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# An Approach for Enhancing the Symbolic, Communicative, and Interpersonal Functioning of Young Children with Autism or Severe Emotional Handicaps

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An intervention approach emphasizing development of symbolic thought, communication, and interpersonal relationships was implemented with 26 children (ages 2 through 6) who had infantile autism, pervasive developmental disorder, or severe emotional handicaps. The main intervention strategy was the use of play in all its interpersonal, cognitive, and structural variety, imbedded in a reactive language environment. Over a six- to eight-month intervention period, the children demonstrated significant changes in several targeted developmental areas, including cognition, perceptual/fine motor, social/emotional, and language skills. The cognitive complexity of their play skills increased significantly in areas of symbolic complexity, symbolic agent, and symbolic substitutions. Additionally, significant improvement in the communicative and interpersonal characteristics of their play was found. These changes support the efficacy of this approach with young autistic and severely emotionally handicapped children when the children's needs for high levels of structure, intensity, and consistency are met.

■ Recent estimates suggest that there are from 5,000 to 10,000 children nationwide between the ages of 2 and 5 years with the diagnosis of autism or pervasive developmental disorder (PDD—a related disorder with disturbances of language, cognitive process, and social relationships) (Rutter, 1977). Children with the diagnoses of infantile autism, PDD, or severe emotional handicaps demonstrate significant cognitive, communicative, and social/emotional impairments which present a complex challenge to the early special education teacher.

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Although the majority of children with autism are also mentally retarded (DeMyer, Barton, DeMyer, Norton, Allen, & Steele, 1973), the child with autism appears to be more educationally handicapped than a mentally retarded child of the same intellectual ability. Children with autism have specific impairments in all areas of symbolic thought: symbolic play, symbolic language, and conceptual thought (Hammes & Langdell, 1981; Maltz, 1981; Mundy & Sigman, 1984; Riguette, Taylor, Benaroga, & Kein, 1981; Ungerer & Sigman, 1981). Autistic children also display a specific deficit in the ability to imitate motor or vocal behaviors (Prior, 1979). Because young children spend their preschool years learning via social imitation and their

growing symbolic capacities (Flavell, 1963), the autistic child's deficits in imitation and symbolic thought are particularly detrimental during the preschool years. Communication is another area of specific impairment for the child with autism or PDD. Most aspects of such children's communication are severely impaired, including use and understanding of communicative gestures, use and understanding of speech, and understanding of the social aspects of communication (Beioler & Tsai, 1983; Conant, Budoff, Hecht, & Morse, 1984; Konstantareas, 1984; Prior, 1979; Prizant & Rydell, 1984). In sum, the core deficits of children with autism, PDD, and severe emotional handicaps in communication, social relatedness, and symbolic thought serve to underscore the importance of effective educational and therapeutic services to improve development in these areas.

The purpose of this paper is to describe a program model for young children with autism, PDD, or severe emotional handicaps, and to present the kinds of developmental changes which the children in the program demonstrated after at least six months of enrollment.

An approach for working with young children with autism, PDD, and other severe emotional handicaps which recognized the tremendous interplay among social/emotional development, communication, and cognition was developed. At the core of this approach was the premise that play is a primary vehicle for communicative, cognitive, and social/emotional development. The child's use of play in constructive, social, and symbolic ways became a major goal of the approach, and play in all its variations in expression and purpose formed the core of most activities in the daily group program. As a result, the program was named "The Playschool."

## **METHOD**

### **Play**

The 26 children who participated over a 2½-year period presented a broad cross-section of play skills, ranging from a total absence of typical toddler play to elaborate, repetitive, symbolic play sequences of very distorted child-adult relationships and traumatic life experiences. The common denominator was

the children's inability to use play to facilitate cognitive, social, and emotional growth without adult help. Though cognizant of the children's difficulties in using play as a learning medium, we maintained the belief that play was irreplaceable for promoting cognitive, social/emotional, and communicative development. While direct skill training seemed to be the optimal teaching technique for certain skills, such as self-care, play was viewed as the most assimilable and generalizable modality for the children to learn a wide range of developmental skills. Thus, almost all learning tasks were presented through the medium of play, although the role of the adult and the purpose of each play activity varied.

### **The Role of Positive Affect**

In the Playschool, work with a child began by finding interpersonal activities to which the child responded with smiles and laughter or other indications of pleasure. The presence of a happy, lively relationship between child and teacher was considered essential for learning to occur. One function of positive affect was to increase attention to a specific experience and to increase the child's motivation to continue the activity at hand. Even within the most highly structured, direct teaching episodes, positive affect was seen as a crucial element for learning, because it conveyed attention and involvement in the task at hand. A second function of sharing strong positive affect with a familiar, consistent adult was that of assisting the development of strong, affectionate ties between the two. Such positively charged relationships increased the child's desire to interact with the adult, leading to increased communications, increased affective range, increased desire to please the adult, and increased imitation of the adult. A third function of strong, positive affect was to increase the salience of an experience and, in Piaget's line of thinking (Flavell, 1963), to help the child remember the experience.

### **Communication**

Pragmatics theory of language development, taught to the Playschool's staff by the IN-REAL Outreach Project (Weiss, 1981), was

the basis of the communication approach used. INREAL was selected because of its emphasis on:

- (1) communicative intent rather than communicative product;
- (2) the natural environment as the appropriate milieu of language development;
- (3) language therapy as part and parcel of the ongoing classroom experience;
- (4) the child's own activities—play—as the basis for communication;
- (5) non-verbal communicative behaviors; and
- (6) the child as the integrator and organizer of language experiences (Weiss, 1981).

All adults in the classroom received 40 hours of training in these reactive language strategies so that every adult-child interaction in the classroom could potentially be a language therapy experience in a natural setting. The children's own verbal and non-verbal communications, whether intentional or not, provided the basis for language intervention. The teaching staff learned to interpret each child's repertoire of potentially communicative behaviors and to respond at a corresponding level. Children's acts, wants, reactions, and feelings were clarified, restated, and reflected back to them at an appropriate linguistic level. With children who had little speech, simple signs taken from American Sign Language and typical preverbal gestures were taught and used consistently.

### **Social Relationships**

Promoting social relationships began with the assignment of a single adult to a child throughout the child's day for the first few weeks after enrollment. The adult joined the child's activities, gently extending the activity, introducing social games, and becoming a source of fun and attention for the child. Child-initiated activities which were not inherently social in nature were turned into social experiences through careful observation and creative planning. For example, a stereotypic behavior like walking in circles was turned into a social game by following the child and playing a "catch you" game, or by spinning the child in one's arms, or by joining the child on a merry-go-round.

The primary goal was to create pleasurable social activities to promote social and communicative interactions.

Peer awareness was facilitated through activities and materials that brought children into close proximity. At these times, adults limited their social roles by (1) assuming an inconspicuous physical position, (2) cueing children's attention to a peer's activities, and (3) prompting developmentally appropriate social behaviors. When social conflicts occurred, adults supplied the verbal "scripts" the children needed to negotiate with each other and highlighted the effect of one child's behavior on the other in simple, affective, cause-and-effect statements. The children thus practiced social strategies while adults modeled those strategies and ensured the success of the child's attempts.

### **Handling Unwanted Behaviors**

Because the majority of children had an extremely limited repertoire of behaviors, the staff worked to increase the number, variety, and complexity of behaviors at their command rather than to reduce the already deficient repertoire. Stereotypic and ritualistic behaviors were ignored unless they grossly interfered with a child's engagement in a more appropriate activity, in which case they were interrupted by drawing the child's attention to an attractive activity or material. Operant techniques for decreasing behaviors were used with behaviors that were dangerous, including tantrums, hitting, biting, running out of the classroom, and eating inappropriate substances. All such procedures were planned with the entire team and discussed with parents prior to their initiation. Perhaps because these children were still quite young, there were fewer instances of dangerous behaviors than we expected.

### **Classroom Structure and Routine**

The classroom design involved precise coordination of physical space, equipment, materials, activities, staff roles, and timing. The children lack attentional flexibility and internal organization of their behavior. Therefore, potential distractions were identified by evaluating every activity with respect to its primary goal(s) for each child. Sensory stimulation was decreased in surrounding areas

to enhance the salience of the target activity for each child. In essence, the whole environment operated as an ego structure that regulates, mediates, selects, focuses, and organizes sensory stimulation for the children to maximize learning.

### Subjects

Over a 2½-year period, data were collected on 26 children who attended the program for at least a 6-month period. Eligibility criteria included the presence of infantile autism, PDD, or a severe emotional handicap and the presence of cognitive developmental levels of at least 12 months (due to the program emphasis on development of symbolic play skills and communication). For all children, the severity of their handicaps prevented them from being enrolled in a less specialized setting. All the children received evaluations from clinical child psychologists or child psychiatrists, speech and language pathologists, and special educators.

Diagnoses of their disorders were made on the basis of the *Diagnostic and Statistical Manual—III* of the American Psychiatric Association. Twenty-three of the 26 children were also rated on the Childhood Autism Rating Scale (CARS) (Schopler, Reichler, DeVillis, and Daly, 1980), using videotapes which were scored independently by two raters experienced with young autistic children and trained to a predetermined level of reliability (interrater agreement of 90%). Three children were not scored on the CARS because videotapes were not available for them. According to the CARS criteria, 13 (11 boys and 2 girls) of the 23 children scored in one of the two autistic categories, 10 children in the severe category, and 3 in the mild/moderate category. All 8 children with a DSM-III diagnosis of infantile autism scored in the autistic range on the CARS. Of the 5 other children scoring in the autistic range on the CARS, 3 had DSM-III diagnoses of PDD, and 2 had other diagnoses.

The mean chronological age (CA) of the 13 children scoring in the autistic categories of the CARS (the autistic group) was 47.92 months (sd = 11.48) and the 10 children scoring in the not autistic category on the CARS (the non-autistic group) was 51.30 (sd = 10.29),  $t = .73$ ,  $p = \text{n.s.}$  Intellectual functioning was determined by an individual psycho-

logical evaluation, using the Leiter International Performance Scale (Leiter, 1979) and/or Merrill Palmer Test of Mental Abilities (Stutsman, 1948) for children with severe language impairments, and the Stanford-Binet Intelligence Scale (Terman and Merrill, 1973) for children without severe language impairments. Mean IQ of the autistic group was 72.23 (sd = 19.95) and for the non-autistic group was 81.44 (sd = 25.06),  $t = .96$ ,  $p = \text{n.s.}$  Since the differences in CA and IQ between the two groups were not statistically significant, their data were combined for all analyses. DSM-III diagnoses and level of intellectual functioning of the subjects are presented in Table 1.

**TABLE 1**  
**Intellectual Range of Functioning and Psychiatric Diagnoses (DSM-III) of the Subjects**

Intellectual Level	Infantile Autism	PDD*	Other*
Normal $\pm$ 1SD	1	2	8
- 2SD	3	1	1
- 3SD	1	-	1
- 4SD	3	3	-

\*Estimated IQ data not available for 1 child in this diagnostic group.

Twenty of the families were White, five were Black, and one was Hispanic. Eighteen families had two parents in the home. In terms of socioeconomic status, eight families received public assistance. For 18 families, at least one parent worked full-time.

### Program

Each child attended the program for 2¾ hours per day, four days per week, in a group of six children, with one teacher and two aides. A maximum of 12 children were enrolled at any one time. There were no program fees, but parents had to arrange their own transportation in most instances. A speech and language therapist and psychologist consulted with the classroom staff regarding management strategies and language, cognitive, and emotional needs for each child, but the children received all di-

rect interventions within the classroom setting from the classroom staff. All children received psychological, motor, speech and language, and educational assessments upon entrance to the program, and each child's most prominent learning needs were incorporated into the child's IEP. Parents received one weekly or bi-weekly conference hour with a child psychologist; these conferences focused on whatever aspects of the child's development or behavior was most concerning to the parent at that time. Monthly parent group meetings were held, and parents had unlimited observation of the classroom.

### Measures

*Early Intervention Profile and Preschool Profile* (D'Eugenio & Moersch, 1981). The Profiles assess development in the areas of cognition, language, fine motor/perceptual, gross motor, social/emotional, and self-care. Validation studies have been carried out with both instruments, on both handicapped and non-handicapped subjects (D'Eugenio & Moersch, 1981). They were administered and scored according to manual instructions by the child's classroom teacher at the time of enrollment and at the end of each school year. For each domain, a developmental score in months was derived from the number of items passed, out of the total number of items possible between the 0 and the 60-month level.

*The Play Observation Scale* (Rogers, 1982). This instrument was used to measure several characteristics of each child's play at the beginning and end of each school year. The Scale was applied to videotapes of a 20-minute standard play procedure between teacher and child. In this procedure, the teacher presents the child with an assortment of dolls and doll dishes, plastic animals, cars, blocks, and a toy phone. For 10 minutes, the teacher is responsive to the child's initiations but does not initiate any play. In the next 10- to 15-minute segment, the teacher models and suggests more mature play sequences, encouraging the child to participate in increasingly high levels of symbolic complexity.

Areas of play behavior scored from this scale include: symbolic agent level (Can the child pretend that a doll can initiate ac-

tions?), symbolic substitute level (Can the child pretend to use an imaginary or a substitute object?), sensorimotor level (How appropriately are toys used?), symbolic complexity level (How many symbolic schemas can the child combine in one play scene?), and social-communicative level (How does the child acknowledge the teacher and incorporate him/her into play?). The Scale is presented in Appendix A. A 30-second time sampling procedure was used in which, for each interval, the rater scored the highest level of play behavior demonstrated in each of five categories, and then calculated the percentage of intervals in which each level of each of the five categories of play behavior occurred. Inter-rater agreement was established and maintained at 85% or better throughout the study.

*Parent-Child Play Interaction* (Rogers and Pulchalski, 1984). For this measure, mother and child were taken to a comfortable room that resembled a living room with an assortment of toys. Videotaping equipment was set up in an adjacent room behind a two-way mirror. The mother was instructed to "play just as you would at home" for a 10-minute period. The specific procedures and scoring criteria have been described elsewhere (Rogers & Puchalski, 1984). Six child behaviors and five parent behaviors were coded every 30 seconds for 10 minutes. Behaviors that were coded for both mother and child included: (1) looking at the other's face (none of the time, fleeting, some of the time, most of the time); (2) vocal quality (positive, neutral, negative, none, or mixed positive and negative); (3) presence or absence of social initiations to the partner; and (4) response to the partner's initiations (positive, negative, mixed, none, or no opportunity). Additional behaviors rated for the child only included (1) number of smiles and (2) discrete affect (happy, fussy, sad, afraid, angry). Additionally, mothers were scored for response to the child's distress (positive, negative, none, no opportunity). For each 30-second rating, the predominant mode for each of the 11 behaviors was scored. Interrater agreement was established and maintained at or above 88%.

*Follow-up data.* Follow-up of the children who moved to another program after their enrollment in The Playschool was carried out by the head teacher. Once a month for

six months, and then every six months thereafter, the head teacher mailed forms to the parents and teachers of each "graduate" to gather information regarding the services the child was currently receiving, the adequacy of the child's adjustment, and the type of current educational placement.

## RESULTS

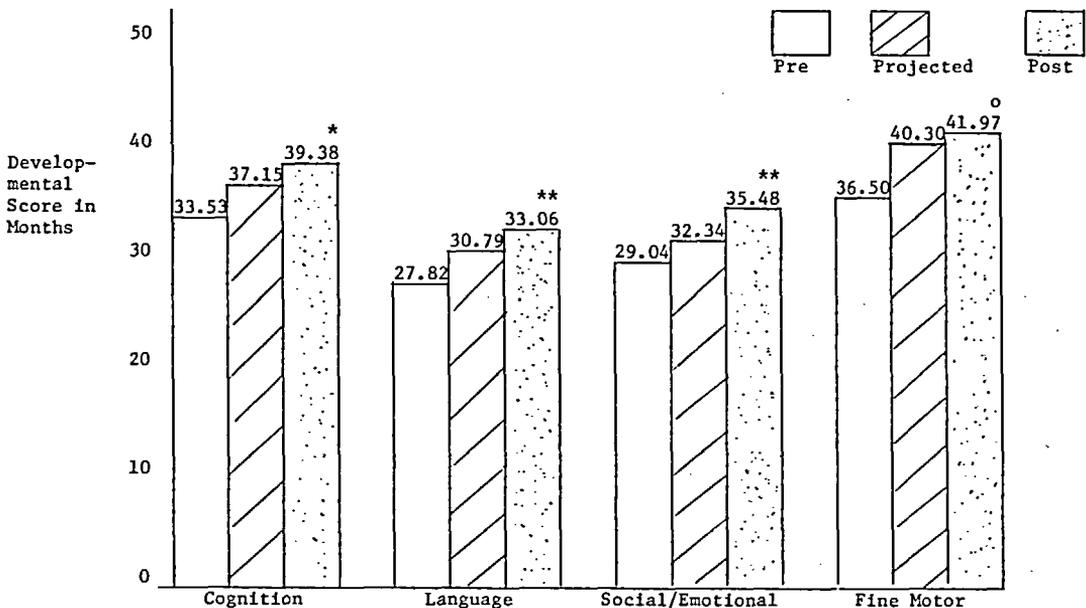
### Early Intervention and Preschool Profiles

Because the following analyses focused on change scores in various developmental areas, it was important to partial out the portion of the change which could be attributed to the passage of time rather than to the specific treatment. This was accomplished by performing comparisons which tested the children's post-treatment gains against projected scores which estimated what their second set of scores would have been had they not received any treatment. For each child, a projected score for each developmental domain was derived by (1) calculating a developmental rate at the beginning of treatment (developmental age divided by chronological

age), (2) multiplying this developmental rate by the number of months between the first and the second developmental assessments, and (3) adding this product to the child's initial developmental age. The group means of these projected scores (which represented the amount of gain the child would have made without treatment) were tested against the means of the children's actual post-treatment scores in order to assess the incremental effect of the treatment approach over and above the effects of the passage of time and developmental rate per se.

In comparing these projected scores with the actual post-treatment scores using one-tailed t-tests, statistically significant changes were noted in three areas: cognition,  $t(18) = 1.95$ ,  $p = .03$ , language,  $t(18) = 2.45$ ,  $p = .007$ , and social/emotional,  $t(17) = 2.91$ ,  $p = .005$ . Changes in perceptual/fine motor scores approached significance,  $t(19) = 1.59$ ,  $p = .06$ . Changes in other domain scores were not statistically significant: gross motor,  $t(18) = 1.21$ ,  $p = .12$ , and self care,  $t(16) = .16$ ,  $p = .44$ . Figure 1 presents the pretreatment, projected, and post-treatment group means for each domain.

Figure 1



Mean developmental scores in months for pretreatment scores, projected scores, and post treatment scores (N=18) in which measures of significance reflect differences between projected scores and post-treatment scores.

o  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$

## Symbolic Play Skills

For the three domains involving symbolic play, the children demonstrated the most change at the intermediate levels. One-tailed t-tests were used throughout the following comparisons. For Symbolic Agent use, the group demonstrated changes approaching significance on Level 2 (other person is recipient of action),  $t(16) = 1.57$ ,  $p = .07$ , and Level 4 (child directs others' play),  $t(16) = 1.69$ ,  $p = .06$ . The group demonstrated significant change at Level 3 (child acts out another's activity),  $t(16) = 3.25$ ,  $p = .002$ . Changes at Level 1 (action initiated by self) were not significant,  $t(16) = .29$ ,  $p = .38$ . (Of the 16 children in these comparisons, 12 were rated autistic on the CARS and 4 were rated not autistic.)

For Symbolic Substitute use, the group demonstrated significant change at Level 2 (substitutes realistic item for real one),  $t(16) = 1.84$ ,  $p = .04$ , and Level 3 (substitutes ambiguous item for real one),  $t(16) = 2.30$ ,  $p = .02$ . Changes were not significant at Level 1 (uses real item in symbolic schema),  $t(16) =$

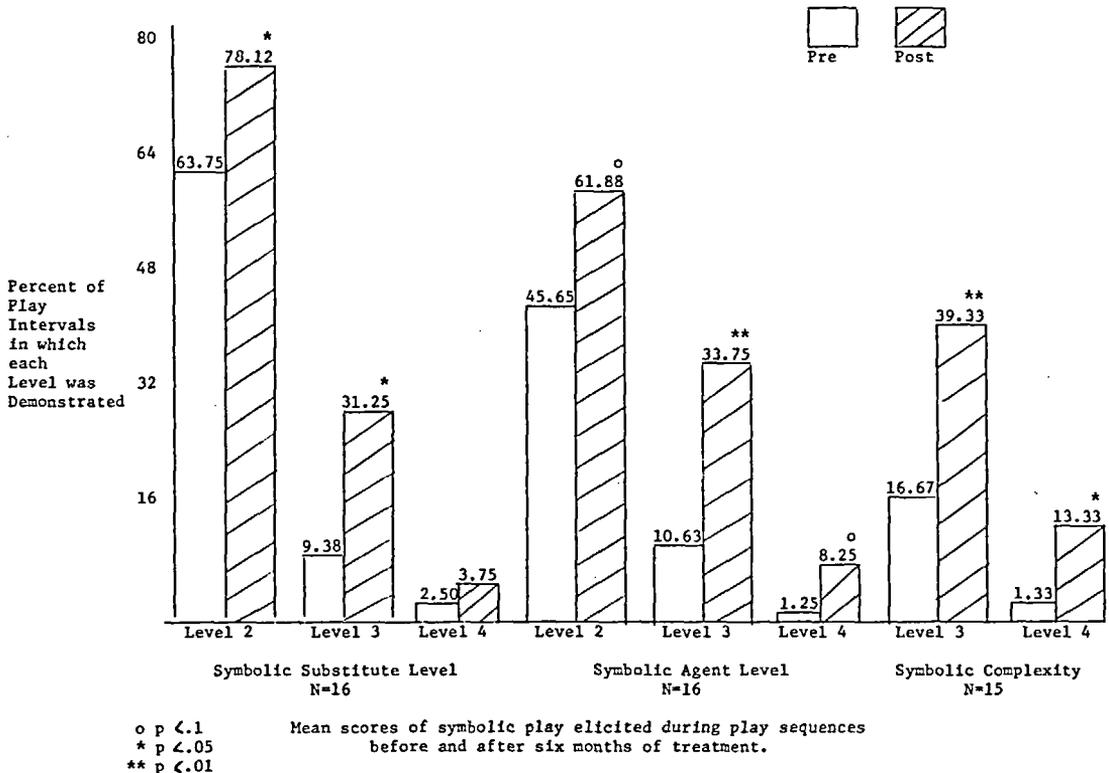
$1.20$ ,  $p = .12$ , or at Level 4 (uses imaginary prop),  $t(16) = .37$ ,  $p = .35$ . (Of the 16 children in these comparisons, 12 were rated autistic on the CARS.)

For Symbolic Complexity, the group demonstrated significant increases at Level 3 (child links two or three related actions),  $t(15) = 3.56$ ,  $p = .002$ , and Level 4 (child plays out a whole life scene),  $t(15) = 2.07$ ,  $p = .02$ . Changes were not significant at Level 1 (single symbolic schema),  $t(15) = .39$ ,  $p = .35$ , or at Level 2 (repeated symbolic schema),  $t(15) = .85$ ,  $p = .21$ . (Of the 15 children in these comparisons, 11 were rated autistic on the CARS.) The changes found in the three domains of symbolic play are illustrated in Figure 2.

## Social/Communicative Play Skills

Significant changes were seen in Level 3 (attempts to continue interaction),  $t(16) = 2.75$ ,  $p = .007$ , Level 5 (engages in turn-taking games),  $t(16) = 2.28$ ,  $p = .02$ , and Level 6 (plays with others in shared play schema),

Figure 2



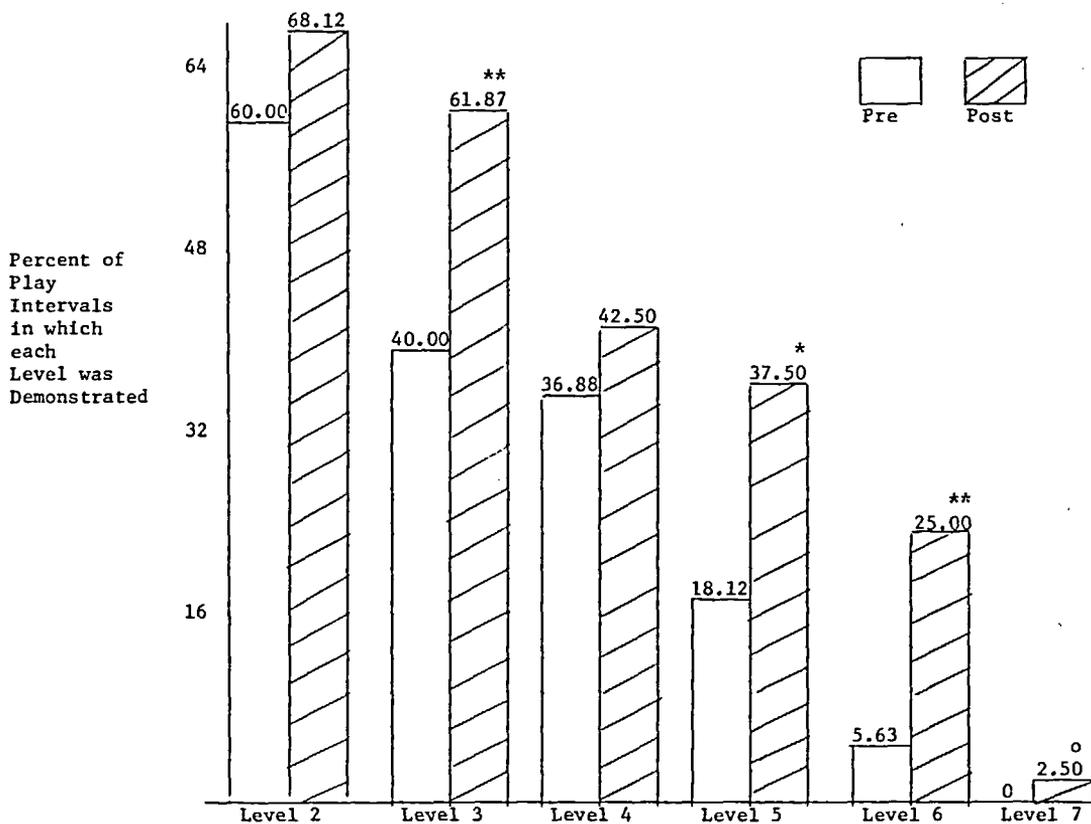
$t(16) = 2.99, p = .004$ . Change approached significance on Level 7 (directs a coordinated play script),  $t(16) = 1.46, p = .08$ . Nonsignificant change was found for Level 1 (awareness of other),  $t(16) = .17, p = .44$ , Level 2 (attempts to engage other),  $t(16) = 1.20, p = .12$ , and Level 4 (communicates with and understands meaningful gestures or words),  $t(16) = .84, p = .20$ . (Of the 16 children in these comparisons, 12 were rated autistic on the CARS.) The significant changes in social/communicative play skills are illustrated in Figure 3.

### Parent-Child Interactions

Data from 13 children (8 rated autistic on the CARS and 5 rated not autistic) were available for analysis on this measure. Statistically significant changes were seen in in-

creased number of 30-second intervals in which the children demonstrated (1) positive affect towards the mother,  $t(13) = 2.63, p = .01$ , and (2) social initiations to the mother,  $t(13) = 5.56, p = .001$ . Statistically significant change was also seen in decreased number of intervals in which the children demonstrated negative responses to mother's social initiations,  $t(13) = 1.89, p = .04$ . Positive changes which approached significance included increased number of intervals in which the children demonstrated (1) positive responses to the mother's social initiations,  $t(13) = 1.70, p = .06$ , and (2) vocalizations,  $t(13) = 1.68, p = .06$ . There were no significant changes in the increased number of intervals in which the children (1) maintained a face-to-face position with the mother,  $t(13) = .33, p = .37$ , (2) used vocalizations with positive affect,  $t(13) = .89, p = .20$ , (3) used

Figure 3



<sup>o</sup>  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$

Mean scores of social/communicative play levels elicited during play sequence with teacher before and after six months of treatment (N=16).

vocalizations with negative affect,  $t(13) = .00$ ,  $p = 1.00$ , or (4) smiled,  $t(13) = .12$ ,  $p = .45$ .

There were no statistically significant changes found in the increased number of intervals in which the mothers demonstrated (1) maintaining a face-to-face position,  $t(13) = .56$ ,  $p = .29$ , (2) vocalizations with positive affect,  $t(13) = .72$ ,  $p = .24$ , (3) vocalizations with negative affect,  $t(13) = .00$ ,  $p = 1.00$ , (4) vocalized,  $t(13) = .68$ ,  $p = .25$ , (5) positive responses to child's social initiations,  $t(13) = .44$ ,  $p = .33$ , (6) negative responses to child's initiations,  $t(13) = .21$ ,  $p = .42$ , or (7) change in frequency of social initiations to the child,  $t(13) = .28$ ,  $p = .39$ . Thus, the mothers' behavior was quite stable across the two videotapings, with no statistically significant changes in any of the scored behaviors.

### Follow-up Data

Follow-up of the 26 children occurred at the end of the 2½-year treatment period and reflected the school placements that had occurred previously and the school placements for children leaving the program at that time. Of the 26 children, seven were enrolled in non-specialized school or day care settings after leaving The Playschool, functioning within the normal range in all areas for their ages. Seven were enrolled in special education classrooms for emotionally/behaviorally handicapped or autistic children in their communities. Five were enrolled in special education classrooms targeted for mentally retarded or developmentally disabled children, and one was enrolled in a special classroom for communication-disordered students. The remaining six children continued their enrollment in The Playschool for another year. Thus, of the 20 who moved on to other programs after The Playschool, 35% went to non-handicapped settings, 30% went on to special education settings in which their emotional/behavioral problems were not seen as the primary handicap, and 35% went to programs in which emotional/behavioral handicaps or autism were seen as the primary handicap.

### DISCUSSION

In the United States, the behavioral approach to the education and treatment of au-

tistic and emotionally handicapped children is often viewed as the approach of choice, because of the measurable and observable changes in children's behavior which result. However, if one views autism, PDD, and severe emotional/behavioral disorders in young children as disorders of cognitive, communicative, and social/emotional development, then developmental approaches to treatment should theoretically be appropriate as well. The developmental approach implemented in this program incorporated the children's needs for high levels of structure, adult attention, and consistency into a curriculum which placed major emphasis on (1) increasing cognitive levels, particularly in the area of symbolic functions, (2) increasing communication via gestures, signs, and words, and (3) enhancing social/emotional growth through interpersonal relationships with adults and peers. The primary vehicle for enhancing development in these three areas was play in all its variety.

The children demonstrated statistically significant progress in several important areas of functioning. Change scores in the cognitive, communicative, and social/emotional domains of the Developmental Profiles indicate important developmental growth for the children above and beyond what would have been expected given the passage of time and the children's initial developmental rates. The difference between the projected scores and the actual post-treatment scores in these three domains is even more notable since the projected scores conservatively assumed that the children would continue at their initial developmental rates, whereas in our clinical experience with these children the developmental rate decreases in these domains over time. The significant developmental growth in cognition, communication, and social emotional development reflects the program's focus on these key developmental areas and supports the contention that deficits in these areas, even with these severely affected children, were not intractable but rather amenable to intensive developmental intervention. The lack of significant change in self-care and gross motor development is considered to be attributable to the children's relatively high developmental scores and developmental rates in these areas at the beginning of treatment.

Increases demonstrated by the children in

the areas of symbolic play and social/communicative aspects of play with a familiar adult are viewed as particularly encouraging, since current researchers suggest that the symbolic deficit in autistic children is a major source of their cognitive and communicative deficits. The improved quality of social interactions with teachers and parents provides support for the general program approach, because these improved social behaviors were not specifically "taught" to the children via a discrete learning program. Rather, it is our view that these changes were promoted by the growth of strong, affectionate interpersonal relationships. These relationships were carefully and gradually facilitated by the adults' (1) careful attention to the child's verbal and non-verbal communications, (2) reactive and reciprocal behaviors, (3) emphasis on the child's positive affective experiences, and (4) use of play as a major interpersonal and learning medium.

The children's growth in social/emotional skills was reflected in three separate measures, each of which explored a somewhat different set of interpersonal behaviors. That positive change was indicated on each of these measures adds a degree of convergent validity to the finding of significant social and emotional growth.

Changes found in the mother-child play interactions were also notable. Since no intervention was focused specifically on parent-child play, these changes indicate a second-order effect and a generalization of learning, from changes in the classroom to changes in social behaviors with the parent. Further, since no changes were found in the mothers' behaviors in this situation, the changes displayed by the children cannot be plausibly attributed to parent training effects. It is argued that these changes indicate increases in the child's own social response repertoire, which enhance interaction in several settings and with several people.

Of greatest importance to the authors was the general finding that these young children with autism, PDD, or severe emotional handicaps made notable progress via a developmentally-oriented treatment approach. Since the current predominant treatment approach is behavioral, it is important to note that a developmental approach can result in broad, developmentally crucial improvements in the children's functioning.

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## PLAY OBSERVATION SCALE

- Sensorimotor play - repetition of sensory motor acts with objects, purpose of which is to practice already existing skills.
- Sensorimotor 1 - repeats an action several times in order to continue some type of bodily sensation - primary circular reaction.
- Sensorimotor 2 - repeats an action with an object several times to maintain some interesting environmental event, especially a visual or auditory event - secondary circular reaction.
- Sensorimotor 3 - the play involves repetition of simple cause and effect sequences in which the goal is chosen first, then the means for achieving it are selected. Examples: stacking blocks and knocking them over, the busy box, hiding and finding, playing with a simple tool - string, stick, etc. to retrieve a toy. At this level the repetitions are not altered.
- Sensorimotor 4 - the play involves trial and error experimentation - the theme, or general goal, of the play is maintained but the behaviors used to achieve the goal are flexibly varied by the child during the repetitions - examples, playing with the busy box by using all the buttons, crashing block towers made of various sizes of objects with hand, car, truck, etc., varying the type of marks made - fingerpaint, etc.
- Symbolic play - in which an object (or no object) is used as if it were something else.
- Symbolic agent 1 - self as recipient of action - child pretends to do a familiar activity with self as object of the action - pretends to go to sleep, eat, drink. Props may be quite realistic - child's behavior must demonstrate he or she is simulating an activity - not just repeating it. Pretending to brush hair, not actually brushing hair.
- Symbolic agent 2 - other as recipient of action - child pretends a simple activity directed towards another object or person as recipient of the action - feeds a doll, pushes car on the floor, gives another child some "medicine."
- Symbolic agent 3 - child acts out another activity - mops floor, pretends to be a kitty, pretends to read a book.
- Symbolic agent 4 - others as agents and recipients of action - child is "stage manager" - plays out scenes in which others carry out the actions towards others - having a mama doll put a baby doll to bed, directing one child to "doctor" another child, acts out scenes with dolls - child not taking an active role.
- Symbolic substitution level 1 - child uses the real life object to simulate an activity - pretends to brush hair with real brush, pretends to eat with real spoon.
- Symbolic substitution level 2 - realistic item - child uses realistic prop to simulate appropriate function of prop.
- Symbolic substitution level 3 - ambiguous item - child uses a prop which may have some vague similarity to the imagined object or which, while not similar, is not strongly identified with some other use: using a wadded-up blanket as a baby, using a small stick as a spoon, using a piece of cloth as a hat.
- Symbolic substitution level 4 - no item - child uses an imaginary prop - with no physical referent, i.e., hands you an imaginary cup of tea, answers an imaginary phone by holding fist to ear.
- Symbolic complexity level 1 - single schema - one isolated symbolic action - drinks, eats, crawls on all fours to be a kitty.
- Symbolic complexity level 2 - repeated schema - child repeats symbolic actions on several different objects - feeds self, then doll.
- Symbolic complexity level 3 - linked schema - child performs 2 or 3 actions that are related to the pretend theme, i.e., stirs drink, drinks, spills, wipes up.

- Symbolic complexity level 4** - script play - child plays out a whole script - a life scene - realistic or fantasy that involves a sequence of symbolic schemas linked logically by the theme and not broken until the end of the scene - i.e., a mealtime script involving food prep, serving and eating, a doctor script involving weighing, exam, shot, etc. In this play the child is clearly acting out a theme and stays "in the play" until the end is reached.
- Social/Communicative level 1** - awareness of other - child demonstrates awareness of others by looking at, reaching toward, touching imitating, approaching, hitting - any gesture that acknowledges the presence of another person; including clearly refusing to interact (parallel play with peers).
- Social/Communicative level 2** - attempts to engage others - child attempts to gain others' attention by vocalizing, touching, bringing an object, doing something cute or funny or naughty, repeats act that gained attention.
- Social/Communicative level 3** - attempts to continue an interaction - child responds to another's social initiation in a way that encourages the other to continue - i.e., constant eye contact and smiles, laughter, vocalizations, imitations, cueing the other to repeat his or her behavior - returns an object in an exchange game.
- Social/Communicative level 4** - understands and sends gestural/verbal communication in play - includes "give me" gesture, pointing, "I want," "sit down," "come here," "look," - gives object to adult to activate - "no" and "yes" gestures.
- Social/Communicative level 5** - engages in turn-taking games - these games involve simple motor acts - putting in and taking out, exchanging objects, imitating another, pushing a car, pretending to eat or drink, etc. The important characteristics are: 1) the child cues the other to take a turn, then the child takes a turn, etc., and 2) there are some rules which the child communicates through gesture or words, or the breaking of which the child communicates through displeasure or words. The interaction is primary, with the imitation and turn-taking as the vehicle for the play.
- Social/Communicative level 6** - plays with others in shared play schema - child and other are together, engaged in some play, doing similar activities, interacting through words or play, in a single play scene. Such as - each driving a car along a shared block road, both caring for dolls, working together to build a block wall.
- Social/Communicative level 7** - coordinates play with others using metacommunications in goal-directed play - includes: 1) the role playing of a socio-dramatic script, involving a sequence of symbolic schemas and the communication of what is going to happen, what the rules are, etc., and 2) includes cooperative efforts for a planned product - the joint building of a town and road and finally driving cars on it, making necklaces and turning them into crowns for a king, etc. Again there is communication about what is being worked toward, how it should happen, who will do what, etc. These are sustained efforts, lasting 10-15 minutes.