

*A SUPERVISION PROGRAM FOR INCREASING FUNCTIONAL
ACTIVITIES FOR SEVERELY HANDICAPPED STUDENTS IN A
RESIDENTIAL SETTING*

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This study was designed to increase the amount of time severely handicapped students living in a residential facility engaged in age-appropriate and functional activities. After a brief in-service training, a program involving instructions to supervisors and staff feedback was implemented in a multiple-baseline design across settings. Results showed that after the supervision program was implemented, the students' participation in activities increased. Further, these increases maintained when feedback was reduced from an average of 3 days a week during treatment, to once a month for a 5-month period.

DESCRIPTORS: residential treatment, maintenance, curriculum, staff management and training, severely handicapped children

A current emphasis in the treatment of severely handicapped individuals involves the placement of these students in the least restrictive environment. To facilitate this integration, recent literature has stressed the importance of teaching these students skills that are age-appropriate, functional, and socially significant (Brown, Nietupski, & Hamre-Nietupski, 1976). Such skills would include street crossing, food preparation, bicycle riding, or any other activity that would prepare these individuals to function as independently as possible in a variety of community environments.

Many of the existing curriculum models for severely handicapped students do not meet these criteria (Donnellan, 1980). For example, adolescent students have been observed to engage in non-functional activities such as assembling tinker toys, climbing jungle gyms, or sorting laminated shapes. Participation in such activities could result in preparing students to function only in segregated settings. Therefore, empirical data are needed to doc-

ument effective strategies that would incorporate functional and age-appropriate activities into existing treatment programs. Also, because of the recent emphasis on deinstitutionalization, residential treatment programs would particularly benefit from this type of research.

One component of effective program implementation in residential centers involves the management of staff behavior (Kazdin, 1973; Miller & Lewin, 1980; Quilitch, 1975). The first behavioral study in this area reported the positive effects of instructing staff to implement behavioral treatment procedures (Ayllon & Michael, 1959). More recently, methods used to change staff behavior have included public notices (Greene, Willis, Levy, & Bailey, 1978), contingent money (Pommer & Streedback, 1974), behavioral lotteries (Iwata, Bailey, Brown, Foshee, & Alpern, 1976), and supervision and self-management (Burg, Reid, & Lattimore, 1979; Burgio, Whitman, & Reid, 1983; Montegar, Reid, Madsen, & Ewell, 1977). Ivancic, Reid, Iwata, Faw, and Page (1981) evaluated a program involving brief in-service training, supervisory prompts, and feedback. Results showed that this program developed and maintained therapeutic language interactions between staff members and profoundly handicapped children.

A further development in staff management research has been the "pyramidal" training method,

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where staff provide training to other staff (Jones, Fremouw, & Carples, 1977). Implementation of this approach in institutional settings has proven to be cost-effective in that only a small amount of administrative time is necessary to implement training programs. This method has also been shown to be effective in producing maintenance of staff skills, because supervisors remain in the work environment (Page, Iwata, & Reid, 1982; van den Pol, Reid, & Fuqua, 1983).

Based on the suggestions of the aforementioned research that effective program implementation involves changing staff behavior, we used effective supervisory procedures to improve the quality of planned staff-to-student activities in a residential treatment setting. Specifically, the purpose of this study was to increase and maintain the use of age-appropriate and functional activities with a severely handicapped population.

METHOD

Participants and Setting

All students living in four residences for severely handicapped youths were studied. The site of the study was a private, nonprofit agency serving children with severe behavior disorders, such as severe communication deficits, social withdrawal, aggression, and self-injurious behaviors. A major agency objective included short-term residential treatment followed by a return to a less restrictive site. As a result, there were some changes in the student population throughout the study. At any one time, 32 students' behaviors were being measured. When considering the movement of students through the residences studied, the activities of 37 students were measured, and all but one of the students were exposed to both experimental conditions. The ages of the students ranged between 4.1 and 16.1 years with a mean of 11.8 years.

This study was conducted in: (a) the students' residences; (b) a simulated vocational training workshop at the facility; and (c) the grounds of the facility, which included a swimming pool, gym, playground, and central dining room. Each of the four residences housed eight students grouped to-

gether on the basis of age and functioning level. Although the residences were designed to be as homelike as possible, at the time of the study, two of the residences required extensive renovations before they could be considered close approximations to homes found in the community. However, all the homes had an array of materials that the staff could use to present functional and age-appropriate tasks to the students during all phases of this study.

The residential staff worked 8-hour daily schedules that created a staff: student ratio of 3:8. The staff was primarily composed of men and women college graduates or students. A profile of the staff—age, educational level, and length of employment was compiled near the midpoint of the treatment phase. Of the 43 staff who participated, 65.1% held bachelor's degrees, 9.3% held master's degrees, and 25.6% had not completed college. The mean age was 25.7 years and the mean length of employment was 12.5 months. In their initial training, they were instructed in applied behavior analysis with severely handicapped students (e.g., principles of language acquisition, discrete trial techniques) as well as the importance of close supervision, tightly structured scheduling, and the need for teaching skills that meet the "criterion of ultimate functioning" as proposed by Brown et al. (1976).

Dependent Measures

In all the experimental conditions, the staff controlled the tasks in which the students were engaged. These tasks were rated for three attributes based on the description of age-appropriate, functional skills presented by Brown, Branston, Hamre-Nietupski, Pumpian, Certo, and Gruenewald (1979). These included: (a) the functional value of the materials; (b) the functional value of the tasks; and (c) the age-appropriateness of the tasks. All observers were acquainted with the following definitions for each of the functional activity attributes:

Functional materials. Materials that would usually be encountered in the students' own community when they were engaged in similar tasks

or recreational/leisure activities were considered functional. For example, nonfunctional materials would include pegboards, inch cubes, laminated shapes, and button boards because they are used less frequently than their functional counterparts. Functional materials would include the students' clothing, roller skates, vending machines, and record players.

Functional tasks. Tasks that would have to be performed by someone else, if the students did not perform the tasks themselves, would be considered functional. For example, a balance-beam task would not be considered functional because an adult would not perform that task for any student who could not walk the beam. Dressing oneself, on the other hand, constitutes a task which, if not performed by the student, would have to be accomplished by an adult. Buying food would also be a functional task that would be an essential part of any community member's repertoire.

Age-appropriateness. Activities usually performed by nonhandicapped, age-matched peers or older persons would meet the criterion of age-appropriateness. Age-appropriateness is evaluated without regard to the hypothesized or tested mental age of the student. For example, a widely used plastic animal shape puzzle is recommended by the manufacturer for 2- to 5-year-old children. Despite the fact that this age range may match the verbal skills or mental ages of some older students, this puzzle would not be considered age-appropriate for a 10-year-old child.

In addition to scoring these three attributes, observers identified tasks as belonging to one of four curricular domains adapted from those proposed by Brown et al. (1979). The descriptions given to the observers included:

1. *Recreation or leisure activities* include those that teach students how to spend leisure time, for example, use of playground equipment, card games, and roller skating.

2. *Domestic activities* are those activities that teach skills normally required for home living, for example, washing clothes and setting tables.

3. *Self-care activities* include those skills that are necessary for a person to exhibit and maintain

good grooming, health, and personal safety, for example, toothbrushing, hair care, and toileting.

4. *Vocational activities* are those that contribute directly to the ability of the student to assume a vocation that would enable some degree of economic independence. Examples included those tasks taught and performed in sheltered workshops or in preparing the students for normal community vocations.

In some cases, students were receiving treatments (e.g., over-correction or time-out) that were designed to decrease disruptive and interfering behaviors. Because these activities were designed to enhance community acceptability, observers noted them in a separate category: *decreasing socially inappropriate behavior*.

The data were compiled by assigning a "point" to each of the activity attributes and curricular domains. Observers were instructed to score between zero and three for functional activity attributes and either zero or one for the curriculum domain. Therefore, the maximum number of points scored for any activity was four (one point each for functional materials, functional task, and age-appropriate task and one point for one of the four curricular domains). If a student was scored as engaging in decreasing socially inappropriate behavior, his or her point score was one.

Observation Procedures

Unannounced observations were conducted at random times for each of the residences. Observation times varied for the purpose of sampling activities presented to the student across the entire range of their daily schedules. These observations occurred during the afterschool and evening hours (3:00 p.m. to 9:00 p.m.) of school days and all day (7:00 a.m. to 9:00 p.m.) on weekends. To reduce reactivity to the presence of the observers, observations were conducted 1 month prior to the onset of the baseline condition. During this time, reliable definitions of the dependent variables were developed and observers were trained in data collection. This training consisted of reading and discussing the description of age-appropriate, functional skills (Brown et al., 1979) with the

experimenter, and conducting observations until interobserver agreement reached 80% (see *Reliability* section) for three consecutive practice observations. Because observers had a limited amount of time to conduct observations due to other job responsibilities at the facility, the frequency of observations during the experimental conditions ranged from one to six per week, with an average of three observations per week in the phases preceding postchecks. Occasionally, two observations would be conducted on the same day. Multiple observations occurred evenly across residences and treatment conditions. The locations of the observations were dependent on the activity site (e.g., workshop, playground) of the students during the time of observation.

The quality of activities was assessed with a time-sampling method adapted from the Planned Activity Check or PLA-CHECK (Doke & Risley, 1972). Specifically, on entering the observation area, each student was observed momentarily (i.e., for as long as it took to determine the activity in which the student was engaged; not exceeding 10 s) in a predetermined order. Each student was observed once per session to prevent scoring of changes in activity while the observers were present. The activities were then assessed as described previously. Two of the experimenters served as primary observers throughout the experiment. On several occasions, other trained observers, who were not informed of the experimental purpose, acted as second observers to conduct reliability assessments. Both primary observers were employed at the treatment center as clinical-support staff, one of whom had previously worked as a direct-care staff member in the residences. Although the third experimenter was not involved in giving the daily feedback, he expressed support for the treatment intervention at the in-service meeting.

Experimental Procedures

To demonstrate the effectiveness of the intervention strategies, a multiple-baseline design (Baer, Wolf, & Risley, 1968) was used in which the intervention was replicated across residences.

Baseline. The activities in which the students were engaged were carried out according to the

usual schedule. As in all subsequent phases, the observations were conducted randomly and unannounced; however, during baseline, no interaction with the staff took place regarding the observations. Prior to the initial baseline observation, a staff meeting was held for all afternoon and evening staff in which the use of functional, age-appropriate tasks was discussed. During this meeting, the staff was informed that after observations were conducted to assess the nature of the activities presented to the students, feedback would be provided. This orientation was also included in the training of new employees joining the staff during or after baseline.

Intervention. The day before treatment was implemented in each residence, the experimenter met with the supervisor of the residence to provide information about the form of the feedback that would be given, to discuss the definitions of the dependent variables, and to give suggestions on how to adapt tasks and activities to fit the treatment objectives. Then, the supervisor was given a list of these definitions to be posted in the residence. The primary form of feedback consisted of a completed score sheet that included positive comments (e.g., "Looks great! It's nice to see all the kids rollerskating!"). If instructive feedback was necessary, it was provided in the form of a suggestion, and was always paired with positive feedback (e.g., "It's wonderful to see everyone working. It would be nice to see some of the kids doing more prevocational tasks. You might want to talk to the Coordinator of Vocational Services for ideas.") The sheet was handed to the supervising staff member of the residence by the observer immediately after the observation. Any questions regarding the feedback received over the week were discussed at a weekly house meeting that was attended by all staff members in a particular residence. These meetings were regularly scheduled to discuss general treatment programs and were conducted during all phases of the study. The graphed data were also made available for review at the weekly meetings.

Maintenance. After 21 to 26 weeks of frequent feedback, follow-up observations were conducted and feedback was provided on a monthly basis.

Reliability

Simultaneous but independent observations were conducted during 25% of the observations across all experimental conditions of each group. In calculating overall, occurrence, and nonoccurrence reliability, observers were considered to agree only when they scored the same behaviors for the same student in the same interval. Overall reliability for each attribute and domain was calculated by dividing agreements by agreements plus disagreements for all categories observed. Occurrence reliability was calculated by dividing the number of occurrence agreements reported by both observers by the number of occurrences reported by either observer. Nonoccurrence reliability was calculated similarly.

Average overall reliability for all four houses was 97% (range 81%–100%). Average occurrence reliability was 92% (29%–100%). The wide range for occurrence reliability can be attributed to the low frequency of categories scored during baseline observations. Out of 50 reliability checks, only four fell below 80% occurrence reliability. Average non-occurrence reliability for all four houses was 97% (81%–100%).

Reliability was also calculated individually for each house. In House 1, occurrence reliability was 93% (57%–100%); nonoccurrence reliability was 98% (83%–100%); and overall reliability was 97% (81%–100%). In House 2, occurrence reliability was 96% (88%–100%); nonoccurrence 97% (81%–100%); and overall reliability was 98% (84%–100%). House 3 occurrence reliability was 92% (67%–100%); nonoccurrence reliability was 96% (79%–100%); and overall reliability was 96% (84%–100%). In House 4 occurrence reliability was 86% (29%–100%); nonoccurrence was 98% (86%–100%); and overall reliability was 96% (89%–100%).

RESULTS

Data obtained from the observations in the four residences are shown in Figure 1 as average student point scores. This average was calculated by dividing the point total for the residence by the number of students present during the observation.

The data show that the quality of planned activities gradually increased during the treatment phase. In each house the data exceeded the baseline measures, and remained high and stable throughout the maintenance phase in all four houses. In House 1, the average point score during baseline was 1.76. This improved to an average score of 3.55 during treatment and remained at a level of 3.5 during 5 months of maintenance. In House 2, the average baseline score was 1.15. This increased to 3.24 when treatment was implemented after 16 baseline sessions, and remained at 3.4 during the 5-month maintenance phase. In House 3, ratings remained low and stable through 20 observation sessions. The average baseline score in House 3 was 1.46. This increased to 2.84 during treatment and was maintained at 3.4. House 4 remained in baseline for 23 observations spanning 7 weeks. Although baseline ratings were less stable than those in the other houses, a similar increase was seen in House 4, where baseline ratings averaged 1.81. This rating increased to 3.14 during treatment and was maintained at 3.4 for 5 months following cessation of frequent observations.

In addition to the session-by-session data reported in Figure 1, individual student data for each of the phases are summarized in Table 1. In compiling the individual data, scores from every observation in each phase were averaged to yield pretreatment, treatment, and maintenance means.

The individual data are consistent with the group data. All students demonstrated increased trends from pretreatment to treatment across all task attributes. Each student received low scores during pretreatment (mean: 1.6 points; range: 0.7 points to 2.4 points) and high scores during treatment (mean: 3.3 points; range: 2.2 points to 3.8 points) and maintenance (mean: 3.5 points; range: 2.2 points to 3.8 points).

Summaries of each of the task attributes were compiled in a manner identical to the individual student data and are depicted in Figure 2.

The top graph in Figure 2 presents the pretreatment and treatment summary data on the use of functional materials across the residences measured. In House 1, functional materials were in use for 47% of the pretreatment observations and

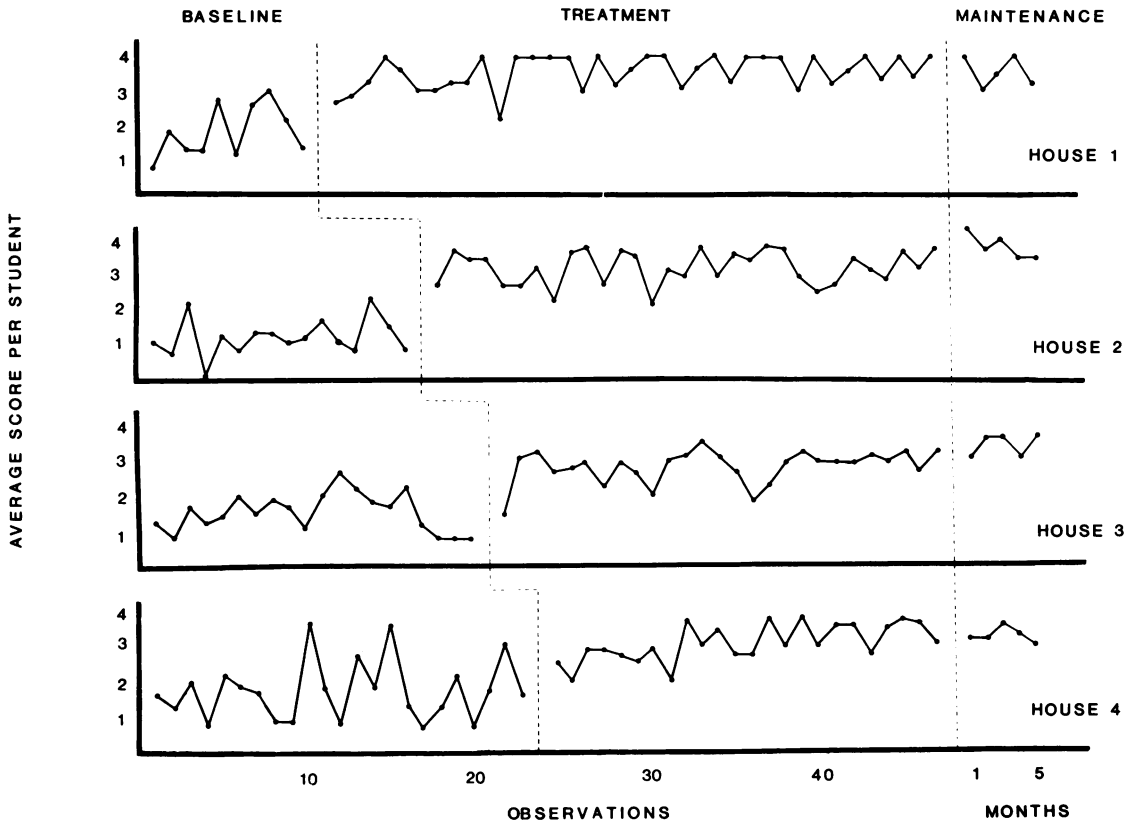


Figure 1. Average instantaneous time-sample score obtained for students in each house.

99% of the treatment observations. In House 2, the pretreatment measure was 31% and the treatment measure was 87%. Similar increases were seen in the last two houses where pretreatment measures were 39% in House 3 and 32% in House 4 and treatment measures were 82% and 92%, respectively.

The middle graph in Figure 2 presents the pretreatment and treatment data on functional tasks. In House 1, 11% of the students were engaged in functional tasks during the baseline phase. After the introduction of the treatment package, 63% of the students were engaged in functional tasks. In House 2, the pretreatment score was 17% with a treatment score of 62%. In House 3, the pretreatment score was 14% and the treatment score was 22%. In House 4, the pretreatment score was 27% which improved to 53% in treatment.

The bottom graph in Figure 2 shows summary

data on the amount of time students were engaged in age-appropriate tasks. In House 1, the pretreatment score was 80% and increased to 98% during treatment. In House 2, the pretreatment score was 37% which increased to a treatment score of 80%. In House 3, the pretreatment score was 56% and the treatment score was 81%. In House 4, the pretreatment score was 64% which increased to 77% during treatment.

The results of the category, decreasing socially inappropriate behavior, showed essentially no change from pretreatment to posttreatment. For example, in House 1, both the pre- and post-treatment scores were 0%. The data from the remaining three houses revealed similar results, with very low scores ranging from 0% to 4% during pretreatment, and 0% to 2% during posttreatment.

Pretreatment and treatment summaries of the

Table 1
Individual Data

Student	Pre-treatment	Treatment	Maintenance
1	1.7	3.6	3.8
2	2.1	3.5	Discharged
3	1.9	3.7	3.0
4	1.7	3.5	Discharged
5	2.4	3.6*	Discharged
6	1.8	3.6	Discharged
7	1.9	3.5	3.6
8	— ^b	3.8*	Discharged
9	— ^b	3.6*	3.8
10	0.9	3.5	Discharged
11	1.4	3.5	3.6
12	1.1	2.9	3.4
13	1.5	3.6	3.8
14	1.5	3.5	Discharged
15	1.0	3.1	3.6
16	0.7	3.3	Discharged
17	0.9	3.3	Discharged
18	— ^b	3.4*	3.3
19	1.9	3.1	3.8
20	1.1	3.0	2.2
21	2.0	3.0	Discharged
22	1.5	2.9	3.4
23	1.4	2.8*	Discharged
24	1.4	3.1	3.0
25	1.3	2.8	Discharged
26	— ^b	2.2*	Discharged
27	— ^b	3.2*	3.6
28	1.3	2.6	3.4
29	1.7	3.2	3.6
30	2.4	3.6	3.8
31	1.5	3.3	3.6
32	1.9	2.9	3.2
33	1.3	3.5	3.6
34	— ^b	3.7	3.8
35	1.6	3.3	Discharged
36	— ^b	3.5*	3.5
37	1.7	Discharged	
Mean = 1.6	Mean = 3.3	Mean = 3.5	

* Student was not living in the residence during the entire condition.

^b Student was not living in the residence during the condition.

percentage of time that students were involved in curricular domains are presented in Figure 3. These data were summarized in the manner described previously. All four houses showed a marked increase in the total amount of time students were engaged in tasks in all four curricular domains.

Summaries of the individual curricular domains

are presented in Table 2. Pretreatment and treatment data were summarized in the manner described earlier for the following curricular domains: recreation, domestic, self-care, and vocational.

DISCUSSION

The results of this study show that the quality of planned staff: student activities in a residential setting can be improved with staff training procedures. After the supervision program was implemented, the students spent more time engaged in activities that were functional and age-appropriate. Another positive outcome was that maintenance data showed that these results remained high for a 5-month period following cessation of frequent feedback sessions.

The supervision program was also effective in increasing the amount of time students engaged in activities in age-appropriate curricular domains. House 1, whose students ranged in age from 11.0 to 16.1 years, decreased the amount of time spent in recreational activities, but showed a large increase in the amount of time spent in the vocational domain. Similarly, House 3, whose students ranged in age from 4.1 to 8.9 years, showed a large increase in the amount of time spent engaged in recreational activities, but only a slight increase in the vocational domain was evidenced. Overall, the changes in the time spent in curricular domains suggested that the treatment resulted in a more well-rounded schedule of activities.

Apart from the increased amount of time spent in functional activities, we cannot determine with certainty what long-term benefits the clients may have derived. Brown et al. (1976) and others have encouraged the teaching of age-appropriate, functional, and socially significant skills. However, to date, there have been no systematic studies conducted measuring all the benefits of such a format change.

In this study, we show that significant changes can be made in the materials and skills presented to severely handicapped residential clients. Further research is needed to determine the extent to which such a change in teaching format results in successful transitions to less restrictive settings. It is

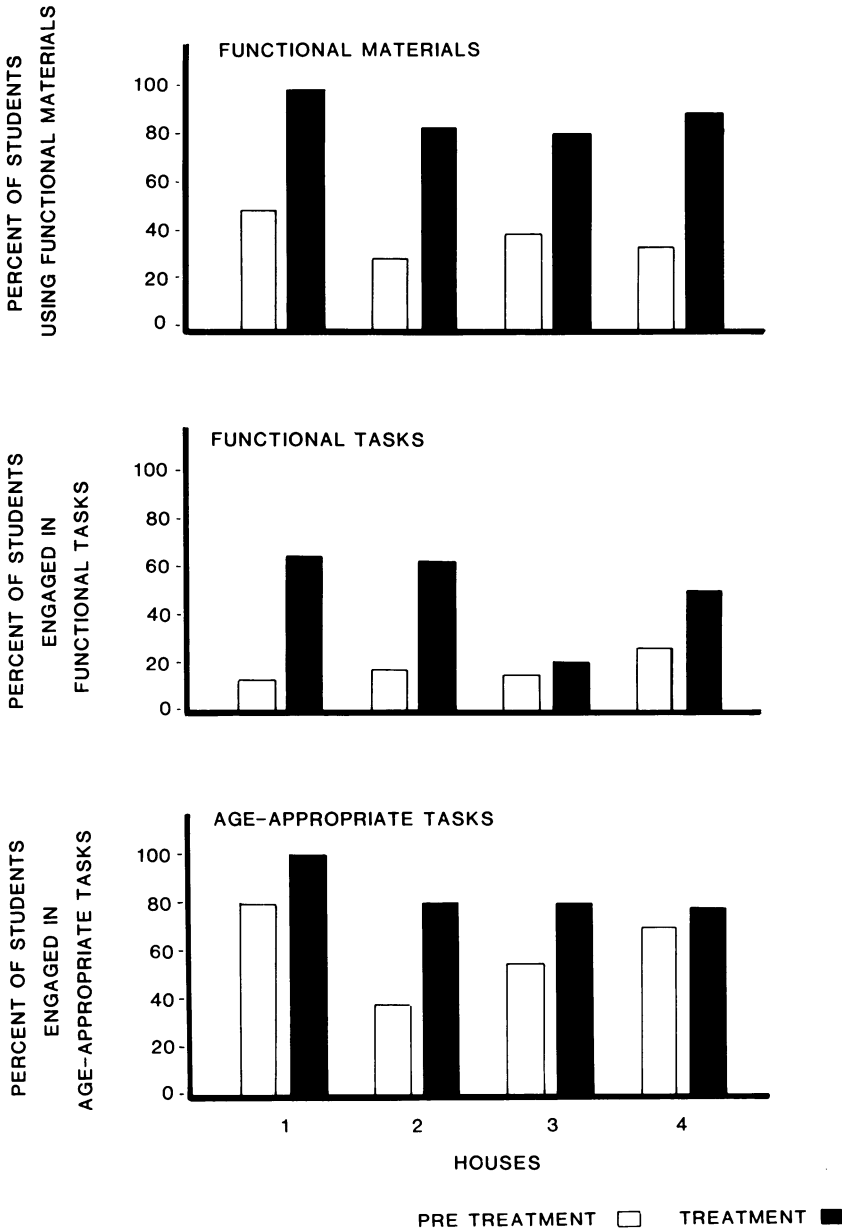


Figure 2. Percentage of students using functional materials and engaged in functional and age-appropriate tasks when evaluated by the instantaneous time samples.

noteworthy, however, that the treatment used in this study represented one of several components used to reorganize a small, traditionally run institutional agency. The results of the multicomponent reorganization were very encouraging (Christian, in press). For example, there was a sig-

nificant increase in students discharged to homes or foster homes and decrease in the mean duration of residential treatment for the students served in the agency. Follow-up data obtained on the discharged students showed that 21 of the 22 students (95%) discharged to home or foster homes

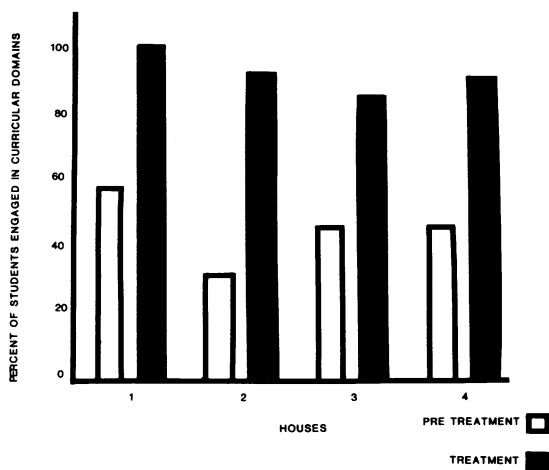


Figure 3. Percentage of students engaged in activities in all four curricular domains when evaluated by the instantaneous time samples.

during the period of institutional change required no further residential treatment.

The supervision procedures used in this study were similar to those implemented in other institutional settings (e.g., Ivancic et al., 1981). Although those studies were successful, they were limited to changing the behavior of staff or residents in one or two environments. Our study expanded this technology to involve the wide-scale implementation of this procedure across an entire treatment facility.

There is a possibility that the results obtained in this study were affected by the characteristics of the staff, thereby limiting the generality of the results. Specifically, not many residential facilities have a workforce comprised of 74.4% bachelor's and master's level employees, many of whom were

interested in further education. Despite those educational qualifications, however, the staff were quite young and inexperienced compared to other residential agencies. It is encouraging to note that similar supervision strategies have been effective with employees who have less formal education (Ivancic et al., 1981; Iwata et al., 1976). Before definitive statements can be made about the generality of the results obtained in this study, further replications in other agencies will be necessary.

As in other studies (Ivancic et al., 1981; Montegar et al., 1977), the supervisory program used in this study also involved multiple components. It is therefore difficult to determine which of these components were most effective in causing the positive change in the planned activities. For example, the quality of planned activities improved when the treatment condition was implemented, but the meeting conducted during the baseline condition might have provided a necessary precondition for the staff to respond positively to the feedback. Similarly, treatment effects may also have been influenced by the discussion held with the resident supervisor prior to the treatment condition. However, because supervisor behavior was not measured in this study, conclusions cannot be drawn regarding the effects of this variable on staff performance throughout the study. Whatever the reasons for the results, this program proved to be effective in improving the quality of the activities across all the residences. Future research would be required to determine the relative effectiveness of the component variables.

In the program described in this study, we used external supervision to maintain the positive

Table 2
Percentage of Students Engaged in Individual Curricular Domains

Age range	House 1 (11.0-16.1)		House 2 (11.7-15.10)		House 3 (4.1-8.9)		House 4 (9.2-13.11)	
	PT	T	PT	T	PT	T	PT	T
Recreation	45	41	19	30	32	55	15	33
Domestic	0	5	3	8	1	3	11	14
Self-care	3	11	7	10	10	18	16	29
Vocational	10	43	1	44	1	7	1	12

Note. PT = pretreatment; T = treatment.

changes in the planned activities. Research examining methods to transfer this control to the staff or in-house supervisory staff is warranted. For example, a participative management approach similar to that described by Burgio *et al.* (1983) might be feasible. In addition to providing a mechanism for improving the quality of staff: student interactions in the residences, this system served other useful functions. Procedures and sources of data that could be used in program-wide evaluation were suggested. One such use was to communicate the quality and effectiveness of the treatment program to outside agencies such as state regulatory authorities. A further use of this observation and feedback system was to evaluate and improve the quality of teaching interactions taking place in the classrooms located at the treatment facility (C. D. Newsom, personal communication, September 1982).

One additional area that would be important to consider is the satisfaction of the staff members with the supervision program. Anecdotal comments from the staff reflected positive and negative reactions. For example, when frequent observations were reduced during the maintenance phase of treatment, several staff members remarked that they appreciated the observations and feedback and requested that they be reinstated. Conversely, other individuals felt that the instantaneous time samples did not allow sufficient time to provide an accurate representation of the staff: student interactions that occurred throughout the day. Both the staff reactions and the results are interesting because there were no contingencies applied to the staff in response to the observation scores. The success of this system might have been due to the potential contingencies associated with the feedback. The impact of administrative support (*i.e.*, administrative personnel were involved in the staff meetings in which the need for implementing age-appropriate functional activities was discussed) may have been a significant factor leading to the results obtained.

This treatment intervention served to improve the quality of planned activities. However, increasing the amount of age-appropriate functional ac-

tivities should be considered as merely a starting point. Further steps need to be taken to increase community integration of these handicapped students. For example, Brown *et al.* (1976) stressed the importance of teaching severely handicapped students to function in natural environments and to interact with nonhandicapped peers. In our study, data required to measure off-grounds activities were not recorded because observers could not accompany students on community-based trips. However, there is evidence that the students did participate in more off-grounds functional activities. For example, after treatment was implemented, a structured group was formed so the students could play with nonhandicapped children at a local playground (Blew, McGrath, & Schwartz, 1982). Also, programs were initiated to teach the students how to use the public library, shop at the supermarket, and wash clothes at the laundromat. Further emphasis needs to be placed in increasing this level of involvement, perhaps including vocational training sites and group home placements.

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