

*IMPROVING RESIDENTIAL TREATMENT SERVICES:  
IMPLEMENTATION AND NORM-REFERENCED EVALUATION OF A  
COMPREHENSIVE MANAGEMENT SYSTEM*

MARSHA B. PARSONS, VICTORIA B. CASH, AND DENNIS H. REID

WESTERN CAROLINA CENTER, MORGANTON, NORTH CAROLINA

Ensuring effective service delivery by direct-care personnel in institutional living units for persons with developmental disabilities historically has been a difficult process, despite considerable attention from researchers, service providers, and governmental regulatory agencies. In this investigation, we conducted a normative evaluation of the extent and quality of treatment services currently provided in residential living units (Experiment 1) and evaluated a comprehensive management system designed to improve such services (Experiment 2). Results of the first experiment, encompassing 22 living units in three states, indicated that on the average two thirds of observed resident behavior did not involve any therapeutic activity. The results also provided social validity for the criteria used to evaluate the quality of treatment provision based on opinions of mental retardation professionals. Results of the second experiment indicated that a behavioral management program implemented during 23 separate time periods across five living units was accompanied by consistent and durable decreases in resident nontherapeutic activity as well as increases in specifically designated habilitative activity. The results provide support for the successful incorporation of behavioral management technology into human service settings on a large-scale, long-term basis.

**DESCRIPTORS:** staff management, institutions, normative evaluation, technology, organizational behavior management

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A primary concern in residential facilities serving persons with developmental disabilities is the provision of active treatment. Usually, providing treatment services is the responsibility of program personnel, who conduct their services through day treatment programs in locations specifically designated for habilitative activities such as schools and sheltered workshops. Recently, however, there has been increased emphasis on treatment services provided in other situations (Sparr, 1987), particularly during traditionally nonprogrammable times (e.g., evening periods) involving paraprofessional staff in

residential living units (Burch, Reiss, & Bailey, 1987).

Several reasons exist for the increased focus on treatment activities conducted by direct-care personnel in institutional living units. First, there has been longstanding recognition of the typical lack of therapeutic services in such situations (Blindert, 1975; Harmatz, 1973), and to date no comprehensive resolution to the issue has become apparent. Second, there has also been recognition that professional services offered during circumscribed treatment sessions will be of limited benefit if such services are not at least partially continued during more substantial time periods outside of the designated treatment sessions (Favell & Phillips, 1986). Third, recently there have been intensified efforts by regulatory agencies to require more comprehensive treatment services in living units. Federal and state agencies within the Title XIX Medicaid Program for Intermediate Care Facilities for the Mentally Retarded (Fernald, 1986) have especially scrutinized institutions regarding the provision of day-long treatment (Sparr, 1987). Consequently, institutions have been faced with either finding a

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Far too many people assisted in conducting this program to be recognized individually here. However, special appreciation is expressed to the living-unit supervisors who carried out many of the procedures. Special appreciation is also expressed to Debbie Sexton, Christina Carter, and Maureen Schepis, who assisted in training the staff and collecting data; to Judy Shoemaker, who helped manage the normative evaluation; to Ed Konarski and Tom Thompson, who reviewed a previous draft of the paper; and to Carole Daves, who prepared the manuscript.

Correspondence and requests for reprints should be addressed to any of the authors at Western Carolina Center, Morganton, North Carolina 28655.

means of providing more comprehensive services during traditionally nonprogrammable times or losing their allocated funding (Braddock, Hemp, & Fujiura, 1987).

Ensuring that treatment activities are provided by direct-care staff represents a formidable clinical and management task. The difficulty is due in part to the lack of preparation of direct-care staff prior to assuming their human service roles (Zlomke & Benjamin, 1983). In addition, the job of direct-care personnel in terms of providing therapeutic services is not an easy undertaking because staff members often are serving a population that is more handicapped or exhibits more severe behavior disorders than previous institutional populations (Eyman & Borthwick, 1980; Scheerenberger, 1982). Direct-care staff also typically work with groups of residents, and providing therapeutic services to groups of seriously handicapped persons generally is more demanding than providing services in a one-trainer-to-one-client situation (Reid & Favell, 1984).

Due in large part to the problems just noted, a considerable amount of behavioral research has been conducted on staff management systems to improve institutional service delivery (see Miller & Lewin, 1980; Reid & Whitman, 1983, for reviews). However, the research typically has been restricted to small-scale demonstrations (Frederiksen, 1984; Mayhew, Enyart, & Cone, 1979). For example, with few exceptions (e.g., Dyer, Schwartz, & Luce, 1984), investigations have addressed only a small portion of an institution's staff and resident population for a relatively brief time period during the institutional routine (cf. Christian, 1983). Relatedly, the long-term effectiveness of interventions has been addressed infrequently, with only a few studies (e.g., Burg, Reid, & Lattimore, 1979; Coles & Blunden, 1981; Dyer et al., 1984) providing evaluations of more than a few months duration.

This investigation consisted of two studies. First, an observational study was conducted (Experiment 1) to evaluate the extent to which institutional living units are providing treatment services. Also, in light of concerns over subjectivity and inconsistency of current methods of evaluating treatment

provision (cf. Sparr, 1987), we attempted through Experiment 1 to develop a methodology that yields normative data for objectively evaluating and/or comparing treatment provision within living units. A third purpose of Experiment 1 was to validate the criteria used to evaluate treatment services. Finally, a second experiment was conducted to demonstrate a means of improving residential services on a large-scale, long-term basis.

## EXPERIMENT 1

### *Method*

*Settings and participants.* Observations of resident behavior were conducted in 22 living units in six state residential facilities serving persons with developmental disabilities. The residential centers were located in three states in the southeastern and northwestern regions of the United States. Eighteen of the 22 living units were certified as intermediate care facilities under the Medicaid program. The residents observed in the living units functioned in the severe or profound range of mental retardation (Grossman, 1983). All residents were ambulatory and the majority were over 18 years of age. The staff in the living areas were direct-care personnel with age ranges, educational backgrounds, and years of work experience similar to those characteristic of most direct-care staff in institutions (e.g., Iwata, Bailey, Brown, Foshee, & Alpern, 1976). The staff-to-resident ratio most frequently observed in the living areas in terms of staff and residents actually present at any given time was 1:4, ranging from 0:10 to 1:2.

*Behavior definitions.* Target behaviors were defined based on previous work that focused on improving the functional utility of activities provided in residential (Dyer et al., 1984) and educational (Reid et al., 1985) settings. The definitions represented a hierarchy of types of resident activity ranging from what would be considered the most therapeutic (functional active treatment) to the least therapeutic (off-task and aggressive or disruptive behavior). The first behavior category, *active treatment*, was defined as a resident being involved in an activity with an apparent purpose such as work-

ing independently on a habilitative task, manipulating leisure materials, interacting with a staff member, or receiving assistance from a staff member (e.g., being physically guided through a task). If the resident was manipulating materials, then the materials had to be used in the manner for which they were intended. Active treatment was further categorized as *functional* or *nonfunctional*. Functional active treatment was defined according to the following four skill domains (see Parsons, Schepis, Reid, McCarn, & Green, 1987; Reid et al., 1985, for elaboration and validation data). A functional *self-help skill* represented a task that would be performed by someone for the resident if the resident did not perform the task for him or herself (see also Brown et al., 1979, for examples). A functional *leisure skill* involved activities that would be likely to be observed during leisure time among a nonhandicapped population of the same age range as that of the residents. For a teenager, listening to rock music on a cassette player through headphones would be an example of a functional leisure skill, whereas a teenage resident listening to a staff member sing a nursery rhyme would be nonfunctional. A functional *social/communication skill* was defined as part or all of an interpersonal interaction that, if performed on at least a weekly basis in a noninstitutional community, would not represent an unusual occurrence for a person of the same age group as the resident. An example of a functional social/communication activity is a resident being physically guided to point to a desired leisure material, whereas a nonfunctional communication skill is a resident being guided to point to paper triangles by color on request from a trainer. A functional *community living skill* was defined as part or all of an activity that, once mastered, would be likely to occur in a normal community environment among a nonhandicapped population of the same age group as the resident. A resident being instructed in how to purchase a drink from a vending machine is a functional community living skill, but a resident being instructed to match pictures of coins to other pictures of coins is nonfunctional. Any active treatment behavior that did not meet the criteria specified by the cur-

ricular domains or in which the materials used were not functional (i.e., the materials were not those that would normally be used to complete the task by nonhandicapped people) was considered to be *non-functional active treatment* (see previous examples).

The second target category, *engaged behavior*, was defined as holding and visually inspecting or manipulating an object in a manner not intended by the design of the object, and was also not stereotypic behavior. A resident turning a toy fire station upside down is an example of engaged behavior because such manipulation of the building is not how the toy was intended to be used. Typically, the term *engaged* has been used to denote the entire range of behaviors that we defined individually here as functional active treatment, nonfunctional active treatment, and engaged behavior (Coles & Blunden, 1981; Spangler & Marshall, 1983). Our purpose in defining each type of activity separately was to provide a more detailed assessment of the therapeutic quality of resident activity. Engaged behavior was not considered as therapeutic as functional or nonfunctional active treatment but was still more desirable from a treatment standpoint than the remaining categories that included *self-care* (a resident engaging in a basic care activity or receiving such care from a staff member), *television watching* (looking at a television), *aggression/disruption* (engaging in self-injurious behavior or doing something to a person or object that could cause harm), and *off-task* behavior (any resident activity not included in the definitions just noted). Examples of off-task included a resident sitting in a chair with no apparent activity, or moving any part of the body continuously in the same cyclical pattern (i.e., stereotypy).

*Observations.* Staff members in the living areas were informed that observations would be made as a part of a project to obtain information about living unit activities. Observations were conducted when most of the residents were in the living areas and direct-care staff were primarily responsible for the residents' treatment provision. The number of observations conducted in each living unit ranged from 1 to 5, with a median number of 3.5. A total

of 72 separate observations were conducted across the 22 living units. The days on which observations within each unit were conducted encompassed different periods of time, ranging from 1 day (i.e., for units with only one observation) to 120 days (one unit was observed on 3 days during a 120-day span) with a mean of 5.5 days across all living units.

Observations were conducted by an observer entering the dayroom or activity room of a living unit and identifying the residents present on the observation sheet following a left-to-right view of the room. Beginning with the first resident listed, the observer then watched the resident only long enough to determine what the resident was doing when first observed (no more than 5 s). Five additional seconds were allowed for recording. Residents were observed sequentially in this manner until each resident present in the living area had been observed for at least two samples or until a minimum of 10 samples of behavior were obtained across all residents.

*Reliability.* Reliability checks were conducted by two observers observing simultaneously and independently on 64% of all observations. Reliability was calculated on a category-by-category basis (Bailey & Bostow, 1979) for overall agreement, non-occurrence of target behaviors, and occurrence agreement using the formula of number of agreements divided by number of agreements plus disagreements multiplied by 100. Overall and non-occurrence reliabilities for each behavior category and subcategory averaged at least 90%. Occurrence reliabilities were more variable, averaging 79% for active treatment, 77% for functional active treatment, 61% for nonfunctional active treatment, 80% for engaged, 83% for self-care, 79% for television watching, 85% for aggression, and 94% for off-task. The somewhat lower averages for occurrence of target behavior categories were a function of a low frequency of occurrence, when a small number of disagreements deflated the average.

*Social validity.* In an attempt to validate socially the hierarchy of resident behavior categories in regard to active treatment as described earlier, 15 professional staff members from three residential

facilities for the developmentally disabled were asked to complete anonymously a questionnaire. The respondents held positions in such professional disciplines as occupational therapy, education, resident advocacy, and administration. The respondents rated examples of resident activity on a scale of 1 to 4 in regard to the usefulness of the activity for providing constructive learning opportunities for severely and profoundly mentally retarded persons. The examples of resident activities were selected randomly from behaviors that were previously observed in the living units and had been scored as representing one of the categories of functional or nonfunctional active treatment, engaged behavior, or off-task behavior. Survey respondents were not informed as to the previous categorization of each example. Resident behaviors were listed in random order on the survey form.

### *Results*

Averaged across all observations, two behavior categories represented the vast majority (86%) of all categories scored. Off-task was the most frequent, averaging 67% (range of 0% to 100% across observations), followed by active treatment, which averaged 19% (0% to 40%). Of the 19% of the activities reflecting active treatment, an average of 56% (0% to 100%) of those activities were functional. The averages for each living unit are presented in Table 1. Further analyses of these behavior categories are presented in Table 2, which presents quartile levels to allow for comparisons across programs (Guilford, 1965). To illustrate, Table 2 indicates that the amount of active treatment provided in 25% of the living units (i.e., fourth quarter) was below 14%, the amount provided in 50% of the living units was less than 20%, and so on. For any given unit to fall within the top quarter (i.e., top 25%) of all units, active treatment would have to average at least 25%. Regarding the categories of engaged, self-care, television watching, and aggression/disruption, frequency of occurrence was low, averaging 6%, 3%, 1%, and 3%, respectively. There was no difference between the Medicaid-certified units and noncertified units for active treatment or off-task occurrences.

Table 1  
Summary of Normative Observations Across Living Units

Living unit	Number of days of observations	Mean Occurrence (%)		
		Active treatment	Functional* treatment	Off-task
1	5	22	61	68
2	5	19	97	68
3	5	22	92	62
4	5	25	48	64
5	5	14	96	73
6	5	14	37	85
7	2	27	84	73
8	2	0	0	97
9	2	18	0	62
10	4	16	100	64
11	5	2	20	86
12	2	38	84	55
13	3	5	33	77
14	5	33	30	52
15	3	14	39	74
16	2	40	81	44
17	4	24	63	68
18	3	18	47	37
19	1	27	25	67
20	2	27	32	67
21	1	11	75	61
22	1	20	100	80

\* Percentage of observations with active treatment that were functional.

Results of the social validity survey (Figure 1) indicated that the opinions of the professional staff supported the hierarchy of definitions in regard to usefulness. The tasks categorized according to the definitions for functional active treatment were seen as the most useful for providing constructive learning opportunities (range of ratings from 2.6 to 3.6 across tasks), followed in turn by activities categorized as nonfunctional active treatment (range, 2.3 to 3.1), engaged behavior (1.9 to 2.5), and off-task (1.3 to 2.1). A Kruskal-Wallis one-way analysis of variance by ranks indicated that there was an overall statistically significant difference ( $p < .001$ ) among the ratings of the four sets of tasks depicted in Figure 1. Subsequent analyses with the Mann-Whitney  $U$  test indicated that the ratings for functional active treatment activities were significantly higher than the ratings for nonfunctional treatment ( $p < .05$ ), that the ratings for non-functional treatment were greater than those for

Table 2  
Quartile Analyses for Observations Across 22 Living Units

Target behavior category	Quartiles (%)			
	1	2	3	4
Active treatment	40	25	20	14
Functional active treatment*	100	84	55	33
Off-task	97	74	68	62

\* Percentage of observations with active treatment that were functional.

engaged ( $p < .001$ ), and that the ratings for engaged were greater than those for off-task ( $p < .001$ ).

### Discussion

Results of the normative study indicated that when institutionalized persons are in living units, two thirds of their time is spent in activity that appears to have no habilitative value (off-task). These results suggest that residential facilities are not fulfilling their active treatment obligations, despite recent attention given to this area of service provision (Sparr, 1987). The purpose of Experiment 2, therefore, was to demonstrate a comprehensive method for decreasing off-task behavior within living unit environments.

## EXPERIMENT 2

### Method

*Setting and participants.* Experiment 2 was conducted in living areas of a Medicaid-certified, public residential facility where approximately 165 profoundly mentally retarded, ambulatory residents were being served. The residents were typically non-verbal, required assistance in completing self-care routines, and displayed various behavior problems. Approximately 33 residents lived in each of five buildings.

The living unit staff were primarily direct-care personnel with similar characteristics to those in Experiment 1. The average ratio of staff to residents (people actually present in the living unit at any given time) ranged from approximately 1:6 to 0:9 in each of the five living units. The direct-care staff

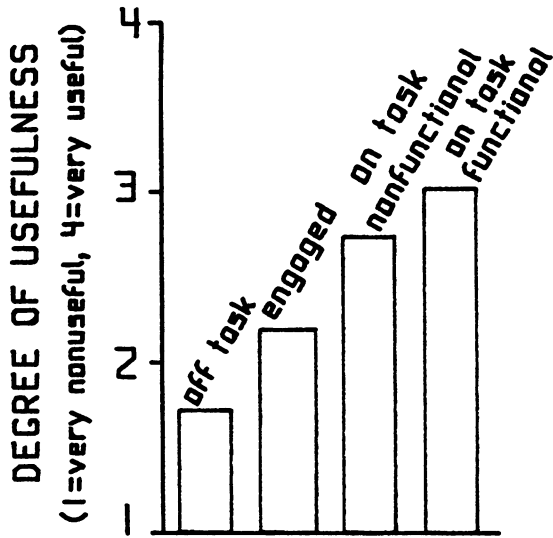


Figure 1. Average ratings by professional staff of resident activities based on the perceived usefulness of the activities for providing therapeutic learning opportunities for each of four categories of behavior.

worked under the direction of a living unit supervisor who was assisted by two intermediate supervisors. Each living unit supervisor held a degree in a human service profession. The five living unit supervisors were administratively responsible to an area director (experimenter), who held a bachelor's degree in education.

These living units were selected for study because senior staff had expressed concern over high levels of resident off-task behavior. The primary periods of concern were the late afternoon and early evening hours when the residents returned to the living units from vocational workshop or school programs. Altogether, 23 time periods were selected for intervention, ranging from 90 min to 120 min in duration.

*Behavior definitions and observation system.* Behavior definitions and observation procedures were the same as in Experiment 1. However, only three categories were of specific concern (off-task, active treatment, and engaged) because of the relative infrequency of the other categories and because the intent was to decrease off-task and increase active treatment. Staff members were aware that observations would be conducted but were not in-

formed of the specific day or time when the observations would occur. Observations were conducted by two experimenters and eight facility staff members and student interns. The latter were not involved in the design of the research.

*Reliability.* Reliability checks occurred as in Experiment 1 during 108 observations, involving all 23 target periods and both baseline and post-intervention conditions for 16 of the periods. Reliability was calculated as described previously. Overall reliability averaged at least 92% for each of the target categories. Nonoccurrence reliability averaged 88% for active treatment, 92% for functional active treatment, 94% for nonfunctional active treatment, 92% for engaged and 80% for off-task. Occurrence reliability averaged 75%, 67%, 50%, 49%, and 85% for the five categories, respectively. The lower occurrence figures were associated with low frequencies.

*Experimental procedures: Baseline.* Observations were conducted when residents were in the living unit during periods typically designated on the residents' schedules as "leisure time." Observations occurred while staff and residents went about their usual routines. Each staff member was usually assigned to a specific group of 6 to 9 residents, although all residents and staff were typically in the central dayroom of the living unit. Occasionally, groups of residents were unsupervised because staff members were attending to the needs of an individual resident within their assigned group in another part of the building (e.g., assisting a resident with toileting). The television was often on and occasionally materials (e.g., puzzles and magazines) were available for resident use. Observations were conducted intermittently over several weeks (ranging from 1 to 12 weeks across units).

*Experimental procedures: Group active treatment system.* The intervention consisted of four basic components. First, *structure* was added to the time period (Spangler & Marshall, 1983). Rather than designating target times in broad terms such as "leisure," highly specific information was included on the residents' daily schedules. With input from the unit supervisor, target time periods were broken down from 90 to 120 min into smaller

periods (30 to 45 min). A brief description of the activity to be conducted and the materials to be used during each period was included on the schedule. For example, the first 30 min of one period might be designated as an exercise session for a portion of the resident group, listing the exercise bike and mini-trampoline as the necessary materials. Another portion of the group might be scheduled to listen to music using tape players and headphones. Groups might then be scheduled to alternate materials and activities for the next 30-min period. The following 30-min period might be scheduled as a coffee break to incorporate self-care training (e.g., preparing a snack) and social/communication training (e.g., requesting items).

Additional structure was added by assigning staff to one of three roles. The roles delineated duties for a resident *care coordinator*, an *activity coordinator*, and a *trainer*. The care coordinator was responsible for ensuring that residents remained in the activity area unless a resident had to leave the area to fulfill a basic care need, and for handling situations in which residents became disruptive. The activity coordinator's role was to circulate throughout the area to make leisure materials available to each resident as a means of briefly prompting residents in appropriate material use and to reinforce resident involvement in treatment activities. Because the majority of residents had essentially no independent, appropriate leisure skills, the activity coordinator was required to move quickly (at least every 60 s) among residents to ensure that each resident was prompted (e.g., handed a material) or reinforced (e.g., praised) frequently. The activity coordinator was assigned to remain with the group at all times. The final role was that of trainer (if there was a third staff person present). A trainer worked with individual residents or small groups of residents for 5 to 10 min, conducting formal training trials on functional skills such as preparing a simple snack. The trainer's role was to provide systematic, individualized training for selected residents while the other residents were being attended to by the activity and care coordinators.

The second component of the intervention involved staff *training* through which the rationale

for increasing functional activities was discussed. Direct-care staff were given written examples of functional activities, descriptions of each of the three staff roles just noted, and an example of a proposed schedule. Staff members were also asked to generate ideas for functional activities or materials that they believed the residents would enjoy. Following the initial meeting, a date was established to begin the proposed activity schedule. After the new schedule began, the supervisor and/or experimenter modeled the job duties of each staff role. Specifically, the supervisor worked with an individual staff member and performed the job duties associated with one of the roles while the staff person observed. In turn, the staff member assumed the role just demonstrated while the supervisor observed and provided feedback to the staff person. This process was repeated for the three staff roles for each staff member. Staff training generally required five meetings, dispersed across 1 to 2 weeks, in which the supervisor observed and provided feedback to staff on the living unit.

The third and fourth components of the intervention involved *monitoring* and supervisory *feedback*. The cottage supervisor (and/or assistant supervisors) began observing each staff person at least weekly during an activity period using a checklist of staff behaviors that were relevant to each job role. Following the observation, the supervisor provided positive or corrective verbal feedback to the staff regarding their performance. Each staff person initialed the checklist when he or she received feedback. In turn, each week the area director (cottage supervisor's superior) reviewed the observations that were completed by the living unit supervisors to ensure that the supervisors were routinely observing and providing feedback to staff.

Staff monitoring was independent of the observations of resident behavior conducted as part of the study proper. The data on resident behavior were summarized graphically to represent the percentage of observation intervals with active treatment for each of the 23 targeted time periods. The graphs were reviewed on a weekly basis by the facility program director (experimenter), who was responsible for all residential staff at the facility and

who also supervised the area director. In turn, the graphs were sent to the area director with the comments from the program director. The area director then sent individual cottage supervisors the data for their respective living units along with comments regarding activity periods that appeared to be doing particularly well or to be in need of assistance.

Once sufficient data were collected to indicate that a given living unit's percentage of off-task was stabilized at a level lower than baseline, a maintenance phase was initiated. The maintenance condition involved the same procedures as the preceding intervention except that observations were conducted less frequently (i.e., every month instead of every week or two). Across all units and time periods, the active treatment condition (including maintenance) was in effect for at least 9 months, with a maximum of 15 months.

### *Experimental Design*

The initial plan for the experimental design was a multiple probe across living units and times of day. However, the state Medicaid review team visited as baseline was being initiated. The team validated management's concerns over insufficient active treatment during the targeted periods, requiring that intervention proceed quickly to avoid decertification and loss of funding for the intermediate care facility. Hence, given the large number of target periods across living units, time constraints prohibited using a sequential intervention process (i.e., multiple probe across time periods). So, to expedite treatment implementation within all periods, the design was changed to a series of AB interventions. Baseline observations were conducted within each target period, and the intervention was then implemented in each period within approximately 1 month (consequently, across periods some of the interventions occurred almost simultaneously and some within a few weeks of each other). Although an AB design may be considered relatively weak for demonstrating functional control of an intervention, as the number of AB replications increases the demonstration of functional control becomes more powerful. In this investigation, a large

number (22) of AB replications occurred following the initial intervention, rendering the experimental control potential of the design relatively powerful (Hersen & Barlow, 1977, chap. 9).

### *Results*

Because the treatment system was implemented 23 times (i.e., across different time periods, groups of staff and residents within and across buildings), space limitations prohibit a graphic analysis of each intervention. Hence, seven representative situations were selected to illustrate the effects of the active treatment system, using the following selection criteria for graphic presentation: (a) all five residential buildings were to be represented, (b) a sufficient number of observations were conducted per experimental condition to allow a graphic analysis, and (c) the mean changes across conditions were not obviously discrepant from the mean changes across all 23 applications.

The effects of the treatment system on resident off-task behavior for the seven selected applications are presented in Figure 2. Each *unit* in Figure 2 represents a different group of staff and residents, and the horizontal line in the body of the graph represents the normative average of off-task obtained in Experiment 1 (67%). For each unit and/or time period, levels of off-task during baseline averaged above or at (within 5%) the normative average. After the active treatment system was implemented decreases in off-task, although variable across units, occurred in all seven situations such that averages were below the normative average. For those intervention applications that extended into a maintenance phase, levels of off-task either continued at the level obtained during the treatment condition or decreased further. One exception was Unit E, in which the level of off-task became considerably more variable and increased somewhat during the maintenance phase. For each of the 23 applications of the management intervention, mean levels of off-task decreased from the baseline condition (mean of 64% across all periods and units) to the active treatment condition (41%).

Although the primary purpose of the intervention was to reduce off-task, it was also desirable



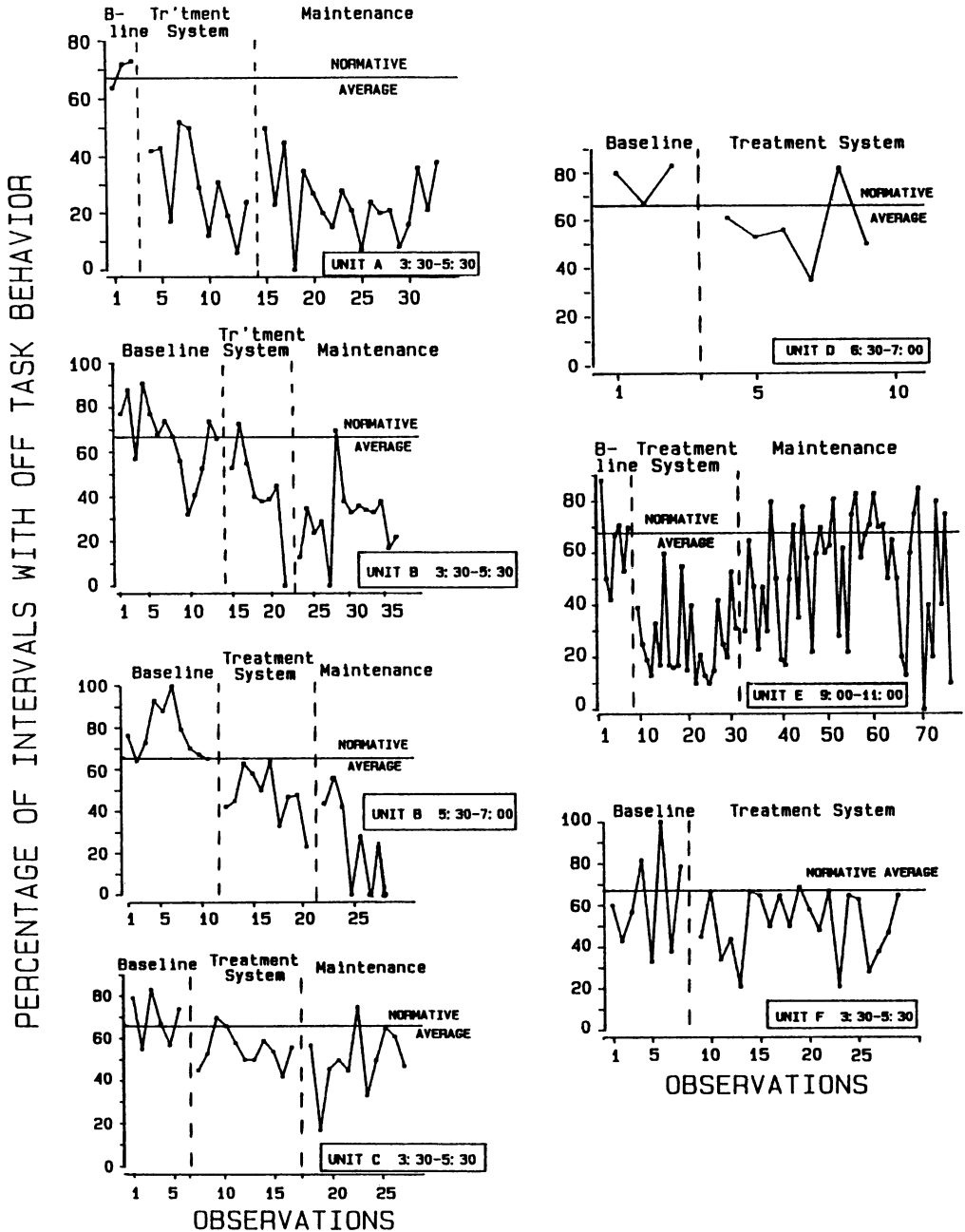


Figure 2. Percentage of observation intervals with resident off-task behavior for each observation session across all experimental conditions for seven applications (i.e., with different residents, staff, and/or time periods) of the treatment intervention. All time periods represent afternoon or evening periods except for Unit E. The horizontal line in the body of each graph represents the normative average for off-task.

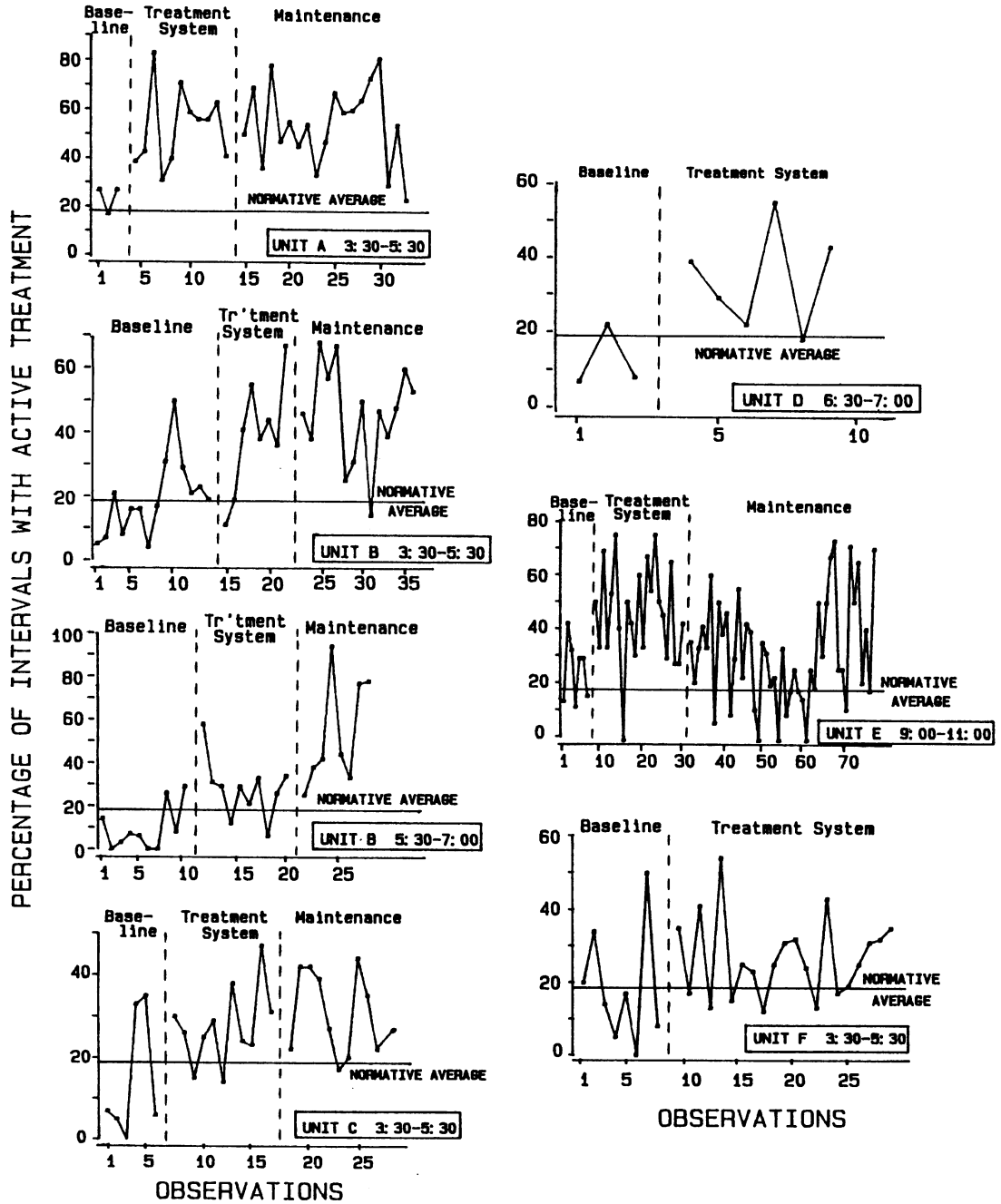


Figure 3. Percentage of observation intervals with resident active treatment for each observation session across all experimental conditions for seven applications of the treatment intervention. The horizontal line in the body of each graph represents the normative average for active treatment.

that as off-task decreased there would be increases in the most therapeutically useful behavior category (i.e., active treatment) relative to less useful behavior categories such as engaged behavior and aggression/disruption. Figure 3 reflects the effects of the management intervention on active treatment for the same seven units presented in Figure 2. During baseline, average levels of active treatment were below or at the normative average (19%). After the intervention was in place, levels of active treatment averaged above the normative average in each of the seven units. For the units and time periods that entered a maintenance phase, levels of active treatment either maintained or increased, except for Unit E in which active treatment gradually decreased and then increased again. Averaged across all 23 units and time periods, active treatment increased from 20% during baseline to 38% after the intervention was in effect, with mean increases occurring with each of the intervention applications.

During baseline, 60% of the active treatment observations involved functional activities, whereas after the intervention, 68% of the observations involved functional activities. Increases in functional active treatment occurred in 15 of the 23 units and time periods. However, these figures are somewhat misleading in that the 60% baseline figure is spuriously inflated. In many baseline sessions, there were only one or two observation intervals with active treatment. If only one of those intervals involved functional activities, the resulting percentage of active treatment that was functional was relatively high even though functional activity represented a small part of the entire observation period. An alternative way to evaluate the occurrence of functional treatment is to consider the observation intervals with functional resident activity as a percentage of all observation intervals (i.e., including engaged, self-care, etc.) per observation session. During baseline, across all 23 units and time periods, an average of 13% of all observation intervals involved functional active treatment. During intervention, the percentage doubled to 26%. Increases occurred in 19 of the 23 units and time periods.

Throughout the study, there were no consistent changes in engaged behavior, which averaged 11% in baseline and 15% during the active treatment system. Self-care, television watching, and aggression/disruption were infrequent throughout Experiment 2, with each category averaging 3% or less.

### *Discussion*

Results of Experiment 2 indicated that the active treatment system effectively decreased the amount of time institutionalized profoundly mentally retarded persons spent involved in no therapeutic activity. Across all living units, the level of off-task averaged about 26% below the normative average of off-task obtained in Experiment 1.

## GENERAL DISCUSSION

Results of this investigation—and particularly results of Experiment 1—indicated that institutional living environments for persons who are mentally retarded continue to experience rather pervasive difficulties in providing comprehensive rehabilitative services. However, the sample of living units observed was not a random representation of institutions across the United States, and several units were observed only a small number of times. Hence, conclusions based on our observations should be qualified accordingly. Nevertheless, the number of living units observed was considerably larger than the number targeted in previous observational studies in institutions (Blindert, 1975; Harmatz, 1973; Repp & Barton, 1980), and the data regarding resident off-task were quite consistent across the 22 living units.

Results of Experiment 2 indicated that resident off-task activity can be reduced through consistent and systematic management practices. The management program, which involved increasing the structure of staff job assignments, training staff, systematically monitoring staff performance, and providing feedback, was accompanied by decreases in resident off-task in all 23 situations in which the program was applied. However, even though the

decreases in off-task behavior were consistent, off-task activity was not eliminated. Even when direct-care staff were competently fulfilling their active treatment roles, their task was hampered because they were trying to involve *groups* of profoundly mentally retarded persons in habilitative activities (e.g., two staff members may have been working with 14 or so residents). Indeed, one reason for collecting the normative data was to obtain an idea of what amount of off-task activity was realistic given typical staff-to-resident ratios in residential living units. In this regard, the amount of off-task in the target living units during baseline (average 64%) in Experiment 2 was very similar to the normative average (67%) in Experiment 1. In contrast, during the active treatment system the average for the target units (41%) was well below the normative average, as well as below the average for at least 75% of the living units observed in the normative sample (Table 2).

These changes in resident behavior are similar to the amount of behavior change reported in other management investigations involving this population (Burgio, Whitman, & Reid, 1983), although some investigations have also reported larger changes (Spangler & Marshall, 1983). One difference between the results reported here and investigations reporting more substantial changes is that the latter studies generally targeted only one circumscribed time period during the day, whereas the current intervention addressed a larger amount of time involving numerous time periods. It is often easier to effect changes in resident behavior during a relatively brief time period than during more extended time blocks (Reid, Parsons, & Green, 1989, chap. 5).

The problems that exist in residential living units (as indicated in Experiment 1) continue despite serious attention from applied behavioral researchers, as noted earlier. Again, research in this area generally has been of a relatively circumscribed nature. Results of the present investigation suggest that the same behavioral management procedures used in demonstration studies can be effective on a larger scale, albeit requiring a relatively greater effort by managers. Habilitative activities provided

by about 110 direct-care staff to 165 residents were increased, involving five different living unit supervisors and 10 assistant supervisors in the implementation of the management program. With few exceptions, the increased resident activity maintained as the management program was continued for periods ranging from 9 to 15 months. The changes in resident activity were durable despite the existence of numerous (typical) variables that can impede long-term attempts to alter institutional services, such as turnover of staff and supervisors, internal management reorganizations, resident relocation across living units, and so on. Also, the management program was durable even though some of the required alterations in staff work routines were rather labor intensive (e.g., the role of activity coordinator) in terms of the effort required of staff.

A likely reason for the maintenance of the initial behavior changes is that the intervention became an ongoing part of the facility's management operation. A feedback loop was established in which data were collected on resident activity and summarized weekly for review by a senior facility manager who in turn provided the data, with positive and/or negative comments, to the next manager in the organizational chain of command. The latter manager subsequently provided the data, with comments, to the living unit supervisors who were responsible, along with their assistant supervisors, for continuing and/or altering what their direct-care staff were doing in regard to resident activity. Hence, a senior facility manager maintained a relatively quick means of evaluating treatment services as well as a means of taking action to improve conditions, if necessary. The consistent attention provided by management staff was probably a significant factor in maintaining the living unit supervisors' use of the active treatment system.

Another feature of the management program that may have facilitated its relatively long-term durability was the focus on *resident* activity. Other residential management systems have included observational measures of *staff* behavior (Burg et al., 1979; Burgio et al., 1983; Iwata et al., 1976). Measures of *staff and* resident behavior are usually

necessary to demonstrate clearly a functional relationship between the two sets of variables. Such a demonstration was not provided here in that staff behavior was not systematically monitored. However, from an applied perspective, a disadvantage of monitoring staff performance is that staff frequently do not like to be observed and are not very accepting of management systems that involve frequent observations of their behavior (Reid et al., 1989, chap. 2). By focusing solely on resident activity, this program may have been more acceptable to the staff, which in turn may have made it more likely that the living unit supervisors continued to use the system.

As noted previously, a review of the institution by the state Medicaid office during baseline highlighted serious problems in the five target living units concerning the lack of active treatment, with the facility given a time-limited mandate to improve services or face decertification. The plan submitted to the Medicaid office to resolve the problems was based on the group active treatment system as described here. Two subsequent Medicaid reviews resulted in no reports of decertification risks as well as commendation regarding improvement resulting from the active treatment system. Also, in regard to evaluating the impact of the management program, the normative data obtained in Experiment 1 provided the facility's management with an objective means of evaluating, relative to other institutions, the facility's proficiency in providing constructive activities in living environments during periods that have been traditionally lacking in such activities.

Outcomes such as those just noted regarding the results of internal and external facility evaluations provide a considerable degree of validation in terms of the use of behavioral management procedures to resolve major areas of concern in residential facilities. It seems likely that other areas of service provision could be improved if service providers could be influenced to learn about, and use, current behavioral technology. One means of influencing service providers in this manner—as exemplified in the current study—is for behavior analysts to be employed in positions of authority in applied set-

tings and incorporate their technology and research into ongoing procedures for resolving existing problems.

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