and whether instructions were followed. Overall, representational play was more prevalent and at a higher level when realistic materials served as signifiers. All children found it easier to both adopt roles and maintain symbolic reference with realistic toys than with their nonrealistic counterparts. Franklin stressed the importance of determining how this relative facility with realistic symbols relates to the child's developmental level. Or, more generally, "can we discern a developmental trend in the types of correspondences underlying the symbolic objects chosen at different ages?" (1973, p. 41). This question is a pivotal concern of the present study.

Assuming that the environment generates its own set of possibilities, Pulaski (1973) assessed the effect of two degrees of toy structure

upon the fantasy play of children between 5 and 8 years of age. It was hypothesized that minimally structured materials such as blocks, clay, or rag dolls, would stimulate more (and "richer") fantasy behavior than extremely realistic toys, leaving little to the imagination, and anchoring the responses to a particular stimulus situation. Pulaski's (1973) hypothesis was derived from Singer's (1973) observation that much less fantasy and imaginativeness was introduced in structured as opposed to free, undirected play situations. To test this, Pulaski observed 5-, 6-, and 7-year-olds at play with five categories of materials. Each included highly structured toys functionally matched with equivalent materials which were as unstructured as possible. Materials included sets of paint, clay, construction material, dolls and costumes. For example, minimally structured painting materials consisted of blank paper and paint. In the high structure situation, the same water colors were used to paint plastic plaques on which were raised outlines of animals and a clown. Though Pulaski found very little variance in response to the two sets of toys, children between 5 and 8 did produce a greater variety of pretend stories when toys were minimally structured than when they were highly structured. The weak differential findings are said to stem from too little difference between the sets of toys, as well as from the homogeneity of the sample. An additional problem may have been the selection of tasks tapping different competencies, and not readily dimensionalized as structured or unstructured imaginative play materials.

Fein, Branch and Diamond's (1973) study of children between 20 and 26 months was addressed to the influence of cognitive and social

factors assumed to have a disruptive effect upon make-believe play behavior. The cognitive issue was the subject's ability to generate pretend activities with play materials varying in their proximity to prototypical cognitive representations of objects. It was assumed that as children grow, their increasing ability to make complex mental transformations (Piaget, 1951) would be reflected in greater facility representing with "figurative" as opposed to "literal" replicas of familiar objects (for example, sea shell [figurative] rather than paper cups [literal] for drinking). The social issue focused on the child's response to unfamiliar people and situations. The effects of these variables across age and sex were assessed. Fein's differential hypotheses appear to be derived from a variety of theoretical and empirical sources. The results were as follows:

(1) Variation in the proximity to a conceptual prototype of playthings influenced make-believe; there was more make-believe with the literal replicas of familiar objects.

(2) Sex differences with highly prototypical materials appeared by 26 months; girls played more.

(3) Familiarity of situation and adults influenced pretend; girls were more sensitive to these factors than boys, familiarity uniformly elicited more play than strangeness did.

Fein's study is provocative as it suggests several potentially significant experimental variables. However, the testing procedure restricts the data in important ways. By instructing the child on both the imaginative theme he was to develop, and the materials with which

this was to be done, much of the spontaneity, individuality and creativity by which we define symbolic play is lost (Piaget, 1951; Sutton-Smith, 1971).

In a more recent study, Fein (1975) attempted to extend past theorizing regarding the mental structures and processes underlying pretend behavior in young children. Reviewing past research, Fein adopted the Wernerian assumption that the developmental course of pretending reflects the child's growing capacity to create symbols increasingly independent of external stimulation, and increasingly "distant" from representations of the events to which they refer (Werner & Kaplan, 1963). Earliest symbolization occurs when sufficient pattern equivalence results in global matching of a mental pattern to an object in the environment. Later, pretending is more a process of feature selection, or, in older children, feature production governed by a mental scheme, rather than an immediately present object.

Fein argued that these symbolizing behaviors may be construed as varying in the extent to which transformation is required for pretending to occur. The term "transformation" was used to designate the process whereby characteristics of the immediate environment become subordinated to a mentally initiated activity, permitting one object to "stand for" another. Fein maintained that symbolic play with objects develops along an orderly course from single transformations to multiple ones. To test this, the enactment of a familiar action pattern with "highly" and "less" prototypical materials was studied. Three categories of transformation were presented to the 2-year-old subjects. The results confirmed the investigator's hypothesis,

suggesting that in young children, pretend transformations require anchor supports from realistic objects in the immediate stimulus field. As the number of required transformations increased, the children became less proficient in playfully representing the activity. Fein's study is important as it represents an attempt to tease out and systematically examine the psychological underpinnings of observed behavior differences. On the other hand, a methodological feature must be noted which limits the usefulness of this approach in spelling out the rules governing symbol formation in play. The children were instructed as to both the materials they were to use, and the pretend activity they were to enact. Thus the investigator imposes the relationship between vehicle and referent, and the child is not free to follow the dictates of his own intellect in assigning meaning to the provided signifiers. In the present study, the processes underlying symbol construction with the two sets of toys were studied by having the child construct the symbolic reference, and by scoring these self-generated symbols as to the quality of the relationship mediating between the symbol and that which it represented.

The play studies just considered present the subjects with tasks designed to approximate real-life play activity. A very different approach to play stimuli is adopted in a study by Switzky, Haywood and Isett (1974). This investigation was done to determine the functional relationships among levels of stimulus complexity (defined by number of turns in randomly generated polygon objects), effects of exposure to these complex stimuli, and amount of exploratory and play behavior elicited in boys and girls between 2 and 7 years of age. Results

indicated that time spent engaged in both symbolic and sensorimotor play was a decreasing function of the level of stimulus complexity for the younger boys and girls and the older boys. Older girls (4 to 7) showed no difference in play time across complexity levels. The authors were able to achieve maximal control over stimulus complexity, thereby providing a sharpened focus on a circumscribed aspect of the representational process. At the same time, the procedure followed brings to light the problem of assessing symbolic play experimentally. As defined in this study, play was that behavior in which the subject engaged in a testing room with a psychologist upon sequential presentation of seven black, three-dimensional random forms. This behavior meets few if any of the traditional criteria for play.

In closing, work by Gramza (1972, 1973) represents yet another preliminary effort to understand the internalized rule systems governing play. Though Gramza did not isolate symbolic play in his analyses, his conceptualization of the issues is noteworthy. Defining play as "a result of the interactional flow between the physical environment and the child's perception of that multifaceted sensory field" (1972, p. 18), he noted that a comprehensive analysis must include study of stimulus dimensions or parameters of play objects, and their settings. Thus Gramza's research had a double-pronged thrust: (1) identification of critical stimulus dimensions, and (2) measurement of the way in which these parameters modulate play behavior. This approach is an ambitious one, only partly realized in the design of the research. For example, definition of critical play stimulus dimensions was inferred from subjects' relative use of play objects selected by the experi-

menter. Other dimensions studied by Gramza included color, complexity and spatial position of materials. The importance of this work lies mainly in the attempt to sensitize play researchers to the crucial need for reliable data in this domain. Gramza's (1972, 1973) research clearly reflects the conviction that varied response patterns may be best understood by refining and differentiating their complex sources.

This conviction is shared by the present investigator. Many of the studies cited, while not in agreement as to objectives or results, demonstrated the differential effect of various materials on symbolic play behaviors. Clearly, there is much theoretical and conceptual material available in the literature as well. In the present study, an attempt was made to integrate these two approaches by exploring the impact of age as well as toy structure upon many elements of symbolic play activity. It was hoped that in so doing, a contribution would be made to unravelling a critical source of variation in play behavior, understanding of the development of this complex behavior would be enhanced.

Questions and Hypotheses

The Organization of Symbolic Play

Age effects. Consistent with cognitive-developmental theory, it was anticipated that over age, symbolic play constructions would become increasingly complex in their organization and degree of integration. Though Piaget (1951) elaborately charted this progression, the generalizability of his findings has been challenged, and little studied. In the present study, the Developmental Play Scale categories

(see Table 2) closely approximate Piaget's description of the activity typical of each phase. It was assumed that the subject's play maturity level as defined in this hierarchy of behavior categories would be an increasing function of age.

The influence of toy structure. The second hypothesis concerned the influence of the structure of play materials upon the complexity or integration of play constructions. While developmental theorists (Piaget, Werner) stress the application of a cognitive structure across functioning, they also warn that contextual demands may influence the quality of the behavioral response deployed.

Pilot data suggested that a tendency towards more "mature" play symbolism would be observable with the highly structured materials. The rationale for this was that specific identities are so compelling as to be nearly "announced" by these toys. Thus the subject might spend less time making identifications, and move more rapidly into the more complex enactment of predetermined themes, strictly imitative rather than distorting assimilation, and the embellishment of specific roles. All of these are criteria for assignment to the most mature level of play symbolism.

It was anticipated that the children's scores in the two play conditions would be highly correlated.

The Establishment of Symbolic Reference

Age effects. Significant age differences were anticipated in the elements that determine symbolic reference. Piaget reported that the play symbol is most idiocyncratic and egocentric in early

childhood (between 2 and 4 years). With development, it loses its distorting quality, and becomes an increasingly imitative representation of reality. While general themes remain symbolic, details in material constructions tend towards exact accommodations (1951, p. 136). On the other hand, with the end point of language in mind, Werner (1963) stressed the progressive "distancing" or diminution of tangible resemblance between the external form of vehicle and referent. Examination of our pilot data led to the view that, with the following qualification, both theoretical positions might prove valid for the present study. Clearly, the linguistic sign is the most "distant" as well as "mature" vehicle. However, focusing solely on symbolic play wherein subjects were specifically instructed that physical objects (toys) were to serve as symbols, the predicted developmental course divered somewhat from Werner's formulations concerning the early growth of representation. As measured by the frequency with which symbols fall into each of the four symbol-referent correspondence categories, the following predictions were made:

(1) Representation in which Language serves as the Vehicular Medium would be an increasing function of age;

(2) Correspondence based on External Similarity would be an increasing function of age, as, when play objects are symbols, establishment of reference would be increasingly constrained by the physical properties of play materials; and,

(3) Establishment of Subjective Correspondences, a most primitive form of cognition, would decrease over age.

The influence of toy structure. It was predicted that the nature of the symbol would vary as a function of toy structure. Investigators including Singer (1973) and Pulaski (1973) have noted that minimally structured play objects offer the child "more opportunities" for imaginative activity. Others (Fein, 1972; Franklin, 1970) suggest that symbolic transformations are more readily formed and maintained with highly structured, realistic materials, at least in young children. Yet here are virtually no empirical data linking play materials to this aspect of symbolization. The following hypotheses were based on the assumption that highly structured playthings constrain the bases on which correspondence might be established. As these materials suggest certain identities, the child's response would be anchored to the suggested situation. Symbolism in this context involves little analogic extension.

(1) Maximally structured materials would elicit significantly more correspondences based on External Similarity than would their minimally structured counterparts.

(2) In the maximally structured condition, there would be significantly fewer correspondences based on Feature Selection than in the minimally structured condition.

Representational Modes

The following hypotheses were made rather tentatively, as to date the subcategories comprising this measure have not been systematically explored in subjects beyond preschool age.

Age effects. Significant age differences were expected in the use of verbal and motor-gestural media during the play segment. In their description of the evolution of symbol formation, Werner and Kaplan (1963) noted that "the increasing differentiation and articulation of expression for states of affairs goes hand-in-hand with the increasing pre-eminence of the verbal-linguistic media of representation" (p. 131). Thus it was postulated that use of the verbal modes would be an increasing function of age, and that Dramatic Play Actions would decrease over age.

The influence of toy structure. The question at hand was whether minimally and maximally structured play props would differentially affect the frequency with which the various representational modes appeared. With regard to the motor-gestural modes, significantly more Structuring Action was predicted in the minimally structured condition. This expectation stems from the greater ambiguity of the materials, and their less "fixed" identity as discrete whole objects. Unlike the structured toys, these might be readily combined as parts of newly constructed wholes.

Sex differences. It was expected that girls would use more role language during the play session than would boys. We drew upon cultural differences in the socialization of male and female children to derive this notion. Despite changing sex roles, boys still play very little with dolls compared to their female counterparts. Hence they might use them in a less differentiated, elaborated manner.

Thematic Content of the Narratives

The purpose here was to begin open-ended exploration of this aspect of play. It was assumed that consistencies in thematic choices might be a valuable indicator of the culture of childhood at various stages. We sought to uncover phase-specific issues, as well as those related to the child's sex, or to the materials at hand.

Age effects. Concerning diversity of themes, pilot testing of the materials supported the hypothesis that older subjects would enact more diverse repertoires of themes than the younger subjects, reflecting their greater experience. Though specific hypotheses were not offered, it was expected that the salience of certain content areas would vary as a function of age, reflecting the particular concerns and interests of children at various age levels.

The influence of toy structure. The issue here was whether the use of more or less structured materials systematically influences the thematic content or fantasy of symbolic play constructions. It was argued that because of their ambiguity, minimally structured play props would offer far more leeway with regard to the content which might be depicted, and that this would be reflected in a greater variety of themes enacted during the minimally structured play segments, than with highly structured materials. Pulaski's (1973) study of fantasy in play supported this position.

Sex differences. It was predicted that themes of nurturance would be more prevalent in the girls' stories, while aggression would be more frequently encountered in boys' stories. Pitcher and

Prelinger's (1963) study of children's stories (unrelated to play with objects) supports this hypothesis.

Latency and the Initiation of a Play Sequence

A latency measure was included as a means of looking at initiation of a symbolic play sequence. As this phase of the observation period has typically been left out of experimental analyses, there is little evidence in the literature suggesting how this variable operates as a function of age, sex, or materials available to the subject. The only directional hypothesis offered was that highly structured materials would yield more rapid movement into a symbolic play sequence than the unstructured materials, which require the subject to create identities before a play sequence may be enacted. Hence the latency period would be significantly longer with the minimally structured toys.

The effect of order of task presentation was systematically varied and assessed in relation to each of the dependent variables, though no significant main effect was expected. By varying the sequence of task presentation (minimally before maximally structured toys, or the reverse), it was possible to control practice or special order effects.

In addition to the prediction of main effects of the independent variables, it appeared quite likely that interactions among these factors might produce differential results. In exploring these interrelationships, two-tailed tests of significance were used except where directional hypotheses were tested. Zeroing in on the interaction between developmental level and the structure of materials, we asked

simply: Do we observe systematic differential response patterns in children (4, 6, and 8 years old) in play with minimally and maximally structured materials? As children grow, play becomes increasingly stable across contexts (Werner, 1957). It was therefore expected that the predicted influences (see above) of the treatment condition upon performance measures would be strongest in the youngest subjects, weakest in the oldest.

Chapter I

METHOD

Subjects

Subjects included 72 Hunter College Elementary School children who comprised three age groups of 24 children each.

An equal number of males and female 4-, 6-, and 8-year-olds were tested. Though the sample was mixed both racially and in terms of socioeconomic status, it was mainly comprised of white, middleclass children. The principal reported that the mean IQ was 125. (The standard deviation was not known). Within each age group, the sample was drawn from at least two classrooms to minimize any systematic effect of specific teaching methods. Three 4-year-olds who started but did not complete the play task were not included in the final sample.

Play Materials

The children were observed during play sessions with each of the two corresponding sets of 15 objects. The sets of materials were designed to systematically vary in terms of degree of structure as defined above. Maximally structured play items (See Table 1 for a complete listing) included literal and realistically detailed replicas of objects and persons, familiar to the child. The minimally structured set included three-dimensional objects which globally approximate the form of the corresponding realistic toy. These signifiers are less detailed, and vary randomly in color, size and material.

Table 1

The Maximally Structured Play Materials

baby doll
bathtub
bed
building
car
chair
cup
female doll
firetruck
knife
lion
male doll
plate
table
television

Procedure

Subjects were observed individually in each of the two treatment conditions. The order of presentation was counterbalanced. The minimally and maximally structured play tasks were administered in sessions at least two weeks apart. Behavioral assessments were made both during the following and observation period. A time-sampling technique for data collection was utilized during the 10-minute play episode. A tape recorder, presenting a soft, but audible piano tone (520 cycles) at 15-second intervals, allowed the observers to describe the flow of a child's behavior by means of a continuous written behavioral protocal, and a

checklist of observation categories. These behavior categories comprise a measure of (1) the complexity and integration of symbolic play (see Table 2), (2) the nature of the symbol-referent relationship (see Table 3), and (3) mode of symbolic expression. This method appeared particularly well-suited for purposes of comparison of children's behavior under different circumstances (Smith & Connolly, 1972). Forty time units were sampled for each subject in each observation period. A child's score for each behavioral category is equal to the number of intervals during which the relevant behavior was observed. Per session scores ranged from zero to 40 for a 10-minute session.

The female observers (Experimenter 1 and Experimenter 2) were in the testing room with the subject, collecting independent records of each episode. After informally interacting with the children in their classrooms, Experimenter 1 (the writer) escorted the subject to the testing room, casually chatting with the child about his play preferences to establish his understanding of the concept of "make-believe." Testing was done in a large, airy room, which serves the school as extra play space and with which all the students are familiar. Here the child found either the minimally or maximally structured materials in a random array on the floor. The subject was invited to sit down, and given a two-minute warm-up period to familiarize him/her with the materials. The child was then given the following instruction by Experimenterl:

> "I've put all these toys here so that you can play with them for a while. You may use them however you like, as long as it is pretend, or make-believe. You can act something out, put on a play. You choose. Sometimes it's hard for me to understand what you're doing. It would help if you would tell me as we go along."

Table 2

Development Play Scale: Definition of

Observation Categories

Level I: Identification of One Object With Another

- identification occurs spontaneously, is indicated by speech before the imitative action begins.

  Example: Child moves disc through the air, calling it a flying saucer.

Level II: Simple Symbolic Combinations

- involves whole scenes rather than isolated imitations or mere assimilation of one object to another; real scenes and imaginary episodes are enacted, the child typically plays one role.

  Examples: child instructs dolls, grocery store scenes, outerspace creatures landing, compensatory reenactment of real event.

Level III: Complex Symbolic Combinations

- characterized by relatively greater orderliness, more exact imitation of reality, differentiation and adjustment of roles, greater attention to details in material constructions.

  Examples: organized doll play scene dealing with families, education, shopping; dramatic enactment of role with attention to speech, stance, gesture, words, behaviors.

Level IV: Symbolic Construction More Nearly Related to Adapted Work

- characterized by the infusion of rules to organize play, predetermination of themes or outcomes of dramatic construction. Plots are complex, may include subplots, and resolution is effected; characters are highly developed with attention to their thoughts or feelings.

  Examples: child narrates sequence of play events, predetermining role requirements in doll play.

No Symbolic Play Activity Observable: This category is scored when the sampled time unit is spent primarily in nonludic activity. The myriad of possibilities here include: questioning investigator about task; interlude between symbolic constructions; protestations and hesitation about task "I can't think of anything to play;" also nonsymbolic play.

Table 3

The Establishment of Symbolic Reference:

Definition of Observation Categories

I. Subjectively Determined correspondence
- free adaptation of the materials to the momentary interest or purpose of the child.
- motor and/or affective attitude of the subject determines the understanding and use of the play objects (physionomic perception).
- may be little or no likeness in external form of symbol and referent from adult perspective, assignment may appear "random" or idocyncratic to observer.

Examples: tongue depressor identified as cruel lion, dollas running man, square block as a cat.

II. Correspondence based on overall External Similarity
- assignment of reference is based on global perception of compelling shared external physical features.
- color, form (shape), material may be among the salient dimensions.
- relation of parts within whole may be the basis for symbolic use.

Examples: cylindrical wooden block becomes a log, rectangular block with wheels is transformed into firetruck.

III. Correspondence based on Feature Selection (articulated)
- though a bond of external similarity is still reflected in the assignment of reference, selection of the vehicle stems less from apparent overall likeness to referent (than in type II).
- selection is more "articulated," linked to a single dimension of the stimulus or to a part of it, attention to detail.
- focus is on a selected property.

Examples: tabletop becomes a wall, a wooden animal is used as a tunnel.

IV. Representation in which Language Serves as the Vehicular Medium
- conventional patterns of communal language become the dominant medium of representation.
- pretending initiated more by an internal scheme, less a function of pattern-matching triggered by an external stimulus.
- symbolic vehicles detached from actual commerce with things of the environment.
- referent is inner structure removed from tangible perceptible features, no longer a concrete particular entity

Examples: scored when reference is severed from action upon concrete objects; subject appears "carried away" by his own story narration

The formal observation period then began, Experimenter 1 scoring each time interval on the checklist of behaviors. After the first two minutes, probing or encouraging was done by Experimenter 1 when the child did nothing, or when necessary to decipher ongoing behavior. Beyond this, interaction with the subject was limited to expression of encouragement, and when needed, repetition of directions. Every effort was made to do this as little as possible. Clearly, no standarized timing could be worked out, as every child's activity pattern was different. Experimenter 2, seated inconspicously several feet from the child, wrote a detailed descriptive protocol of the subject's behavior (Singer, 1973). The focus here was primarily on motor-gestural behavior, as all verbalization was simultaneously tape-recorded.

Design and Analysis of Data

All subjects served in both treatment conditions (minimally and maximally structured materials), to provide a control on variability due to differences in the average responsiveness of subjects. To randomize any rder effects, half of the male and female subjects at each age level were first tested with the minimally structured toys, then those of maximal structure. This order was reversed for the remaining half of the children.

Reliability of the findings of this study was assessed by obtaining inter-observer agreements. Protesting of the direct observation scoring techniques was done by having an additional observer practice, then independently score the performance of 12 subjects during the play session. Intraclass correlations were computed to establish the inter-

rater reliability for sequential behavior ratings by Experimenter 1 and the additional observer of the following variables: (1) the developmental play scale, $\underline{r}$ = .87, (2) the vehicle-referent relationship categories, $\underline{r}$ =.84, and (3) the representational modes, $\underline{r}$ - .88. When the checklist of themes was derived from the children's narratives, another scorer was employed to score the narratives with respect to themes, so as to establish inter-observer agreement with regard to the presence or absence of each theme. Transcripts for 12 subjects were again independently scored by two raters. An intraclass correlation of $\underline{r}$ - .90 was obtained.

When data were in the form of frequency measures, these were transformed into proportions based on occurrence only during those time-sampled intervals when symbolic play was ongoing. By thus eliminating from each subject's score those time units when no representational activity was observed, it was possible to increase control of variation due to extent or duration of play, and concentrate on the quality of symbol construction. In this way, the subject who awaited instruction, or required more time between play episodes was not artifactually penalized in the evaluation of his behavior.

The data obtained from the observations and subsequent ratings were treated in the following ways. Multifactorial analyses of variance was repeated measures were applied to the data (Armor & Couch, 1972; Nie et al., 1975). The main effects were Age, Sex, Order of presentation and the Structure of available materials. The following indices of symbolic play activity comprised the dependent variables:

(1) Developmental Play Scale Scores (2) Symbol-Referent Correspondence Scores (3) Mode of Symbolic Reference Scores (4) Latency Scores. Post hoc Scheffe tests served to establish the significance of the differences between group means. Chi-square tests were done to test the statistical significance of systematic variation in the elaboration of themes.

A description of the pattern of interdependence of the criterion measures was of interest as well. An attempt to reduce the data and indicate the major dimensions of individual variability in behavior was made by using a principal components factor analysis.

The Dependent Measures

Direct observations of play behavior. The behavior observation categories were derived from the cognitive-developmental theories of Piaget (1951) and Werner and Kaplan (1963), as well as from analysis of data collected in pilot testing of this method. The Developmental Play Scale enables us to describe the structural complexity and integration of the symbolic play episode as construed by Piaget (see Table 2). The Symbol-Referent Correspondence categories, on the other hand, are designed to tap another dimension of symbolic reference: the nature of the analogy between the external form of the symbolic vehicle and that which it represents (see Table 3). These measures stem primarily from Werner and Kaplan's (1963) formulations. Though rated simultaneously, the categories which comprise these two measures are separately analyzed. As both theories are addressed to symbol formation in a naturalistic, spontaneous setting, extrapolations to the laboratory situation have of necessity been made by the investigator.

In spite of their heuristic power, it has been noted that the behavioral referents to Piaget's developmental play concepts often remain too imprecise to provide reliable criteria for classifying instances of behavior. One problem in deriving observational categories from Piaget's data stems from the observer's need to make inferences about a child's present behavior, based upon knowledge of his past behavioral repertoire. For example, Piaget defines "the simple identification of one object with another" as an early symbolic play acquisition. Strictly speaking, one must be aware of exactly how the child construes both objects in order to evaluate the present application. Clearly, one's experimental interaction with a child does not provide information adequate to make such an inference with any certainty. Thus, in deriving the checklist of behaviors, it was necessary to allow for varying degrees of inference on the part of the observer-scorer. Certain categories provocatively differentiated by Piaget have been collapsed into a single one. For example, within the category "complex symbolic combinations" (level 3), instances such as compensatory and liquidating combinations are not amenable to experimental identification without prior clinical knowledge of the subject. Thus, all play episodes reflecting this common developmental level are scored as instances of a single broad category.

The sequence of behavior categories derived from Piagetian theory reflects Piaget's conception of increasingly mature play symbolism. As behavior typical of each stage builds upon and reconstructs that of prior stages, elements of earlier acquisitions are characteristically reintegrated during the next phase. Thus the categories are not mutu-

ally exclusive. To deal with this in the context of time-sampled behavior frequencies, only the highest behavioral level scored during each interval went into the final analyses. An overall measure of the play maturity demonstrated in each experimental period was readily provided by a weighted average of the subject's occupancy in each of the four categories.

Although the above qualifications do not apply to the mutually exclusive "correspondence" categories, others must be noted. While Piaget has extensively observed and described the cognitive aspects of symbolic play, Werner's writings on the ontogeny of representation include extremely brief, nonspecific speculations on symbolic play. Thus, much extrapolation from the general developmental theory to the specific domain of playful representation was required, and observational categories are more tentatively linked to the theory than is the case for the Piaget scale.

Four more dependent variables were assessed by time-sampled ratings. These comprise a measure of the representational modes, or alternative strategies in the expression of symbolic reference in play. This section of subcategories was compiled by Franklin (1970) as a classification system referring to manifest behavior, and requiring minimal inference. The verbal representational modes were included in the direct observation checklist of variables which were time-sampled during the experimental period by Experimenter 1. To assess the motor-gestural modes, direct observation records were conjointly examined by Experimenter 1 and Experimenter 2 to determine the play-time units during which each mode was apparent.

1. Verbal Modes: Vocal-Articulatory
   a. Role Language: Verbalization indicating assumption of a role, or some scene contextualized remarks (e.g., "Dinner is ready. Everyone hurry to the table.");
   b. Onomatopoesis: The use of sounds or quasi-words in the context of play activity (e.g., "ding-dong" while doll is banging on door).
2. Motor-Gestural Modes:
   a. Structuring Actions: Arrangement of materials in the context of any type of representational activity, such as setting up scene, building a construction (e.g., setting chairs around table, and placing dolls on chairs, "This will be the house");
   b. Dramatic Play Actions: Gesturing or enactive movement of play materials in imitation or approximation of "realistic" action with the signifier (e.g., rolling vehicle slowly across floor).

The direct play observations provide the data base to explore latency and the rhythm of experimentally induced symbolic play as well. Our concern here was the impact of the independent variables upon the time between exposure to play materials and the beginning of clearly identifiable symbolic play. The latency measure consisted of the number of time-sampled fifteen second intervals elapsing before representational activity was observable.

Additional Schemes for Analysis of Play Behavior. The detailed protocol of the child's behavior during the sampled period, and the transcipts of the children's verbalizations, were another basic source of data. Analyses stemming from these data are described below. The emphasis here was on careful reporting and recording without evaluation or interpretation. As the subjects' verbalization was simultaneously tape-recorded, Experimenter 2 was instructed to concisely note whatever the subject did, including: gestures, manipulation of play materials, assignment of identity to play material, dramatic play actions, as well as non-ludic activity such as stretching or leaving the testing area.

The behavior protocols and transcripts of the play narratives contain a wealth of information beyond the scope of the individual play behaviors which are time sampled during the play episode. A more comprehensive and differentiated view of symbolic play was made possible by exploring these data as well. Their primary utility in the present study was in the assessment of thematic content. It is a long held assumption that the content of child play is a valuable indicator of children's interests, concerns, preoccupations. Developmental, sex and treatment-related differences were of interest here. For each observation period, all themes enacted by the subject were recorded, providing information about variability (How many thematic shifts were made? How many different themes were enacted during the play session?) as well as redundancy (are there "compelling" themes which were more relevant to one age group than another?). The final list of 27 content areas included those which occurred in no fewer than 10% of the transcripts. These categories are presented in Table 4.

Table 4

Criteria for Scoring Thematic Content Areas

Achievement - scored when story contains specific reference to success, concern with completion or outcome of task.

Aggression - scored when story contains description of intent to destroy, harm, anger, etc., resulting in damage to person, animal, object (i.e., hitting, shooting, stabbing). References to killing considered under death.

Birth - scored when the subject includes the birth process in story, as well as when reference is made to pregnancy (or other avenues to getting a baby, such as buying one in the market).

Competition - scored when an actor in the story is pitted against another to outperform him or her; when a contest is a focus of the story.

Death - only that material in which the words dead, killed, drowned or suffocated appeared; unequivocal notions.

Distress - scored when the subject enacts or attributes this emotion to a character in his play; crying.

Domestic Animals - pets or barnyard animals such as horse, cow, dog, cat, goldfish, etc.; tamed nonaggressive animals.

Fears - scored when child identifies or describes this feeling in relation to a play character or event in his story.

Fire - scored when a fire is central to the plot sequence.

Getting lost - scored when actor actually or nearly gets lost, or when feelings about this are expressed.

Hurt, Misfortune - accidental injury or misfortune involving damage, loss or calamity to person, animal, object; without hostility (i.e., falls, fire, sickness).

Love & Marriage - scored when subject includes falling in love, courtship, romance and marriage in story.

Machines, Vehicles - scored story includes construction or description of machines and vehicles and/or how they work; also when characters in story utilize them.

Morality - scored when judments are made or right or wrong, good or bad persons, praiseworthy or punishable acts (i.e., noble lion resists eating the baby).

Table 4 (Continued)

Nutriance - providing, preparing, partaking of food or drink (i.e., mother goes to buy a cake, the dog eats it in the car).

Outerspace - scored when the details of outerspace equipment or travel is described, as well as event occuring in outer space.

Playing - scored when character in story plays with another or alone.

Relations with Father - scored when story describes father, his activity, or his interaction with another person.

Relations with Mother - scored when story describes mother, her activity, or interaction of mother with another person.

Relations with peers or siblings - scored when story contains description of or interaction with peers or siblings.

Running Away - scored when actor in story runs away from home, typically as an act of protest.

School - scored when story involves going to school, activities and events in or related to school, the child's reactions to or feeling about school.

Sleeping - scored as present when story contains references to going to bed, being asleep, the child's reactions to this routine.

Travel - scored when story actors go to, or find themselves in faraway places; holidays, expeditions, setting up new lives.

TV Watching - scored when character or characters spend time watching TV, or a program is described.

Unreality - scoring when the story reflects the child's discrimination between the real and the unreal, subh as magic, disguise, imaginary creatures, dreaming.

Wild Animals - scored when dangerous or zoo animals are actors in the story.

The criteria for identifying the beginning or ending of a discrete play story included the following:

(1) use of a marker, such as "once upon a time . . ." or ". . . and they lived happily ever after,"

(2) when a plot is resolved,

(3) child reorganizes the play materials, setting up new location, activity which may stand independently of that preceeding it.

As an aid to the reader, the scoring procedure is illustrated in Appendix A. This sample protocol, presenting the behavior records of a single 6-year-old in both conditions, was selected on the basis of its typicality. Included are the direct observation records, behavior protocols, narratives, and thematic content records. The check marks ( ) on the direct observation records indicate the intervals during which each behavior was observed.

Chapter II

RESULTS AND PRELIMINARY DISCUSSION

The data derived from the observations and subsequent ratings were subjected to analyses of variance with repeated measures (Armor & Couch, 1972; Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). The three factors considered were Age, Sex, and Toy structure. Task order was deleted from the analyses following an initial scan of the data, as no significant main effects were ascribable to the order of task presentation. The impact of the other three variables was examined in relation to scores from each of the following areas:

(1) Developmental Play Scale Categories

(2) Categories defining the quality of symbolic reference

(3) Representational modes

(4) Latency

(5) Measures of play content

(6) Interrelationships among dependent measures.

Data in the form of absolute frequencies were transformed to proportions, reflecting only those intervals in which symbolic play behavior was observed. The adjusted scores (used for the ANOVAS) were derived by dividing the frequency score by the total number of intervals (4), minus the number of intervals during which no symbolic activity was observed. The rationale for this adjustment was the assumption that variation in the extent or duration of play would distort measurements of the quality of play. A clear picture of the amount of adjustment involved for all

groups of children is provided by Table 5, which illustrates the mean number of intervals during which no representational activity was observed.

Table 5

Mean Number of Intervals During Which No Symbolic Play Was Observed

	Age (Years)		
	4	6	8
Girls			
Min S	3.42	2.83	3.25
Max S	0.67	1.58	2.17
Boys			
Min S	8.50	3.75	3.42
Max S	3.75	2.92	1.42

The relevance of this transformation was confirmed by an analysis of variance (presented in Table 6) revealing significant main effects for age, sex, and toy structure in relation to the percentage of intervals when no symbolic play was recorded.

Table 6

The Analysis of Variance Summary Table for the Percentage of Intervals During Which No Symbolic Play Was Observed

Source	Sum of Squares	d.f.	Mean Square	F-Test	Significance p =
Age	65.264	2	32.632	3.498	.036
Sex	96.694	1	96.694	10.366	.002
Age x Sex	119.597	2	59.799	6.410	.003
Unit	615.667	66	9.328	-	-
Condition	160.445	1	160.445	42.245	.001
Age x condition	49.847	2	24.924	6.562	.003
Sex x Condition	6.250	1	6.250	1.646	.205
Age x Sex x Condition	8.792	2	4.396	1.157	.321
Condition x Unit	250.667	66	3.798	-	-
Total	1373.221	143	9.603	-	-

Developmental Play Scale

The four behavior categories which comprise the Developmental Play Scale were defined in Table 2. They include:

(1) simple identification of one object with another

(2) simple symbolic combinations

(3) complex symbolic combinations, and

(4) symbolic constructions more nearly related to adapted work

Data for the following analyses consisted of the percentage of symbolically active time-sampled intervals during which each behavior

was observed. For each behavior category, an analysis of variance with repeated measures was done. Thus the impact of age, sex and toy structure upon each component measure in the scale was accessible.

To describe a subject's overall level of functioning during a play episode, an index averaging his occupancy in each of the four categories was derived. The Play Maturity Index Scores are weighted averages, reflecting the ordinal property of the Developmental Play Scale. Correlations of these scores with age shed light on the validity of this measure of imaginative play. Separate analyses of variance were also done for each condition, seeking systematic age and/or sex differences in play maturity scores. To address the question of a generalized level of functioning across contexts, a Pearson's correlation coefficient describes the strength of the relationship between the subjects' pairs of play maturity scores (from the minimally and maximally structured toy conditions). A t test assessed the significance of the differences between scores in the minimally and maximally structured conditions.

Identification of One Object With Another

The simplest level of play organization was scored when subjects spontaneously identified one object with another, indicating this by speech before the imitative action begins. Significant main effects for age, sex, and toy structure were found. As expected, "Identifications" were a function of decreasing age, F (2,143) = 13.181, $p < .001$. Subsequent Scheffé tests established that the 4-year-olds were discriminable from both older age levels at the .01 level, but that the two older groups were not discriminable from one another ($p > .05$). Boys played

far more extensively at this low level than did girls, F (1,143) = 8.684, $p < .01$. Upon Scheffé testing, a significant age x sex interaction, F (2,143) = 8.112, $p < .01$, was found to be wholly due to the behavior of the 4-year-old boys, since indeed they were discriminably higher than all other groups at the .01 level, while all remaining groups proved indiscriminable from each other. Toy structure proved to be a significant factor as well, F (1,143) = 30.551, $p < .001$. It is possible that more "Identifications" were made in the minimally structured condition because of the task demand that the subject tell the experimenter what he was doing. Given the relative ambiguity of these materials, subjects may have considered communication of such identifications necessary to convey their meaning.

Simple Symbolic Combinations

Symbolic play at this level involved the enactment of whole scenes and imaginary episodes rather than mere isolated imitations or assimilations of one object to another. The prevalence of simple symbolic combinations decreased dramatically over age for all groups, F (2,143) = 56.052, $p < .001$. Scheffé tests established that 4-year-olds were discriminable from 6-year-olds at the .01 level, but that the 6-year-olds were discriminable from the 8-year-olds only at the .05 level. Interestingly, sex differences were no longer significant as we move to this more complex play category. Toy structure, however, did produce differential results. Play at this level was observed more frequently during play with minimally structured materials, F (1,143) = 10.226, $p < .05$, than with the maximally structured ones. Examining the age by toy structure interaction, F (2,143) = 5.316, $p < .05$, Scheffé tests demonstrated

that three levels of performance were discriminable at the .05 level: The 8-year-olds in both boy structure conditions were indiscriminable from the 6-year-olds in the maximally structured condition, but these three groups were discriminably lower than the 6-year-olds in the minimally structured condition, whose behavior in relation to this variable was discriminably lower than that of the 4-year-olds in both play conditions. The interaction thus inheres in the differential response of the 6-year-olds from one condition to the next. In the maximally structured condition, 6-year-olds look more like the 8-year-olds than like themselves playing with minimally structured toys.

Complex Symbolic Combinations

"Complex symbolic combinations" are characterized by considerable concern for orderliness, exactitude in imitations, differentiation of roles, and attention to detail. The data indicated significant age differences in relation to this category, F (2,143) + 14,411, p .001. Complex symbolic combinations, an intermediate entry on the play organizational hierarchy, substantially increased from 4 to 6 years of age and diminished somewhat thereafter. Scheffe tests established that only the 4-year-olds were discriminable from both older groups (p .05). Neither structure of toys nor sex produced differential results in relation to the prevalence of play constructions at this level.

Symbolic Constructions Related to Adapted Work

This most complex play category was scored when rules were established to organize play, when themes or outcomes were predetermined, when the symbolic construction approximated an exact imitation of reality.

The analysis of variance showed significant main effects of both age, F (2,143) = 29.491, $p < .001$, and toy structure, F (1,143) = 4.244), $p < .05$. Play at this level was observed increasingly over age, regardless of the subject's age, and in both play contexts. Scheffé tests established that the 4-, 6-, and 8-year-olds were all discriminable from each other at the .01 level. The effect of toy structure was consistent over all groups of subjects as well. Contrary to the findings of Pulaski (1973) this most elaborated and organized form of symbolic play occurred far more frequently in play with highly structured materials.

In summary, the above findings point to several interesting conclusions about the development of symbolic play. First, sex differences in play complexity are significant only in the youngest subjects (age 4 years), and in relation to the most primitive play structures. By 6 years of age, sex differences have largely disappeared. Second, behavioral differences related to toy structure reveal that contextual factors influence the deployment of the subjects' cognitive skills. Third, the pattern of age differences indicates that for the present sample, behavior changes over development are quite consistent with the sequence described by the Developmental Play Scale.

The Play Maturity Index

The Play Maturity Index scores were derived to provide a summary of the subjects' average level of functioning as measured by the Developmental Play Scale. To compute this average, the four levels of play organization which comprise the scale were given the weighted values of 100, 200, 300, and 400, respectively. This ascending series of multipliers was selected as it was the simplest set of numbers taking cognizance

of the hierarchy built into the scale. The breakdown of play maturity scores by age and sex is presented for each condition in Table 7.

Table 7

Mean Weighted Play Maturity Scores For All Ages in Both Conditions

	Age (Years)		
	4	6	8
Girls			
Min S	205.33	247.63	328.54
Max S	231.37	297.77	341.96
Boys			
Min S	175.26	293.53	315.54
Max S	201.17	307.90	360.07
Overall M	203.33	286.71	336.53

NOTE: Min S refers to minimally structured toys condition.
Max S refers to maximally structured toys condition.

Analyses of variance revealed that sex had no significant influence upon play maturity level in either toy condition. The age factor, however, was significant, confirming our hypothesis that play maturity level was a function of increasing age. For the minimally and maximally structured conditions respectively, F values of 37.580 and 62.103 were obtained, both significant beyond the .001 level. Subsequent Scheffé tests confirmed that, in each condition, all age groups were discriminable from

one another at the .01 level. A significant age x sex interaction was obtained in the minimally structured condition, F (2,143) = 3.404, $p < .05$. Scheffé tests revealed that as expected, the sexes were not discriminable at any of the three age levels. But the spread between sexes at age 6 was so large that the 6-year-old girls were indiscriminable from 4-year-old girls, while 6-year-old boys were indiscriminable from the 8-year-olds. Pearson correlation coefficients of .707 and .788 demonstrate the extent of concomitant variation of age with play maturity level for the minimally and maximally structured conditions, respectively. The fact that the Play Maturity Index scores showed the predicted relationship with age is suggestive of the validity of the Developmental Play Scale as an index of cognitive functioning in the symbolic play domain.

The impact of toy structure upon this general measure of play maturity was examined. A Pearson correlation coefficient (r = .83), demonstrated the strong linear relation between the subject's play maturity scores. Significant at the .01 level, this correlation tells us that a child's score in one toy structure condition is a good predictor of his behavior with the other materials. Table 7 indicates that play maturity scores were consistently higher in the maximally structured condition. A t test was performed to assess the significance of these differences. In this way it was possible to ask whether children function at a uniform cognitive level across play contexts, or whether play maturity varies as a function of the play things. The latter was expected and confirmed by the significant difference between play maturity scores in the minimally (M = 261) and maximally (M = 290) structured condition, t = -5.66,

p .001. Thus, play was more "complex" with the highly structured toys. Assuming that the same cognitive skills were available to the subjects in both contexts, the data suggest that toy structure differentially influences the components of the subject's repertoire of cognitive skills which are applied. Therefore, descriptions of the cognitive structure of symbolic play over development may well be qualified by specifying the setting in which play is observed.

The Establishment of Symbolic Reference

Subjective Correspondences

"Subjective correspondences" are those in which the symbol is freely adapted to the child's whim, determined by his motor and/or affective attitude. Regarding external form, there may be little or no similarity between symbol and referent from the adult perspective. The significant main effect for age F (2,143) = 5.549, p .01, lent partial support to the hypothesis that such correspondences would be a function of decreasing age. Scheffe tests demonstrated that no groups were discriminable at the .01 level, but that the 4-year-olds were significantly higher than the 6-year-olds at the .05 level. Thus the age effect was largely explained by the decreasing use of Subjective Correspondences from 4 to 6 years. This was consistent with Werner's (1957 contention that this is a most primitive form of cognition. The significant age x sex interaction, F (2,143) = 3,536, p .05, demonstrated that much of the age variation was accounted for by the girls, while the boys' use of these symbols remained comparatively stable over age (See Table 8). Scheffe tests indicated that at the .05 level, 4-year-old girls created significantly

more Subjective Correspondences than did 6-year-old girls, while all remaining groups proved indiscriminable from each other.

Table 8

Mean Percentage of Symbolic Play Intervals During Which Subjective Correspondences Were Observed

	Age (Years)		
	4	6	8
Girls	21.46	7.67	10.46
Boys	15.92	14.17	15.08

Play materials proved highly significant as well, the less structured toys consistently eliciting more Subjective Correspondences than their highly structured counterparts, F (1,143) = 60.82, p .001. It is likely that their relative ambiguity made these simpler props more appropriate vehicles for the projection of subjectively determined attributes. Developmental patterns varied as a function of toy structure as well, F (2,143) = 13.028, p .001 (see Table 9). Scheffe tests indicated that 4-year-olds playing in the minimally structured condition utilized significantly more Subjective Correspondences than all other groups, while none of the other groups were discriminable from each other at the .01 level.

Table 9

Mean Percentage of Symbolic Play Intervals During Which Subjective Correspondences Were Observed

	Age (Years)		
	4	6	8
Girls			
Min S	36.58	11.58	14.92
Max S	6.33	3.75	6.00
Boys			
Min S	27.67	17.00	18.92
Max S	4.17	11.33	11.25

Correspondence Based on Overall External Similarity

This category was scored when reference was based on global perception of compelling, shared physical features. The hypothesis that correspondences based on External Similarity would increase over age was rejected, as age was not significant in this ANOVA. This expectation was based on Piaget's developmental notion that details in material play constructions gradually lose their distorting quality, and tend towards exact imitations. The investigator failed to anticipate that the considerable increase over age in play governed by internalized schemes (Linguistic Representation) would dominate as it did. While play did become decreasingly distorting over age, the toys with which the subjects were instructed to play grew less compelling as the direct focus of symbolic

activity, and were pre-empted by internalized imitative schemes, triggered by the toys but somewhat independent of them thereafter.

As predicted, the maximally structured toys elicited significantly more correspondences based on External Similarity, F (1,143) = 148.238, $p < .001$, than did their minimally structured counterparts. This was true of both girls and boys at all ages sampled. The data indicated that the highly structured toys so clearly suggested identities and situations that they allowed the subject few alternative strategies. The effect of toy structure varied systematically as a function of age, F (2,143) = 7.378, $p < .01$. Scheffé tests revealed no discriminations beyond the condition effect, but the order of means did reveal the basis of the interaction effect: namely, that while in the minimally structured condition, 4-year-olds construct the fewest symbols based on External Similarity, in the maximally structured condition this reverses, and 8-year-olds construct the fewest such symbols.

Table 10

Mean Percentage of Symbolic Play Intervals During Which External Similarity Was Observed

	Age (Years)		
	4	6	8
Girls			
Min S	71.08	79.00	78.50
Max S	99.67	97.75	91.83
Boys			
Min S	56.33	71.25	64.25
Max	98.25	90.58	88.58

Correspondence Based on Feature Selection

Symbols in this category were based on a single shared dimension or aspect of the stimulus, rather than on an overall bond of similarity to the referent (as above). A highly significant main effect for toy structure was found, F (1,143) = 405.932, $p < .001$, supporting the hypothesis that in the maximally structured condition subjects would produce fewer correspondences based on Feature Selection. While the combined attributes of the highly structured toys conveyed obvious identities, this was not so of the unstructured materials, in which the association of form, color, material, etc. by no means presented an unequivocal identity. Thus the child seemed freer to focus his attention on one or another of these aspects. The significant age x toy structure interaction, F (2,143) = 8.001, $p < .001$, directs our attention to the different developmental patterns elicited by the minimally and maximally structured toys. Again, Scheffé tests revealed no discriminations beyond the condition effect, but the order of means did reveal the basis of the interaction effect: In the unstructured condition, correspondences based on Feature Selection occurred most frequently at 4 years, decreased at 6 years, then increased again at 8 years. The directions of change reverse in the maximally structured condition, increasing from 4 to 6 years, then decreasing (see Table 11).

Table 11

Mean Percentage of Symbolic Play Intervals in Which Feature Selection Was Observed

	Age (Years)		
	4	6	8
Min S	54.21	43.50	48.79
Max S	8.38	15.63	11.71

Representation in Which Language Serves as the Vehicular Medium

We refer here to symbolization initiated by an internal scheme, and no longer a function of pattern matching triggered by an external stimulus. No physical resemblance is obvious between vehicle and referent, as sentation. Analyses confirmed the hypothesis that use of this most abstract form of symbolizing activity was a function of increasing age, F (2,143) = 21.211, p .001. Scheffe tests established that while the three age groups were discriminable from each other at the .05 level, at the .01 level the 4- and 6-year-olds were indiscriminable from each other, though means of both these groups were significantly lower than those of the oldest subjects. Thus the age effect is largely explained by the substantial increase in this behavior from 6 to 8 years. It is consistent with cognitive-developmental theory that as intellectual functioning is increasingly governed by internalized schemes, so too is the play symbol. In referent eventuates in an inner structure, removed from tangible perceptible features.

Toy structure significantly influenced the prevalence of Linguistic Representation, though no main effect was anticipated. For all groups, the maximally structured toys yielded more of this behavior than did the minimally structured props, F (1,143) = 16,977, p .001. The explanation for this is unclear at this time. Perhaps the relative boredom many subjects experienced with the unstructured materials led to their use of simpler, more concrete forms of symbolization, rather than to the deployment of this more demanding strategy (see Table 12).

Table 12

Mean Percentage of Symbolic Play Intervals When Linguistic Representation Was Observed

	Age (Years)		
	4	6	8
Min S	12.79	28.00	42.96
Max S	20.29	37.33	59.04

Representational Modes

Onomatopoesis

The hypothesis predicting that use of Onomatopoesis would increase over age was rejected, as the age effect was not significant. There was, however, a significant age x sex interaction, F (2,143) = 3.737, $p < .004$, which demonstrates the dissimilar developmental path followed by boys and girls with regard to this mode (see Table 13). Scheffe tests established that the 6-year-old boys' greater use of onomatopoesis differentiates them from both the 6- and the 8-year-old girls ($p < .05$), but that no other groups were discriminable.

Table 13

Mean Percentages of Symbolic Play Intervals During Which Onomatopoesis Is Observed

	Age (Years)		
	4	6	8
Girls	12.42	3.04	2.38
Boys	6.83	17.71	5.82

Role Language

It was postulated that the use of dialogue in symbolic play would increase over age, and that girls would use more Role Language than boys. Considered independently, age did not prove to be a significant factor. Thus the developmental hypothesis was rejected. Sex differences, however, were significant in the predicted direction, F (1,143) = 6.333, $p < .02$. This finding may well reflect differences in the socialization of boys and girls. The fact that boys are not traditionally given dolls may account for the girls' greater facility in playfully protraying this complex behavior.

The age x sex interaction, F (2,143) = 4.899, $p < .01$, points to a temporal lag in the boys' development with regard to this variable (see Table 14) Post hoc Scheffé tests indicated that the 4-year-old girls used significantly more role language than did the 4-year-old boys, while the 6- and 8-year-old boys and girls were indiscriminable from each other. Thus the age x sex interaction inhered in the differential behavior of the sexes at this youngest age level (p .01).

Table 14

Mean Percentage of Symbolic Play Intervals During Which Role Language Was Observed

	Age (Years)		
	4	6	8
Girls	20.25	12.12	14.42
Boys	0.25	15.83	7.33

Though not anticipated, toy structure proved significant with regard to Role Language as well, F (1,143) = 7.385, $p < .01$, the maximally structured props eliciting more dialogue than the less structured ones. This may be explained by the relative "realness" of the maximally structured figures, requiring less imaginative extension by the subject. The sex x toy structure interaction, F (1,143) = 4.279, $p < .05$, revealed that the girls account for much of the variation between toy structure conditions. The boys' use of role language was comparatively stable across conditions (see Table 15).

Table 15

Mean Percentage of Symbolic Play Intervals During Which Role Language Was Observed

Girls	
Min S	11.50
Max S	19.69
Boys	
Min S	7.25
Max S	8.36

Structuring Actions

Structuring Actions are defined as those involving the arrangement of materials, or construction with them, in the context of representational play. The analyses indicated that Structuring Actions did not vary systematically as a function of either age or sex. Consistent with our hypotheses, toy structure did, F (1,143) = 38.720), $p < .001$, prove to be significant. Across all groups, there were invariably more Structuring Actions in the less structured context. Again, this may reflect the relative ambiguity or vagueness built into these toys with regard to their identities. This quality seemed to permit use of the materials in accordance with a variety of strategies (see Table 16).

Table 16

Mean Percentage of Symbolic Play Intervals During Which Structuring Actions Were Observed

	Age (Years)		
	4	6	8
Girls			
Min S	37.58	46.08	46.58
Max S	26.42	22.58	30.17
Boys			
Min S	60.08	37.33	43.50
Max S	34.08	23.83	26.25

Dramatic Play Actions

Werner and Kaplan (1963) contend that the centrality of the motor-gestural media of representation diminishes developmentally. In keeping with this notion, it was hypothesized that imitative gesturing or enactive movement of play materials would be a function of decreasing age. A significant main effect for age, F (2,143) = 4.312, $p < .02$, revealed that this was true. In general, the prevalence of dramatic play actions decreased over age. Scheffé tests indicated that the 4 and 6-year-olds used significantly more Dramatic Play Actions than did the 8-year-olds at the .05 level, but that the two younger groups were not discriminable from one another. It is likely that during this period play structure is internalized. A significant main effect was ascribable to toy structure as well, F (1,143) = 38.121, $p < .001$. The highly structured toys produced far more Dramatic Play Actions than did the other toys. It is probable that the relative literal realism of these representations makes it easier for children to enact "real-life" behaviors with them.

It is noteworthy that the sexes behaved differently over age as a function of toy structure. The age x sex x toy structure interaction was significant, F (2,143) = 4.673, $p < .01$. While the same two developmental patterns were found in both treatment conditions, the pattern of each sex reversed systematically with toy structure. Thus, in the minimally structured condition, girls used Dramatic Play Actions with decreasing frequency, while boys increased from 4 to 6 years, where they peaked, then dropped off at 8 years. In the maximally structured condition, the two sexes reversed patterns. The girls increased from 4 to 6 years, and decreased thereafter, while the boys consistently decreased with age (see Table 17).

Table 17

Mean Percentage of Symbolic Play Intervals During Which Dramatic Play Actions Were Observed

	Age (Years)		
	4	6	8
Girls			
Min S	67.00	53.92	42.42
Max S	75.08	79.75	64.00
Boys			
Min S	45.33	65.50	50.33
Max S	75.17	73.42	61.42

Latency and Movement Into a Play Sequence

The experimental study of play has largely ignored the temporal aspects of this behavior. The present study explored latency, a simple measure of the time elapsed in the play session before symbolic play began. The latency score for each observation period was equal to the number of consecutive 15-second intervals during which no representational activity was apparently ongoing, beginning with the first time-sampled unit of the session. Analyses of variance were done for both conditions to assess systematic variation in latencies ascribable to sex and age variables. No significant main effects were found in play with

highly structured materials. This was not the case in the minimally structured condition. A significant main effect for age, F (2,143) = 3.63, p <.05, revealed that latency decreased with age. The youngest subjects needed the most time to warm-up by examining and manipulating the toys, before initiating a symbolic sequence. Latency periods for boys were dramatically longer than those for girls in the minimally structured condition, F (1,143) = 7.66, p < .01. This sex difference was particularly strong at 4 years of age. The youngest boys apparently took more time to settle into the task demands. Their relative silence before and during the play observation may have been an important influence here as well. More than with any other group, at times it was impossible to convince these youngest boys to verbally convey their thoughts and actions to the investigators. Thus, there may have been intervals when a child rolling a vehicle reported he was doing nothing, but may in fact have been participating in an imaginary race.

The hypothesis that highly structured materials would yield more rapid movement into a symbolic play sequence (i.e., shorter latencies) was confirmed, F (1,143) = 20.979, p < .001. Subjects simply appeared to need more time to devise identities and conjure up action sequences with the minimally structured toys than with those which strongly suggest both identities and actions.

Thematic Content of the Narratives

The following analyses of the play content were done as this material appeared to offer an interesting and meaningful complement to the structural and formal description central to this study. The children's

narratives were intriguing and compelling. Indeed, it seemed impossible to convey the "flavor" of the make-believe productions without indicating what the children's play was about. Most of the play research focused on content has attempted to reveal the symbolic relationship between manifest behavior and presumed underlying fantasies and impulses. This approach was obviously unsuited to the present investigation, as any attempt to decipher latent meanings of the content would require inference unjustified by the experimental procedure. Rather, story content was viewed here as an indicator of the culture of childhood (Erikson, 1963; Klinger, 1971; Piaget, 1951; Singer, 1973). It was hoped that consistencies would emerge, suggesting clues as to the range of the children's experience, the impact of socialization and society, and recurrent phase-specific issues.

In order to integrate these data with the rest of the study, it was decided to systematically examine variation in content as a function of age, sex, and play materials. As our interest was exploratory, an attempt was made to regard the data without forcing them into a preconceived mold. Post hoc attempts to cluster the many themes which emerged met with little success, as no satisfactory grouping system was identifiable. Every scheme we tried was rejected as at least some of the themes could be classified under more than one "grab-bag" category. In addition, the intercorrelations between all possible pairs of themes were largely insignificant. We inferred from this that the areas differentiated were in fact discrete domains from the children's perspective. Though our focus was on themes requiring minimal inference, the final list did include entries varying somewhat in abstractness (e.g., competition is

more abstract than wild animals). What follows is a brief description and discussion of this preliminary work.

Analyses of the Story Contents

The data consisted of transcripts of the subjects' taped verbalizations during the play segment. A preliminary reading of the stories yielded a rough count of identifiable themes, as well as their frequencies. To assess its relevance to the present sample, the above tally included Pitcher and Prelinger's (1963) list of themes often found in stories told by children between 2 and 5 years of age. The final list of 27 content areas included those which occurred in no fewer than 10% of the transcripts. As expected, many of the Pitcher and Prelinger entries were deleted as irrelevant to our subjects (e.g., toilet training), or because psychoanalytic inference was required of the judge (e.g., oedipal conflicts). Several of the content areas which appeared repeatedly in the present study were not identified by Pitcher and Prelinger (e.g., competition, achievement).

Data analysis began with the scoring of a checklist of themes, or content areas. Once the transcript was read, and divided into discrete stories, the scorer indicated each theme elaborated in every story told during the 10-minute play segment. For a content area to be scored, more than an isolated mention was required. The theme had to be developed in at least a rudimentary fashion, over a few consecutive sentences, as the subject of a subplot, or as the object of some story action. A list of the themes and the criteria for scoring each is presented in Table 4. Each theme category was counted only once per story, though it may have been mentioned many times by the child. For every play session, the

number of times each theme appears was calculated. In addition, the following quantitative measures were derived from the data:

(1) number of stories told

(2) verbal fluency during play (number of words)

(3) overall number of themes included in stories

(4) theme diversity (number of different themes enacted)

The data were treated in the following way. Analyses of variance were performed to determine the impact of age, sex, and degree of toy structure upon the four quantitative aspects of play content listed above. The results are reported in the section which follows. With regard to the themes themselves, absolute frequencies (weighted by redundancy within play episodes), were recoded, for purposes of analysis, to simply indicate whether or not a given theme occurred in either the minimally or maximally structured play session. The frequency with which each theme appeared in relation to age and sex was tabulated and is summarized in Table 18. Chi-square tests were done to determine those age and sex differences which were statistically significant. McNemar tests were done to uncover significant differences related to toy structure.

Table 18

Frequencies of Themes in Relation to Age and Sex[1]

Themes	Girls				Boys			
	Age			Total	Age			Total
	4	6	8		4	6	8	
Achievement	1	0	3	4	1	3	3	7
Aggression	6	8	7	21	7	10	11	28
Birth	2	4	4	10	0	1	1	2
Competition	0	1	2	3	4	8	6	18
Death	4	3	2	9	4	7	8	19
Distress	3	4	8	15	2	4	7	13
Domestic Animals	11	10	10	31	9	10	10	29
Fears	2	5	7	14	0	2	3	5
Fire	4	5	4	13	9	7	9	25
Getting Lost	6	4	3	13	3	1	2	6
Hurt, Misfortune	12	6	12	30	9	9	12	30
Love, Marriage	4	3	3	10	0	1	3	4
Machines, Vehicles	12	12	9	33	12	12	12	36
Morality	7	3	6	17	6	5	11	22
Nutriance (eating)	11	12	11	34	10	10	11	31
Outerspace	1	0	2	3	2	4	5	11
Playing	9	9	9	27	3	4	7	14
Relations with Father	12	12	11	35	9	10	10	29
Relations with Mother	12	12	11	35	10	8	10	28
Relations with Peers, Siblings	3	4	4	11	1	1	2	4
Running Away	4	1	4	9	5	1	5	11
School	3	6	1	10	6	1	3	10
Sleeping	12	12	11	35	12	10	11	33
Travel	4	5	7	16	3	4	4	11
TV Watching	6	7	3	16	3	5	7	15
Unreality	5	5	6	16	3	5	7	15
Wild Animals	7	7	10	24	9	11	11	31

[1]Counts based on occurrence in the minimally and/or maximally structured condition.

Number of Stories

Age was the only independent variable which proved significant, F (2,143) = 3.225, p .05. The overall number of stoies told increased over age (see Table 19). Scheffe tests established that at the .05 level, none of the age groups differed significantly with regard to this variable. But the less strigent Duncan test demonstrated that the 4-year-olds told significantly fewer stories than both the 6- and 8-year-old children, but that the older two groups were indiscriminable from each other (p .05).

Table 19

Mean Number of Stories Told by 4-, 6-, and 8 Year Olds

	Age (Years)		
	4	6	8
Number of Stories	1.96	2.81	2.77

Verbal Fluency (Number of Words)

Significant main effects were found for both age and toy strucutre. The number of words used during the play session, F (2,143) - 23,365, p .001, consistently increased over age for both sexes and in both conditions. Scheffe tests indicated that the 4-year-olds used significantly fewer words during the play episode than did the 6- or 8-year-olds p .05), but that the 6- and 8-year-olds were indiscriminable from one another. Thus this effect is largely a reflection of the substantial increase in verbalization which occurred from 4 to 6 years of age. With regard to toy structure, F (1,143) - 13.549, p .001, boys and girls

at all ages talked more during play with the maximally structured toys. Their relative quiet with the unstructured toys may have reflected the task demand for more "thinking through" to assign identities, etc. Or, the highly structured props may simply have been more interesting, and therefore stimulating to the children. This investigator believes both are true (see Table 20).

Table 20

Mean Number of Words Used by 4-, 6-, and 8-Year-Olds in the Minimally and Maximally Structured Condition

	Age		
	4	6	8
Min S	287.46	452.21	500.54
Max S	333.58	542.00	644.58

Overall Number of Themes, Theme Diversity

With regard to overall number of themes enacted during the play episode, both age and toy structure yielded significant main effects. As predicted, number of themes increased with age, F (2,143) = 5.182, p <.01, reflecting the older children's greater range of experience. Scheffé tests indicated that 4-year-olds elaborated significantly fewer themes than did the 8-year-olds at the .05 level, but the 6-year-olds were indiscriminable from both groups. Many more themes were identified in play with the highly structured toys, F (1,143) = 21.827, p < .001, than in the less structured condition. These summary findings are weighted equally by each theme that appears in every story. As theme redundancy is

Table 21

Play Themes: Listed in Decreasing Frequency of Occurrence

Rank	Theme	Percentage of Subjects That Used Each Theme
1	Machines, Vehicles	96
2	Sleeping	95
3	Eating	90
4	Relations with Father	89
5	Relations with Mother	87
6	Domestic Animals	83
7	Hurt, or Misfortune	83
8	Wild Animals	76
9	Aggression	69
10	Relations with Peers, Siblings	62
11	Playing	57
12	Morality	54
13	Fire	52
14	Unreal	43
15	TV Watching	43
16	Travel	38
17	Death	38
18	Distress	36
19	Competition	29
20	School	28
21	Runaway	28
22	Get Lost	26
23	Fear	26
24	Love	19
25	Outer Space	19
26	Birth	17
27	Achievement	15

Table 22

Significant Sex and Age Differences in Thematic Content

Theme	Frequency		Chi Square	Significance
	Girl	Boys		
Significant Sex Effects:				
Playing	27	14	8.158	$p < .01$
Relations with Mother	35	28	4.571	$p < .05$
Birth	10	2	4.899	$p < .05$
Fear	14	5	4.576	$p < .05$
Space	3	11	4.345	$p < .05$
Competition	3	18	13.176	$p < .001$
Fire	13	25	6.743	$p < .01$
Death	9	19	4.734	$p < .05$
Significant Age Effects:				
	Age (Years)			
	4	6	8	
Running Away	9	2	9	6.785	$p < .05$
Morality	13	8	18	8.392	$p < .05$
Distress	5	8	15	9.236	$p < .01$
Hurt & Misfortune	21	15	24	12.600	$p < .01$
Fear	2	7	10	7.007	$p < .05$

disregarded (a subject may incorporate a single theme into each of four or five stories), the number of different content areas enacted provides a more accurate picture of theme variability. With regard to the effect of toy structure, results were again contrary to the investigator's hypothesis that the more abstract toys offered greater leeway with regard to content alternatives. In fact, themes were far more diverse in play with maximally structured toys, F (1, 143) = 33.192, $p < .001$. This was true of both sexes at all ages. These data dispute Pulaski's (1973) conclusion that more varied fantasy themes emerge during play with less structured toys, as responses are less bound to suggested content. It appeared that the information provided by the more structured toys was suggestive rather than constraining. From the subjects' affect during the two sessions, it was the impression of the writer that the unstructured materials were rather boring to some of the children sampled. The hypothesis that theme diversity would be a function of increasing age was rejected. Thus, the age trend in overall number of themes enacted appeared to be tapping redundancy.

Age and Sex Differences in Thematic Content

Small chi-square values indicated that not all analyzed themes varied systematically as a function of either sex or age. Raw frequencies in relation to both these independent variables are presented in Table 18. Some contents appeared so consistently as to represent concerns common to all age and sex groups. Those themes which occurred most frequently across groups included: machines and vehicles (used by 96% of subjects), the bodily functions of sleeping (95%) and eating (90%), and relations

with father (89%). Among these, content dealing with sleep, going to bed, etc. appeared to have a somewhat special function. Children repeatedly used going to bed as both temporal markers, and "dividers" of play action in their stories. Thus, the behavior or ritual enacted often had a stereotyped, empty quality, not shared by the other content areas represented. Table 21 lists the themes in descending order, defined by the proportion of subjects whose transcripts included each of the content areas.

Chi-square tests revealed sex differences significant at the %5 level or better for 8 of 27 themes analyzed (see Table 22). Girls included significantly more playing, relations with mother, birth and fears in their stories than did boys. Generally speaking, the girls' play was involved with the everyday interpersonal and domestic scene. Their stories described people and relationships more frequently and extensively than did the boys'. Though the sex difference attained significance only in the case of relations with mother, a pattern of higher frequencies for girls was apparent in <u>all</u> categories tapping interpersonal relations, with the exception of competition. Relations with care-taking parents was largely the domain of the girls, supporting the hypothesis that themes of nurturance would be more prevalent in their stories. Girls were somewhat freer than the boys to explore fears. Rather than tapping variation in emotional life, this difference could be a manifestation of a difference in sex role socialization stressing that boys do not advertise such sentiments, even if they have them.

Data from the stories suggest that the boys were significantly more involved than girls with the themes of outerspace, competition, death,

and fire. They appeared fascinated by physical events and objects of all kinds: missiles, defense systems, elaborate fire houses, technical paraphernalia galore! While at 4 years, boys and girls included death with equal frequency, by 6 years, the boys have taken the lead. This may in some way reflect their adaptation to the masculine role defined by our culture: as killer, soldier, risktaker, etc. Death was quite violent in the boys' stories (i.e., people explode, they are stabbed, shot 20 times), while the girls frequently associate death with illness or accidental injury. Sex-related socialization patterns may again be invoked to account for the scarcity of competition in girls' narratives, as compared to those of their male counterparts. The Women's Movement notwithstanding, the present subjects see competition (typically in the form of a race) as the domain of the male. In summary, the significant sex differences in thematic content reveal both the conventional and stereotyped sex roles the children have internalized, as well as differences in orientation to the physical and social aspects of their world.

The absence of the predicted sex difference in aggressive content was surprising in the light of the large body of evidence pointing to freer expression of aggression in boys than in girls (Biblow, 1973; Tizard, Philps & Plewis, 1976).

Aggressive content was very prominent in both sexes. It is possible that the typical attribution of aggression to the play objects or characters used in the experiment may have lessened some of the feminine inhibition of aggressive thoughts or actions. Sex differences were informally noted in the quality of the described aggression. It was often verbal for the girls, while the boys were more physically active in depicting violent aggression.

We turn now to developmental differences in thematic expression. The few clear age differences which emerged were in relation to distress, fear, hurt or misfortune, morality, and running away (see Table 22). The frequency with which fear and distress appeared increased with age for both boys and girls. It is impossible to know whether these data reflected the children's progressive development of understanding of affect, or their ability to represent such material. With regard to hurt or misfortune, boys and girls followed different developmental patterns. The youngest and oldest girls mentioned this theme with about equal frequency, while at 6 years this was less common. For boys, themes of accidental hurt or misfortune consistently increased over age, perhaps reflecting the boys' increasing concern with mastery. At 4 years this content area was expressed chiefly by people or objects falling. With age, the sources of possible harm seemed to become more impersonal (i.e., rather than clumsiness we found natural forces, car crashes, etc.). A curvilinear relationship between age and morality themes was found with the 6-year-olds infrequently including such content. While the youngest children grappled with the opposition of good and evil, the more sophisticated 8-year-olds concerned themselves with personal and civil justice. On the whole, the increasing frequency with which most themes are enacted over age, reflects the subject's growing capacity to consider more alternatives, and represent his broadening range of experience.

The Influence of Play Materials on Thematic Content

It is hard to imagine that the content of children's stories would not reflect elements of the physical environment of the storytelling. A McNemar test was done for each theme to test for significant differences

related to the play materials. Of the 27 themes studied, the elaboration of 7 of them did vary as a function of materials. The only content area that was significantly more prevalent with the unstructured toys was "domestic animals." The set of realistic, highly structured playthings stimulated more frequent inclusion of the following themes (differences significant at or beyond .05 level): relations with mother, relations with father, TV watching, aggression, wild animals, and fire. Some of these frequencies were obviously inspired by the presence of particular objects. It is not surprising that fires, wild animals, and TV watching were more common when toys included firetrucks, lions, and televisions. The effective stimulus environment did influence the content enacted in symbolic play. Its role must therefore be considered in any dynamic interpretation or description of the meaning of play behavior.

Interrelationships Among Dependent Measures

A vexing problem associated with observational-experimental studies of this kind is that of data reduction and the maximization of useful information extracted. Intercorrelation matrices were generated to demonstrate the extent of concomitant variation of the criterion measures. Table 23 presents the correlations between play maturity level (our summary measure of level of cognitive functioning) and each of the directly observed and derived dependent measures. To assess the relationships among themes elaborated, the scores for all possible pairs of themes were intercorrelated. As noted earlier, the correlations which emerged were largely nonsignificant. We infer from this that the themes differentiated were in fact discrete domains from the subject's perspective. Notable

Table 23

Correlations Between the Play Maturity Index and Other Criterion Measures: Conditions Analyzed Separately

Dependent Measures	Minimally Structured Toys	Maximally Structured Toys
Latency	-.37***	-.24*
No symbolic play ongoing	-.51***	-.16
Identification of one object with another	-.58***	-.10
Simple symbolic combination	-.87***	-.92***
Complex symbolic combination	.38***	.23*
Symbol nearly adapted work	.88***	.89***
Subjective correspondence	-.33**	.14
External similarity	.18	-.18
Feature selection	-.18	.10
Linguistic Representation	.75***	.60***
Onomatopoesis	.12	.11
Role language	.41***	.38**
Structuring actions	-.50***	-.15
Dramatic play actions	.16	-.21*
Number of stories	.18	.21*
Number of words	.56***	.68***
Overall number of themes	.34**	.44***
Number of different themes	.32**	.44***

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

exceptions were the correlations between eating and sleeping (r - .53), and between relations with mother and relations with father (r - .67).

The correlations between play maturity scores and other criterion measures indicated that the variables were not independent. Therefore, it was of interest to obtain a more parsimonious description of the major dimensions of co-variation among these variables. To this end, a principal components factor analysis with varimax rotation was done. In so doing, a new group of mutually independent factors was generated. The factors which emerged describe clusters of interaction among variables, and serve a predictive function with regard to amount of variance accounted for by a particular factor. The variables included in the separate analyses for the minimally and maximally structured conditions were: (1) the Play Maturity Index scores, (2) the four Representational Modes, and (3) the four bases for the Establishment of Symbolic Reference. Tables 24 and 25 present the loadings of each variable on the factors which emerged in the minimally and maximally structured conditions.

A three-factor solution was achieved in the minimally structured condition, accounting for 70.3% of the data variance. Thus, the factors are of considerable value in interpreting the patterns of relationships among the variables. The first factor, accounting for 34.6% of the variance, consisted of representation modes: onomatopoesis (=.654), role language (=.653), structuring actions (-.778) and dramatic play actions (-.866). Loadings on factor II, explaining 19.8%) of the variance, included linguistic representation (-.929) and the play maturity index (-.848). This factor was most strongly related to age, and demonstrated clearly that the tendency towards high Play Maturity scores varied

Table 24

Rotated Factor Matrix for Minimally Structured Condition

Variables	Factor I	Factor II	Factor III
Onomatopoesis	.654*	.038	.358
Role Language	.653*	.355	.042
Structuring Actions	-.778*	-.354	.273
Dramatic Play Actions	.866*	.174	.224
Conventionalized Patterns	.008	.929*	-.134
Play Maturity Index	.269	.848*	-.185
Subjective Correspondences	.023	-.185	.688*
External Similarity	.357	.129	-.837*
Feature Selection	.112	-.273	.663*
Eigenvalue	3.114	1.785	1.434
Percentage of Variance	34.6	19.8	15.9

* Denotes loadings greater than .600.

Table 25

Rotated Factor Matrix for Maximally Structured Condition

Variables	Factor I	Factor II	Factor III	Factor IV
Onomatopoesis	.055	-.061	.879*	.103
Role Language	-.140	.128	.880*	.083
Structuring Actions	.072	-.227	-.078	-.900*
Dramatic Play Actions	-.216	-.321	.140	.817*
Conventionalized Patterns	.176	.885*	-.153	.012
Play Maturity Index	.049	.866*	.230	-.030
Subjective Correspondence	.890*	.143	.093	.082
External Similarity	-.842*	-.190	.083	.321
Feature Selection	.828*	-.021	-.120	-.149
Eigenvalue	2.923	1.928	1.347	1.169
Percentage of Variance	32.5	21.4	15.0	13.0

*Denote loadings greater than .600.

directly with use of symbolic relationships in which language is the vehicular medium. The final factor, explaining 15.9% of the variance, included subjective correspondences (=.688), correspondence based on external similarity (-.837), and correspondence based on feature selection (=.663). The high loaded variables suggested that this factor may be labelled more broadly as an index of symbolic reference or correspondence type.

As we turn to the maximally structured condition, our findings reveal that the structure of the observation categories was quite stable across conditions. A four-factor solution accounts for 81.9% of the variance. The first factor, accounting for 32.5% of the variance consisted of three correspondence categories: subjective correspondences (=.890), external correspondence (-.842), and feature selection (=.828). Loading on the second factor, accounting for 21.4% of the variance, were play maturity score (=.866) and linguistic representation (=.885). Once again, this factor indicated that the linguistic representation variable associates strongly with play maturity, rather than with the other bases on which correspondence may be established. This result suggests that the presence of these behaviors defined as linguistic representation may be at least as good a developmental predictor as the maturity index derived from the Developmental Play Scale.

In the maximally structured condition, the verbal modes pull apart from the motor-gestural representational modes, defining two principal components which are orthogonal to one another. The third dimension extracted, the verbal modes, accounted for 15% of the variance. Loadings on this factor were onomatopoesis (=.879) and role language (=.880). The

final component, the motor-gestural modes, explained 13% of the variance. It consisted of structuring actions (-.900) and dramatic play actions (=.817).

While frequency measures comprising the data for the ANOVAS make the minimally and maximally structured play contexts look quite different, the similarity of the above three- and four-factor solutions speaks to the stability of the structure of behavior across contexts in relation to the criterion variables.

Chapter III

DISCUSSION

In the discussion which follows, the three domains of symbolic play which were the major concerns of this study are individually considered. The obtained results are evaluated with respect to the original hypotheses. They are explained and interpreted in relation to the theoretical and empirical literature which provided the conceptual underpinnings for this research.

Play Maturity

Effects of Age

The hypothesis that age observed play constructions would become increasingly complex and integrated was confirmed. Two measures, the Developmental Play Scale and the derived Play Maturity Index, provided the relevant data. The categories comprising the developmental measure closely approximate Piaget's (1951) description of the universal sequence of play acquisitions, and represent an attempt to operationalize Piaget's portrayal of the evolving structural organization of symbolic play behavior. The Play Maturity Index Scores summarize overall level of functioning on the Developmental Play Scale by averaging each child's placement in each of the four weighted component categories.

The pattern of behavior ratings and the main effects for age clearly speak to the coherence of the Developmental Play Scale as a measure of cognitive maturity. With regard to the component measures, play

behavior at the simplest and second level of organization (i.e., Identification of One Object with Another, Simple Symbolic Combinations) was most prevalent in the behavior of 4-year-olds, decreasing thereafter. The third entry on the play organizational hierarchy (Complex Symbolic Combinations), was most frequently seen in the play of 6-year-olds, reflecting its intermediate developmental status. Finally, the analyses revealed that the most complex play activities (Symbolic Constructions Related to Adapted Work) were a function of increasing age. This constellation of significant age effects points to the usefulness of the component measures in differentiating developmentally among subjects.

The derived Play Maturity Index scores summarize these age-related changes in play organization (see Table 7). Pearson correlation coefficients of .71 and .79 illustrate the concomitant variantion of age with maturity level for the minimally and maximally structured conditions, respectively. These theoretically based observation categories thus permit systematic description of the evolving structural complexity of symbolic play behavior in school-aged children.

These data tell only part of the story. A clear picture of the constellation of component behaviors comprising the play episodes at each sampled age is essential to convey the richness and variability of the children's behavior. Such a reconsolidation of the data (see Table 26) provides a "formula" for describing the elements of the average play episode for each age group. The mean percentage of symbolic play intervals during which children played at each of the four

levels comprising the Developmental Play Scale is presented.

Table 26

Play Complexity and Organization at 4, 6, and 8 Years of Age: Mean Percentage of Play Intervals During Which Each Component Measure of the Developmental Play Scale Was Observed

	Age (Years)		
Observation Categories	4	6	8
Identification of One Object with Another	7.82	2.08	0.56
Simple Symbolic Combinations	81.65	32.17	12.60
Complex Symbolic Combinations	11.02	43.31	36.81
Constructions Related to Adapted Work		22.87	50.71

Among 4-year-olds, the preponderance of play assessed as Simple Symbolic Combinations *82%) reveals that this complexity level was most representative of the youngest subjects' functioning. Behaviors defined as Complex Symbolic Combinations and Identifications of One Object with Another were also observed, though much less frequently (approximately 11% and 8% of the play intervals, respectively). Our records indicated that none of the 4-year-olds created Symbolic Constructions Related to Adapted Work. The necessary planning and roletaking skills were apparently unavailable at this age.

By 6 years, the picture changes. Complex Symbolic Combinations were most representative (43%), followed by Simple Symbolic Combinations (32%) and Constructions Related to Adapted Work (23%). Play was very seldom limited to Identifications of ONe Object with Another (2%).

The major component in the breakdown of play complexity at 8 years was Symbolic Constructions Nearly Related to Adapted Work (50%). Moving down the scale from this highest category, the percentage of play intervals during which children function at each level steadily decreased: Complex Symbolic Combinations (37%), Simple Symbolic Combinations (13%), And Identifications of One Object with Another (.56%). Observers recoded merely a "taken" smattering of play at this lowest organizational level among 8-year-old subjects. These data demonstrate an interesting point. As the children get older, the most commonly observed class of behaviors consistently increases in complexity. While it is possible, and at times maximally efficient to reduce description of play maturity to a single averaged score, it must be kept in mind that the richly blended "flavor" of a play episode can only be conveyed when each of the component ingredients is considered.

As noted above, the Developmental Play Scale echoes the sequence of stages elaborated by Piaget. Application of this measure enabled us to examine the generalizability of Piaget's sequence to the present sample. Indeed, the behavior of 4-, 6-, and 8-year-old children cross-sectionally sampled here did closely follow the sequence of acquisition presented by Piaget. The ages at which the relevant play behaviors were typically observed were somewhat older in the present sample

than as specified by Piaget. This is not surprising as age of attainment may vary as a function of factors of motivation, exercise, milieu, etc. (Piaget & Inhelder, 1969).

Sex Differences in Play Maturity

Sex differences in play maturity did not enter into our hypotheses, and in fact, the boys and girls in this study appeared to be more alike than different. The data are interesting, however, as they reveal different developmental patterns with regard to timing. Amongst the youngest children (4 years of age), it appeared that boys played somewhat less maturely than did girls. By age 6, this difference had disappeared. As measured by the Developmental Play Scale, sex differences in play complexity were significant only in relation to the simplest play behaviors. Identifications of one object with another more frequently characterized the play of boys than of girls. The significant age x sex interaction revealed that this sex difference was explained by the relative immaturity of the 4-year-old boys. While sex did not systematically influence Play Maturity Index scores in either condition, these data also reflect the somewhat less mature play of the youngest boys.

Our findings interestingly parallel those of Tizard, Philps and Plewis (1976), who defined play complexity in terms of the number of simple play events chained together by 3- and 4-year-olds. Their data indicated that while 3-year-old boys played "less complexly" than girls, by age 4, this sex difference was non-existent.

The Impact of Play Objects on Play Maturity

A most striking finding of this study was the influence of the playthings upon the structural complexity of symbolic play behaviors. The data consistently indicated that the children played more maturely with the maximally structured props than with their minimally structured counterparts. Though pilot testing had suggested that such a tendency might emerge, the extent of this difference was far greater than anticipated, t (1,71) = -5.66, p .001. At the same time, the data confirmed our expectation that the subjects' play maturity scores in the two conditions would be strongly related with one another. The significant Pearson correlation coefficient (r - .83) demonstrated that a generalized level of functioning was identifiable across the two play contexts.

How do we account for these findings? Let us begin by considering more thoroughly the nature of the observed differences. Play Maturity scores provide a summary of the occurrence of the four categories of behaviors comprising our scale. Thus, when we speak of higher play maturity scores in one context or another, we are actually referring to different patterns of frequencies in relation to the component measures.

Our sense of what the play session actually looked like is improved by considering the extent to which the child's behavior consisted of each of these elements. It is noteworthy that regardless of significant treatment differences, the same sequence emerges in the two conditions when the behaviors are ranked in terms of the percentage of the play episode during which they are scored. In both condi-

tions, Simple Symbolic Combinations were scored more frequently than any other level of behavior, followed by Complex Symbolic Combinations. ehaviors at the upper and lower end of the scale were elicited less often, partly because they were not relevant to all three age groups. Symbolic Comstructions Nearly Related to Adapted Work ranked third in both conditions. Behavior limited to the level of Identifications was observed most infrequently in both conditions. Thus, the position of each of the assessed behaviors in terms of relative weight in the play session remained the same across conditions (see Table 27).

Table 27

The Impact of Toy Structure on Play Complexity: Mean Percentage of Intervals During Which Each Behavior Category Was Observed

Observation Categories	Toy Structure	
	Min S	Max S
Identification of One Object with Another	6.69	0.28
Simple Symbolic Combinations	44.87	37.40
Complex Symbolic Combinations	26.19	34.57
Symbolic Construction Nearly Related to Adapted Work	30.87	28.18

The pattern of significant treatment effects suggests partial explanation for the finding that children play more "maturely" with

highly structured materials. It appeared that the minimally and maximally structured toys made somewhat different demands of the children. Behavior corresponding to the first two levels on the Developmental Play Scale was elicited more frequently by the minimally structured toys than by the other set. The ambiguity of the minimally structured toys seemed to require the children to generate and assign identities to the materials they wished to use in the play segment. This identificatory behavior defined the simplest level of play organization. Subjects asked to verbally report what they were doing considered communication of such identifications (and the simple combinations generated from them) necessary to convey the meaning of the "inexplicit" signifiers.

The highly structured toys, on the other hand, seemed to clearly and compellingly announce specific identities. The children were to some degree freed of the taks of "transforming" the objects for play use, allowing them to enter directly into elaborated enactments of symbolic sequence. It seemed to be "easier" for the children to develop complex characters out of dolls representing obvious roles (e.g., young woman in apron) than out of the global, undifferentiated wooden forms (looking as much like gingerbread cookies as like people)! The availability of toys suggesting particular content (e.g., a firetruck) often led to the predetermination of the themes to be enacted. These behaviors were criteria for assignment to the most mature level of play symbolism on the Developmental Play Scale. They were observed significantly more often in play with highly structured materials. These data led us to conclude that the rich detail of the structured toys

provided the children with a headstart, or a boost, as it were, towards symbolic play constructions which were more complex than those created in the minimally structured context.

This view is consistent with results of past studies by Franklin (1973) and Fein (1970, 1975). In comparing the present results with previous work, it must be noted that there are important differences between these studies in experimental design, age of subjects, play task, and criterion measures. Each study, however, compared symbolic play with two sets of materials: minimally structured toys as opposed to realistic replicas of familiar objects. Franklin (1973), studying nursery school children, reported that all subjects found it easier to adopt and maintain symbolic reference with realistic toys than with their nonrealistic counterparts. On the basis of her study of two-year-olds, Fein (1970, 1975) argued that the ability to pretend varies as a function of the number of object transformations involved. The young child requires the anchor supports of realistic objects in the immediate stimulus field. With age, the increasing ability to make complex mental transformations is reflected in greater facility representing with unstructured as opposed to realistic materials. Our study indicated that by the time children are 4 years old, they are competent to both generate and maintain object transformations with unstructured materials. But the complexity of the play segment into which these symbols are woven is invariably less than with the highly structured materials.

Another factor which probably contributed to the elicitaion of more complex play by the highly structured toys was the relative

attractiveness of these materials. The children often remarked that they preferred these to the unstructured playthings, which were reportedly "boring," "useless," or worst of all, "babyish." Several of the 6- and 8-year olds who were first observed at play with the unstructured materials, expressed their hope that the second set of toys would be "better." This dissatisfaction was not expressed by children tested with highly structured toys first. It is assumed that this informally observed motivational difference may have been a contributor to the differential play maturity scores in the two conditions. The subjects appeared to be more readily engaged by the very realistic toys (latencies were significantly lower), and spent significantly more of the observation period involved in symbolic play in this condition than with the unstructured toys. In evaluating the notion that the attractiveness of the materials may influence play maturity scores, the duration of the observed play segment must be borne in mind. Based on a single 10-minute experimental period, we have no way of determining whether over time these materials retain their appeal and continue to stimulate elaborate pretending. Jeffree and McConkey (1976) repeatedly observed the play of preschoolers and reported that realistic materials do consistently elicit more frequent and enduring imaginative play. A remark by Singer (1973 speaks to this issue. Observing the strong appeal of highly specific toys with many components, Singer notes that it is possible that the very specificity of function which is so provocative during a short play episode, may ultimately limit play with the toy once the child tires

of the game ans seeks to develop other play situations (p. 239). Further investigation is needed to clarify this issue.

The expectation that play objects would differentially influence response patterns in the present study was based on Werner's (1957b, 1963) assumption that the context in which an activity occurs may lead to a multiplicity of developmental forms, (as responses are anchored to the stimulus situation). This experiment represents an attempt to systematically tease out and evaluate the effect this contextual variable. The control achieved by using a repeated measures design enables us to conclude with a reasonable degree of certainty that behavior differences were in fact a function of the degree of imposed toy structure--not a reflection of actual variation in competence. Each child was observed at play with both the minimally and maximally structured materials, thereby serving as his own control. Under these circumstances, it is clear that the same repertoire of cognitive skills was available to the children in the two contexts. The possibility that the obtained differences were an artifact of sampling inconsistency was thereby eliminated. Thus the fact that the subjects consistently played more maturely with the highly structured than with the less structured materils leads to the conclusion that the toys differentially influenced which of the subjects' skills were applied in the varied play environments.

This line of reasoning is consistent with a research position presented in a recent paper by Glick (1977). Basic to Glick's approach is the assumption that cognitive processes, rather than controlling the mind, are selected from a set of alternatives, both by our subjects and

our studies. These processes are then deployed "on occasions seen as conducive to their application" (p. 3). It is also consistent with Beilin's (1969) notion of cognitive efficiency which holds that task demands differentially call forth those cognitive strategies from the subjects' repertoire which are easiest to apply. It is therefore particularly important for students of cognitive development to concern themselves with the conditions of elicitation, and the functional sphere within which behavior is observed. The information so gleaned would likely prove useful in the specification of rules underlying behavior differences (Cole, Gay, Glick & Sharp, 1971).

The Establishment of Symbolic Reference

A major concern of the present study was the nature of the relationship underlying symbol formation at different ages. The Symbol-Referent Correspondence categories were designed to zero in on the resemblance mediating between the external form of the symbolic object, and that which it represents. Clearly, the type of analogy constructed depends upon how the child construes the resemblance, as well as on the form itself. It was assumed that the similarity mediating the symbolic relationship might be based upon: (1) the subjective influence of the motor and/or affective attitude of the subject, (2) overall external similarity, (3) feature selection, or (4) use of language as the sole vehicular medium. These measures stem primarily from Werner and Kaplan's (1963) developmental theory of symbol formation. They tap various points in the progressive diminuation in tangible substantive and qualitative similarity between the vehicle and referent. As Werner's writings on the

ontogeny of representation include extremely brief, nonspecific speculations on symbolic play, much extrapolation from the general theory to the specific domain of playful represenation was required. Therefore these observational categories are rather loosely linked to the theory.

Developmental Tends in the Establishment of Symbolic Reference

We approach these data from two perspectives. First, the impact of age upon each of the dependent measures is examined. Second, a profile of the component behavior at each age level is presented, as this enriches our description of the changing composition of the play episodes over development.

The data confirmed our expectation that the prevalence of Subjective Correspondences would decrease over age. Indeed this proved to be the most primitive type of relationship we assessed, occurring most frequently amongst the 4-year-olds and dropping significantly thereafter. Our findings are consistent with the cognitive-developmental theories of Piaget (1951) and Werner and Kaplan (1963). Piaget describes the earliest symbols as most personal, and egocentric. Werner and Kaplan (1963) similarly contend that immature forms of symbolic reference are highly individual in their meanings, lacking in stable connotation necessary for communication to others. The resemblance mediating between vehicle and referent is assumed to be ased on the physiognomic properties of the stimuli. It is noteworthy that while symbols constructed on subjective bases were observed most frequently in 4-year-olds, this behavior was clearly not their dominant mode of symbol

formation (See Table 28). It is probable that sampling of children younger than those studied here would yield a greater preponderance of this type of correspondence.

Table 28

The Establishment of Symbolic Reference at 4, 6, and 8 Years of Age: Mean Percentage of Intervals During Which Each Type of Correspondence Occurred

Correspondence based ON	Age (Years)		
	4	6	8
Subjective Features	19	11	13
External Similarity	81	85	81
Feature Selection	31	30	30
Linguistic Representation	17	33	51

A developmental trend was also discernible in Representation in which Language Serves as the Vehicular Medium. The data supported our assumption that this most abstract form of symbolic reference would become increasingly evident over age. Why? The theories of Werner and Kaplan (1963), and Piaget (1951) provide overlapping, but perhaps complementary explanations.

Our data are consistent with Werner and Kaplan's (1963) notion of progressive distancing between vehicle and referent. The increase over age in Linguistic Representation reflects at once that the meaning of the referent <u>is</u> decreasingly bound to a concrete external form, while

vehicle are of increasingly conventional and communal nature.

Piaget (1951) states that as symbolic play evolves, details in material constructions tend towards exact imitations, and that there is an increasing penchant for realism in the use of play objects. As subjects serving in this study were specifically instructed to play with objects, it was expected that this trend would be manifest in increasing evidence of symbols based on External Similarity over age. This hypothesis was rejected, as no such trend emerged. Correspondences based on External Similarity were equally prevalent at all ages. This line of reasong neglected Piaget's more encompassing notion that as cognitive functioning is increasingly governed by internalized schemes, so too is the play symbol. What the child of age 4 must do in overt action, the older child does mentally. Thus the materials become decreasingly relevant as mental schemes increasingly govern the product. This transition was demonstrated in the present study in the children's increasing reliance upon Linguistic Representation.

We move now to description of the establishment of symbolic reference by each age group. A profile of the constellation of symbols constructed by 4-, 6-, and 8-year-olds summarize age-related change in this important aspect of symbolic play. Table 28 presents the averaged (M) percentage of symbolic play intervals during which each type of correspondence was observed. The behavior of the four-year-olds breaks down as follows: Symbols based on External Similarity were observed most frequently (during 81% of the 15 second intevals), followed by those based on Feature Selection (31%). Few Subjective Correspondences were counted (19%). As noted above, while these symbols were

most frequently constructed by the youngest subjects, they clearly were a relatively infrequent occurrence. Linguistic Representation was least common amongst 4-year-olds (17%). This pattern reflects the dominance of overt actions over mental schemes in these pre-operational children.

The 6-year-olds' play sessions were composed of the following combination of symbols: Again, symbolic reference based on External Similarity occured most (85%). The increasing ability to deal with abstraction was demonstrated by the scoring of Linguistic Representation in a third of the play intervals (33%). Feature Selection, the intermediary entry in the scaling of distance between vehicle and referent, occurred with nearly the same frequency (30%). An average of only 11% of the intervals included subjectively based correspondences. The physiognomic properties of symbolic stimuli apparently lose ground over age in the governance of behavior.

The pattern of symbolizing behavior of 8-year-olds closely resembles that of the 6-year-olds: Symbols based on External Similarity (81%), Linguistic Representation (51%), Feature Selection (30%, and Subjective Correspondences (13%). The important difference is in the increased use of Linguistic Representation in this oldest age group. These subjects dealt most abstractly with the materials at hand. During half the play segment, pretending appeared to be governed at least in part by an internal shceme, or inner structure, rather than a function of pattern matching triggered by an external stimulus.

A major impetus for the present study was q question Franklin (1973) posed for future study: "Can we discern developmental trends

in the types of correspondences underlying the symbolic objects chosen at different ages (p. 41)?" Our data directly addresses this question. Striking age differences as well as consistencies emerged in the make-up of the play episodes with regard to the resemblance mediating the symbolic relationship. The four types of correspondences were apparent at all ages. The age differences, based on frequencies, thus reflect combinations of the same four ingredients appearing in varying proportions. Interestingly, the most frequently observed symbols were those based on External Similarity between vehicle and referent. These occurred with rather uniform frequency at ages 4, 6, and 8 (approximately 83% of the time-sampled units). Part of the explanation for this may lie in the fact that play with the maximally structured toys almost always involved symbols based on External Similarity (95% of the observed intervals). The highly structured materials appeared to offer the children few alternatives with regard to assignment of diverse identities. These data, combined across conditions, therefore reflect the heavy loading of symbols based on External Similarity in the maximally structured condition. This explanation is insufficient though, as these symbols also appeared in 70% of unstructured play units. Fein's (1975) transformational model of pretending is useful in accounting for this finding. Fein argues that make-believe becomes more difficult as the number of "transformations" required increases. Symbols based on External Similarity may surely be construed as involving the fewest imaginative transformations. Perhaps this makes them the "easiest" symbols to construct, thereby accounting for the children's heavy reliance on them at all ages.

The Impact of Play Materials Upon Symbolic Reference

By providing the children with two sets of play materials to serve as signifiers, it was possible to ask whether degree of imposed structure systematically influenced the observed symbolizing activity. "Structure" has recently become a popular experimental dimension in play research. Its differential effect had not been studied, however, in relation to the types of symbolic relationship manifest in play with minimally as opposed to maximally structured materials. Our expectations in this regard were based on two assumptions. The first was Werner's (1957) holistic principle that cognitive processes reflect the context in which they occur. Second, it was assumed that the highly structured playthings would limit the bases upon which symbolic relationships might be established. As these props "articulate" certain identities, it was expected that their use as signifiers would be limited to the obvious, suggested content.

In the present study, the impact of toy structure on the establishment of symbolic reference was far more extensive than anticipated. The data confirmed our hypotheses that (1) correspondences mediated by External Similarity between vehicle and reference would be observed more frequently in the maximally than the minimally structured condition; and (2) symbols based on Feature Selection would be elicited more frequently by the minimally than by the maximally structured props. In addition, unpredicted significant condition effects emerged in the ANOVAS in relation to correspondences based on Subjective factors, and Linguistic Representation. Subject Correspondences occurred more commonly in the less structured context, while Linguistic Representation was more preva-

realistic, structured toys were much less provocative of "loose" associations between the vehicle and object represented than were the unstructured materials. However, with regard to the most abstract class of symbolizing activity assessed (Representation in which Language Serves as Vehicular Medium), the reverse was true. For all age and sex groups, the highly structured toys elicited more of this symbolizing strategy than did the less structured materials. It appeared that the very complexity and richness of detail which led to the continuous construction of symbols based on External Similarity had another effect as well. We refer here to behavior indicating that these props often triggered a burst of "internalized" imaginative activity, going beyond the physical stimuli at hand. The children appeared to be "carried away" by their creations, often ignoring the materials completely during these moments.

We have speculated before in this study that the relatively obvious identities of the highly structured playthings freed the players somewhat of the task of defining symbolic forms, thereby giving the children a "boost" in relation to the maturity of play structures. This point is relevant to the establishment of symbolic reference as well. The fact that the subjects seemed to respond to the maximally structured toys as though identities were "given," allowed them more time in the play segment to incorporate these signifiers into complex mental fantasy constructions. Pretending was then maintained by an internal scheme, the referent an inner structure removed from tangible perceptible features. Thus, while highly structured toys appear to limit the variety of physical relationships on

lent in play with the highly structured toys.

This pattern of results strongly indicated that the structure of play things is indeed a critical stimulus dimension, differentially influencing the nature of the observed play symbols. These differences must be both explained and considered in relation to theory. Several partial explanations are suggested as we look more closely at certain characteristics of the materials themselves. It is likely that the relative ambiguity of the minimally structured materials made these props more appropriate vehicles for symbolic relationship based on both subjectively determined qualities and Feature Selection. It has been noted that the combined attributes of the highly structured toys articulated an obvious identity. This is not true of the less structured toys, which allowed the children to focus their attention, or key in on one salient dimension (color, form, etc.), seemingly disregarding the others. Thus, if a relatively "free" adaptation of the materials to the whim of the player is the desired symbolic product, the unstructured toys are more likely to elicit these behaviors than the highly structured ones.

In contrast, children produced significantly more symbols based on External Similarity and Linguistic Representation during play with the maximally structured props than with their less structured counterparts. As noted above, the identities "announced" by these toys were so compelling as to allow few alternative strategies. Little analogic extension was necessary. The physical resemblance mediating the symbolic relationship between the external form of the symbol and that signified was most often based on External Similarity. The highly

which symbolic reference is based, they also enhance the play by activating abstract imaginative processes in which physical resemblance need not mediate between the symbol and that which it represents.

In evaluating the influence of play objects upon referential behavior, a profile of the behavior elicited in each condition is an essential complement to our discussion of significant differences. By viewing the data in this way, important consistencies in the construction of symbolic relationships are highlighted (see Table 29. We refer here to the strikingly similar pattern of behavior in the two conditions which becomes evident when the measures are ranked in terms of the percentage of the play episode during which each was scored. In the minimally structured condition, symbols based on External Similarity are scored most frequently (during 70% of the play intervals). Behaviors classified as Feature Selection and Linguistic Representation are intermediary entries in this ranking, observed in 49% and 28% of the intervals, respectively. Finally, the children constructed symbols based on Subjective Features in only 21% of the play segment.

Our composite of play symbolism elicited by the highly structured toys reveals that though the proportions differ, the behaviors most and least commonly emitted are the same regardless of play materials. Symbols based on External Similarity are once again dominant, observed in 95% of the intervals in the maximally structured condition. Not surprisingly, Subjective Correspondences are scored least often (7%). As in minimally structured context, symbols based on Feature Selection (12%) and Linguistic Representation (39%) once again occupy intermediary

positions in this condition with regard to their relative weight during the play episode.

Table 29

The Impact of Play Materials Upon the Establishment of Symbolic Reference: Mean Percentage of Intervals During Which Each Type of Correspondence Occurred

Correspondence Based on:	Toy Structure	
	Minimally Structured	Maximally Structured
Subjective Correspondence	21	7
External Similarity	70	95
Feature Selection	49	12
Linguistic Representation	28	39

By assessing the ways in which the play materials modulate the establishment of symbolic reference, we hoped to disentangle the influence of this source of varied responses in relation to a multi-faceted behavior. The profiles of the component symbolizing activity observed with the minimally and maximally structured toys demonstrate important generalities in the make-up of behavior across conditions. The significant treatment effects which emerged in relation to each of the four types of symbolic relationships enabled us to present a more refined view of the differntial influence of toy structure upon symbol construction.

It is difficult to compare these data to findings of past research because the approaches have varied in such important ways. This study is, however, in keeping with a trend in the current play literature towards comprehensive analysis of the parameters of the play environment (Gramza, 1972, 1973). The effect of structured verses unstructured materials has been compared in relation to many facets of symbolic play (Fein, 1970; Franklin, 1973; Jeffree & McConkey, 1976; Pulaski, 1973). It is noteworthy that none of these studies focused on the kinds of symbolic relationships constructued with different representational materials. Fein's (1970, 1975) recent work is unique in that she went beyond phenomenological description of symbolic play, to explore the process whereby one thing is used to symbolize another. The transformation model Fein constructed provides an interesting framework in which to consider the enhancing or limiting effects of the play materials utilized in this investigation. By telling the children what the materials were to represent (dictating the vehicle-referent association), Fein was able to manipulate and to control the number of transformations involved in the play task. The subjects' ability to pretend was assessed in contexts varying as to the number of transformations required. We share Fein's interest in the physical resemblance mediating between the external form of the symbolic object chosen and that which it represents. However, we approached this symbolic relationship from a different angle. Our concern was with the quality of the correspondences generated by different sets of materials. It was therefore critical that the children (not the investigator) construct the symbolic relationships which were the focus of our assessment.

The fact that symbolic reference was shaped by the quality of the available materials brings us back to a point raised earlier. Recall that in our discussion of the effect of toy structure on play maturity scores, it was concluded that children applied cognitive skills in response to dissimilar environmental demands. The same dynamic appears to be operating with regard to differences in symbol construction in play with minimally and maximally structured props. Thus, not only the complexity of behavior, but also the underlying patterns of operation were susceptible to the influence of the immediate stimulus field. In evaluating this conclusion, it is crucial that we remember that the ability to apply different cognitive strategies in different contexts speaks not only to the influence of the materials, but also to attributes of the children. Werner (1957b), for example, pointed out that it is a reflection of flexibility when a person is able to operate at different levels depending on the requirements of the situation. This point has been extended in more recent works by Cole and Scribner (1974), Glick (1977), and Beilin (1969).

Representational Modes

The four behavior categories comprising the measure of representational modes are neither exhaustive nor mutually exclusive. Rather, they are a sampling (selected on the basis of applicability to the present study) of the many motor-gestural and verbal media through which symbolic activity may be expressed in play (Franklin, 1970). In order to minimize the inference required, scoring was limited to the presence or absence of each mode during each 15-second interval. No

distinction was made between those modes which were or were not central to the sampled interval. The investigator's hope that the problem of interpretive judgments would be circumvented in this way proved to be false. The scoring of the motor-gestural modes (Structuring Action and Dramatic Play Actions) was wt times fraught with ambiguity. Though a high inter-rater reliability was obtained (r = .88), both scorers commonly found it difficult to ascertain whether a behavior was being used to arrange a scene, or as a dramatic enactment. This was particularly problematic when subjects spoke little (and frequently resulted in disturbing the flow of play by asking the child for clarification. For example, imagine a child silently sliding a figure across the floor into a chair. If the child does not explain what he is portraying, one might reasonably assume either that the figure is walking to his chair (Dramatic Play Action), or that the child is pre-arranging a scene he is about to enact (Structuring Action). In light of this scoring problem, conclusions concerning nonverbal modes must be drawn most tentatively.

Age and Sex Differences in Representation Modes

The results of the study revealed consistencies in behavior over age which were as compelling as the observed differences. Our expectation that the use of the verbal modes would increase with age was not supported, as age did not prove to be a significant factor. Of the nonverbal modes, on the other hand, the data confirmed the assumption that the prevalence of Dramatic Play Actions would diminish developmentally. A closer look at these data may shed light on possible

explanation.

The hypothesis that Role Language and Onomatopoesis would increase with age was based on extrapolations from cognitive-developmental theory of symbol formation. Recall Werner and Kaplan's (1963) description of the increasing pre-eminence of the verbal-linguistic media of representation. Smilansky (1968) echoed this, noting that over development her subjects increasingly relied upon verbal play behaviors, rather than actual manipulations of the play objects. With regard to role language, Piaget (1951) extensively charted the increasing elaboration and exactitude with which children enact roles.

The behavior of the children serving in this investigation was only minimally consistent with these trends. The absence of main effects for age suggests that on the whole, subjects behaved rather uniformly from one age to the next. Interestingly, significant age by sex interactions emerged which reveal that boys and girls followed different developmental courses with regard to Role Language and Onomatopoesis. Amongst female subjects, both behaviors are most common at age 4 years and drop sharply thereafter. The pattern for boys was consistent over both behaviors as well. Here we find a dramatic increase from 4 to 6 (as predicted), followed by a sharp drop at 8 years. These data, like that tapping play maturity, suggest that boys and girls may develop certain play competencies at different rates. With regard to these verbal referential behaviors, the 4-year-old boys appear to lag behind their female counterparts. By 6, years, however, this difference has largely disappeared.

Coming back to the discrepancy between our findings and our theo-

retically derived expectations, seemingly plausible, though incomplete explanations are offered in hindsight. The first is simply that the relevant theory is addressed to the emergence and early development of symbolic behavior, primarily in children under 6 years of age. The assumption that general developmental trends identified in the verbal behavior of young children might be extended to older subjects proved to be only partly true. Within the range of ages tested, these behaviors peaked at ages 4 and 6 for the girls and boys, respectively, dropping off somewhat thereafter. It may now be speculated that the children sampled in this study (especially the girls) were too old to demonstrate the postulated increase average in deployment of verbal representational modes. The implication is clear that this type of study should be repeated with preschool subjects.

Second, a facet of Werner and Kaplan's (1963) distancing hypothesis sheds light on the pattern of results emerging with relation to onomatopoesis. Though Onomatopoesis does involve translation of perceived noises into linguistic media, this kind of translation is most primitive, and appears early. The diminuation observed over age may be interpreted as a reflection of the decreasing similarity between the vocal utterance and the depicted event.

The fact that the prevalence of Dramatic Play Actions decreased over age may be interpreted as a demonstration of the increasing internalization of play activity. The applicability of this trend to a school-aged sample is particularly striking as the children were specifically instructed to play with the materials. It appeared that as the children got older, the toys became an increasingly bothersome

encumbrance to the flow of their imaginative activity. The 8-year-olds often appeared frustrated by the slowing, constraining effect of having to keep pace with enactive movement of the play materials. This was commonly expressed in vexed pleas to "let me just tell it, not do it."

A more integrated view of the children's deployment of representational modes is provided by the profile of behavior at each sampled age (see Table 30). One is struck by the fact that when the categories are ranked on the basis of prevalence, the same sequence emerges at all three ages. The most frequently scored mode was Dramatic Play Actions, followed by Structuring Actions. Role Language ranked third in terms of the percentage of intervals during which it occurred at each age, while Onomatopoesis was uniformly scored least often. Thus, the conditions of the present study elicited a single pattern of interwoven representational modes which was manifest by 4-, 6-, and 8-year-old children. It remains for future research to determine the generalizability of this configuration beyond the present sample.

Table 30

Use of Representational Modes at 4, 6, and 8 Years of Age: Mean Percentage of Symbolic Play Intervals During Which Each Behavior Was Observed

	Age (Years)		
	4	6	8
Onomatopoesis	9.62	10.37	4.12
Role Language	10.25	13.98	10.87
Structuring Actions	39.54	32.46	36.62
Dramatic Play Actions	65.65	68.15	54.54

The Impact of Play Materials Upon Representational Modes

The results of this study indicated that toy structure does differentially effect the child's use of various representational modes. The hypothesis that Structuring Actions would be more prevalent in the minimally structured condition was supported by the data. In addition, significant treatment differences emerged in relation to Role Language and Dramatic Play Actions. Indeed, only Onomatopoesis did not vary systematically as a function of the toys. Interestingly, it appeared that the children's behavior at once varied and remained the same across contexts. We refer here to the unifromity in the position occupied by each mode when ranked in terms of the percentage of the play segment during which the behavior was scored (see Table 31).

Table 31

The Impact of Toy Structure on Representational Modes: Mean Percentage of Intervals During Which Each Behavior Was Observed

Mode	Toy Structure	
	Minimally Structured	Maximally Structured
Onomatopoesis	6.72	9.36
Role Language	9.37	14.03
Structuring Actions	45.19	27.22
Dramatic Play Actions	54.08	71.47

These data raise as many questions as they answer. Foremost is clearly why the discrepancy in use of the modes from one context to the

next? As this area is relatively uncharted in the literature (Franklin's 1970 study is the only one known to the investigator), it is difficult to integrate these findings in relation to theory, except in a most general sense. In the discussion which follows, an attempt is made to explore some of the factors which may have contributed to the systematic application of the representational modes as a function of toy structure.

The data clearly indicate that more Role Language and Dramatic Play Actions are produced by the highly structured playthings than by their less structured counterparts. The children apparently found it easier to attribute both words and actions to these richly detailed representations of familiar objects than to the more abstract forms. Thus, the suggestiveness of the highly structured toys seemed to have a provocative rather than constraining effect in relation to these symbolic play behaviors. This difference in the prevalence of Dramatic Play Actions may also stem from the fact that the minimally structured toys elicited so much more Structuring Action that less time was available for dramatic enactments.

The finding that the children uniformly produced more Structuring Actions in the minimally structured condition is noteworthy. It appeared that the relative ambiguity of these toys, and their less "fixed" identity as discrete whole objects made it possible to use these materials in a variety of ways. For example, as identities were less obvious, subjects appeared to "support" their symbols by constructing more elaborate settings around them. In addition, qualities unique to these more global, less differentiated forms led to their frequent

use as parts of more complex wholes (i.e., tongue depressor knife on top of nearly triangular female figure becomes see-saw). Structuring Action is obviously essential to this type of construction as well.

This pattern of significant treatment effects gives the impression that behavior varied widely in the two toy structure conditions. The perspective provided by the profile of component behavior in each context reveals that though the proportions did differ, the breakdown of the play segment was stable across condition as well as age in terms of the relative weight of each representational mode. The fact that this constellation of behaviors emerged for all age groups in both conditions is compelling evidence of a hierarchy of representational modes which overrides the influence of both age and condition.

Interrelationships Among Dependent Measures

Considered together, the principal components factor analyses served to validate the approach we have taken. The fact that the factors extracted brought us back to the clusters of variables comprising the major dependent measures, indicates that the domains of symbolic play activity differentiated in the present study were indeed discriminable. Most generally, Representational Modes were discriminated from Play Maturity Index scores and correspondence types involved in the Establishment of Symbolic Reference. The one exception was the Linguistic Representation measure, which associated not with the other bases for correspondence but with the index of Play Maturity.

The only respect in which the two factor analyses differed from one another inhered in the behavior of the Representational Mode variables. While these four variables cohered in the minimally structured

condition, they pulled apart as two independent factors in the maximally structured condition: the one defining Verbal-Linguistic Modes, the other Motor-Gestural Modes. Thus, the variables appear to describe play in the two settins equally well, but the highly structured condition permits of an additional discrimination over the minimally structured context.

Chapter IV

SUMMARY AND CONCLUSIONS

The outcome of the present study is reflected in two kinds of results. The first demonstrates the progressive elaboration of symbolic play behaviors with increasing age. The second describes the modulating influence of the effective stimulus environment upon several aspects of symbolic play. In addition, the findings of the present study lead to the conclusion that symbolic play may be broken down into component dimensions which are amenable to replicable experimental measurement. The many behaviors assessed were combined into subscales which proved to be useful in the discrimination of independent domains of play activity. The play measures were sensitive to differences brought about by the two independent variables upon which our interest focused: the children's age, and the degree of structure of the play materials. Though not a central concern of this study, sex differences were also occasionally tapped. The data revealed striking consistencies as well. In closing, our findings are summarized in relation to age and toy structure. The many implications of these data are highlighted.

A complex and multidirectional pattern of age-related behavior differences emerged as the play episodes in both conditions were analyzed. With regard to the initiation of a symbolic play sequence, we found that the two sets of toys generated different results. Age was significant only in the minimally structured conditions, where latencies decreased over age.

With regard to the structural organization and complexity of play, the fact that the categories comprising the Developmental Play Scale showed the predicted relationships with age, is suggestive of its coherence as a measure of imaginative play. Use of this scale (derived from Piaget's description) allowed us to experimentally demonstrate the increasingly complex behaviors typical of children at 4, 6, and 8 years of age. The Play Maturity Index, a summary of overall levels of functioning, was derived from the Developmental Play scale.

Our findings affirm that developmental trends are indeed demonstrable in the types of correspondences underlying use of symbolic objects at different ages. While the four kinds of mediating correspondences were observable at all ages, these skills were deployed in varying proportions by children at different ages. It was not surprising that the inclusion of Subjective Correspondences diminished over age, while Representation in which Language is the Vehicular Medium increasingly dominated play over age.

The domain of Representational Modes was exceptional in that consistencies over age were more compelling than the differences. Age proved to be a significant factor only in relation to Dramatic Play Actions, which decreased developmentally, reflecting the continuous internalization, or interiorization of behavior over the sampled age range.

The transcripts of the children's verbalizations during the observation period were another source of age-related data. These narratives suggested clues as to the increasing range of the children's experiences and interests, as well as phase-specific issues and concerns.

The results of this investigation clearly lead to the conclusion that the activities involved in symbolic play follow discernable, often divergent developmental paths. These complex changes are amenable to reliable experimental observation and documentation. This has important implications for future study in this area. First, both the Developmental Play Scale and the derived Play Maturity Index provide potentially valuable research tools. Such a measure might be used in playtraining studies in which play maturity must be assessed both before and after intervention.

Second, in order to understand the relationships between symbolic play activities and other cognitive behaviors, it would be useful to conduct studies in which these play measures were related to other dimensions which are better understood. For example, it may be that certain play activities are related to some components of creativity and not others. Studies in this tradition would provide a useful contribution to the development of a nomological network of theory related to this area of functioning.

Let us now turn briefly to a consideration of the impact of toy structure. The present study is a testimony to the complexity of the relationship between play materials and symbolic play behaviors! This multifaceted analysis of make-believe, with both structured and unstructured playthings, argues strongly for a more refined, differentiated approach to the evaluation of the relative merits of minimally versus maximally structured toys. This study dramatically demonstrates that the many specific behaviors involved in symbolic play do not vary consistently as a function of the playthings. While some play behaviors

were elicited more often by the unstructured toys, others appeared more frequently in the highly structured condition. Thus, the relative usefulness of each set of toys in stimulating symbolic play varied as our attention shifted from one to another facet of this complex behavior. As we summarize the differential influence of toy structure, a critical and seemingly paradoxical point must be kept in mind. refer here to the fact that although many significant differences were obtained, the children's behavior was in another sense strikingly stable across conditions. This stability was reflected in the similarity of the profiles (or patterns of component behaviors) which were generated in relation to the clusters of variables comprising each dependent measure (e.g., the Developmental Play Scale categories, the Representational Modes, etc.). The same, or nearly the same sequence emerged in the two conditions when behaviors were ranked in terms of the percentage of the play episode during which they were scored. This speaks to important generalities in the composition of imaginative play behaviors which appear to override the differential influence of the playthings. Finally, it is noteworthy that <u>all</u> the behaviors we assessed were generated by both sets of materials. The treatment differences thus reflect combinations of the same elements appearing in varying proportions.

Given the findings of the present investigation, what then, can one expect to observe in symbolic play with unstructured as opposed to highly structured toys? The variation ascribable to the toys may be highlighted by indicating those behaviors which are particularly enhanced by each set of materials. The data made it quite clear that children between 4 and 8 years are still in a period of change, and subject

to the impact of the material context upon the play behaviors which are deployed.

First, shorter latencies revealed that the highly structured toys yielded more rapid movement into a symbolic play sequence. Once a sequence was initiated, other differences emerged as well.

With regard to structural organization, our findings led to the conclusion that highly structured toys elicit more complex play than do less structured materials. This difference was demonstrated in the uniformly higher Play Maturity Index Scores obtained by all groups, as well as in the pattern of significant treatment differences in the prevalence of those behaviors comprising the Developmental Play Scale.

The structure of the toys proved to be a critical stimulus dimension in relation to the establishment of symbolic reference as well. Of the four types of correspondences between symbol and referent which were studied, two appeared to be fostered more by the highly structured toys; the other two were noted more often in the less structured domain. The more ambiguous minimally structured toys appeared to be particularly generative of symbols based on both Feature Selection and Subjective Factors. A common denominator to these two mediating relationships is the relative "looseness: of the physical tie between the object as symbol, and that which it represents. This kind of association is traditionally embodied in our notions about creativity and divergent thinking (Singer, 1973; Werner, 1957b). The highly structured toys, on the other hand, proved to be the more appropriate vehicle for symbols based on External Similarity and Linguistic Representation This tells us that while these materials do seem to provide less leeway

with regard to the playful assignment of identities or functions, they at the same time set other highly abstract imaginative processes into action.

Turning to the Representational Modes, our findings again refute the unilateral assumption that richly detailed, structured materials stimulate less symbolic play than do unstructured playthings (Caplan & Caplan, 1973; Pulaski, 1973). In fact both Role Language and Dramatic Play Actions were observed more often in the highly structured setting. (In the case of Role Language, the girls' differential behavior was the source of the treatment difference). Structuring Actions, on the other hand, were more typical of play with the less structured toys. It was not surprising that the content of the children's narratives was influenced by the stimulus environment as well. We had not expected, however, that a greater variety of themes would be enacted during play with the maximally structured toys than with the others.

This intricate array of differences has important implications for both the future study of play and the optimization of the physical environment created for the child at play. First, our findings make it clear that sweeping generalizations as to the relative merit of minimally versus maximally structured toys must be refined to take into account the differential influence of the materials upon the myriad of imaginative activities falling under the umbrella of make-believe play. Judgments as to the preferability of one set of toys or another might be more reasonably based on specific knowledge of the effect of toys upon the desired behavioral outcome.

These findings have practical implications for the selection of toys, too. Assuming that one's goal is to set the physical stage for

the exercise of as many imaginative activities as possible, this study leads to the conclusion that the best strategy would be to provide the child with a combination of unstructured and rather detailed materials, so that they could be used together. One could thereby increase the probability that make-believe behavior would be richly varied.

It remains for future research to supply the information necessary to a fuller appreciation of how the environment shapes a child's play. It is likely that our understanding could be greatly enhanced via systematic delineation and analysis of other facets of the play context, such as the novelty or familiarity of the materials, as well as interpersonal factors (solitary versus cooperative play).

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Appendix A

Name: Michael N.
Sex: Male
Age: 6
Condition: Maximally Structured
Order: Max S, then Min S (2)

Narrative

Story No. 1

Once upon a time there was a lion and he lived in the zoo. And one time he escaped and he went to the fire station first. And the fireman said, "There's a lion in the fire station. Help!" So they called the police and the police came around "brrrm, brrrm" and they got the lion and then he went into the car and he was put back in the zoo. And then he got out again and went into somebody's bathtub in somebody's house. And he said, "Will you please get out of my house?" A man said it and he (lion) got out of the bathtub and went "rrr." And the man's wife comes in and she screams like this (screams). And she was surprised and then she got her little baby to see him. She said, "Look at that lion. Let's call the zookeeper." And the zookeeper got the lion and put him back in the zoo. And then he got out once more and he went back to the house and he got into bed with the wife and the man and the little baby and he said "rrrr." While they were watching TV she said "get a knife," and then they killed him. The End.

Story No. 2

Once upon a time there was a little red fire engine that didn't know what to do to rescue people. And he wanted to do lots of help and

stuff to help them. So one day when two little old people had a fire they called the little red fire engine. He came right over and "Help! Help! Help!" the people said in the house. And then the little red fire engine came, but one got there before he did. But he wanted to help that day in that rescue. So then they got the fire out and they were O.K. Then the next day they went to bed before dinner because they were very tired from that fire. When they woke up they had supper. And then the baby was crying because he was sinking in the bathtub. And then the mommy got the baby out, and a lion popped out of the back and went "rrrr." Then she said, "I'll get some food." And she let him eat it. They like meat, and he ate it all up, and went to bed. They had to go to sleep on the floor, and it was very cold on the floor. So the lion gave them a cover. The cover wasn't warm enough so the lion gave them one pillow to sleep on. And then that's all. He became very friendly with them. The End.

Story No. 3

Once upon a time there was a little sloppy baby and she didn't have any parents. And she was very sloppy and she ate and ate all day "chomp, chomp." And she always had to wash up before her dinner every day. After dinner she got her p.j.'s on and watched TV for a little while. And then she ate, and drinks tea, and had to wash up again and went to bed. Then a lion came (roars). She got into bed, but she needed the fireman and the firewoman. And they came and they got him (the lion). When they finally got him, she asked the man who got him to get her the zookeeper. And so he came, "brrum, brrum."

And so they all took the lion together. And when they got back to the station they killed him with a sword. The End.

Story No. 4

Once upon a time a car was running down the street and he didn't know that a lion was loose in that part of the state. And he went "rrr" and looked in the car. And there was a little baby sitting in the back. The wife and the mother was sitting in the front and she said "help." And the zookeeper then came and got him, and he again escaped from the zoo. And then it went to their house, and then it knocked all the furniture down and then everything was "ooooo." And then they got up and they said "Who wrecked our house? I'll bet that lion did it! He's mean and I bet we'll have to pick up all this stuff!" And the water went out over the bathtub. "Oh dear, oh dear! I get sick and tired of that lion knocking down all our stuff."

Name: Michael N.
Sex: Male
Age: 6
Condition: Maximally Structured (2)
Order: Max S, then Min S (2)

Time-Sampled Behavior Protocol

Interval No.

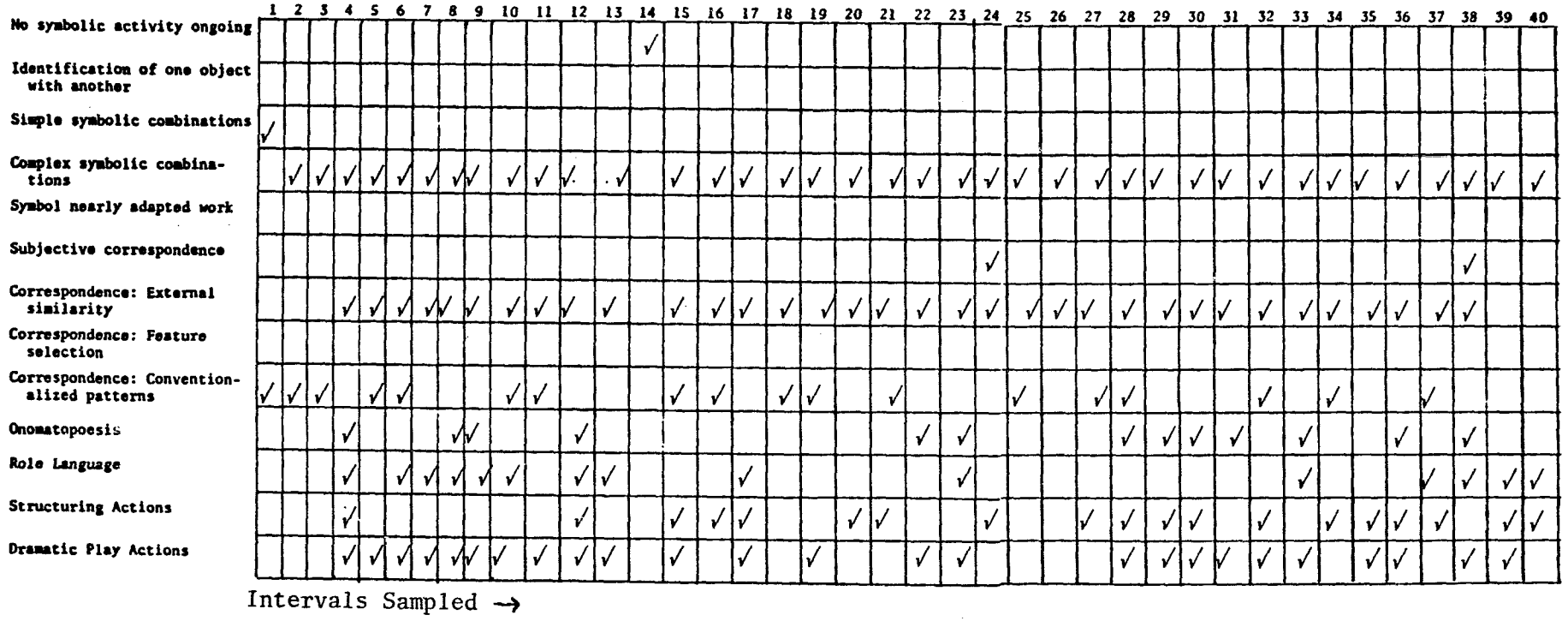
1. Looks at toys, but does not touch them.
2. Continues narrating, but does not touch materials.
3. Continues narrating, but does not touch materials.
4. Picks up lion and puts it next to fire engine, imitates cowering in fear.
5. Rolls the car around broad area on floor.
6. Has lion jump on top of car, opens hatch and puts lion partially inside.
7. Lifts lion out of car and walks him over to bathtub, lion bounces in.
8. Male figure talks to lion, pointing with arm, walks lion out of tub.
9. Female figure walks in, talks (gesturing) to male, places baby in arms of female.
10. Female figure continues dialogue--does not manipulate toys.
11. Moves lion across floor away from family cluster.
12. Male, female, baby placed in bed, lion walked over and onto bed.
13. Places TV near bed, picks up knife and stabs lion.
14. Toys rearranged, subject silently looks at them.
15. Takes fire engine and rolls it through the labyrinth of materials.
16. Holds up male figure and female figure.
17. Holds up male and female figure, rolls the fire engine to them.
18. Continues holding figures while narrating story.
19. Walks male and female figure across floor and puts on bed.
20. Removes figures from bed and places them on chair.
21. Places plate, cup and knife on table, baby in bathtub.
22. Female figure picks up baby in arms from tub, lion jumps into tub.

Interval No.

23. Lion eats food from the plate, then leaps onto the bed.
24. Lies male, female, baby figure on floor next to bed, one by one.
25. Touches several toys, but manipulates none.
26. Touches lion in bed as he continues narration.
27. Holds up baby as he narrates.
28. Places plate on table, baby on top of plate, bobbing up and down (eating).
29. Places baby in tub, baby moves around in the tub.
30. Places baby in front of TV, holds up to baby's mouth, placed in tub again.
31. Baby and lion are each walked into bed.
32. Puts male figure on fire engine, female on car, rolls both together.
33. Lion jumps on fire engine, stabs lion with sword.
34. Puts sword aside, rearranges toys.
35. Touches car, rolls it, picks up lion.
36. Lion rears as he roars, baby is placed in back of car.
37. Mother in front of car on top of it.
38. Lion knocks over table and chair vigorously.
39. Male figure pushes table and chair back into place, baby removed from car.
40. Subject arranges table, bed, chair, tub, while narrating.

Direct Observation Record

Name: Michael N.
Age: 6
Sex: Male
Condition: Max S



Name: Michael N.
Age: 6
Sex: Male
Order: Max S, then Min S (2)

Table A

Thematic Content of the Narratives:

Number of Stories During Which Theme Occurred

Themes:	Condition: Maximally Structured — Story Number					Minimally Structured — Story Number				
	1	2	3	4	E	1	2	3	4	E
Achievement		1			1				1	1
Aggression	1		1	1	3					
Birth										
Competition										
Death	1		1		2					
Distress	1	1		1	3	1		1	1	3
Domestic Animals, Pets						1		1	1	3
Fears	1	1		1	3				1	1
Fire		1			1					
Getting Lost										
urt, Misfortune		1		1	2		1			1
Love, Marriage										
Machines, Vehicles	1	1		1	3	1			1	2
Morality							1			1
Eating		1	1		2	1		1		2
Outerspace										
Playing										
Relations with Father						1	1	1	1	4
Relations with Mother	1	1		1	3	1	1	1		3
Relations w/Peers, Sib.										
Running Away										
School										
Sleeping		1	1		2	1	1	1		3
Travel										
TV Watching	1		1	2						
Unreality										
Wild Animals	1	1	1	1	4					

Name: Michael N.
Sex: Male
Age: 6
Condition: Minimally Structured (1)
Order: Max S, then Min (2)

Narrative

Story No. 1

One day a man and a woman came to town riding on a cow. And that day the cars were not invented. And they brang a little baby along in a crib with wheels on it. And the string was attached on the trailer with the crib on it and they went to the forest and all kinds of cities. And then they found a nice place, and they took the string of the crib and they pulled the string (the daddy). And then they found this nice house, and it was very pretty to them. And then the next day they had cars invented and they bought two cars. One was a car and one was a truck. And one time they went for a ride. The mommy took the car and the daddy took the truck. And the little baby went with the mommy. And then, when it was night they went to bed. Before they ate supper on the dining chairs. And then they got up in the morning and ate breakfast. And the little baby had to sit in high chair. He was crying because the mother took a long time. The mother said, "O.K., don't cry. Here's your supper." And then there it was. And they all ate their bacon and eggs, and orange juice and milk and toast.

Story No. 2

It was night and a bank robber came when she and him were sleeping with the little baby. The robber came and he said, "Gee, these

look expensive. All the stuff in the house I will take, even the cow!" And the mother slept on the floor and the baby slept on the floor, too. In the morning they woke up and said, "Where's all our furniture gone?" And then they went walking (the daddy) and he saw a bank robber carrying a truck of loads of furniture and it was their furniture. They got it back because they called the police and he got him to jail. The End. I hope my mommy comes tomorrow so she can hear my voice.

Story No. 3

Once upon a time there lived a cow with now owner, and he wanted one. So he went looking for an owner. He went through the forest and then he came to this house. And he said, "Would you be my master? I don't have anybody to be my master." So he said, "Shoo, shoo. Go away, you cow!" He was very sad. So he went through the forest again. Then he went to bed. And then, in the morning he took a bath before breakfast, and then he ate breakfast. "Delicious!" Then he went to two different homes. And this house had a baby and nobody was home and the baby got out and opened door and said "Waa, waa," and hid behind the stove. And the cow just walked out and the baby got in bed again. Then this is the second house. He saw a woman and man and little baby. And the man said "sure" and the wife said "sure" and the baby said "sure." And then he had an owner. The End.

Story No. 4

Once upon a time there was a little toy car. Nobody wanted to play with it. So it went looking for a little boy that would want to play with him, because nobody ever played with him. He was just

sitting there lonely with all the other toys. Then somebody threw a horse on the car "zow." And then there was a woman and man who went on the horsie, and a little baby. Now the car was really sad. And then lots of toys went "clang, clang, clang" all over the little toy car. Nobody ever wanted to play. So one time he went to a baby. And the baby said, "I'll play with you sometimes. You be my little toy," the baby said. The little toy car said "O.K." So the baby got in and played with it and they went "wheee!!" The End.

Name: Michael N.

Sex: Male

Age: 6

Condition: Minimally Structured (1)

Order: Max S, then Min S (2)

Time-Sampled Behavior Protocol

Interval No.

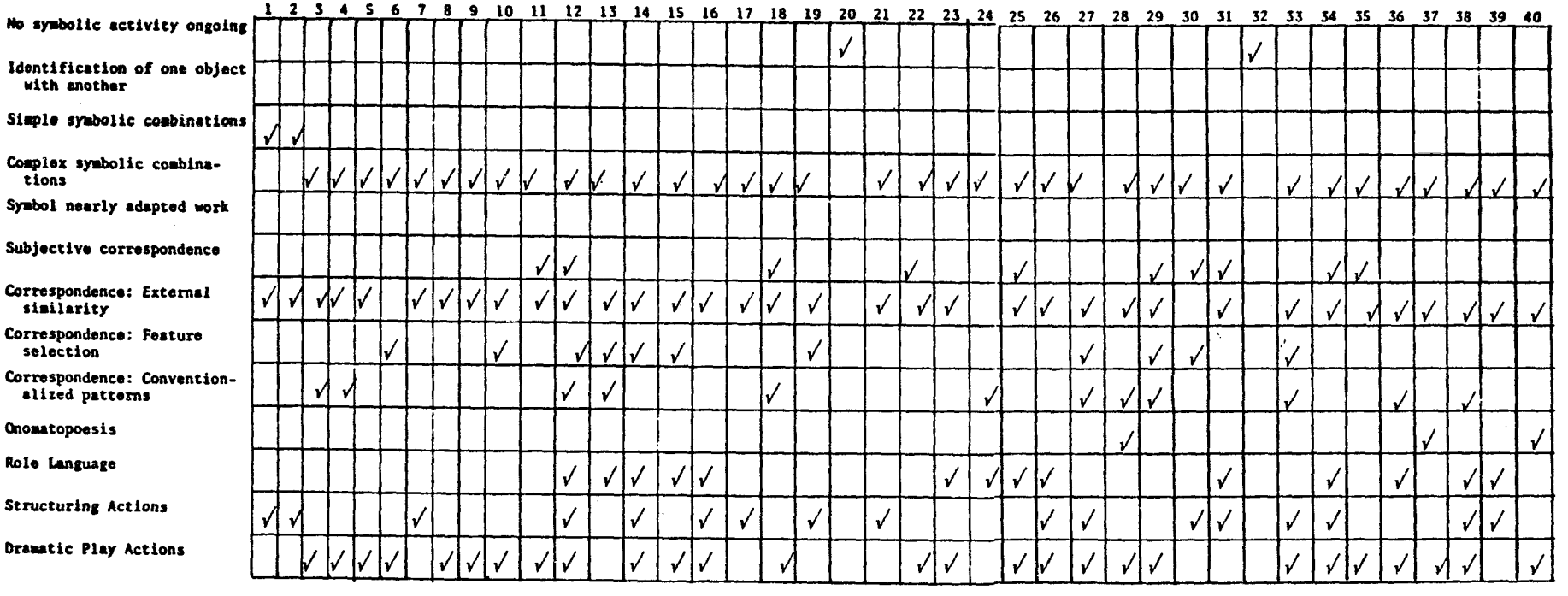
1. Places female figure on top of animal, adds male figure behind female.
2. Balances figures to make them stay upright on animal.
3. Puts peg figure into tub, puts animal next to it.
4. Walks animal with figures on it, animal is moved close to plate.
5. Takes off the male figure, then the female figure, stands them at side.
6. Puts tub on floor next to figures, begins building a house.
7. Table is placed in front of bench, holds car and truck up in the air.
8. Puts female figure on top of car, puts male figure on truck.
9. Places peg figure on car with female figure, moves bed over, puts on female.
10. Male figure placed on bed, male and female figure on bench before table.
11. Inverts cup as highchair for baby, puts baby on.
12. Female figure put in front of rectangular block (stove), bounces it up and down.
13. Talks about food and family eating, does not touch toys.
14. Female and male figures are placed on the bed, male figure placed at distance.
15. Picks up bench, then rectangular block, examines them (playing part of robber).
16. Picks up the rectangular block again, then the plate, puts each outside house.
17. Female figure put to sleep on floor, baby put to sleep on floor.
18. Walks male figure over to grouping of all the other props.
19. Puts all toys in a pile a few inches from the heap just constructed.

Interval No.

20. Talks to experimenter.
21. Puts male and female figure on a plate setting up house.
22. Animal walks slowly over to the plate with figures atop.
23. Animal walks around the plate.
24. Talks without touching toys.
25. Walks animal amidst array of toys, cow placed on bed.
26. Arranges cup as animal's feeder, cow is placed on top of table to eat.
27. Locates peg figure in tub (crib) and walks animal to the peg figure.
28. Walks baby out of tub and next to rectangular block, then back to tub.
29. Walks animal over to plate.
30. On plate places tub with peg figure inside, male figure, then female figure.
31. The animal is positioned on plate along with figures.
32. Fingers the female figure while speaking.
33. Repeatedly rolls car along the floor, places it on top of rectangular block.
34. Throws the animal at the car, which he then retrieves from two yards away.
35. Balances the animal figure on top of the horse.
36. On top of the animal, he balances the male figure, female figure, peg figure.
37. Throws all the other props on top of the configuration described above.
38. Toys rearranged, puts peg figure in bed, rolls car over to peg figure.
39. Small peg figure is placed on top of car.
40. Rolls car with figure on top, crawls behind car to go a few yards from testing area.

Direct Observation Record

Name: Michael N.
Age: 6
Sex: Male
Condition: Min S



Intervals Sampled →