

*INDEPENDENT AND SOCIAL PLAY AMONG PROFOUNDLY MENTALLY
RETARDED ADULTS: TRAINING, MAINTENANCE,
GENERALIZATION, AND LONG-TERM FOLLOW-UP*

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Play skills were taught to eight profoundly mentally retarded adults in two interrelated experiments. In Experiment 1, a multiple baseline across subjects design was used to assess the efficacy of verbal and physical prompts on independent play. In Experiment 2, the same subjects and experimental procedures were used to develop social play. Verbal prompting and graduated physical guidance procedures were found to be effective in substantially increasing independent play in Experiment 1 and social play in Experiment 2. Positive changes were also observed in collateral behaviors. Inappropriate play decreased slightly and stereotypy decreased to very low levels. Social interaction increased substantially in Experiment 2 when social play was targeted but little change was observed in Experiment 1 when only independent play was targeted. Treatment gains were maintained for 26 weeks in Experiment 1 and 10 weeks in Experiment 2. In addition, the treatment gains were generalized across subjects and settings in Experiment 2. Finally, regular follow-up checks showed that independent and social play remained in the repertoire of the subjects for 12 months following the termination of programmed maintenance.

DESCRIPTORS: independent play, social play, prompting, profoundly mentally retarded adults, stereotypy, social interaction

The failure of institutionalized mentally retarded persons to engage in appropriate play and leisure activities has been well documented (see Singh & Winton, 1983). When compared to others, profoundly mentally retarded persons are less likely to develop play skills due to the extent of their learning disability and the lack of one-to-one training and play materials in residential institutions (Marchant, 1979). Indeed, in residential institutions profoundly mentally retarded persons are more likely to engage in such behaviors as aimless wandering, stereotypy, self-injury, and aggression rather than in play (Berkson & Davenport, 1962).

Several studies have focused on the development of independent play in severely and pro-

foundly mentally retarded persons (Flavell, 1973; Hopper & Wambold, 1978; Kissel & Whitman, 1977; Wehman, Karan, & Rettie, 1976; Wehman & Rettie, 1975). In reviewing these studies, Wehman (1978) noted several problems with the research in this area, including continuous reinforcement of play behavior, reliance on a limited repertoire of play skills, and the lack of formal programming and assessment of maintenance, generalization, and follow-up. A more recent review (Singh & Winton, 1983) has indicated that most of these problems are still present in current research on independent play in mentally retarded persons.

Singh and Winton (1983) also reviewed studies in which institutionalized severely and profoundly retarded individuals were trained in social play. Various combinations of prompting, modeling, and reinforcement procedures were used to teach simple ball-rolling to pairs of profoundly retarded persons (e.g., Cone, Anderson, Harris, Goff, & Fox, 1978; Morris & Dolker, 1974; Whitman, Mercurio, & Caponigri, 1970). The studies on social play have been plagued with the same problems noted earlier for independent play. The type of

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social play taught has been extremely limited, with the majority of studies using ball-rolling or block-passing tasks. With a few exceptions (e.g., Cone et al., 1978; Keogh, Faw, Whitman, & Reid, 1984; Spangler & Marshall, 1983), changes in collateral behaviors have not been measured. Few studies have incorporated formal programming and assessment of maintenance and generalization, and if follow-up data have been collected, it has been done usually for no more than a few weeks.

Our study was designed to overcome some of the problems associated with previous research. Prompting procedures were used to teach independent and social play to a group of eight profoundly mentally retarded adults. The toys provided could be used for imaginative play (e.g., creative building with Lego® pieces) and fantasy play (e.g., with soft toys) in either independent or social play. In addition to training in independent play (Experiment 1) and social play (Experiment 2), a maintenance program was instituted, and generalization and long-term follow-up data were collected.

EXPERIMENT 1

METHOD

Subjects and Setting

Eight mentally retarded adult females participated in this experiment. They were between 15 and 25 years of age ($M = 21$ years), resided in an institution for mentally retarded persons, and were all classified as profoundly mentally retarded on the AAMD criteria (Grossman, 1983). They were able to dress and feed themselves under supervision and could toilet themselves. One subject received medication (Melleril, 0.7 mg/kg twice daily), but her dosage was kept constant throughout the study. None of the subjects had previously been taught to play and preliminary observations revealed that when provided with toys, they usually manipulated them in an inappropriate manner.

The experiment was conducted in a research room (5 m by 4 m) situated adjacent to the subjects'

residential unit. The room was carpeted and furnished with tables and chairs. A wide range of toys was available for the subjects during each phase of the experiment. These included peg boards, jack-in-the-box, posting boxes, dowelling toys, puppets, and paper and crayons. In addition, there were toys that could be used for social play. These included building blocks, Lego®, brickle blocks, and Tonker toys. A one-way mirror along one wall allowed independent observations to be carried out from an adjoining room. The research and observation rooms were wired for sound and video-recording so that the observers could clearly hear the experimenter's instructions and the subjects' responses.

Response Definitions

Five behaviors were recorded for the duration of the study:

1. *Independent play*: The subject uses play materials in an appropriate and independent manner.
2. *Social play*: The subject allows a peer to take, touch, or manipulate play materials that the subject was using, or two subjects are involved in a cooperative play activity (e.g., adding blocks to the same tower).
3. *Inappropriate play*: The subject manipulates play materials in a manner that does not constitute appropriate use of toys (e.g., repetitive manipulation, fiddling, or destructive actions with toys).
4. *Social interaction*: The subject directs positive attention towards another subject or subjects (e.g., physical attention, smiling). This category does not include eye contact on its own.
5. *Stereotypy*: Any rhythmic or repetitive movement of body parts (e.g., rocking, head-rolling, complex finger movements).

Data Collection and Reliability

Data were collected by one observer, randomly selected from a pool of six others, on a daily basis. Daily experimental sessions were scheduled from 1:30 to 2:30 p.m., 5 days a week. Observations began when the subjects were seated at the table. A whole-interval recording procedure was used, with each interval being 10 s. A timer signaled

through earplugs the end of each 10-s interval to the observer.

The six observers were trained in the use of the behavioral observation system until their interobserver agreement with a randomly assigned partner was above 85% on five successive occasions. An interval-by-interval agreement method was used to compute interobserver reliability. An agreement was scored if both observers recorded the occurrence or nonoccurrence of the same behavior during the same interval. Reliability checks were made on 25% to 30% of the observation sessions in each phase for each subject. Mean occurrence and nonoccurrence reliabilities were, respectively: independent play—87% (range, 81%–100%) and 75% (69%–92%), social play—96% (86%–100%) and 90% (85%–97%), inappropriate play—84% (79%–98%) and 82% (75%–95%), social interaction—88% (83%–97%) and 80% (75%–92%), and stereotypy—94% (87%–100%) and 81% (70%–96%).

Procedure

A multiple baseline across subjects design (Kazdin, 1982) was used to assess the effects of verbal and physical prompts on independent play in the eight subjects. The experiment consisted of the following phases:

Baseline. During baseline the subjects were taken to the research room and seated at the table where a large variety of toys was available. There were enough toys for each subject to have at least three different ones per session. In addition, there were several toys that could be used in social play. The subjects were instructed to play with the toys. If a subject wandered away from the table, she was verbally prompted to return to her seat. Physical guidance was used if the subject did not respond to the verbal prompt.

Intervention. Verbal and physical prompts were introduced sequentially across the eight subjects during sessions 5, 9, 13, 17, 21, 25, 29, and 33. During training, the experimenter stood behind the subject, verbally instructed the subject to play with one of the toys that was directly in front of her, and provided physical guidance if the subject

did not respond appropriately to the request. The experimenter placed her hands on the subject's hands and gently guided her to play with the toy. Physical guidance was graduated so that only the minimum amount was used, and was withdrawn as the subject began playing by herself. Training was carried out for 1 min preceding the observation of that subject. During this time, the experimenter stood behind the subject regardless of the behavior of the subject. Once all subjects were receiving training, the experimenter used the procedure for 1 min with the first subject, then with the second subject for the second minute, and so on with the rest of the subjects. While the experimenter was training the second subject, the observer recorded the behavior of the first subject for 1 min, then recorded the behavior of the second subject for 1 min while the experimenter was training the third, and so on.

Once there was an increasing trend in independent play for the 1-min period following intervention, each subject's behavior was observed five times for 2 consecutive min each. A second observer was required during this phase so that alternate subjects could be observed by the two observers. The experimenter now verbally prompted each subject when necessary during a 2-min period. Graduated physical guidance was used if the subject did not respond to the verbal prompt. Each subject was observed for 10 min in each 40-min session.

When the mean rate of independent play reached 60% or more for all subjects, formal individual training was terminated. The experimenter verbally prompted only those subjects who needed prompting. Graduated physical guidance was used when necessary. Observations were now carried out by four observers, with each observer alternating six times between two subjects, every five min, during a 1-hr session. Thus one experimenter provided either verbal or physical prompts if necessary (i.e., once or twice per subject per session, on average) and four observers recorded the subjects' behavior, with each subject being observed for 30 min in each 1-hr session.

Maintenance. The maintenance phase began when all subjects exhibited independent play in

80% of intervals observed. The subjects were observed once a week for 6 months. Verbal prompts were provided when necessary (i.e., on average, once per session per subject) and data were collected for a total of 30 min per subject in a 1-hr session.

RESULTS

Figure 1 presents the percentage of intervals each subject engaged in independent and inappropriate play. The mean rate of all behaviors for each subject across the five phases is presented in Table 1. Independent play occurred at very low rates during baseline, with the mean rates ranging from 0% to 5%. Following the introduction of verbal and physical prompts, independent play increased substantially for all subjects. It remained at high levels during the 10-min and 30-min observation phases. Social play changed little throughout the experiment, remaining at near-zero levels across all subjects. Similarly, social interaction also remained at low levels during training for independent play.

Inappropriate play occurred at a variable, low rate during baseline, ranging from about 1% to 30% across all subjects. During intervention, inappropriate play decreased for five subjects and increased for three. However, by the end of the intervention phase no subject engaged in inappropriate play for more than 10% of all intervals observed.

Stereotypy occurred at high rates during baseline, with the lowest mean rate being 64%. With the introduction of training for independent play, stereotypy decreased dramatically for all but one subject. By the end of the intervention phase, stereotypy occurred for less than 8% of all intervals observed for any one subject.

Independent play remained at high levels during the 26-week maintenance period, with the lowest mean rate being about 82% of all intervals observed for one subject. Social play, social interaction, and inappropriate play remained at very low levels during the maintenance period. Finally, stereotypy remained at low levels during this period, with the highest mean rate being no higher than about 8% for any one subject.

EXPERIMENT 2

The efficacy of prompting procedures in the development of independent play skills was demonstrated in Experiment 1. However, minimal positive changes were noted in two collateral behaviors, social play and social interaction, despite the fact that independent play was maintained over a 6-month period following training. Experiment 2 was designed to assess the efficacy of the prompting procedures in increasing social play among the same subjects and to assess its effects on collateral behaviors, including independent play.

METHOD

Subjects and Setting

All eight subjects from Experiment 1 participated, and the same setting was used for the training sessions. In addition, the playroom in the subjects' residential unit was used to assess generalization. This room was approximately the size of the research room and contained a variety of toys that could be used for independent and social play. Some of the toys were similar to those in the research room, others were of a different variety.

Response Definitions

The same response definitions were used as in Experiment 1.

Data Collection and Reliability

Data were collected by six observers, three of whom had participated in Experiment 1. The new observers were trained on the response definitions, and baseline observations were initiated when the interobserver reliabilities between random observer pairs were over 85% on five consecutive sessions for each observer. Data collection procedures during intervention were similar to those of the initial training phase in Experiment 1. Data were collected between 1:30 and 2:30 p.m., 5 days a week. In addition, to assess stimulus generalization of the subjects' behavior, observations were undertaken in a second setting from 3:00 to 4:00 p.m. at regular intervals throughout the experiment.

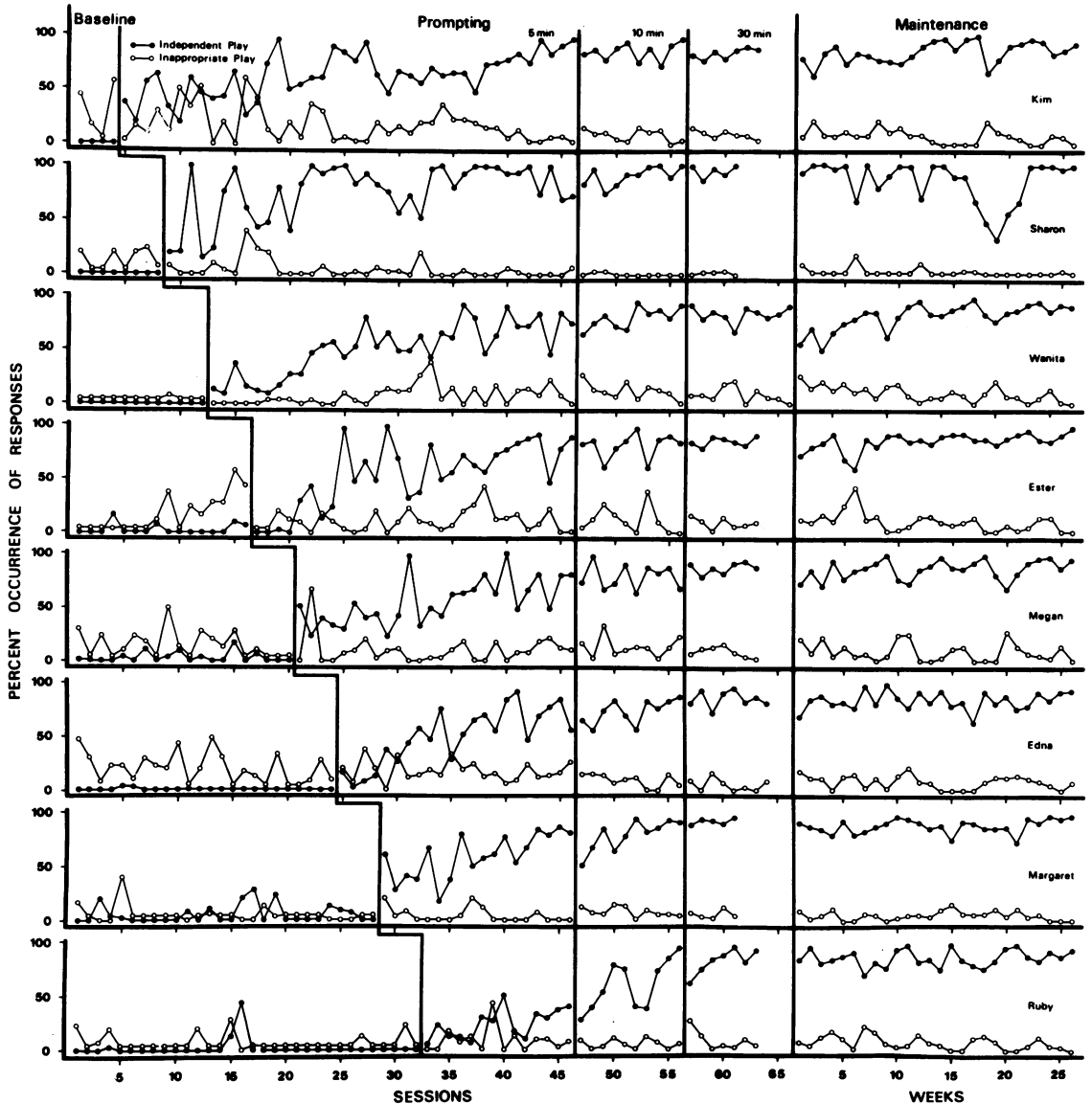


Figure 1. The percentage of independent and inappropriate play for all subjects. Five, 10, and 30 minutes refer to the length of the observation per subject during each phase. Following session 65, maintenance data were collected 1 day a week.

The recording and reliability procedures were the same as in Experiment 1. Reliability checks were made on 20% of the baseline and training sessions, 50% of the maintenance sessions, and 100% of the follow-up sessions. Mean occurrence and nonoccurrence reliabilities were, respectively: independent play—85% (range, 78%–96%) and 83% (75%–96%), social play—87% (80%–93%) and 87% (77%–93%), inappropriate play—82%

(76%–89%) and 75% (64%–87%), social interaction—89% (83%–100%) and 67% (58%–95%), and stereotypy—92% (85%–100%) and 74% (68%–93%).

Procedure

A multiple baseline across subjects design (Kazdin, 1982) was used to assess the effects of verbal and physical prompts on the social play of the

Table 1
Mean Percent Occurrence of Behaviors Across Conditions

Experimental condition	Independent play	Social play	Inappropriate play	Social interaction	Stereotypy
1. Kim					
Baseline	0.0	0.0	30.0	0.0	64.0
Prompting					
5 min observations	63.0	0.0	17.5	1.2	16.2
10 min observations	85.2	0.0	8.7	1.6	4.1
30 min observations	85.0	0.0	9.7	0.0	4.6
Maintenance	84.3	0.0	7.9	0.0	5.4
2. Sharon					
Baseline	0.0	0.0	11.8	0.0	78.0
Prompting					
5 min observations	74.9	0.5	4.4	0.7	14.8
10 min observations	91.6	0.0	0.6	0.0	6.7
30 min observations	95.6	0.0	1.8	0.0	2.0
Maintenance	86.5	0.0	1.7	3.6	6.0
3. Wanita					
Baseline	0.0	0.0	0.8	0.0	93.0
Prompting					
5 min observations	52.0	0.0	7.6	0.0	33.1
10 min observations	80.0	0.0	12.5	0.0	5.4
30 min observations	83.4	0.0	8.9	0.0	6.2
Maintenance	81.9	0.0	10.7	0.0	7.3
4. Ester					
Baseline	2.6	0.0	15.3	0.0	71.4
Prompting					
5 min observations	53.9	0.0	10.7	0.0	29.3
10 min observations	76.7	0.0	12.1	0.5	5.5
30 min observations	85.3	0.0	9.0	0.0	5.7
Maintenance	85.2	0.0	9.9	0.6	3.7
5. Megan					
Baseline	2.7	0.0	13.5	0.0	77.5
Prompting					
5 min observations	55.0	0.0	9.7	0.1	29.0
10 min observations	78.7	0.0	13.6	0.0	3.7
30 min observations	87.0	0.1	9.1	0.0	3.4
Maintenance	85.5	0.2	8.9	0.2	4.2
6. Edna					
Baseline	0.3	0.0	19.6	0.0	70.5
Prompting					
5 min observations	50.2	0.0	17.2	0.0	28.2
10 min observations	73.8	1.0	9.4	2.3	10.5
30 min observations	85.9	0.6	5.8	0.0	5.0
Maintenance	83.6	0.9	8.2	0.4	5.0
7. Margaret					
Baseline	5.1	0.5	3.1	0.3	79.7
Prompting					
5 min observations	58.7	0.0	4.1	0.1	29.3
10 min observations	78.2	1.0	7.5	0.9	10.3
30 min observations	91.2	1.0	4.8	0.4	2.4
Maintenance	88.4	0.7	5.0	1.0	4.4

Table 1 Continued
 Mean Percent Occurrence of Behaviors Across Conditions

Experimental condition	Independent play	Social play	Inappropriate play	Social interaction	Stereotypy
8. Ruby					
Baseline	1.9	0.1	4.3	2.6	72.6
Prompting					
5 min observations	23.8	0.0	8.8	0.7	63.1
10 min observations	60.4	0.0	5.5	0.0	31.5
30 min observations	82.1	0.0	8.0	0.6	7.9
Maintenance	85.7	0.3	6.9	2.6	3.9

eight subjects. The experiment consisted of the following phases:

Baseline. During baseline, the subjects were taken to the research room and seated in pairs at the table. They were verbally prompted to play with the toys available on the table, and if they wandered away from the play table they were asked to return or were physically led back to it. Data were collected for 30 min per subject in each 1-hr session.

Intervention. Verbal and physical prompts were introduced sequentially across the four pairs of subjects in sessions 5, 9, 13, and 17. During this phase, the trainer stood between the target pair of subjects and verbally instructed them to play together with the toys in front of them. The trainer physically guided each subject's hands as much as necessary, fading out her assistance as each subject began playing with her partner. The trainer used the prompting procedures with each pair of subjects for 2 min before moving on to the next pair of subjects. Each pair was observed for the 2-min period immediately following 2 min of training. Each subject was observed for a total of 10 min during the 40-min observation period. From session 25 each subject was free to select her own partner. When prompted to select a partner, the subjects chose to play with whomever was nearest to them. Thus new pairings usually occurred in each session. Formal training in social play was terminated after 30 sessions.

Maintenance. Maintenance of the subjects' behavior was monitored for an additional 10 weeks,

1 day each week. During this phase, a group nurse was assigned to the subjects and she verbally prompted them to play at the beginning of each session. Data were collected in the same way as during the baseline phase for 30 min per subject in each 1-hr session.

Follow-up. Follow-up data were collected for 1 year. The subjects had daily access to the play materials during this phase, with damaged or broken objects being replaced every 3 months. Observations were scheduled as in baseline. During this phase, follow-up and generalization probe (see below) data were collected on the same day, once a month. No training was given to the subjects during this phase.

Stimulus generalization. Generalization was assessed at regular intervals throughout the study. Data collection procedures were identical to those used in baseline and no training was provided. Data were collected in a new setting and a second group of eight profoundly mentally retarded females was present in this setting.

RESULTS

Figure 2 presents the percentage of intervals each subject engaged in independent and social play. The mean rate of all behaviors for each subject across all conditions is presented in Table 2. Seven of the eight subjects did not engage in any social play during baseline. The eighth subject had a mean of 1.5% social play during baseline. Social play increased with the introduction of training, with the mean rate across subjects ranging from

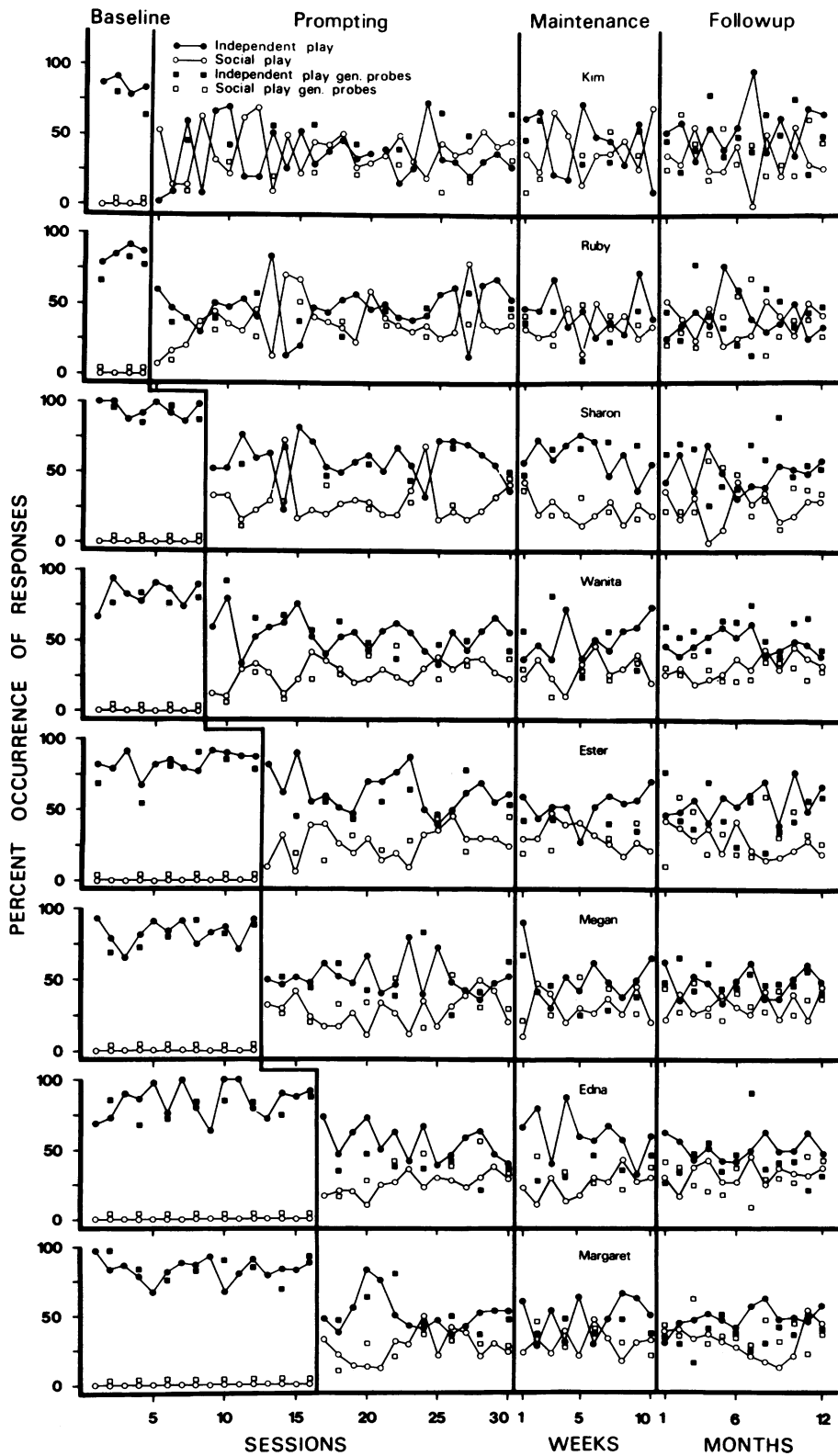


Figure 2. Percent occurrence of independent and social play for all subjects. Maintenance data were collected 1 day each week and follow-up data, 1 day each month.

26.3% to 38.9% of all intervals observed. Independent play, which occurred at high levels (83%–94%) during baseline, decreased to between 36% and 64% of intervals observed when the prompting contingency was implemented for social behavior.

There were minor changes in the occurrence of inappropriate play and stereotypy when training was initiated, but these were mainly positive. Social interaction, which had not exceeded 2% of the intervals during baseline, increased to between 7% and 18%.

The maintenance data showed that changes observed in the behaviors of all subjects during intervention were maintained at about the same level during the 10-week period. Similar results were obtained in the 12-month period following the termination of programmed maintenance. Indeed, small but positive changes were noted in some behaviors (e.g., decrease in inappropriate play).

Table 3 presents data on the mean percent occurrence of all behaviors during the generalization sessions. Overall, the generalization data follow the trend obtained with the intervention data. Social play in the second setting increased from no occurrence during baseline to at least 22% when training was introduced in the first setting. This increased further in the following phases, with the lowest mean occurrence of 30% during follow-up. As in the first setting, decreases were observed in independent play, inappropriate play, and stereotypy when the intervention was scheduled in the first setting. Finally, social interaction increased in all but one subject (Ester); it remained about the same for this subject.

DISCUSSION

Results of this study clearly demonstrate that verbal and physical prompts were effective in the acquisition and maintenance of independent and social play in a group of profoundly mentally retarded adult females. In Experiment 1, the introduction of prompts resulted in a rapid increase in independent play which was maintained for 6 months following intervention. In Experiment 2,

Table 2
Mean Percent Occurrence of Behaviors Across Conditions

Experimental condition	Independent play	Social play	Inappropriate play	Social interaction	Stereotypy
1. Kim					
Baseline	84.8	0.0	8.0	0.0	2.3
Prompting	36.0	38.9	6.9	11.8	4.6
Maintenance	44.0	41.2	4.0	7.0	3.0
Follow-up	55.1	33.8	1.3	7.3	1.5
2. Ruby					
Baseline	85.5	1.5	6.5	0.0	5.5
Prompting	46.9	36.7	3.7	7.4	5.3
Maintenance	44.9	33.9	7.7	5.5	5.7
Follow-up	42.3	37.9	5.2	7.7	4.1
3. Sharon					
Baseline	94.4	0.0	0.0	1.5	2.0
Prompting	58.5	29.6	0.2	6.7	4.5
Maintenance	61.4	23.6	2.4	6.6	5.4
Follow-up	49.4	25.2	2.4	17.6	5.5
4. Wanita					
Baseline	83.1	0.0	6.0	1.6	6.5
Prompting	54.6	27.2	8.2	6.2	3.5
Maintenance	51.4	29.3	3.2	11.3	4.0
Follow-up	48.6	31.7	3.0	10.8	3.8
5. Ester					
Baseline	83.6	0.0	9.5	2.0	2.1
Prompting	63.9	26.9	2.6	5.3	2.3
Maintenance	53.6	31.5	1.5	7.8	4.5
Follow-up	56.3	28.8	0.3	11.3	2.3
6. Megan					
Baseline	83.3	0.0	7.0	1.3	5.5
Prompting	52.0	28.4	5.9	5.3	5.3
Maintenance	52.1	30.4	2.6	8.0	1.6
Follow-up	47.9	32.5	3.0	9.3	5.6
7. Edna					
Baseline	84.9	0.0	8.9	0.0	5.3
Prompting	55.1	26.3	4.9	7.7	3.9
Maintenance	60.6	25.0	1.3	8.9	2.6
Follow-up	51.8	33.0	2.4	9.5	4.3
8. Margaret					
Baseline	83.6	0.0	10.1	0.3	5.4
Prompting	50.7	26.8	3.3	10.1	5.9
Maintenance	49.2	29.3	4.7	15.7	0.9
Follow-up	48.3	31.0	1.7	9.3	3.8

independent play decreased and social play increased with the introduction of prompts for social play. Both independent and social play were maintained for 10 weeks following intervention, and

Table 3
Generalization Probes: Mean Percent Occurrence of
Behaviors Across Conditions

Experimental condition	Independent play	Social play	Inappropriate play	Social interaction	Stereotypy
1. Kim					
Baseline	73.0	0.0	13.0	0.0	11.0
Pair training	51.9	22.3	7.6	6.6	9.4
Maintenance	46.2	32.2	3.6	14.2	3.0
Follow-up	49.3	39.4	3.2	4.3	3.8
2. Ruby					
Baseline	75.0	0.0	12.3	4.0	6.0
Pair training	44.2	33.1	7.4	5.6	5.8
Maintenance	33.0	37.4	6.6	9.2	5.4
Follow-up	42.4	36.3	5.2	6.3	5.1
3. Sharon					
Baseline	91.5	0.0	0.0	1.8	4.5
Pair training	57.0	29.9	0.0	3.7	7.0
Maintenance	64.6	26.6	0.0	7.0	1.4
Follow-up	57.4	33.4	0.0	6.9	2.3
4. Wanita					
Baseline	79.0	0.0	5.5	0.0	6.3
Pair training	56.9	28.4	4.6	7.3	3.0
Maintenance	51.4	26.6	5.2	13.4	4.6
Follow-up	56.3	30.8	2.3	7.3	3.0
5. Ester					
Baseline	77.5	0.0	8.2	3.8	9.3
Pair training	56.5	28.5	2.4	5.6	1.8
Maintenance	39.4	28.6	2.4	11.4	9.4
Follow-up	47.5	34.9	1.3	3.6	8.0
6. Megan					
Baseline	82.3	0.0	7.5	4.8	5.0
Pair training	50.6	33.0	2.7	4.3	5.0
Maintenance	41.4	34.6	3.4	5.0	7.2
Follow-up	50.6	35.9	1.8	5.9	3.3
7. Edna					
Baseline	80.4	0.0	10.1	0.0	6.1
Pair training	37.1	38.1	3.4	12.0	8.0
Maintenance	37.8	33.8	2.6	13.6	6.8
Follow-up	42.1	30.3	0.3	14.0	5.7
8. Margaret					
Baseline	84.3	0.0	8.0	0.0	5.0
Pair training	51.9	27.1	3.6	8.7	5.0
Maintenance	39.8	31.6	0.2	13.2	8.2
Follow-up	36.0	38.0	0.9	17.3	2.6

for a period of 1 year following the termination of maintenance procedures. Furthermore, both these behaviors generalized across subjects and settings.

In both experiments, the use of prompts for independent or social play produced concomitant changes in collateral behaviors. Stereotypy, a maladaptive behavior that was exhibited at high rates during baseline in Experiment 1, was reduced to very low levels following intervention for independent play. This is consistent with the findings of previous studies demonstrating an inverse relationship between maladaptive behavior, such as stereotypy, and play (e.g., Cone et al., 1978; Flavell, 1973; Singh, Dawson, & Manning, 1981; Wehman et al., 1976). Stereotypy remained at very low levels throughout maintenance in Experiment 1 and across all phases of Experiment 2.

Inappropriate play decreased in those subjects who had a high rate (from 12% to 30%) during baseline in Experiment 1. Social play and social interaction remained at near-zero levels throughout Experiment 1, indicating that for these subjects, there was no generalization from independent to social play in Experiment 1. Once prompts were introduced for social play in Experiment 2, the behavior increased with, as may be expected, a concomitant decrease in independent play. Social interaction increased as well without any specific programming. Thus, it appears that social interaction can be increased by focusing on social rather than independent play, a condition that has not been evident in the current literature.

Few studies on the development of independent and/or social play in profoundly mentally retarded persons have provided data on changes of collateral behaviors. Cone et al. (1978) showed concomitant changes in self-stimulation, aggression, and inactivity of five profoundly mentally retarded children due to training in social interaction. Spangler and Marshall (1983) reported reductions in stereotypy with increased purposeful behavior and Keogh et al. (1984) found that severely retarded adolescents increased their verbal interactions as a consequence of engaging in social/leisure skills. When taken in concert, these studies suggest that focusing on one

socially significant behavior such as social play may result in major reductions of maladaptive behavior and an increase in other, adaptive, behaviors. Indeed, future studies should investigate the possibility of using such a tactic when dealing with maladaptive behaviors rather than focusing on the maladaptive behavior itself.

Results of Experiment 2 showed that the subjects' responses generalized across subjects and settings without specific training. Independent play was observed in a novel setting during both baseline and intervention sessions. However, social play generalized to the novel setting only when intervention was introduced in the experimental setting. In this experiment, the trained subjects engaged in social play with a group of eight new (untrained) residents in an extra-training setting. In addition, changes in other behaviors were noted in both the experimental and novel settings only when prompts were used for social play.

Other studies have reported little or limited generalization of newly acquired social behavior from experimental to nontreatment settings. For example, Burney, Russell, and Shores (1977) developed social responses in two profoundly retarded children but found only limited stimulus and response generalization with one of the subjects. Mayhew, Enyart, and Anderson (1978) increased naturally occurring but low-rate social behaviors of 18 severely and profoundly retarded adolescents in an unstructured ward environment. However, this increased social behavior did not generalize to other nontreatment settings. Finally, cooperative play did not generalize to other settings in the Cone et al. (1978) study in the absence of explicit instructions.

In contrast, our study demonstrated generalization of independent and social play, and of several collateral behaviors, across subjects and settings. When generalization occurs in the absence of specific programming, it is often difficult to explicate its occurrence. In our study, it is likely that situational generalization of independent play occurred in Experiment 2 because the new setting shared several features (e.g., toys, institutional furniture) in common with the training setting. In

addition, because the prompting procedure used did not include the establishment of reinforcement contingencies, this suggests that naturally occurring reinforcers maintained independent and social play. By relying on natural reinforcers, the procedure may have enhanced maintenance and generalization.

Most studies on the development of social behavior in profoundly mentally retarded persons do not include long-term follow-up (Singh & Winton, 1983). This is a serious omission because in the absence of programmed intervention subjects usually revert to their original behaviors. In our study, data collected regularly during a 1-year follow-up showed that the newly acquired behaviors were present during this period. It is likely that behavioral trapping may have occurred, with both the subjects and their caregivers finding their newly acquired social behaviors very reinforcing.

In this study, various toys were used to increase independent and social play. It can be argued that the toys used were not age-appropriate for the young adult females who participated in the study. While we agree with the philosophy of teaching mentally retarded persons age-appropriate leisure skills, the decision to use toys in this study was based on a specific request made by the parents of the subjects and the ward staff. The nursing staff had previously attempted but failed to teach the subjects various age-appropriate leisure skills (e.g., board games, darts) and it was suggested that one of the problems was the subjects' lack of basic play skills. Thus, it was decided by an interdisciplinary team to teach them basic play skills with the sort of toys used in this study before making a second attempt with age-appropriate leisure skills. In addition, it was hoped that such training might reduce their levels of maladaptive behavior which interfered with their learning.

During training, the subjects' behaviors were monitored immediately following intervention, initially for 1 min and gradually increased to 30 min. Because each subject was observed during alternate 5-min periods during an hour's observation (from session 57 in Experiment 1), it can be suggested

that the data reflect the subjects' unprompted play behavior during the entire observation period. Thus, while it can be argued that the data collection procedure used may have increased the probability that intervention effects would be noted, this would apply only to the early phase of training. The data from the later intervention sessions show that the subjects engaged in independent toy play during the entire 1-hr session with virtually no prompts. Indeed, the maintenance (Experiments 1 and 2), generalization (Experiment 2), and follow-up data (Experiment 2) show that the subjects engaged in independent and/or social play in the absence of trainer prompts. If the aim of the intervention is to have severely and profoundly retarded persons engage in unprompted play for extended periods of time, this study demonstrates a method by which this can be achieved.

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