

INCREASING HABILITATIVE SERVICES FOR PERSONS WITH PROFOUND HANDICAPS: AN APPLICATION OF STRUCTURAL ANALYSIS TO STAFF MANAGEMENT

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We evaluated a structural analysis methodology for enhancing the utility of a staff management program. In Experiment 1, a structural analysis of direct-care staff behavior in a mental retardation facility revealed differences in work patterns over time. Specific times were identified when few basic care duties were necessary and staff engaged in nonwork activity. In Experiment 2, a management program was implemented to increase staff members' training activities during periods identified through the structural analysis. The program was accompanied by increases in training activities and decreases in nonwork behavior. The improvements were maintained during a 43-week period while the most labor-intensive component of the program was withdrawn. Staff acceptability measures indicated a positive response to the management intervention, although responses varied across components within the multifaceted program. The increased training was accompanied by beneficial changes among clients with profound handicaps. Results are discussed regarding practical considerations for improving staff performance and for adopting innovations resulting from applied research.

DESCRIPTORS: organizational behavior management, staff management, structural analysis, profound multiple handicaps, habilitative services

A recent development in behavior analysis and developmental disabilities is an increased emphasis on the examination of variables controlling certain behaviors. Traditionally, the primary focus in applied behavioral research has been on changing a target behavior through experimenter-controlled consequences (Bailey & Pyles, 1989). Recently, however, investigations have demonstrated the utility of first analyzing existing variables associated with the behavior and then developing behavior-change strategies based on results of the analysis (Bailey & Pyles, 1989). An example of the latter strategy is structural analysis. The intent of structural analysis is to identify environmental structures or variables (e.g., times of day, locations and/or activities in which people are involved) that tend to coincide with the presence and absence of various

behaviors and then to employ information about the variables to develop behavior-change programs (Axelrod, 1987).

To date, structural analyses have been used primarily in the treatment of maladaptive behavior among persons with developmental disabilities (e.g., Touchette, MacDonald, & Langer, 1985). For example, by analyzing the occurrence of self-injury by an adult with autism in association with such variables as times of day, presence of certain caregivers, and ongoing activities, it was determined that the highest rates of self-injury coincided with the presence of a certain caregiver. By altering the presence of the caregiver with the individual client, the latter's self-injury was reduced (Touchette et al., 1985).

Structural analyses might also be beneficial in areas other than the reduction of client maladaptive behavior. One such area is staff management in residential facilities. Managing the work performance of direct-care personnel has been a long-standing concern in behavior analysis (Panyan, Boozer, & Morris, 1970; Welsch, Ludwig, Radiker, & Krapfl, 1973), as well as in the field of

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developmental disabilities in general (Bensberg & Barnett, 1966). Despite considerable research on staff performance, much work is still needed to develop a comprehensive technology of staff management (Reid, Parsons, & Green, 1989). One area especially in need of continued research is maintaining desirable changes in staff behavior initially accompanying management interventions (Repp, Felce, & de Kock, 1987). By better analyzing variables associated with certain staff behaviors (e.g., through the use of a structural analysis of staff behavior during the work day) staff management interventions might be developed with an increased likelihood of maintaining behavior change.

If this type of structural analysis of staff behavior is conducted, the results may help determine opportune (and inopportune) times to implement a management intervention. To illustrate, historically one of the more difficult types of caregiver work behaviors to evoke and maintain is direct-care staff members' consistent implementation of client training regimes (Greene, Willis, Levy, & Bailey, 1978; Welsch *et al.*, 1973). One explanation for the difficulty is that direct-care staff have multiple work responsibilities with different contingencies operating on their performance that compete with fulfillment of client training duties (Reid *et al.*, 1989). Hence, even when increases in client training endeavors conducted by caregivers are evoked through the efforts of program personnel, the competing responsibilities (and contingencies) continue to exist and, in essence, eventually occur in lieu of the training duties. However, it is also well established that there can be periods of time when direct-care staff engage in no apparent work-related activity (Repp *et al.*, 1987). A structural analysis of staff behavior patterns over time might help identify specific periods when important duties occur (e.g., personal care of dependent clients) that compete with client training responsibilities compared to periods during which nonwork behavior predominates. If these variations in work are identified, then an opportune time to expect staff to conduct client training programs would be these latter periods.

When considering how to facilitate the maintenance of changes in staff work behavior, a nec-

essary condition, of course, is to bring about initial changes. One of the most effective means of changing staff behavior is multifaceted management interventions involving the simultaneous use of several behavior-change procedures (Ivancic, Reid, Iwata, Faw, & Page, 1981). Despite the effectiveness of multifaceted management interventions, such approaches frequently are effortful to implement (Reid *et al.*, 1989). Because of the labor-intensive aspect of multifaceted programs, the likelihood of supervisors using these management strategies consistently over time may be decreased relative to the use of less effortful, but perhaps less effective, management approaches. Subsequently, maintaining changes in staff performance resulting from multifaceted interventions can be problematic due to inconsistent management implementation. One possibility for overcoming part of the labor-intensive problem would be to partially withdraw (Rusch & Kazdin, 1981) some of the more effortful management components while continuing to use less time-consuming components to maintain the initial changes.

The primary purpose of this investigation was to demonstrate how a structural analysis could be applied within a management program to analyze (Experiment 1) and improve (Experiment 2) staff performance. A secondary purpose (Experiment 2) was to evaluate the use of a multifaceted management program to improve staff performance in conjunction with a partial withdrawal approach to maintain the improvement while reducing the time and effort necessary to continue the program.

EXPERIMENT 1

Method

Participants and setting. Four direct-care staff members, assigned to the day shift of one living unit of a state residential facility for persons with developmental disabilities, participated in the study. The 4 women ranged in age from 26 to 44 years (mean of 32 years). The amount of formal education of the staff ranged from a high school degree to 1 year of college.

The client population of the living unit in which

the staff worked consisted of 20 individuals. Fourteen of the clients, each of whom had profound multiple handicaps, participated in the study. The clients, ranging in age from 19 to 40 years (mean of 30 years), were profoundly mentally retarded (Grossman, 1983), nonambulatory, and had serious medical complications such as severe difficulty with food ingestion. Each client also had multiple physical disabilities such as hypertonicity and spastic quadriplegia. The clients had histories of non-responsiveness to behavior-change programs and generally displayed disabilities characteristic of people with the most profoundly handicapping conditions (Landesman-Dwyer & Sackett, 1978).

These staff and clients were selected to participate in the investigation for four reasons. First, each client met the criterion of having profound multiple handicaps, and these staff were the regular caregivers of the clients. Second, these 14 clients spent most of their day in the living unit, in contrast to the other 6 clients in the unit who attended an off-unit educational program for a greater amount of time. Third, informal observations in the clients' living unit frequently had indicated very low levels of client treatment activities conducted by staff. Fourth, for purposes unrelated to the study, the first author recently had been assigned to provide program consultation to this particular living unit.

Behavioral definitions. Five mutually exclusive categories of staff behavior were targeted. *Basic care* was defined as a staff member engaging in direct contact with a client to take care of the client's personal or health needs (e.g., bathing and changing clothes). *General interaction* was defined as a staff member engaging in a social or game-type interaction with 1 or more clients (e.g., talking to a client about his or her clothes, playing a musical instrument for a client). *Training* involved a staff member conducting a skill acquisition training program, a stimulus preference assessment, a behavior-change or reinforcer identification program, or a noncontingent stimulus presentation program (see *client training program* section for elaboration). *Indirect basic care* consisted of a staff member performing general maintenance duties in the living unit, not involving direct contact with clients, such

as folding clothes and paperwork. *Nonwork* was defined as a staff member not engaging in any behavior related to living environment maintenance or client welfare (e.g., watching television, reading a magazine, talking to other staff persons about nonwork activities, and sitting in a chair with no other apparent activity).

Observation procedures. Prior to conducting observations, the direct-care staff were informed that living unit activities would be observed periodically during the day for several weeks. In an attempt to minimize the potential reactivity of the observation process, staff were not told specific days or times of day when observations would occur. Additionally, the specific staff behaviors targeted for observation were not described to them.

Observers were facility staff members whose job duties included partial responsibility for programmatic services provided in the living units. Observer training included reading the behavior definitions, receiving experimenter instructions, and practicing observations in other living units with experimenter feedback. Observations involved a time-sampling system in which an observer entered the living unit, located each staff person present (1 to 4 staff could be present at any given time), noted the behavior of each person when first observed, and recorded the number of staff engaged in each type of the five behavior categories.

Observations occurred on weekdays at 15-min intervals beginning at 7:30 a.m. and continuing through 11:15 a.m., and then again from 1:15 p.m. through 3:00 p.m. However, each time interval was not observed every day. Rather, different time periods were observed across days. In total, 96 observations were conducted during 26 days, with an average of 4.0 observations for each 15-min interval. The distribution of observations across days for different time periods reduced the predictability of the observations and ensured that observations would occur when different subgroups of staff were assigned to work on different days of the week.

These time periods were selected for observational analysis because they appeared to include times amenable for increasing client training activ-

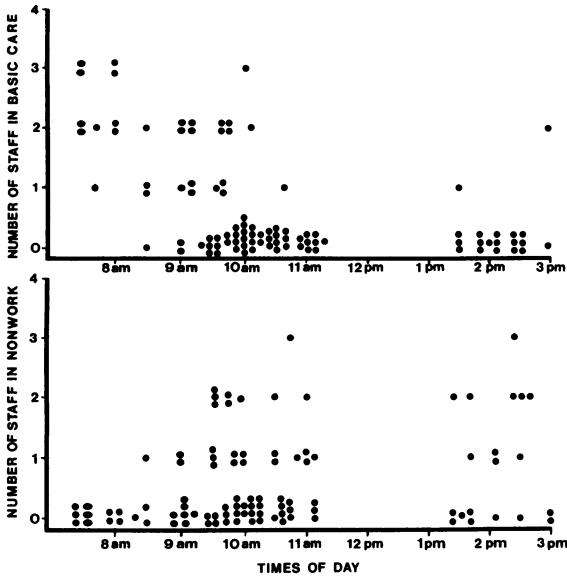


Figure 1. Scatter plot of staff basic care behavior (top panel) and nonwork behavior (bottom panel). Each panel shows the number of staff engaged in the respective behaviors for all observations across various times of day. Each data point in a panel represents the results for one observation.

ities based on general staff and client schedules that had been in effect for several years. Also, observations did not appear necessary prior to 7:30 a.m. because at that time clients were in bed or being helped out of bed by staff. Similarly, at 11:30 lunch began for all clients, followed by rest periods (and staff lunch) until 1:15.

Reliability checks were conducted during 20% of all observations. Across all reliability checks, disagreements occurred regarding the observed behavior of respective staff persons on only 5 occasions (in each case observers disagreed as to the number of staff engaging in direct vs. indirect basic care; no disagreements were noted regarding the other behavior categories).

Results and Discussion

To assess the times of day appearing most opportune to increase staff training behavior without interfering significantly with other staff duties (in particular, basic care responsibilities), a scatter plot analysis was conducted (Touchette *et al.*, 1985). Specifically, an analysis (Figure 1) was conducted

regarding the number of staff engaged in basic care and nonwork activities relative to different times of the day across 30-min time blocks. These two categories were targeted because basic care duties were considered very important for the clients because of their dependent personal and medical care needs. These duties usually could not be rescheduled like some other duties (e.g., indirect basic care). Nonwork behavior was considered the least desirable staff activity. The analysis revealed changes in staff work activity at different times of day that could be important in regard to assigning additional and/or alternative client service responsibilities. As indicated in Figure 1, in the morning the number of staff engaged in basic care was greatest during the earlier time periods and decreased as the morning progressed. Conversely, the number of staff engaged in nonwork increased as the morning progressed. Hence, 10:30 a.m. to 11:00 a.m. appeared to be an optimal morning time to increase structured client training activities without interfering with client basic care. A similar pattern occurred during the afternoon, except basic care was generally much less frequent. Nonwork activity occurred most frequently from 2:00 p.m. to 2:30 p.m., with no observations of basic care during that period. Consequently, this period appeared to be an optimal time to attempt to increase client training.

There were no clear patterns of occurrence for other staff behaviors, although general interactions tended to follow the same pattern as nonwork during the morning (only one observation involved general interaction in the afternoon). Indirect basic care occurred intermittently during the morning with no apparent trends, and occurred infrequently in the afternoon (1 staff person was observed to be engaged in indirect basic care during four afternoon observations). Only three occurrences (involving 1 staff person each) of training activity were noted throughout all observations.

In summary, based on the results of the observational analysis of staff behavior, there were several specific times during the workday in which staff could conduct structured client training activities without interfering with other basic care responsibilities. Experiment 2 was conducted to evaluate a

method of evoking and maintaining client training activities during the designated periods.

EXPERIMENT 2

Method

Participants, setting, and behavioral definitions. The participants included the clients and staff in Experiment 1 as well as 4 staff persons from the afternoon shift in the same living unit. These additional staff persons represented all of the full-time staff on the afternoon shift, with educational backgrounds and years of experience similar to those of the morning shift staff. The setting and behavioral definitions in Experiment 2 were identical to those in Experiment 1.

Client training program. The client training program to be conducted by the direct-care staff with the guidance of education personnel was developed specifically for persons with profound multiple handicaps who had long histories of nonresponsiveness to traditional skill acquisition training using a positive reinforcement paradigm (for elaboration see Green, Reid, Canipe, & Gardner, 1991; Green et al., 1988). To date, however, the program has been implemented only by research and education personnel. The purpose here was to attempt to extend the research findings into routine practice (Stolz, 1981) by training and managing the staff members' implementation of the newly developed program. The training program consisted of three related components. The first involved conducting 12- or 13-item stimulus preference assessments to determine stimuli most likely to function as positive reinforcers in operant-based training programs. The second and third components stemmed from the outcome of the first. If the preference assessment identified at least one stimulus likely to function as a reinforcer, then that stimulus was used in a behavior-change program to document its reinforcing value and to attempt to evoke adaptive behavior change (Pace, Ivancic, Edwards, Iwata, & Page, 1985). The behavior-change programs were selected in accordance with the agency's interdisciplinary team process. If however, the preference assessment did not identify at least one stimulus

likely to function as a reinforcer, then the third component was implemented. The third component involved noncontingent presentation of the stimuli (or stimulus) that evoked the most responsiveness during the assessment, although not at a level of responsiveness sufficient to suggest the stimulus would function as a reinforcer (Green et al., 1988). The focus of the latter component was to (a) monitor responsiveness to the stimulus over time to determine if stimulus-specific responsiveness increased to a level at which the stimulus was likely to function as a reinforcer if applied contingently and (b) provide the client with one or more stimuli that the client seemed to prefer at least somewhat relative to other stimuli in the client's environment as a means of increasing the overall pleasantness of the environment (Ivancic & Bailey, 1986). If the client's responsiveness to a stimulus changed over time such that it appeared that the stimulus might function as a reinforcer, then the behavior-change component with contingent stimulus presentation was implemented. If the client's responsiveness did not change, then a reassessment (first component) was conducted and the entire process was implemented again, based on the client's response to the second assessment.

Observation system. The observation system was the same as in Experiment 1 with two exceptions. First, observations of staff behavior were conducted only during the targeted intervention times (i.e., 10:30 a.m. to 11:00 a.m., 2:00 p.m. to 2:30 p.m., and 4:00 p.m. to 4:30 p.m.). The latter time period was included to provide a more comprehensive (i.e., at an additional time with other staff) evaluation of the staff management program. Also, informal observations had indicated a lack of training activities conducted by the afternoon staff. However, in contrast to the morning periods, a formal observational analysis was not conducted because few basic care responsibilities were regularly scheduled, or expected, during the afternoon and, hence, there was no concern that increasing training activities would interfere with basic care duties. Based on interactions with supervisors and review of work schedules, the designated afternoon time period already was assigned to be used for general inter-

actions and training with clients, although such activities did not seem to be occurring. The second change in the observation system was that during each observation, the observer (the same observers as in Experiment 1) observed staff behavior at 5-min intervals throughout each 30-min period. Observers frequently had been in the living unit for observation purposes (Experiment 1), as well as for other reasons, and their presence was not a novel situation for staff; these factors were likely to reduce the potential reactivity of the observation process (Wildman & Erickson, 1977). Relatedly, the days of the week during which observations occurred varied such that staff did not have advance notice regarding when observations would occur. As in Experiment 1, observations occurred intermittently during the work week. On the average for all time periods, observations were conducted 2 days per week during baseline and the first intervention condition and 1 day per week during the second intervention condition.

Reliability checks were conducted as in Experiment 1, during 22% of all observations and during each experimental condition and each time period. For all reliability checks (41 checks with seven 5-min samples per check), disagreements occurred during only two samples regarding the number of staff engaged in the categories of basic care, general interaction, and nonwork activity, and during only three samples for the categories of training and indirect basic care.

Experimental conditions: Baseline. During baseline, staff engaged in their usual routines. As mentioned previously, staff had been instructed repeatedly during the previous 2 years to encourage client engagement with leisure materials and to interact with clients as much as possible during these times. Staff also had received repeated verbal instructions on how to interact with clients as well as how to provide leisure activities by keeping leisure materials within reach of clients, physically prompting use of leisure materials, and praising clients for using materials.

Experimental conditions: Multifaceted staff training and management program. The multifaceted intervention consisted of two phases: an

initial staff training phase and a management phase. The staff training phase began with a meeting to explain the rationale for increasing client programming activities. Also, the specific purposes of the client training programs were explained. A third purpose of the meeting was to assign each staff person to specific clients, with an accompanying schedule for each client's training, to help ensure accountability in program implementation.

Following the initial group meeting, each staff person received individualized training by an experimenter. The training involved a basic behavioral model (Reid *et al.*, 1989), including an experimenter demonstrating the desired training behavior, observing the staff person practice the programming techniques, and providing corrective and approving verbal feedback until the staff person met designated competencies. All individual training was completed in 2 weeks and required 40 to 60 min per staff person.

The management phase of the intervention consisted of four components. First, daily verbal feedback was provided to each staff person, contingent on the occurrence and proficiency of client training activities. The verbal feedback was provided by a representative of the facility's education department (an experimenter) who had programming responsibilities with the clients in the target unit. The feedback was based primarily on her informal and formal observations (she periodically conducted the systematic time samples of staff behavior) and was provided later in the day after the designated training period. Second, private written feedback was provided weekly to each staff person, summarizing his or her week's performance in brief, narrative form. This feedback was presented by the same individual who provided the verbal feedback. Third, a self-recording component was included; each staff person initialed a chart posted in the living unit each time he or she conducted a training activity with an assigned client. The self-recording procedure also was used to monitor the frequency of client training and to help determine the verbal and written feedback. The individual who provided the feedback made frequent (at least several times weekly) comparisons between her observations and

the self-recording. Finally, at the end of each month, those staff who had implemented at least 80% of their assigned training sessions were eligible to participate in a drawing for a special privilege. One staff person's name was selected randomly from all the names of eligible staff persons, and he or she was given the option of selecting, for example, a free lunch, 30 min extra time at lunch or at the end of the work shift, a private parking space, or a written commendation letter to be placed in the personnel file. These particular types of winnings were selected for the lottery based on recommendations from the staff and supervisors. In total, the multifaceted program was in effect for 5 weeks during the 2:00 p.m. period, 20 weeks during the 10:30 a.m. period, and 21 weeks during the 4:00 p.m. period.

Experimental conditions: Intermittent management program. The intermittent management program involved the same procedures as used in the management condition except that the frequency of verbal feedback was reduced from daily to twice per week. This component was reduced because the daily verbal feedback was the most time-consuming aspect of the program (e.g., the person presenting the feedback had to meet individually with each staff member on both work shifts each day). However, no attempt was made to withdraw the feedback totally, because at least intermittent feedback is usually needed to maintain the effectiveness of a staff management program (Reid et al., 1989). The intermittent management program was in effect for 38 weeks during the 2:00 p.m. period, 23 weeks during the 10:30 a.m. period, and 12 weeks during the 4:00 p.m. period.

Experimental design. A multiple baseline design across times of day and groups of staff was used to evaluate the effects of the program. Also, implementation of the intermittent management condition represented a partial withdrawal design (Rusch & Kazdin, 1981).

Acceptability measure. To assess staff acceptance of the program, a questionnaire was completed anonymously by the staff participants following completion of the study. The questionnaire consisted of four questions asking staff how much

they liked or disliked each of the supervisory procedures, using a 5-point Likert-type rating scale with 5 representing "liked very much" and 1 representing "disliked very much." In addition, a fifth question addressed their views regarding the verbal feedback provided twice per week during the intermittent management phase versus the daily feedback in the preceding condition.

Results and Discussion

Staff performance. Effects of the multifaceted management program on provision of training activities by staff are presented in Figure 2. During the baseline condition, there was a very high level of nonwork behavior during the 2:00 p.m. period (average of 93% of observation samples) and relatively high levels during the 10:30 a.m. period (27%) and 4:00 p.m. period (18%). Conversely, there were very low levels of training during the baseline conditions for each period, averaging 0%, 7%, and 0% for the three periods, respectively. When the multifaceted management program was implemented, there were immediate and large changes in both types of behavior in opposite directions for each of the three periods. While the management program was in effect, nonwork decreased to an average of 8% and training increased to an average of 91% for the 2:00 p.m. period, and respective averages for the 10:30 a.m. period were 2% and 86% and were 5% and 84% for the 4:00 p.m. period. When the frequency of verbal feedback was reduced during the intermittent management phase, levels of nonwork and training remained very close to the levels observed during the initial management condition (the only exception was a small increase in variability during the 2:00 p.m. period). Throughout the conditions for all periods, there were no apparent changes in occurrence of basic care duties, which averaged 4% or less in all conditions.

The method of data collection used (recording number of staff engaged in each type of behavior during each time sample) did not permit an analysis of the effects of the program on individual staff behavior. However, the amount of change occurring with the behavior of the group as a whole

(Figure 2) most likely reflects improvements in the performance among all staff persons. To illustrate, during the 2:00 p.m. period, none of the observations of the day shift staff involved client training activities during baseline (hence, the average amount of training conducted by individual staff persons had to be zero). While the program was in place, 14 of 26 observation sessions resulted in 100% recordings of training activities; therefore, throughout the entire condition, the average amount of training for each individual staff had to average at least above zero. Similar results occurred with the afternoon shift, in that no observations of training occurred during the 15 baseline sessions, whereas during the management program, 8 of 24 sessions involved 100% training.

Acceptability measure. Results of the acceptability survey indicated that, overall, staff were quite accepting of the the management procedures (average rating across all procedures of 4.08 on the 5-point scale). However, there was also variability among the different components, with externally presented feedback (daily verbal, intermittent verbal, and written) receiving the highest rating (average rating of 4.5), followed by self-recorded feedback (3.8) and the performance lottery (3.0). The performance lottery was the only management procedure for which the average rating was not on the "like" end of the scale.

Client performance. All staff persons completed the first component of the client training program; therefore, all 14 clients successfully participated in the stimulus preference assessment. Nine clients then participated in the contingent stimulus component and 5 initially participated in the noncontingent stimulus component. Although the 14 clients are still participating in the programs, sufficient data have been obtained to indicate that the staff are providing the training services proficiently. However, it should be noted that our focus was on staff performance and not on client responsiveness, at least from a strict research perspective. Consequently, the data on client performance should be interpreted accordingly (e.g., although frequent observations were made of program implementation by the experimenter who provided the staff

feedback, no formal reliability checks were conducted on client behavior). Nevertheless, the program data were used as part of the clients' overall habilitation program and a summary is provided here.

Currently, 13 clients have participated in the contingent stimulus component, including the 9 who originally responded to the first preference assessment and 4 who originally did not respond. Among these 4, 2 clients gradually increased their responsiveness to the noncontingent component to the level that behavior-change programs were later implemented. The other 2 clients did not increase their responsiveness to noncontingent presentations of certain stimuli and subsequently participated in a second preference assessment. These 2 clients did indicate a preference for a respective stimulus at that point and then began to participate in the contingent stimulus component. The 1 client who has not participated in the contingent stimulus component did not indicate a preference during the initial assessment and subsequently became seriously ill, requiring her programs to be temporarily discontinued.

Of the 13 clients in the contingent stimulus component, 10 have shown increases in adaptive behavior to at least some degree, 2 have just begun participating in this component and therefore their responsiveness cannot yet be determined, and 1 client has shown no change, so a new behavior-change program is being developed. To provide an illustration of the progress the 10 clients have made, Figure 3 presents the behavior-change data for 2 clients (JM and MC) who are among the top 5 in terms of progress and 2 (MH and JK) who have shown the least progress. The data for JM and MC show an increased independence in regard to the level of prompt required to evoke their manipulation of an adaptive switch (Green *et al.*, 1988) when their preferred stimulus of rock music was provided contingently, relative to baseline without contingent music, using an ABAB evaluation design. The data for MH show an increase in the percentage of trials during which she looked at the trainer on request when her preferred stimulus of hand clap was provided contingently, relative to

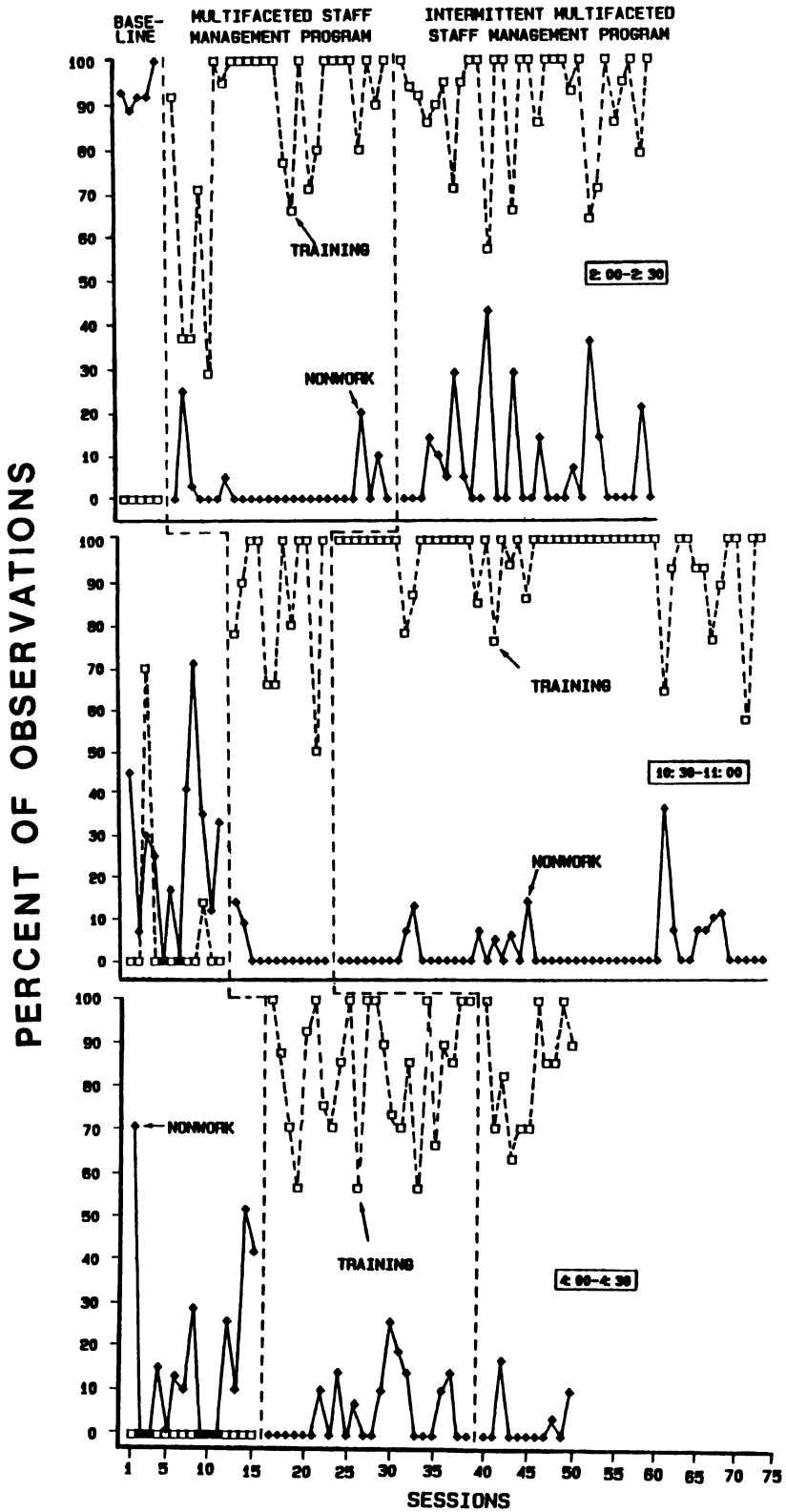


Figure 2. Mean percentage of observations in which staff were engaged in training and nonwork activities during each observation for all experimental conditions for each of three time periods.

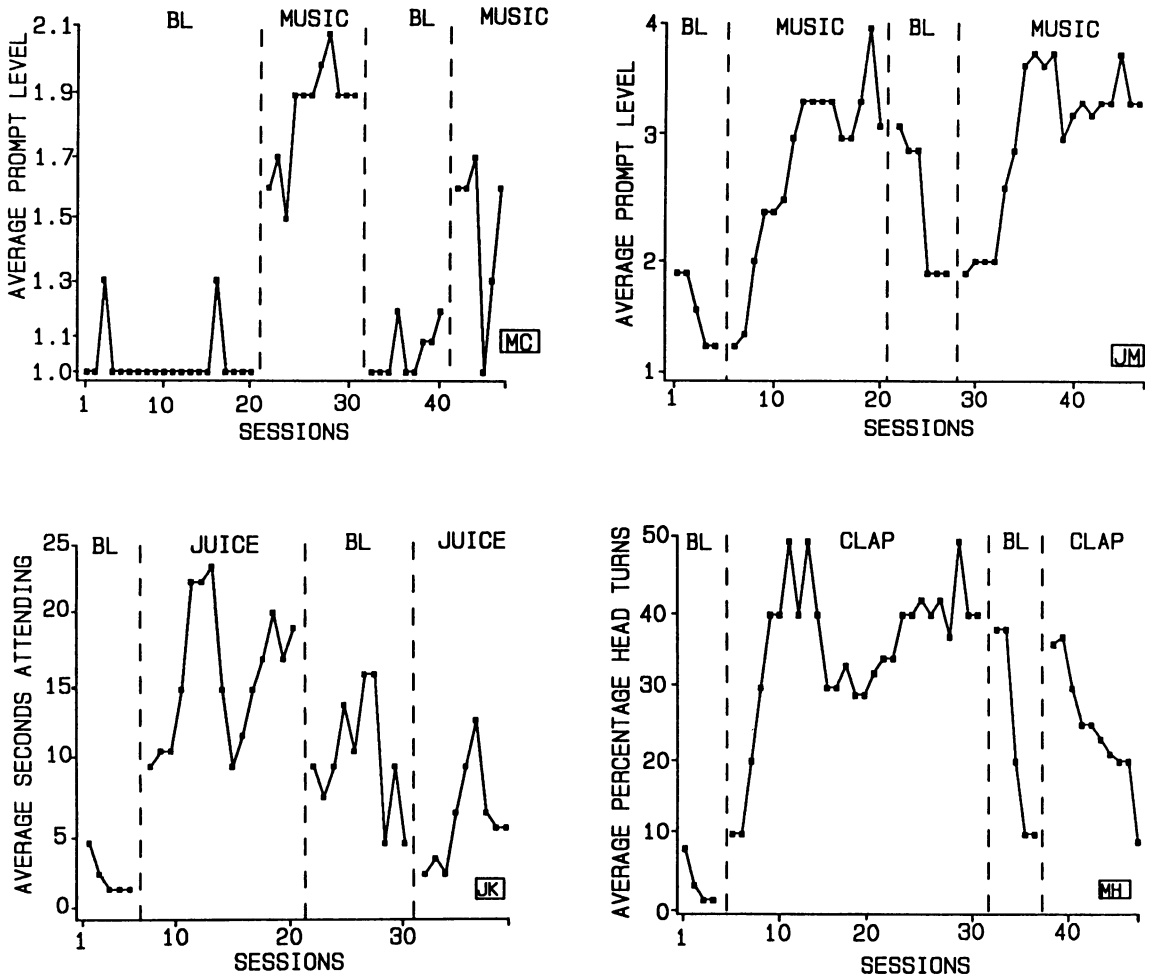


Figure 3. Representative data for 2 clients (MC and JM) who were among the most responsive to staff-conducted training and for 2 (JK and MH) who were the least responsive of all clients. The top two panels show the average level of trainer prompt required to evoke the target behavior (with 1 being the most intrusive—full physical guidance) for each session for each experimental condition. The bottom two panels show the average time attending (JK) and head turning (MH) to the trainer on request for each session for each experimental condition.

the first and second baselines, although at this point the behavior change has not been replicated during the second condition with a contingent hand clap. Similarly, JK's data show an increase in amount of time he attended to the trainer when contingent juice was provided, relative to baseline, with no clear replication at this point.

GENERAL DISCUSSION

Results of the two experiments demonstrate how a structural analysis of staff work behavior can be

helpful for improving performance. The analysis identified times during the work shift when important duties were being fulfilled and when staff were not engaging in work activities. A multifaceted management program was then applied when staff were not involved in work duties, and resulted in substantial increases in staff-conducted training services with clients. The change in behavior was brought about without interfering with important basic care responsibilities. These results have several practical implications in regard to providing habilitative services to persons with profound multiple

handicaps. For example, as noted previously, a frequent difficulty in evoking increases in client programming activities by direct-care staff is the numerous duties expected of staff, particularly when serving persons with profound multiple disabilities who are dependent on staff for fulfillment of basic needs. Consequently, some staff persons have reported that there is insufficient time to conduct client training. A structural analysis over time, as conducted in this study, can objectively determine whether such reports are accurate.

The potential disagreements about the availability of time to conduct client training programs can be especially relevant for program personnel (e.g., psychologists, occupational therapists) who may have no direct authority over direct-care staff yet must involve them in client training regimes in order to have a significant impact on client habilitation. In such a situation, which occurs often in residential settings, clinicians frequently must solicit the assistance of the supervisor of direct-care personnel in order to evoke their consistent involvement in implementing client training programs (Fisher, 1983). Supervisors may also be under the impression, due in part to staff reports, that staff do not have time to conduct training programs with those clients who have numerous personal care and health-related needs. Hence, the supervisors are not always very supportive of the clinicians. Use of a structural analysis can be a useful means for clinicians to demonstrate rather vividly, to supervisors as well as to senior administrators, that there indeed can be time to conduct training.

Due to the multifaceted nature of the staff management program, conclusions cannot be reached regarding what aspects of the program were responsible for the staff behavior change. However, the purpose here was not to conduct a component analysis of a multifaceted program, but rather to use this management approach to reduce staff nonwork behavior and increase client training activities. The multifaceted program was successful in this regard. Additionally, the most time-consuming component of the program was reduced by 60% (i.e., verbal feedback presentation was reduced from 5 days per week to twice per week) with continued

low levels of staff nonwork behavior and high levels of client training activities. The initial management program and subsequent modified program was effective for time spans ranging up to 43 weeks. It should also be noted, however, that the program involved a relatively small number of staff, particularly in regard to the structural analysis component of the program (4 of 8 total). Until additional research is conducted, it cannot be determined how much a structural analysis approach to designing a staff management program could be expanded to larger numbers of staff without becoming impractical.

Results of the staff acceptability survey supported previous results (see Reid & Whitman, 1983, for a review) with respect to a generally positive response to a behavioral staff management approach. Results showing more acceptance of externally provided feedback than self-recorded feedback also coincide with previous research (Korabek, Reid, & Ivancic, 1981), perhaps due to the increased response cost of staff recording their behavior relative to supervisors providing the feedback. Somewhat conflicting results also exist, however, indicating more acceptance of self-control management programs, including self-recording, relative to supervisor-controlled programs (Burgio, Whitman, & Reid, 1983). Continued research is needed to analyze better staff acceptance of different behavioral management procedures. Such research should also look at measures of acceptability in addition to anonymous questionnaire data, in light of research suggesting that verbal reports of acceptance of procedures do not necessarily coincide with willingness to be recipients of the procedures when provided with an actual opportunity (van den Pol, Reid, & Fuqua, 1983). Consequently, the acceptability results in this investigation should be qualified accordingly.

One of the most encouraging outcomes of this investigation was the initial, and maintained, use of a client training program designed specifically for persons with profound multiple handicaps who had histories of nonresponsiveness to training programs. As indicated previously, the program has been useful for this client population in research

applications (Green *et al.*, 1988, 1991), and it seemed appropriate to extend the program to more routine service provision. Extending innovations in applied research to day-to-day service settings has been a well-discussed problem in applied behavior analysis (King, 1981; Repp *et al.*, 1987; Stolz, 1981). Such an extension was possible in this investigation in part because the authors of the previous work were employed in the setting in which the program was implemented by the direct-care staff. Nevertheless, these authors lacked direct supervisory control over the direct-care staff and needed a means of affecting the latter's performance. The structural analysis of staff performance and the multifaceted management program provided such a means. A logical next step for future research is the application of a multifaceted managerial or consultative strategy, albeit perhaps with some different behavior-change components, to the performance of supervisory and decision-making personnel in human services settings. Research directed at altering supervisory and administrative behavior may have a noticeable impact on facilitating the adoption of research innovations into routine service delivery.

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