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AUTHOR Ungerer, Judy A.; And Others
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ABSTRACT

This paper presents an overview of the development of play in children from 9 to 34 months of age, focusing specifically on those aspects of play which occur with sufficient consistency to function as markers for judging developmental progress in clinical populations of young children. A procedure for assessing the sophistication of spontaneous play in 1- to 3-year-old children is described, and the relation of play to general cognitive functioning in the same age period is discussed. Evidence supporting the use of play as a cognitive assessment tool is presented from longitudinal studies of children tested periodically with Piagetian and psychometric developmental scales, from research correlating play sophistication and Bayley Mental Scale performance in 1 1/2- to 2-year-old normal children, and from research relating play and cognitive functioning in autistic and mentally retarded populations. (Author/MP)

Play As a Cognitive Assessment Tool

Judy A. Ungerer

UCLA School of Medicine

Philip R. Zelazo, Richard B. Kearsley, and Katherine Kurowski

Tufts University School of Medicine

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Abstract

This paper presents an overview of the development of play from 9 to 34 months of age, focusing specifically on those aspects of play which occur with sufficient consistency to function as markers for judging developmental progress in clinical populations of young children. A procedure for assessing the sophistication of spontaneous play in 1- to 3-year-old children is described, and the relation of play to general cognitive functioning in the same age period is discussed. Evidence supporting the use of play as a cognitive assessment tool is presented from longitudinal studies of children tested periodically with Piagetian and psychometric developmental scales, from research correlating play sophistication and Bayley Mental Scale performance in 1 1/2- to 2-year-old normal children, and from research relating play and cognitive functioning in autistic and mentally retarded populations.

Play as a Cognitive Assessment Tool

Psychologists involved in developmental evaluation often question the adequacy of available instruments for assessing cognitive functioning in clinical populations of young children. Most early assessment instruments are not clearly grounded in developmental theory and are biased to emphasize motor rather than cognitive skills. In addition, they require the child's participation in highly structured interactions which include complex response requirements and extensive demands on attention (Bayley, 1969; Knobloch & Pasamanick, 1974).

The questionable validity and difficulty of implementing current instruments have encouraged psychologists to develop a variety of alternate assessment procedures for use with clinical groups. In our own research, we have focused on identifying major qualitative and quantitative changes in play which occur with sufficient consistency to function as markers for judging developmental progress in clinical populations of young children. We have focused on play for two reasons. Developmental research suggests that the age-related changes occurring in play derive from and reflect basic transitions in cognitive functioning (Piaget, 1962; Sinclair, 1970). Therefore, play should be a useful index of a child's general intellectual status. In addition, play is an easily implemented assessment procedure which is appropriate for a broad range of children, including those with behavior problems, cognitive and language delays, deficiencies in attention, or moderate impairments of motor function. It is applicable to many children whose impairments may negate the validity of conventional assessment instruments. In this paper we first will present an overview of the development of play from 9 to 34 months of age, focusing specifically on those aspects of play which appear most reliable and meaningful for assessment purposes. We then

will relate this development to research on more general cognitive functioning in the same age period in order to provide a rationale for the use of play as an index of a child's intellectual status.

Development of Play

Two cross-sectional studies were conducted to assess the development of play in children 9 to 34 months of age. Subjects in the first study (Zelazo & Kearsley, 1977) were 9 1/2, 11 1/2, 13 1/2, and 15 1/2 months of age, while those in the second study were 18, 22, 26, and 34 months of age. In both studies eight males and eight females were tested at each age. All children were Caucasian, could either crawl or walk, and were predominately middle class.

The paradigm used in each study was an unstructured free play setting. An array of toys was placed in an arc on the floor of a carpeted playroom, and the child was observed through a two-way mirror while playing with the toys for 15 minutes. The child's primary caregiver was seated in a corner of the playroom so the child would be at ease and natural in play. The caregiver was instructed not to initiate interactions with the child but was permitted to respond naturally to the child's overtures. The toys used in the first study included a teaset, telephone, small unisex doll with an appropriate-sized chair, table, and bed, large baby doll with hair brush and bottle, dumptruck with rectangular blocks and garage, and baseball bat, glove, and cap. For the second study, a medium-sized baby doll with bottle and handmirror, a cloth, three 1" square pieces of sponge, and three cylindrical blocks were added to the toy set, and the baseball bat, glove, and hat were omitted. The cloth, sponges, and blocks were added to include items without clear functional uses which could readily be transformed into other objects in symbolic play sequences. The baseball toys were omitted to discourage gross motor play in the older age groups.

The child's play behavior was recorded using a time-sampling procedure with a 10-second sampling unit and a check list which included the behaviors most frequently observed with these toys. If the child performed a play behavior not included in the check list, it was separately noted. The recorded play behaviors then were grouped into four different play categories defined as follows:

1. Stereotypical Play: Mouthing, fingering, waving, or banging of the toys
2. Relational Play: The simultaneous association of two or more objects in a non-functional (or unconventional) manner, e.g., touching a block to a brush or putting a telephone receiver into a teapot
3. Functional Play: The use of objects in a functionally appropriate way or the conventional association of two or more objects, e.g., dialing the telephone, placing a teacup on a saucer, stirring a spoon in a cup
4. Symbolic Play: Three different types of symbolic acts were recorded.
   a. Substitution: Use of one object as if it were another different object, e.g., using a teacup as a telephone receiver
   b. Agent: Use of an inanimate object (a doll) as an independent agent of action, e.g., propping a bottle in a doll's arms as if it could feed itself
   c. Imaginary: Creation of objects that have no physical representation in the immediate environment, e.g., pretending to pour imaginary sugar from a bottle into a cup

In addition, the symbolic play was coded according to the medium (i.e., language or action) in which it was expressed by the child. If the symbolic content of the play could be inferred from the actions of the child alone,

it was coded in the action-symbolic category. However, if the child's speech during play was necessary to infer symbolic content, then the act was coded in the language-symbolic category. This distinction is important when working with clinical populations since these children often demonstrate delayed language development and do not often verbalize during play. The amount of symbolic play which can be inferred from action alone is less than can be detected when language also is used to encode symbolic content.

The results of the play studies indicated that the predominant form of behavior in the youngest age groups was stereotypical and relational play. Infants at 9 1/2 months spent 85% of their play activity mouthing, waving, banging, or fingering objects, and 14% relating objects in a non-functional manner (see Table 1). The frequency of stereotypical play

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Insert Table 1 About Here

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decreased sharply with age, while relational play increased to constitute approximately 39% of play at 13 1/2 months. Relational play then declined to a low but relatively constant level through 34 months of age. Of greater clinical significance, however, is the developmental course of functional and symbolic play. Functional play was only minimally present at 9 1/2 months of age but was firmly established in all children by 13 1/2 months (see Figure 1). The end of the first year and the beginning of the second

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Insert Figure 1 About Here

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year define a period for the emergence of functional object use in play. The diversity of functional play then increased steadily with age until 26 months when a mean of 18 different functional acts was performed by each child.

A period for the emergence of symbolic play in this research was identified from 18 to 22 months of age. Approximately 84% of the children demonstrated some form of symbolic play in this age period, and by 34 months symbolic play was universally present. The mean number of different symbolic acts demonstrated by each child also increased between 18 and 34 months, with the major increment occurring after 22 months of age. The diversity of action-symbolic behaviors remained relatively constant with age, while the mean number of different language-symbolic behaviors steadily increased (see Figure 1). Similar developmental findings for the emergence and elaboration of functional and symbolic play have been reported in other research (Inhelder, Lezine, Sinclair, & Stambak, 1972; Lowe, 1975).

Relation of Play to General Cognitive Functioning

Longitudinal studies of children tested periodically with Piagetian or psychometric developmental scales provide evidence for major transitions in cognitive functioning which occur at ages similar to those at which functional and symbolic play emerge. McCall, Eichorn, and Hogarty (1977) reanalyzed mental test data from the Berkeley Growth Study in which subjects were tested longitudinally with scales which were the precursors of the contemporary Bayley Scales of Infant Development. McCall and his colleagues reported finding longitudinal patterns of instability in individual test performance and major qualitative shifts in the content of the mental tests occurring at approximately 13 and 21 months of age. They interpreted these changes as reflecting major transitions in mental behavior which define the course of normal development. Similar findings were reported by Uzgiris (1976) from a longitudinal study of infants assessed at regular intervals with the Piagetian-based Uzgiris-Hunt Psychological Developmental Scales. Uzgiris observed major qualitative changes in sensorimotor development occurring at the beginning of the second year and in the period from approximately 21 to 23 months of age.

Thus, age-related changes in cognitive functioning as assessed by developmental tests have been identified which correlate with the ages at which functional and symbolic play appear. These correlations suggest that play and cognition are developmentally related, and evidence supporting this relation is available from two sources. In our own research we assessed the relation between play sophistication and Bayley Mental Scale performance in groups of 18-, 22-, and 26-month-old children. For each child a play score was computed based on the number of different functional acts performed and the simple occurrence or nonoccurrence of symbolic play. These play scores were correlated separately by age with Raw Scores on the Bayley Mental Scale. Moderate correlations of .51 and .55 ($p < .05$) were found in the 18- and 22-month-old groups, but the range of Bayley scores for the 26-month-olds was too small to permit a valid test of the relation between play and test performance with these children.

Further support for the relation between play and cognitive functioning comes from research with atypical children. Hulme and Lunzer (1966) compared mentally retarded children with mental age matched normal controls and found that the functional and symbolic sophistication of play in both groups was correlated with mental age as assessed by the Terman-Merrill scale. When mental age was controlled, no differences in play sophistication between retarded and normal children were found. In addition, Wing, Gould, Yeates, and Brierley (1977) looked at the relation between play and mental age in severely mentally retarded and autistic children. No child with a mental age below 20 months demonstrated symbolic play, which is consistent with our finding of the emergence of symbolic play in normal children between 18 and 22 months of age.

In sum, research on normal and atypical children indicates a relation between the emergence and elaboration of functional and symbolic play and

cognitive functioning in children 1 to 3 years of age. This relation is present because the changes observed in play depend on the development of specific cognitive skills which have been identified by several theorists. Piaget (1962) and Uzgiris (1976) have described a major developmental change occurring at approximately 13 months of age which involves an objectification of objects and events which, thus, come to have an existence independent of the infant's own actions. This development is manifested through the infant's ability to regulate and modify actions on the basis of social and nonsocial feedback from the outcome of the actions, and through the ability to imitate novel actions. These skills underly the emergence of functional play at 12 months of age and its continued elaboration in the second year of life.

The second period of developmental change observed at 20-21 months of age has been identified by Piaget (1962), Uzgiris (1976), and McCall et. al. (1977) as signaling the emergence of the ability to represent objects and events symbolically. The child forms symbols of entities and events not present and places these symbols in relation to other events and to each other. This ability is manifested in symbolic play when the schemes that the child applies to objects become decontextualized, internally coordinated, and applied independently of the evident properties of the objects. For example, the child takes a scheme formerly applied to a specific object and applies that scheme to a totally different novel object, i.e., he brings a cup to the ear as a telephone receiver instead of using the receiver itself.

Before closing this discussion there are a few points which should be made concerning the use of play as an assessment tool in clinical settings. The age-related changes in play that have been identified are derived from

group data, and represent the average ages at which specific play behaviors occur. When individual children are considered, variability in the rate of play development will be observed. The age relations we have described are useful developmental markers. but they should be applied conservatively and with the awareness that some variability in developmental rate is normal. In addition, the unstructured play setting we have used is appropriate for many types of children, but it is not the only setting which can be employed. We have found that a more structured interaction can elicit play from children who do not spontaneously interact with objects, and we have found that modeling a few symbolic play acts at the beginning of an unstructured session increases the probability that symbolic play will be demonstrated spontaneously by a child. With an awareness of these few cautions and suggestions, play can be used as a rich source of information for elucidating the development of cognitive skills in clinical populations of young children.

References

Bayley, N. Bayley Scales of Infant Development. New York: The Psychological Corporation, 1969.

Hulme, I., & Lunzer, E. Play, language and reasoning in subnormal children. Journal of Child Psychology and Psychiatry, 1966, 7, 107-123.

Inhelder, B., Lezine, I., Sinclair, H., & Stambak, M. Les debuts de la fonction symbolique. Archives de Psychologie, 1972, 41, 187-243.

Knobloch, H., & Pasamanick, B. Gesell and Armatruda's Developmental Diagnosis. Hagerstown, Maryland: Harper & Row, Publishers, 1974.

Lowe, M. Trends in the development of representational play in infants from one to three years--an observational study. Journal of Child Psychology and Psychiatry, 1975, 16, 33-47.

McCall, R., Eichorn, D., & Hogarty, P. Transitions in early mental development. Monographs of the Society for Research in Child Development, 1977, 42(3, Serial No. 171).

Piaget, J. Play, Dreams and Imitation in Childhood. New York: W. W. Norton & Company, Inc., 1962.

Sinclair, H. The transition from sensory-motor behavior to symbolic activity. Interchange, 1970, 1, 119-125.

Uzgiris, I. Organization of sensorimotor intelligence. In M. Lewis (ed.), Origins of Intelligence. New York: Plenum Press, 1976, 123-163.

Wing, L., Gould, J., Yeates, S., & Brierley, L. Symbolic play in severely mentally retarded and in autistic children. Journal of Child Psychology and Psychiatry, 1977, 18, 167-178.

Zelazo, P., & Kearsley, R. Function play: Evidence for a cognitive metamorphosis in the year old infant. Paper presented at the Biennial Meeting of the Society for Research in Child Development, New Orleans, March 16-20, 1977.

Table 1

Mean Percentage of Stereotypical and Relational Play by Age Group

	Age (months)							
Play Category	9 1/2	11 1/2	13 1/2	15 1/2	18	22	26	34
Stereotypical	.85	.47	.29	.21	.29	.15	.13	.09
Relational	.14	.38	.39	.27	.16	.19	.19	.22

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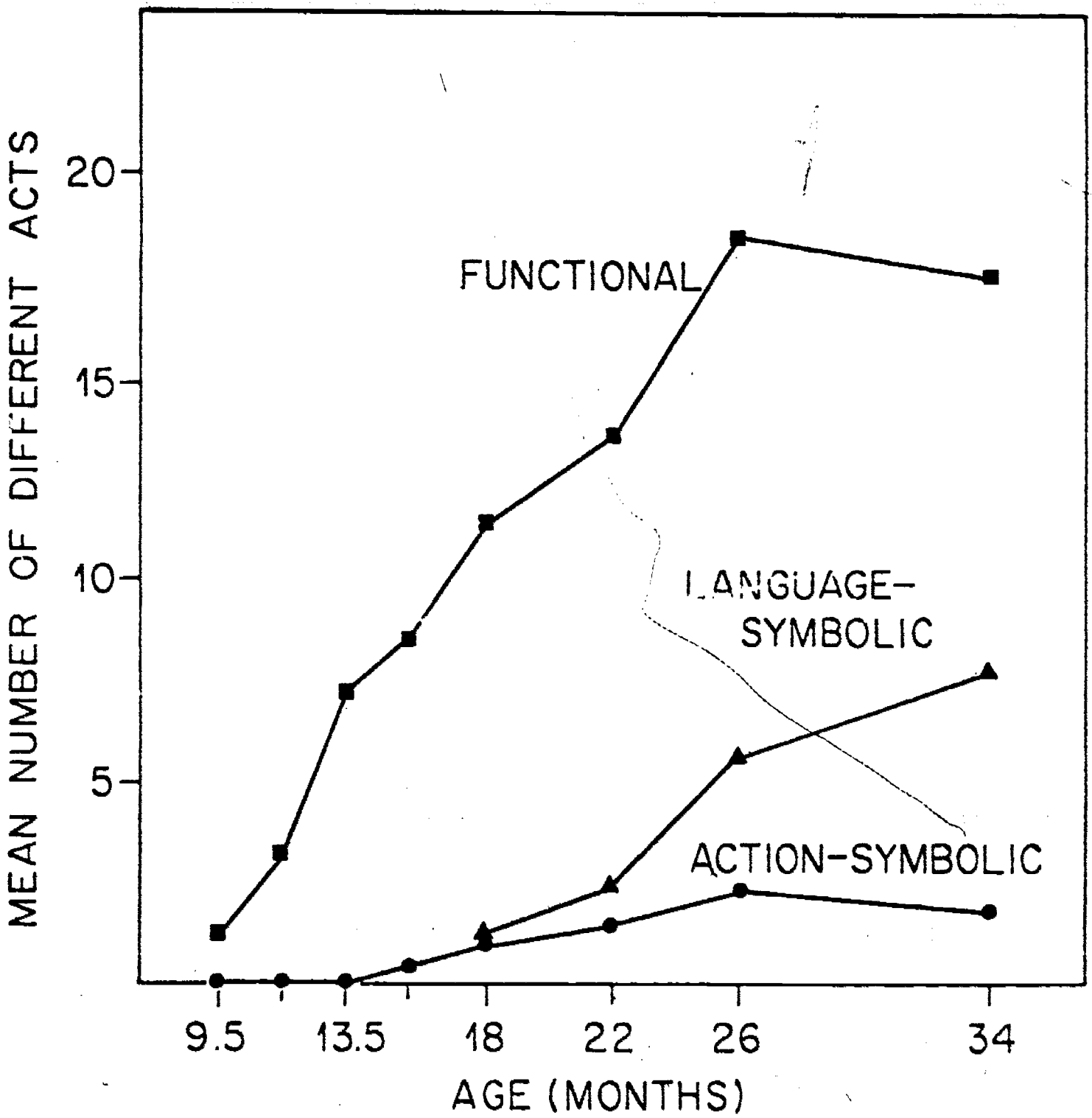
MEAN NUMBER OF DIFFERENT ACTS
20
15
10
5
FUNCTIONAL
LANGUAGE-
SYMBOLIC
ACTION-SYMBOLIC
9.5
13.5
18
22
26
34
AGE (MONTHS)