

# Developmental Changes in the Representation of Objects in Symbolic Play from 18 to 34 Months of Age

Judy A. Ungerer

*UCLA School of Medicine*

Philip R. Zelazo, Richard B. Kearsley, and  
Kathleen O'Leary

*Tufts University School of Medicine*

UNGERER, JUDY A., ZELAZO, PHILIP R., KEARSLEY, RICHARD B., and O'LEARY, KATHLEEN *Developmental Changes in the Representation of Objects in Symbolic Play from 18 to 34 Months of Age* CHILD DEVELOPMENT, 1981, 52, 186-195 This research investigated developmental differences in the way children represent objects in symbolic play. Observations of the spontaneous and elicited play of children 18-34 months of age indicated that children most frequently represent objects by performing actions functionally appropriate to the represented objects with objects physically similar to or commonly associated with the represented objects. However, with increasing age, children become able to represent objects without using functional actions and with objects bearing little physical similarity to the represented objects. The results confirm hypotheses derived from Piaget's theory of symbolic-play development and emphasize the importance of the object's perceptual properties in determining its representation by young children in symbolic play.

The appearance of symbolic play in the second year of life marks one of the most significant cognitive developments of the early childhood years. Along with deferred imitation and language, it signals the development of representational thought which greatly increases the flexibility of the child's mental processes. Most researchers agree that symbolic play first appears between 18 and 24 months of age (Largo & Howard 1979, Lowe 1975, Rosenblatt 1977, Sinclair 1970), although precursors of symbolic play are evident at younger ages. The purpose of this research was to explore the development of symbolic play, with the specific goal of describing how sensorimotor object knowledge is transformed into representational thought and reflected in symbolic play. This information is relevant to the understanding of the sensorimotor foundations of symbol-

ic play and its later development in the second and third years of life.

## Symbolic-Play Development: Piaget's Theory

Piaget (1962) provides the most detailed theory of symbolic-play development. He hypothesizes that play symbols originate in the generalizing assimilations of the second sensorimotor stage in which the infant applies action schemes to objects more and more remote from their initial object of focus. These early generalizations mark the beginning of a progressive separation between action and object which culminates in the fully differentiated signifier and signified characterizing the first symbolic relations. For Piaget, the signifier is constituted by the new object chosen to rep-

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resent the initial object and by the make-believe actions applied to the new object. The signified is the action scheme as it would develop if completed seriously and the object to which it is conventionally applied. The child's first symbols are derived from his own sensorimotor schemes and are inseparable from them. Later, the child becomes able to extend his action schemes to other objects and persons and to adopt symbolically the action schemes of other objects and persons. Finally, the symbol becomes independent not only of the child's own action but of all action. The symbolic act of identification occurs internally in representational thought and is no longer inseparable from the action which expresses it.

For Piaget, action and perception, the two major sensorimotor modes of knowing objects, are central to the development of symbols in play. Symbols are derived from and expressed through sensorimotor actions, and they are perceptually motivated, that is, there is a schematic resemblance between the signifier and signified. The major change in symbol use occurring with development is a decrease in dependence on overt action and physical resemblance as the symbol becomes an internalized image.

Several studies have concurred with Piaget in demonstrating a gradual increase in the ability to use objects symbolically in play which are physically dissimilar from those used in real life (Elder & Pederson 1978, Fein 1975, Watson & Fischer 1977). The most extreme form of this play is the creation of imaginary objects which do not require the physical support of real objects in the environment (Inhelder, Lezine, Sinclair, & Stambak 1972). Evidence supporting an increasing independence of symbols from overt action is less extensive. Piaget (1962) hypothesizes that the symbol is independent from overt action when the symbolic act of identification occurs in representational thought prior to its expression in play. In support of Piaget, Nicolich (1977) observed internalized symbolic identification in children demonstrating symbolic play which was indexed by the verbal labeling of the symbolic relation prior to its expression in action. For example, one child picked up a play screwdriver, said "toothbrush," and then proceeded to make toothbrushing motions with the object. The recent work on early metaphor also is relevant to the development of internalized symbolic images independent of overt action (Winner 1979). Winner, McCarthy, Kleinman, and

Gardner (1979) reported that young children produce verbal metaphors purposefully indicating the symbolic identification of one object with another. For example, they reported one child calling a yellow bat corn and another child labeling a pencil a big needle. These metaphors were produced in the absence of any manipulation of the object other than holding, looking at, or showing the object to someone else, and they were applied to objects that the child could appropriately use and label.

Verbal metaphors unaccompanied by actions which occur during play generally have not been considered in analyses of symbolic-play development, but there are several strong arguments for their inclusion. On theoretical grounds, verbal metaphors can be viewed as reflecting the child's ability to generate symbols internally in thought independent of overt action. The expression of the symbol, as well as its generation in thought, become independent of overt action and represent a logical extension of the child's developing symbolic-play skills. In addition, verbal metaphors often occur in conjunction with symbols expressed through action only or through both action and verbal means. They form an integral part of the child's stream of symbolic play which suggests that they derive from a common symbolic process. Finally, the inclusion of verbal metaphors as one type of symbolic play provides a framework for understanding verbally represented imaginary objects which also occur frequently in play. For example, a child may represent an imaginary substance like tea by simply picking up a cup and saying, "Tea in here," without performing accompanying drinking actions. This verbal representation of the imaginary substance tea can be viewed as another example of a play symbol whose generation internally in thought and expression occur independent of overt action.

### Symbolic-Play Development: Issues and Hypotheses

Piagetian theory proposes that sensorimotor-based action and perceptual knowledge of objects are the foundation for the expression of symbols in play. Symbols initially are dependent on action and physical similarity for their development and expression, but become increasingly less dependent as the symbol becomes an internalized image. There are two hypotheses suggested by the theory which will be investigated in this research. The first hy-

## 188 Child Development

pothesis is that there will be an increase with age in the symbolic use of objects which are physically dissimilar from those used in real life, and the second hypothesis is that there will be an increase with age in the expression of symbols without the use of action. The former hypothesis has been supported by developmental research, while the latter hypothesis remains to be tested. In addition to investigating these hypotheses, several related issues will be explored. The first issue of concern is the relation of physical similarity to action in the expression of symbols in play. Is physical similarity more important than action in supporting the symbolic relation, or is action primary? Does the relation between action and physical similarity change with age? Winner et al. (1979) indicate that for the class of symbols known as metaphors, developmental changes do occur. Early metaphors depend for their definition on both action schemes and perceptual resemblances, while later metaphors are based primarily on perceptual grounds.

A second issue of concern is the similarity in development of different types of play symbols. Most work on symbolic play has focused on the development of substitution symbols, that is, the use of one object to represent or substitute for another different object, but the development of other types of symbols also needs to be explored. Of particular interest here is whether the hypothesized changes in the use of action and physical similarity in symbolic play apply to the creation of imaginary objects (for example, when a child picks up an imaginary "cookie" from a plate and feeds it to a doll), as well as to the development of substitution symbols. The role of action in the expression of imaginary objects can be assessed, but the role of physical similarity is obviously less clear, since the imaginary objects have no tangible form. Of relevance in this context, however, is the child's use of auxiliary objects to support the symbolized imaginary object. In the example above, both the plate and the doll provide physical support for the expression of the imaginary cookie. It is through the use of such tangible auxiliary objects that the child creates a perceptual basis for the expression of imaginary objects in play.

A final issue of interest concerns the functional properties of the objects children use in symbolic play. Previous research suggests that when substitution symbols first emerge, they incorporate objects whose functions are ambiguous, for example, blocks or pieces of cloth. Only later are objects with clear functions, like

cups or spoons, used as substitutes for other objects. Just as children initially have difficulty violating conflicting perceptual cues and do not use as signifiers objects which are physically dissimilar from those signified, they may have difficulty violating conflicting functional cues. Therefore, objects with ambiguous functions initially may be transformed and used more readily as substitution symbols than objects with unambiguous functions. Although the role of functional cues in supporting the expression of imaginary objects has not been investigated, there is reason to believe that they may operate in a different way. Objects with clear functional features which are conventionally associated with the represented objects may be employed more readily than ambiguous objects by younger children because they provide the clearest support for the signified imaginary objects. However, objects with functions not conventionally associated with the signified imaginary objects would create conflict and would be used only by older children capable of using mental representation to override the conflicting cues.

### METHODS

#### *Subjects*

A total of 61 children were tested, including 16 children at 18 months (8 M, 8 F), 13 children at 22 months (6 M, 7 F), 16 children at 26 months (8 M, 8 F), and 16 children at 34 months (8 M, 8 F). All children were Caucasian and predominantly middle class.

#### *Materials*

The toy set was composed of 31 items which included a tea set (two cups, two saucers, a teapot with a lid, two spoons), a telephone, doll furniture (table, chair, bed), three dolls (large, medium, and small in size), two baby bottles, a brush and mirror, a dumptruck and a garage, a white cloth, three 1-inch-square pieces of sponge, three blue rectangular blocks, and three yellow cylindrical blocks. All items except the cloth, sponges, and blocks were realistic representations of common objects with unambiguous, appropriate uses.

#### *Procedure*

The primary caregiver and child were brought by the experimenter into a carpeted, 3.65 × 5.48 m room adjacent to an observation room. The room contained a chair for the primary caregiver, a couch on which the experimenter was seated during the play session, and the toys which were arranged in a predetermined order in an arc 1.42 m in front of

the primary caregiver's chair. The primary caregiver was present to insure that the child was at ease during the play session, and the experimenter was present to make a verbatim record of the child's speech during play.

The session began with the primary caregiver telling the child to "Go play with the toys." Following 8 min of free play, the experimenter approached the child and modeled four different acts with the toys. Each act was modeled twice and was accompanied by a verbal description (see table 1). The modeled acts were used in an effort to stimulate the production of both symbolic and nonsymbolic play by the children (Watson & Fischer 1977). Following the modeling procedure, the experimenter returned to her seat, and the child was permitted to play alone with the toys for an additional 8 min. During the play session, both the primary caregiver and the experimenter refrained from initiating interactions with the child, but they responded naturally to the child's overtures.

The child's play behavior was recorded by an observer in the adjacent observation room using a time-sampling procedure with a 10-sec sampling unit and a check list which included the behaviors most frequently observed with this specific set of toys. If the child performed a play behavior not included in the check list, this was separately noted. In addition, the child's play was videotaped from the observation room. Following the play session, the videotaped record was used to complete any gaps in the speech sample recorded by the experimenter and to identify the play behavior accompanying each of the child's utterances.

#### Measures

The combined play and speech records were surveyed, and all instances were listed in which the child used one object as if it were another, different object, used speech to indicate that a different object was represented, or used action or speech to represent an object or person with no tangible referent in the testing room. Each instance then was classified into one of the following four categories, depending on whether there was high or low physical support for the represented object and whether or not the child performed an action functionally appropriate to the represented object.

**1 High physical support with action**—This category includes substitution-object symbols, in which there is a high physical similarity between the object used and the object repre-

TABLE 1  
MODELED SYMBOLIC AND NONSYMBOLIC ACTS

Action Performed	Verbal Description
Wipe mouth of doll with a piece of sponge	Look, baby's all done eating. Let's wipe her mouth, wipe her mouth.
Bite a rectangular blue block	Look, here's a yummy cookie. Let's eat the cookie, eat the cookie.
Lay doll on floor and roll it over and over	Look, the baby's playing. She's rolling and rolling, rolling and rolling.
Wipe imaginary tea from floor with cloth	Look, the tea's spilled. Let's clean it up, clean it up.

sented, and imaginary-object symbols, in which the child uses an auxiliary object to provide physical support for the symbolized imaginary object. All symbols are expressed using actions functionally appropriate to the represented objects. Substitution: The child brings a rectangular block to his ear like a telephone receiver and says, "Hi." Imaginary: The child picks up a teacup, says "Tea," and then proceeds to drink from the cup while making drinking sounds.

**2 High physical support without action**—Same as category 1 except that no actions functionally appropriate to the represented object are performed. Substitution: The child picks up a cylindrical yellow block and calls it a "carrot." Imaginary: The child picks up a teacup, shows it to her mother with a smile, and says, "Tea."

**3 Low physical support with action**—This category includes substitution-object symbols, in which there is a low physical similarity between the object used and the object represented, and imaginary-object symbols, in which no auxiliary objects are used to provide support for the symbolized imaginary object. All symbols are expressed using actions functionally appropriate to the represented objects. Substitution: The child makes combing motions with a baby bottle while saying, "I comb hair." Imaginary: No instances were observed.

**4 Low physical support without action**—Same as category 3 except that no actions functionally appropriate to the represented object are performed. These instances occurred very infrequently and were considered anomalous.

## 190 Child Development

rather than symbolic Substitution The child hands a table to his mother and says, "This house" Imaginary The child says, "Books," as she puts a teaspoon into a cup

A total of 586 instances were assigned to the above categories The reliability of category assignment, which incorporated judgments of the degree of physical support and the presence or absence of functionally appropriate actions, was determined by having a second person independently score the records of 28 randomly selected children in the sample Percentage of agreement between scorers computed separately for each category of substitution and imaginary-object play ranged from 67 to 100 (median = 88)

### RESULTS

The proportion of children demonstrating each category of play was used as the dependent variable in all analyses, because it was the most representative index of the generality of the changes in play The frequency of occurrence of each category of play was not used because it was too variable within each age group to be a reliable index of the developmental trends in the data

A child was considered to demonstrate a particular category of play, if he produced one or more play acts which could be classified in that category An attempt was made to be conservative in accepting acts for inclusion in the symbolic-play categories All acts which were simply direct imitations of the modeled symbolic-play acts were excluded, although variations of the modeled acts were accepted For example, if a child placed the blue block in his own mouth and said, "Eat the cookie," this was considered a direct imitation of the modeled act and was excluded If a child placed the blue block to the mouth of a doll saying "yum yum," or if he placed a yellow block in his own mouth and said, "Eat the cookie," these were considered variations of the modeled act and were included The number of children at each age who produced only direct imitations of the modeled acts and no other instances of symbolic play was two at 18 months, two at 22 months, and none at 26 or 34 months Thus, most children produced symbols which clearly could be interpreted as reflecting their own cognitive skills

Play acts not accompanied by speech or some type of meaningful vocalization (e.g., drinking sounds) also were excluded from the

play categories This was done in order to be conservative in judging the presence of symbolism in play and, more important, to prevent bias in the frequency of recognition of the different play categories Speech and other vocalizations are very helpful in elucidating the symbolic content of play If a child places a piece of sponge in a pot and stirs it with a spoon but provides no verbal description of his behavior, it is ambiguous as to whether a symbolic act is intended However, if a child says, "Make crackers," as he stirs the sponges, then the act can be classified reliably as an example of substitution-object play Although play acts expressed with high physical support and functional action often can be identified as symbolic without accompanying speech, other categories of play are much more difficult to recognize When speech is not present, acts expressed without functional action cannot be identified at all, and acts expressed with low physical support are recognized less reliably Since the inclusion of symbolic acts unaccompanied by speech or meaningful vocalizations would result in the biased sampling of play behaviors, only acts accompanied by these verbalizations were considered This resulted in the exclusion of only 5% of the identified, not solely imitative symbolic acts

### Developmental Trends in Symbolic Play

The first analyses tested the hypotheses predicting an increase with age in the symbolic use of objects physically dissimilar from those used in real life, and an increase with age in the expression of symbols without the use of functional action The first hypothesis was evaluated by using a Fischer's exact probability test (two-tailed) to test for increases between successive ages in the proportion of children demonstrating either substitution- or imaginary-object play in the category of low physical support with action The second hypothesis was evaluated by applying the same Fischer's exact probability test to the proportion of children demonstrating either substitution- or imaginary-object play in the category of high physical support without action Both hypotheses were confirmed The proportion of children expressing symbols with low physical support increased significantly with age, replicating previous research findings (Elder & Pederson 1978, Fein 1975, Watson & Fischer 1977) The proportion of children expressing symbols without functional action also showed a significant increase with age (see table 2) Additional analyses indicated that the proportion of children

demonstrating either substitution- or imaginary-object play in the remaining symbolic-play category—high physical support with action—also increased significantly with age. Thus, significant increases with age were demonstrated in all three symbolic-play categories for the data combining substitution- and imaginary-object play.

Analyses of acts expressed with low physical support without functional action also were conducted. These acts occurred infrequently and were considered anomalous rather than symbolic. The proportions of children demonstrating this category of play were .06 at 18 months, .38 at 22 months, .13 at 26 months, and .25 at 34 months. No significant age-related changes in the proportion of children demonstrating these acts were found.

The next analyses attempted to determine whether children at different ages relied more on physical support, functional action, or both to express symbolic relations. McNemar's test was applied to all possible paired comparisons of the three symbolic-play categories within each age group to assess the significance of the differences in the proportion of children dem-

onstrating each category of play. Data for substitution- and imaginary-object play were combined in the analyses. In general, symbolic acts expressed with both high physical support and functional action were most common at each age. When the proportion of children in each age group demonstrating this category of play was compared with the proportion demonstrating the category of high physical support without action and with the proportion demonstrating the category of low physical support with action, the differences were statistically significant in six of the eight possible comparisons (see table 3, rows 1, 2). In addition, the comparisons provided evidence indicating that physical support was relied on more readily than functional action to express symbolic relations. When the proportion of children at each age demonstrating play in the category of high physical support with action was compared with the proportion demonstrating play in the category of high physical support without action, only two of the four possible comparisons yielded statistically significant differences (see table 3, row 1). Thus, when the effect of physical support was held constant and the proportions of children expressing sym-

TABLE 2  
PROPORTION OF CHILDREN WITH SUBSTITUTION OR IMAGINARY OBJECT PLAY BY PLAY CATEGORY

CATEGORY	AGE (Months)				SIGNIFICANT COMPARISONS
	18	22	26	34	
High physical support/action	50	62	88	88	18 vs 26*, 18 vs 34*
High physical support/no action	13	62	50	63	18 vs 22*, 18 vs 26*, 18 vs 34**
Low physical support/action	06	08	25	44	18 vs 34*, 22 vs 34*

\*  $p < .05$   
\*\*  $p < .01$

TABLE 3  
SIGNIFICANCE LEVELS FOR DIFFERENCES AMONG THE PROPORTIONS OF CHILDREN DEMONSTRATING EACH PLAY CATEGORY SUBSTITUTION AND IMAGINARY OBJECT PLAY

COMPARISONS	AGE (Months)			
	18	22	26	34
High physical support/action greater than High physical support/no action	05	N S	01	( 10)
High physical support/action greater than Low physical support/action	01	01	01	01
High physical support/no action greater than Low physical support/action	N S	01	N S	( 08)

## 192 Child Development

bols with and without action were compared, the evidence for the greater frequency of occurrence of symbols expressed with functional action was slight. However, when the effect of action was held constant and the proportions of children expressing symbols with high and low physical support were compared, there was strong evidence supporting the greater frequency of occurrence of acts with high physical support. Thus, when the proportion of children at each age demonstrating play in the category of high physical support with action was compared with the proportion demonstrating play in the category of low physical support with action, all four possible comparisons were statistically significant at the .01 level (see table 3, row 2).

The next issue addressed was whether the developmental trends reported above applied equally well to both imaginary- and substitution-object play. Examination of results for imaginary-object play alone yielded generally consistent findings. The proportion of children expressing symbols without functional action showed a significant increase with age as determined by a Fischer's exact probability test (two-tailed) analysis of the increases between successive ages in the proportion of children demonstrating play in the category of high physical support without action (see table 4, row 2). However, a comparable developmental trend for symbols expressed with low physical

support was not observed, since no instances of this category of imaginary-object play were recorded. The absence of symbols expressed with low physical support provided clear evidence for the importance of high physical support in the expression of imaginary objects in each age group. Although physical support was relied on very heavily for the expression of imaginary objects, there also was some evidence indicating that symbols expressed with functional action occurred more often than symbols expressed without functional action. When the proportion of children in each age group expressing symbols with high physical support and action was compared with the proportion expressing symbols with high physical support but without action, two of the four possible comparisons showed statistically significant differences. The significance levels for the differences between the proportions of children in these two play categories at each age based on McNemar's test were 18 months,  $p < .05$ , 22 months, NS, 26 months,  $p < .01$ , and 34 months,  $p = .06$ .

The developmental trends for substitution-object play were similar to those found with imaginary-object play, but the differences both within and between age groups generally were of lesser magnitude. The proportion of children expressing substitution objects with low physical support increased significantly with age (see table 5, row 3). There was no

TABLE 4  
PROPORTION OF CHILDREN WITH IMAGINARY OBJECT PLAY BY PLAY CATEGORY

CATEGORY	AGE (Months)				SIGNIFICANT COMPARISONS
	18	22	26	34	
High physical support/action	.50	.54	.81	.88	18 vs 34*, 22 vs 34, $p = .09$
High physical support/no action	.06	.38	.38	.56	18 vs 22, $p = .06$ , 18 vs 26, $p = .08$ , 18 vs 34**
Low physical support/action	.00	.00	.00	.00	None

\*  $p < .05$

\*\*  $p < .01$

TABLE 5  
PROPORTION OF CHILDREN WITH SUBSTITUTION OBJECT PLAY BY PLAY CATEGORY

CATEGORY	AGE (Months)				SIGNIFICANT COMPARISONS
	18	22	26	34	
High physical support/action	.19	.31	.50	.44	None
High physical support/no action	.13	.31	.38	.31	None
Low physical support/action	.06	.08	.25	.44	18 vs 34*, 22 vs 34*

\*  $p < .05$

significant increase with age in the proportion of children expressing substitution symbols without functional action. In the younger age groups, there was a trend for the proportion of children expressing substitution symbols with high physical support to be greater than the proportion expressing symbols with low physical support. McNemar's tests comparing the proportion of children within each age group demonstrating play in the category of high physical support with action to the proportion demonstrating play in the category of low physical support with action yielded a statistically significant difference in the 26-month group ( $p < .05$ ) and a difference approaching significance in the 22-month group ( $p = .08$ ). No significant differences in the expression of symbols with or without functional action were found.

The final issue of interest was the effect of an object's functional properties in determining its use by the children in symbolic play. Within each age group, McNemar's test was used to determine if the proportion of children expressing symbols with objects whose functions were ambiguous—for example, blocks—was significantly different from the proportion expressing symbols with objects whose functions were unambiguous—for example, cups. Data for substitution- and imaginary-object play were analyzed separately. The results for substitution-object play indicated that 18-month-olds were more likely to use objects with ambiguous functions in expressing substitution symbols than objects with unambiguous functions ( $p < .10$ ). However, in the older age groups, no significant differences between the use of functionally ambiguous and unambiguous objects were found (see table 6). These results supported previous research which suggested that substitution symbols first emerge through the incorporation of objects whose

functions are ambiguous, and only at later ages are objects with unambiguous functions used as substitution symbols. For imaginary-object play, the results were different. In each age group, objects with unambiguous functions were used more readily than objects with ambiguous functions to provide physical support for the imaginary objects (18 months,  $p < .02$ , 22 months,  $p < .05$ , 26 months,  $p < .01$ , 34 months,  $p < .001$ ). In addition, in 97% of the instances recorded, the functions of the objects used for physical support were conventionally associated with the signified imaginary objects. For example, when representing the imaginary substance tea, children were much more likely to use as physical support an object with conventionally associated functions—for example, a cup—than an object whose functions were not conventionally associated with the substance tea—for example, a chair.

**Discussion**

The results of this research indicated that the most common means used by young children to express substitution- and imaginary-object symbols in play was to perform actions functionally appropriate to the signified objects with objects that were physically similar to, or conventionally associated with, those objects. This reflects the children's use of sensorimotor-based action and perceptual knowledge of objects for the development and expression of symbols in play. With increasing age, however, other less common means of expressing symbols also were used. Older children were likely to express symbols without using functional actions or with objects bearing little physical similarity to the signified objects. The proportion of children expressing substitution- or imaginary-object symbols in these ways was minimal at 18 months of age and increased gradually thereafter. Piagetian theory provides a frame-

TABLE 6  
PROPORTION OF CHILDREN USING FUNCTIONALLY AMBIGUOUS AND UNAMBIGUOUS OBJECTS IN SUBSTITUTION AND IMAGINARY OBJECT PLAY

	AGE (Months)			
	18	22	26	34
Substitution play				
Ambiguous function	31	31	50	50
Unambiguous function	00	31	38	31
Imaginary play				
Ambiguous function	06	08	06	06
Unambiguous function	56	62	81	94



## 194 Child Development

work for explaining these developmental changes. It suggests that the ability to express symbols with little perceptual support or without action appears as the child's ability to create symbols in thought matures. Initially, the creation of the symbolic signifier-signified relation and its expression in play are synonymous—and heavily dependent on the support of strong perceptual cues and action. As the ability to symbolize matures, the creation of the symbolic relation occurs internally and becomes independent of its expression in play. Concomitant with this change is a decrease in dependence on both strong perceptual support and action for the definition and expression of the symbolic relation.

Of interest was whether children compensated for the absence of action or strong perceptual support when expressing symbols by talking about the signified objects' action and physical properties as they played. Analyses of the content of the children's speech during play indicated that the independence from perceptual cues was real, but that some compensation through linguistic means for the absence of action did occur. In only 2% of the cases did the children label perceptual features when expressing substitution- and imaginary-object symbols. In 26% of the cases, functional action properties were labeled. However, in only 67% of these cases were the corresponding functional actions performed.

This research also indicated that perceptual cues were of greater importance than action for conveying symbolic relations in play. When expressing substitution symbols, children depended more on the physical similarity between the signifier and signified to convey the symbolic relation than on the signified object's functional action properties. When expressing imaginary-object symbols, both perceptual cues and action were heavily used, but there was greater dependence on the use of perceptual cues. The children almost always incorporated a tangible object conventionally associated with the signified object to provide physical support for the imaginary-object symbol, while the use of action to support the symbolic relation was more variable. The importance of perceptual features for determining the symbolic representation of objects in play is consistent with studies of early language development, which stress the importance of perceptual features for determining the meanings of the child's first words (Clark 1973), and with developmental studies of metaphor, which indicate an in-

crease with age in the use of metaphors based primarily on perceptual grounds (Winner et al 1979).

In expressing substitution- and imaginary-object symbols, the children's choice of objects as signifiers was influenced by the objects' functional properties as well as by their physical features. In substitution-object play, the youngest children tended to use as signifiers objects which were physically similar to the signified objects and which had only ambiguous functions. The youngest children chose as signifiers objects whose perceptual and functional properties presented the least conflict with those of the signified objects and, therefore, were the easiest symbolically to transform. However, at the older ages, the children were capable of violating an object's perceptual and functional features and using as signifiers objects with clear and conflicting functions which were perceptually dissimilar from the signified objects. With imaginary-object symbols, objects with clear functional uses were employed almost exclusively at all ages to support the symbolic relations. For example, a common form of imaginary-object play was the addition of an imaginary food substance like milk or tea to a functionally unambiguous and physically present object like a cup. In most cases, the functional and physical properties of the concrete supporting objects were not in conflict with those of the signified objects, but rather were used to lend some physical and functional substance to the associated imaginary objects. The few cases in which objects with conflicting functional cues were used occurred only at the older ages when the children's symbolic skills were sufficiently articulated to permit the violation of conflicting cues.

In sum, this research indicated that there are developmental changes in the way children use sensorimotor-based action and perceptual knowledge of objects to represent objects in symbolic play. In addition, it provided increasing support for the importance of perceptual information for defining the child's early conceptualizations of objects in the environment.

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