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Integrated Play Groups: A Model for Promoting the Social and Cognitive Dimensions of Play in Children with Autism[1]

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This investigation provides a description of a multifaceted model to promote peer play, and an evaluation of its impact on the social and cognitive dimensions of play in three children with autism. A combination of quantitative and qualitative methodologies were used to evaluate the effectiveness of the model application. A multiple-probe design across participants demonstrated (a) decreases in isolate play and collateral gains in more social forms of play, and (b) decreases in stereotyped object play and collateral gains in functional object play. While no symbolic play was observed in any of the participants during baseline, two participants demonstrated symbolic play in the final condition. Generalization and social validation measures indicated (a) advances in play behaviors were not limited to the play groups but observed in other contexts, and (b) were accompanied by language gains. Implications are discussed in terms of preferred service delivery models as well as of the importance of social interaction for the development of play and language.

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INTRODUCTION

Qualitative impairments in reciprocal social interaction, imaginative activity, and a markedly restricted repertoire of activities and interests are viewed as hallmarks of the syndrome autism (American Psychiatric Association, 1987; Wing & Attwood, 1987), and are all reflected in the commonly noted lack of spontaneous play. The play of children with autism is typified as sterile, ritualistic, and void of social engagement (Wing, Gould, Yeats, & Brierly, 1977). They tend to engage in higher rates of manipulative forms of play (Tilton & Ottinger, 1964) and fewer diverse functional play sequences (Sigman & Ungerer, 1984). The odd and awkward manner in which children with autism play is frequently misinterpreted by other children, resulting in their social exclusion. Failure to imitate and comprehend the social nuances involved in entering and coordinating joint play activities, as well as to interpret social advances made by other children, increases their likelihood of social isolation. Thus, even when given opportunities to engage in play with peers, without specific support children with autism remain on the periphery of peer groups or in complete isolation (Rutter, 1978; Strain & Cooke, 1976). Moreover, without playmates to share, expand, modify, and negotiate play routines, their play remains inflexible and unimaginative.

One of the major challenges in teaching play skills lies in the fact that play is not easily defined in operational terms, and ceases to be play when it is externally imposed. The very nature of play, characterized as being voluntary, intrinsically motivated, spontaneous, and free from adult-imposed rules (for overviews of definition issues, see Garvey, 1977; Rubin, Fein, & Vandenberg, 1983; and Smith & Vollstedt, 1985) defies the type of highly structured step-by-step teaching programs which heavily dominated the early phases of the social skills training literature. Such instructional programs may actually discourage play because of the high demand structure and the focus on child responses rather than child initiations. Play-related interventions for children with autism are often either highly structured or, led by the assumption that play is what children do when left to their own devices, lack structure altogether.

Integrated Play Groups: A Model to Promote Peer Play

To teach play in its totality, we developed a more comprehensive model of play incorporating a number of variables that have been documented to affect play and social interaction. Rather than being directive, the approach adopted provides a support system for peer play. Play development

is fostered by physically arranging the environment to bring about most competent forms of play, and by guiding participation within these environments while capitalizing upon child initiations. The integrated Play Groups model includes the following features.

Natural Integrated Settings. Natural integrated settings in which children typically engage in play activities with other children have become increasingly incorporated into interventions for children with autism and related severe disabilities (Casner & Marks, 1984; Goldstein & Wickstrom, 1986; Haring & Lovinger, 1989; Lord & Hopkins, 1986; McHale, 1983; Odom & Strain, 1986; Strain, 1984). Common to these types of interventions is the inclusion of socially competent peers as play partners (for a review of peer-mediated approaches for promoting social interaction, see Odom & Strain, 1984). Thus, Integrated Play Groups are implemented in social settings characterized by a higher proportion of children who are socially competent as compared to children who require extensive social support.

Well-Designed Play Spaces. A number of features related to the physical design of play spaces have been shown to promote optimal opportunities for participation in play and social interaction (for a review of physical arrangements of play spaces, see Phyfe-Perkins (1980). Well-designed play spaces, which take into consideration spatial density and size, spatial arrangements, organization of materials, and general accessibility, are incorporated into the model.

Selection of Play Materials. Play materials are selected on the basis of their interactive potential (Beckman & Kohl, 1984), structure (Dewey, Lord, & Magill, 1988), and complexity (Ferrara & Hill, 1980) as these have been shown to influence the play and social behavior of children with autism. The toys selected include constructive and sociodramatic toys mutually enjoyed by children with differing abilities. Toys representing diversity in terms of gender roles, cultural values, and abilities are also purposefully included.

Establishing a Consistent Schedule and Routine. The beneficial effects of designing interventions with high degrees of predictability and consistency have long been recognized for children with autism (Rutter, 1978). To afford greater opportunities for participation in peer play, a highly predictable environment is created through establishing a consistent play group schedule, and carrying out ongoing routines involving opening and closing rituals.

Forming Balanced Play Groups. To afford optimal opportunities to develop social relationships with other children, play groups are limited in the number of familiar peers and/or siblings who meet on a regular and consistent basis over an extended period of time (Lord & Magill, 1989). Since peers of different ages and developmental status have been documented

to promote different types of beneficial play experiences (Bednersh & Peck, 1986; Lord & Hopkins, 1986), these are also considered when forming play groups.

Focus on Child Competence. Spontaneous initiations made by children learning to play are viewed as indices of a child's developmental level and emerging ability even if they might take unusual forms. To facilitate more social and imaginative forms of play, each child's range of individual competence as supported by collective activities is identified. By capitalizing on spontaneous initiations, the amount and type of support provided is matched to what Vygotsky (1978) referred to as each child's "zone of proximal development" (Dawson & Adams, 1984; Dawson & Galpert, 1986; Tiegerman & Primavera, 1981). Consequently, multiple opportunities are provided for children to self-select play activities which are desirable (Koegel, Dyer, & Bell, 1987), and correspond to developmental levels and prevailing object schemes (Hauge, 1987; Tremblay, Hendrickson, Strain, & Shores, 1980).

Guided Participation. The concept of "guided participation" refers to the adult's role in guiding the children to participate in increasingly socially coordinated and sophisticated play activities in a supportive rather than directive fashion. The avoidance of adult-imposed structure in facilitating spontaneous play and social interaction is supported by a number of investigations (Casner & Marks, 1984; Lord & Hopkins, 1986; McHale, 1983; Meyer et al., 1987; Shores, Hester, & Strain, 1976). The amount of external support provided is regulated in a "scaffolded" (Bruner, 1982) fashion; as the children demonstrate increasing competence, the adult gradually removes her or himself, reducing the amount of support provided. To facilitate play activities, the adult guides the children to initiate, join, maintain elaborate, and negotiate play routines. In particular, strategies are presented that enable the children to establish a mutual focus by recognizing and responding to each other's subtle cues and initiations.

Full Immersion in Play. A final critical feature of the Integrated Play Groups model is that children are fully immersed in the total group play experience. Rather than presenting play as discrete subtasks, children engage in the whole play experience, even if active participation is minimal. A system of mutual support and collaboration is developed as children learning to play (novices) take on whatever role they are capable of performing in a larger play context designed by children experienced in play (experts). Children participate in activities and carry out tasks they may not as yet fully comprehend. For example, a child who has a particular inclination to manipulate objects through ritualistic banging may incorporate this into a larger play theme of constructing a building with blocks. With the assistance of more capable peers, the child may take the role of a construction worker and hammer the blocks with a play tool.

This study reports on the application of the Integrated Play Groups model in an integrated school setting, and its impact on the play behavior of three children with autism. We hypothesized that application of this model would produce gains in both the social as well as cognitive dimensions of play. More specifically, we hypothesized that collateral increases would be observed in levels of object manipulation and social interaction. We predicted that participants would show (a) increases in the percentage of time in which objects were used in conventional ways involving functional as well as symbolic object use (Cognitive Play) and (b) increases in the percentage of time in which participants engaged in activities characterized by a common focus of attention and coordination of action with peers (Social Play). This study was designed to determine the optimal length of intervention, and the feasibility of implementation. More specifically, this study was designed to determine whether the initial brief intervention should be extended to insure longer lasting effects that could be maintained by peer facilitation independent of adult support. Finally, this study was designed to determine whether observed changes would generalize to other settings and could be socially validated by significant others.

METHOD

Approach Used

A combination of quantitative and qualitative methodologies were used to evaluate changes in the social and cognitive dimensions of play in each child participating in the intervention. A multiple-probe design across target participants (Tawney & Gast, 1984) was used to measure rates of specific play behaviors as the intervention progressed over a period of approximately 7 months. In addition, semistructured interviews (Bogdan & Biklen, 1982) were conducted with a parent of each child and the special education teacher who facilitated the play groups to determine whether the changes observed in the context of the integrated play groups in the classroom generalized to other settings (i.e., the home) and could be socially validated. Finally, pre- and postsamples of solitary play were collected to provide an index of diversity versus stereotyped play.

Participants

Three separate play groups were established in a public elementary school. Each play group included two children with autism (enrolled in a

special day class) and three nondisabled peers (enrolled in general education classes) ranging in age from 6.11 to 8.5 years and mixed by gender. From each play group, one male with autism (7.10, 7.10, and 7.7 years, respectively) was targeted as a primary participant. Psychological reports indicated that each of the three target participants had been independently evaluated and diagnosed as conforming to Rutter's (1978) diagnostic criteria for autism: onset in early childhood, impaired social development, disturbance of language and cognitive skills, and an insistence on sameness.

Participant 1: Jonah. Jonah mainly manipulated objects in a ritualistic manner. He was able to imitate conventional play schemes in adult-structured situations. He had minimal social contact with peers, and frequently hit them when they approached him. Jonah's verbal repertoire included mainly immediate and delayed echolalic phrases.

Participant 2: Craig. Craig engaged in highly ritualized and repetitive play sequences. He occasionally demonstrated functional play acts with dolls. Craig avoided social contact with peers, and protested when they approached him or his preferred play objects. Craig's verbal repertoire consisted of echolalic speech with a few spontaneous single word and two-word phrases.

Participant 3: Gary. Gary's play included highly ritualized sensorimotor action patterns. He generally avoided social contact with peers but sometimes watched other children. Gary had no verbal language but communicated through vocalizations and other informal means.

Setting and Materials

Play groups were conducted for 30 minutes two times a week in a designated play area in the special classroom. The play area was equipped with a wide range of age-appropriate constructive and sociodramatic toys. All reported sessions were videorecorded.

Procedures

Baseline. During baseline, ranging from 6 to 12 sessions, the children were told to play together as much as possible using the materials present. The teacher stayed to the side of the play area and monitored the session intervening only when necessary. No specific instructions were provided as to how to play together.

Intervention I. Utilizing strategies presented in the Integrated Play Group intervention model, the teacher conducted two 30-minute sessions weekly over a period of approximately 1 month, totaling six sessions. Four of the six sessions were videorecorded for data analysis.

Probe I. Adult guidance was withdrawn and data collected for three sessions over a 2-week period to determine to what extent the peers were able to mediate play interactions independently. The adult no longer provided support to the play group participants.

Extended Intervention. Following the Intervention I condition, adult guidance was again provided following the same guidelines as Intervention I for a 2-month period. While no specific intervention data were collected during this period, the effectiveness of this component of the Integrated Play Groups was evaluated in the follow-up condition described below.

Follow-Up: Probe II. Adult guidance was again withdrawn and data collected for two sessions within a 2-week period to determine to what extent peers were able to mediate play interactions independently.

Data Collection and Measurement

Play Groups. All observations were conducted on videotaped recordings of each session probed. Five-minute samples were randomly selected from the middle 20 minutes of the 30-minute session. Consecutive 10-second intervals with a 5-minute time frame were analyzed. The occurrence of one of four dimensions of Cognitive Play with Objects (Object Play) and one of four dimensions of Social Play were coded for each 10-second interval. Precise definitions of the dimensions of Cognitive Play with Objects and Social Play are specified in Table I. When more than one dimension of Object and/or Social Play was observed, the more sophisticated one was recorded if observed for a minimum of 3 seconds. The collected data were tabulated at the following three levels of organization:

1. The percentage of time each participant spent in play activities that could respectively be described as dimensions of Cognitive Play with Objects (i.e., "no interaction," "manipulation," "functional," or "symbolic/pretend") observed across the four treatment conditions.

2. The percentage of time each participant spent in play activities that could respectively be described as dimensions of Social Play (i.e., "isolate," "orientation," "parallel/proximity," or "common focus") observed across the four treatment conditions.

3. The percentage of time spent in play activities that meet both the social and cognitive dimensions of appropriate play (i.e., incorporating common focus and at least functional object use) for each observation across participants.

The latter measure was adopted to provide for the most stringent index of changes in play behavior for individuals with autism, as they typically display high rates of isolate nonfunctional object manipulations. To

Table I. Definitions of Dimensions of Cognitive and Social Play[a]

Cognitive play with objects	Social play with peers
No interaction The child does not touch or play with toys. The child engages in self-stimulatory behavior that does not involve toys (e.g., the child stares at hands; rocks body; waves or flaps arms or hands; stares at toys).	Isolate Child appears to be oblivious or unaware of others. May occupy self by watching anything of momentary interest, playing with own body or playing alone (e.g., child wanders, gets on and off chair, sits quietly, plays with back to peers).
Manipulation Exploratory play with toys ranging from simple to quite complex interactions. There is an apparent motivation to control the physical world. Child shows an interest in toys, but does not use them in conventional ways (e.g., holds and gazes at toy; mouths, waves, shakes or bangs toys; stacks blocks or bangs them together; lines up objects).	Orientation Child has an awareness of the other children as evidenced by looking at them, their play materials, or activities. The child does not enter into play (e.g., child quietly watches other children, child turns whole body facing children).
Functional Complex and conventional use of toys in which there is a definite dependency of one response on another. There is a quality of delayed imitation while actions are performed which include simple pretense (e.g., puts teacup to mouth; puts brush to hair; connects train sections and pushes train; arranges pieces of furniture in dollhouse; builds a building with blocks).	Parallel/proximity Child plays independently, beside rather than with the other children. There is simultaneous use of the same play space or materials as peers. There may be occasional imitation, showing of objects, or alternation of actions with peers (e.g., one child plays with a ball sitting close to another child who plays with a train; one child brushes a doll's hair while another pushes a doll in a carriage).
Symbolic/pretend The child pretends to do something or to be someone or something else with an intent that is representational. Mature pretense involves role playing and includes movements, vocalizations or verbalizations which are substituted for real objects (e.g., child makes hand move to mouth signifying drinking from tea cup; makes a puppet talk; uses a toy person or doll to represent self; uses block as a car accompanied by engine sounds).	Common Focus Child engages in activities directly involving one or more peers including: informal turntaking, giving and receiving assistance and directives, and active sharing of materials. There is a common focus or attention on the play (e.g., each child plays with blocks sharing blocks, each plays with dolls and touch each other's dolls, they take turns playing bean bag toss).

[a] Definitions of cognitive play dimensions were derived from Fenson & Schell, 1986; McCune-Nicholich 1981; Piaget, 1962; and Smilansky, 1968. Definitions of Social Play dimensions were adapted from Parten (1932).

clarify the relative contributions of each, the averages for social and cognitive dimensions were calculated separately (i.e., play designated as displaying common focus and play designated as demonstrating functional and/or symbolic object use).

Social Validation and Generalization. To determine the generalization of the acquired play skills to other settings (i.e., the home) and socially validate the intervention, descriptive information was obtained from the following sources:

1. A semistructured interview was conducted by the principal researcher with a parent of each target participant and their teacher at the end of the study. Interviewees were asked to respond to the question, "Tell me about anything you have noticed from the beginning of the school year until now in terms of your child's play with objects and with others." Each interview was audiotaped and transcribed verbatim. Transcripts were then examined for emerging themes pertaining to the play and related behavior changes of each child.

2. Assessments of each target participant's individual symbolic play behavior were conducted by the principal researcher prior to the implementation of the intervention and again at the end of the study (Nicholich, 1977). The assessments involved presenting the child with a selection of toys ranging from simple to complex, and observing independent play interactions with the toys for approximately 5 minutes. Each individual play assessment was videotaped and rated according to the following criteria: total number of play acts, total number of different play acts, total number of objects used, percent of manipulative/stereotyped play acts, percentage of functional/symbolic play acts, total number of words spoken, and mean length of utterance.

Reliability

Interobserver reliability levels were conducted by two independent observers. Agreements were recorded whenever both observers coded the same play category within each 10-second interval. Percentage of agreement was calculated by dividing the sum of agreements by the sum of agreement plus disagreement and multiplying this quotient by 100. After attaining initial reliability training agreement levels (an average of 86% ranging from 75–95%), the first observer coded all of the videotaped segments while the second observer independently coded a random selection of 30% of the observations reported. Calculations for all sampled observations revealed that an average of 86% agreement was attained ranging from 75–97% for each of the social and cognitive play categories coded within the 5-minute time frame.

To ensure accurate implementation of the model, two independent raters evaluated the selected intervention videotaped segments mentioned above. The teacher facilitating play groups was checked on her ability to implement five model components in each play group session: (a) focus on child initiations, (b) scaffolding interactions, (c) social communication strategies, (d) play strategies, and (e) full immersion in play. The results of the evaluation revealed that between 80 and 100% of the intervention model components were effectively carried out in each of the sessions observed.

RESULTS

Play Groups

Table II displays the average percentage of time during which participants were engaged in the various dimensions of social and cognitive play that were measured. All participants demonstrated decreases in "manipulation" and gains in "functional" object use. In addition, all participants demonstrated decreases in "isolate" play and collateral gains in more social forms of play involving "common focus," and "parallel/proximity."

While during baseline all participants spent the majority of their time (respectively, 71, 64, and 88%) in stereotyped, nonfunctional object manipulations, the amount of functional and/or symbolic object play was at least doubled for all participants during all phases of subsequent treatment. Similarly, while all participants spent approximately 50% of their time in isolate activities during baseline, their participation in common focus play more than doubled during the final treatment condition.

Figure 1 presents combined changes in the social and cognitive dimensions of play. Despite the stringency of the measure applied, all participants demonstrated notable gains during the Intervention I condition (averages of 24, 33, and 21%, respectively, following a rate of near zero percent at baseline) as well as during the followup probe (averages of 15, 92, and 24%, respectively). Furthermore, the behavior change data across participants indicate that the changes were not due simply to extended exposure or time, since gains were observed only when the intervention was introduced.

Closer examination of the data presented in Figure 1 indicates that initial behavior gains observed during the first phases of treatment were not maintained when adult support was withdrawn in the Probe I condition. Higher rates of appropriate play were restored in the Probe II condition following the Extended Intervention.

Table II. Average Percentage of Time Participants Engaged in Categories of Object and Social Play Across Conditions[a]

	Jonah				Craig				Gary			
	B	I1	PI	PII	B	I1	P1	PII	B	I1	PI	PII
Object play												
No interaction	21	10	4	6	10	12	6	2	11	22	2	5
Manipulation	71	50	57	39	64	32	68	0	88	42	95	62
Functional	8	40	38	41	25	56	26	88	2	36	4	34
Symbolic/pretend	0	0	0	15	0	1	0	11	0	0	0	0
Social play												
Isolate	56	5	8	17	48	6	51	0	50	13	15	8
Orientation	18	11	16	10	18	10	9	0	27	23	33	25
Parallel/proximity	25	42	45	49	24	29	29	7	23	25	28	25
Common focus	1	42	30	24	10	56	11	93	0	39	23	42

[a] B = Baseline; I1 = Intervention 1; PI = Probe I; PII = Probe II.

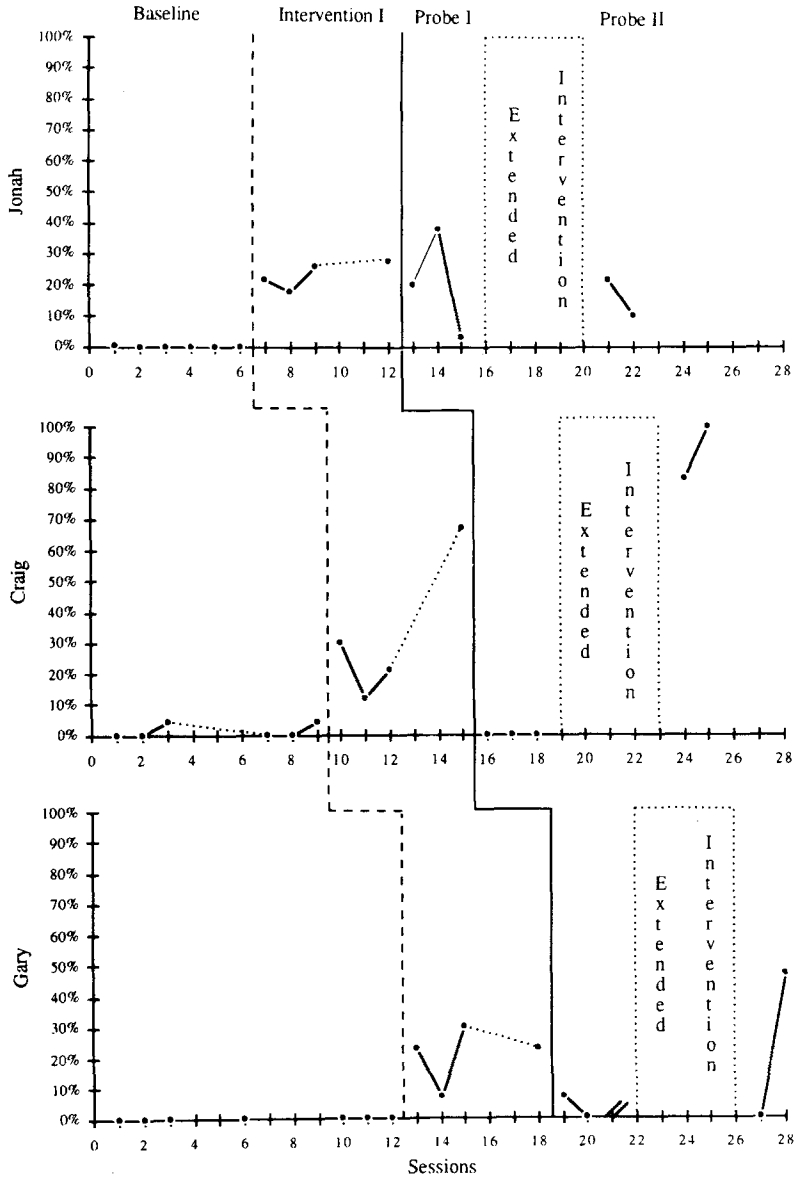

Fig. 1. Percentage of time engaged in functional/symbolic play combined with common focus.

Figure 2 presents changes in only the cognitive dimension of play across participants. The percentage of time spent in play activities characterized as functional or symbolic is presented as a function of the progression of the intervention. Additionally, Figure 3 presents changes in only the social dimension of play across participants. The percentage of time spent in play activities characterized as having a common focus is presented over time following the same progression.

All participants demonstrated notable gains in functional/symbolic object play (see Figure 2) as well as in social play involving common focus across all sessions and conditions following baseline (see Figure 3). In particular, as indicated in Table II, Jonah's symbolic play was observed during the Probe II condition only, where it occurred at an average of 15% of the time. Craig's symbolic and functional object use as well as common focus rose to approximately 100% in the final probed condition. Moreover, while symbolic play was absent during baseline condition for Craig, it rose to 11% during the final phase of intervention.

Social Validation and Generalization

Parent and Teacher Interviews. Upon examination of the interview transcripts, themes pertaining to the play and related behavior changes of each child were categorized as follows: functional and symbolic forms of play versus manipulative (stereotyped) play, diversity of play, attachment to socially appropriate objects, peer/sibling relationships and friendships, and behavior changes. Table III summarizes for each child, parent and teacher responses according to the themes recorded, suggesting considerable individual growth.

Individual Symbolic Play Assessment. The results of the pre- and post-assessments of each child's individual play are presented in Table IV. Notable increases were observed for all participants in terms of total number of different play acts (diversity of play) and percentage of functional/ symbolic play acts. Concurrently there were decreases in the percentage of manipulative/stereotyped play acts for all participants. For two of the participants (Jonah and Craig) there were increases in the total number of objects used, total number of words spoken, and the mean length of verbal utterances.

DISCUSSION

The integrated play groups model as a whole is effective in enhancing play. Although determining which components of the model are most

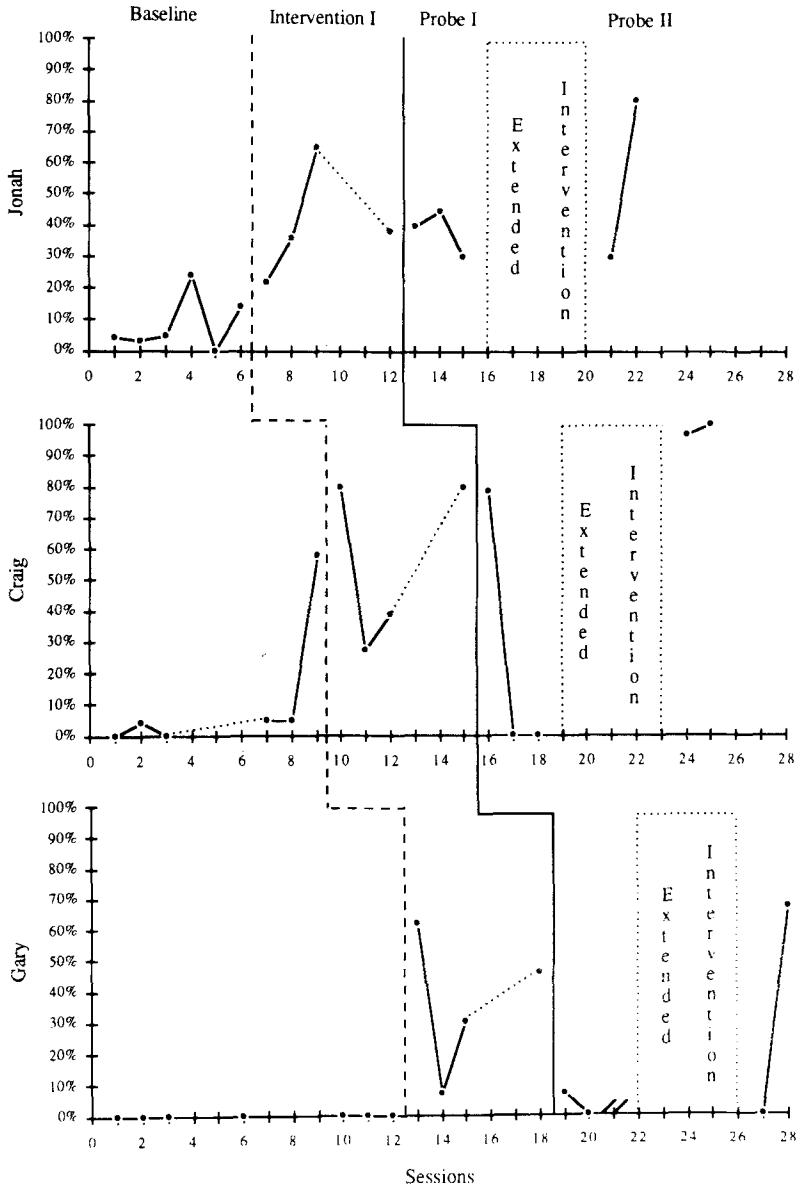

Fig. 2. Percentage of time engaged in functional/symbolic play.

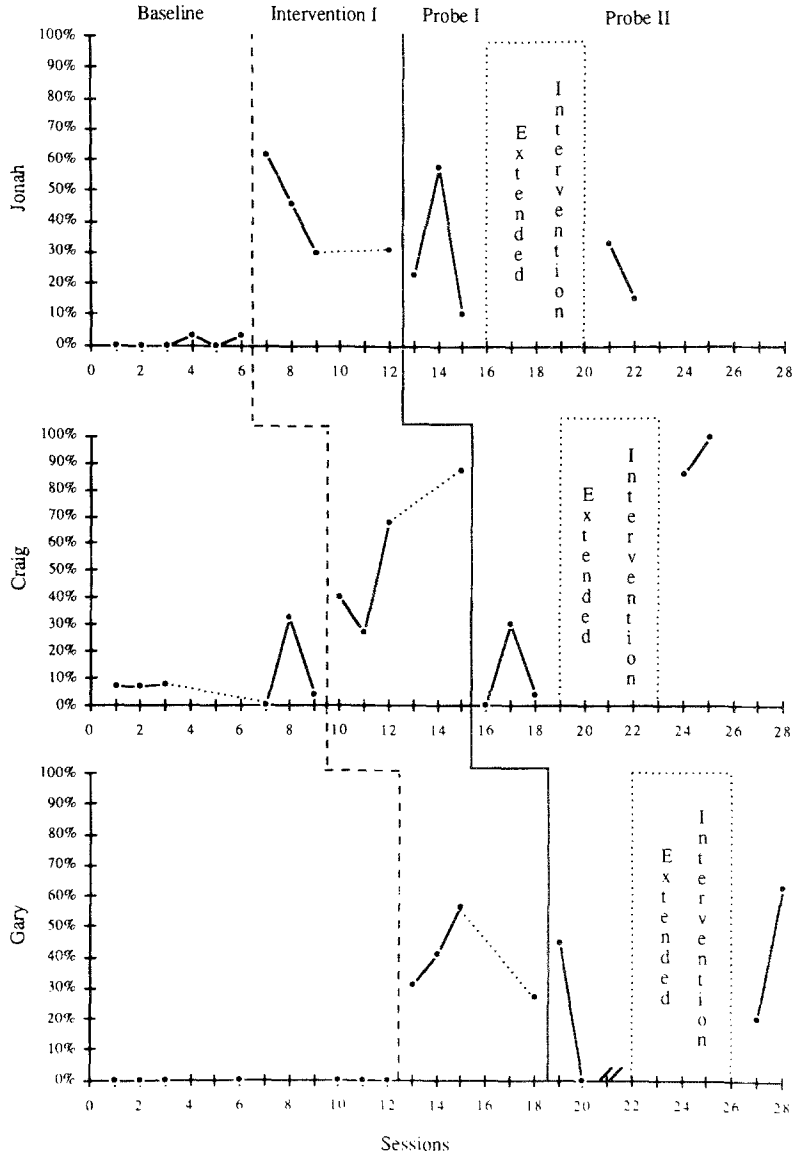

Fig. 3. Percentage of time engaged in common focus.

Table III. Summary of Interviews with Parents and Teacher[a]

Themes	Jonah	Craig	Gary
Attachment to socially appropriate objects	Sometimes you put him to bed and he sleeps with a doll beside him. (P) He has his little stuffed animals and he pats the back. (P)		I caught him last night just rocking the doll. I have a rag doll in my living room, in a rocking chair. Rocking the doll, just holding the doll and rocking it like a baby. (P)
Peer/sibling relationships and friendships	He doesn't have a lot of playmates (at home) so I really don't know if in school he likes to play with other kids. He doesn't have brothers or sisters. (P) R. (male play group peer) would nonverbally, extend himself to Jonah . . . somehow initiate contact with him so that Jonah would realize that it was safe to come over . . . . And that was the first relationship that I saw happen for Jonah. (T)	He asks to have L. (female classmate) come over to the house, he asks for E (male classmate) all the time . . . Tony (male play group peer) is coming to his roller skating birthday party. (P) And of course Craig has made his first friend, and that's Tony. He loves Tony and Tony loves him. I could see a relationship that they would have over the years, because there is a real fondness there. (T)	C. is his older sister. She's 10 years old. Its wonderful for him, they're very close and they play a lot together. So, its only happened that they have been close basically, within the past year and a half. (P)
Behavior change	Even his Dad said, he was telling me the other day, that before, he would never touch toys, he would break them and start banging. Now he would play with it, he's not breaking it. (P)	He definitely likes being around children, but then if they intrude in his space too much, he kind of gets upset and doesn't know what to do. (P)	I notice more . . . choosing to be with people and not being fearful, and not going away and secluding himself

	In my mind, Jonah has made the most dramatic change because he just couldn't sit or be anywhere for more than 5 minutes without hitting a chair or hitting himself or striking a person. And he has really made progress, especially in play group. (T)		in his room, but wanting to be a part of it. (P)
Diversity of play	He plays with a lot of toys lately. He's interested in trucks, dolls . . . He's really interested in playing with toys. What I've noticed with Jonah is that he's really interested in reading . . . mostly reading books . . . and he sings, he loves to sing. (P)	He's definitely more interested in putting little figures in car seats. For his birthday, I bought him a real cheapo schoolbus that has room for about 14 little people and he just loves it . . . That's taking up the majority of his play time right now. (P)	He uses other toys, exploring more and finding out there are other things that are just as much fun and just as appropriate, that you get the same type of thrill from it. (P)
Functional/symbolic vs. Manipulative (stereotypic) play	He really would watch kids and go over and imitate what they were doing. (T)	(in reference to toy schoolbus) . . . And the people go through the door, he opens the door, they go through the door, they walk down the aisle and they sit in the seat. (P)	He pulled up the children's table and chair and he sat down, the doll on one side and he just sat down and he pulled it all together . . . and he'll bring a doll with him and he'll set it down in a little buggy . . . He had a little tin and he was pretending cup and things like that. Just pretend. (P)

[a] P refers to parent response; T refers to teacher response.

Table IV. Results of Individual Symbolic Play Assessment

	Jonah		Craig		Gary	
	Pre	Post	Pre	Post	Pre	Post
Total no. of play acts	23	19	11	7	15	27
Total no. of different play acts	9	15	3	6	4	6
Total no. of objects used	7	10	5	6	4	3
% of manipulative/stereotyped play acts	78	32	82	42	10	81
% of functional/symbolic play acts	22	68	18	58	0	19
Total no. of words spoken	2	6	3	41	0	0
Mean length of utterance	1	2	1	5	0	0

pertinent is difficult without further research, guided participation appears critical during the initial phases of play acquisition, and should not be withdrawn prematurely. Considering the stringent criteria used to concurrently evaluate both cognitive and social dimensions of play, the changes observed are most noteworthy. Moreover, as judged by posttreatment measures pertaining to social validation and individual play gains, the changes extend beyond the intervention setting. The most striking changes were demonstrated by Craig who reached target levels of play almost 100% of the time. In addition, the interview data indicate that a first friendship (with a nondisabled peer) was established in the context of the play group, which carried over to the home environment. Despite some inconsistencies and variability in intervention data for Jonah and Gary, evidence was presented of remarkable qualitative changes in play and related behaviors across school and home settings. These changes include attachment to socially appropriate toys (i.e., dolls, stuffed animals) and pretend play, as well as decreases in aberrant behaviors (see Table III).

Variability and apparent inconsistencies in intervention data may be accounted for by several factors. First, criteria for the selection of most representative play samples are not easily established, particularly when the contextual variation inherent in peer and related context variables (e.g., peer responsiveness will vary as a function of the current play focus) is considered. Another source of variation lies in the combination of the social and cognitive dimensions of play in one measure. For instance, in Jonah's case the apparent drop in performance observed in the Follow-up: Probe

II condition (see Figure 1) may be explained by the fact that a high level of functional/symbolic play was masked by his involvement in parallel rather than in more closely coordinated social play (i.e., common focus) (see Table II). The apparent drop in performance may thus be explained as a measurement artifact.

A similar measurement artifact may explain Gary's apparent low level of performance in the first Probe II session (see Figures 1 and 2). During this session, Gary was observed to imitate peers in terms of their selection of toys for which he was not credited because he used the toys in a stereotyped fashion. However, with regard to the social dimensions of play, the use of toys in stereotyped ways set the stage for Gary's closer and closer physical approximations within the play space of his peers. In fact, Figure 3 suggests that this strategy was used to establish common focus with his peers (observed approximately 20% of the time) and was, therefore, functional. Unfortunately, these types of strategies and the overall processes involved in learning to play with peers are not captured by the type of data collected in this study. More qualitative types of research need to be undertaken to illuminate these processes.

Variations in treatment outcome across participants raise fundamental questions pertaining to the role of speech and language in the ontogenesis of pretend play. It is of interest that the two participants who progressed to symbolic play exhibited speech, albeit of limited communicative significance, at the onset of this study. While there was initial evidence of some referential and communicative functions, they were of a highly concrete and instrumental nature. No evidence was found of any grammatical organization as all words and phrases were highly stereotyped and of an apparent echolalic nature (Schuler & Prizant, 1987). Nevertheless, the presence of initial speech skills may have been of critical importance in the emergence of symbols.

A related critical question pertains to the indirect language and communication benefits of participation in integrated play groups. Informal analyses of transcripts of verbal interactions during the observed play group sessions as well as during the individual symbolic play assessments show evidence of significant language gains for both Craig and Jonah. The language gains observed include a greater variety of linguistic forms as well as communicative functions, including the type of socially referenced communication that is so rarely observed in individuals with autism (Fay & Schuler, 1980; Tager-Flusberg, 1981; Wetherby & Prutting, 1984). The use of integrated play groups as an indirect tool to enhance communicative competence deserves close investigation.

The fact that gains in functional and symbolic object use appear to go hand in hand with gains in functional and symbolic language use invite

further speculations on the interrelations between the acquisition of symbolic language and pretend play. Informal observation and examination of collected play and language samples suggest that "echo-play-lia," defined as the literal repetition of play of others, may be as instrumental in learning to play as echolalia to learning to talk (Prizant & Duchan, 1981). Difficulties in separating echolalic from true language use may be even surpassed by the difficulties encountered in separating true pretend play from echo-play-lia. In this study, we used the most stringent criteria for coding pretend play demanding concurrent verbalizations and/or vocalizations. It needs to be determined to which extent gestures and formalized nonspeech communication systems as well as other expressions of affect could take the place of speech in pretend play. By the same token, it would be of interest to research the impact of integrated play experiences on the normalization of affect.

Another question for future research pertains to the interdependence of gains across the social and cognitive dimensions of play. Gary's case suggests that the two may not always operate in tandem. While it is difficult to attribute gains in play to either changes in the behaviors of the typical peers or the children with autism, it is our impression that they affected each other in a transactional fashion (Sameroff & Chandler, 1975). It is our observation that changes in the social dimensions of play seemed more readily obtained as compared to transitions to functional and particularly symbolic object use. The presence of peers allowed children to imitate and practice more advanced play behaviors. These newly appropriated skills subsequently surfaced in solitary play activities. Commensurate with Bruner's (1975) and Vygotsky's (1978) claims, this underlies the importance of social support for cognitive advances.

The rather dramatic gains demonstrated by the participants invites speculation on the nature of the symbolic deficits so commonly ascribed to the syndrome. While basic deficits in symbolic operations have often been assumed, the data here presented urge a careful reevaluation of such claims. One might speculate that the deficiencies demonstrated are not so much a result of basic cognitive deficiencies, but rather secondary to limited social experience. It would be of interest to determine whether demonstrated gains in play are accompanied by gains in the understanding of the perspectives, beliefs and feelings of others as different from oneself, a capacity that has been described as having a theory of mind, as was first discussed in the context of autism by Baron-Cohen, Leslie, and Frith (1985). A more systematic study of the social–cognitive gains that accompany improvements in play might help to elucidate the origin of those mental abilities that have lately been described in the context of theory of mind.

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