

USE OF A SELF-RECORDING AND SUPERVISION
PROGRAM TO CHANGE INSTITUTIONAL STAFF BEHAVIOR

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The use of a self-recording and supervision program to increase interactions between direct care staff and profoundly retarded persons in a state residential facility was investigated. Following baseline, staff were provided with instructions regarding what to self-record, criteria for how many interactions to record, and a prepared card on which to make the recordings. Throughout the study, the staff supervisor monitored intermittently staff-client interactions. Observations indicated that when the staff recorded their interactions with clients in a loosely structured dayroom setting, the rate of interactions increased noticeably for each staff person. Behavioral ecology measures indicated that other staff responsibilities, such as maintaining the cleanliness of residents and the physical area, were not affected detrimentally when social interactions increased and actually showed small improvements. Additionally, small decreases in resident self-stimulatory and disruptive/aggressive behaviors occurred when the rate of social interactions from staff persons increased. Follow-up measures indicated that the rate of staff self-recording was variable, but when staff did self-record, the increased rate of staff-client interactions maintained.

DESCRIPTORS: self-recording, staff management, institutions, retardates

The management of staff behavior in residential facilities for handicapped persons has evoked considerable interest in behavior analysis research. The use of supervisor praise and/or vocal feedback to alter staff behavior has been researched (Montegar, Reid, Madsen, and Ewell, 1977; Pomerleau, Bobrove, and Smith, 1973), as well as a variety of procedures involving written feedback (Greene, Willis, Levy, and Bailey, 1978; Kreitner, Reif, and Morris, 1977; Panyan, Boozer and Morris, 1970; Patterson, Griffin, and Panyan, 1976; Quilitch, 1975, 1978; Welsch, Ludwig, Radiker, and Krapfl, 1973). Other reports have investigated techniques using contingent money (*e.g.*, Katz, Johnson, and Gelfand, 1972; Pommer and Streedback, 1974) and

trading stamps (Bricker, Morgan, and Grabowski, 1972; Hollander and Plutchik, 1972; Hollander, Plutchik, and Horner, 1973) as reinforcing stimuli. Group contingencies (Reid, Schuh-Wear, and Brannon, 1978) and behavioral lotteries (Iwata, Bailey, Brown, Foshee, and Alpern, 1976) have also received attention. Despite the success of these and similar studies, problems with many of the procedures have been pointed out, including short-lived effects, lack of economic feasibility (Iwata *et al.*, 1976), and/or administrative reluctance to adopt the procedures (Montegar *et al.*, 1977; Zaharia and Baumeister, 1977).

One behavioral procedure which has not been evaluated for its effectiveness with institutional staff is self-recording, although it has been one component of a multi-faceted approach (Patterson *et al.*, 1976). Many investigations have included self-recording as an effective behavior change technique with other populations (see Jones, Nelson, and Kazdin, 1977; Nelson, 1977, for reviews). However, despite the reported success of self-recording as a behavior change pro-

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cedure, data are also available that suggest this is not always the case (Mahoney, 1977; Nelson, 1977). Hence, researchers have suggested a number of variables involved in self-recording regimes that may play a part in their reactivity (*e.g.*, Nelson, 1977). Several of these components, including instructions to the self-recorders, criterion setting for the self-recorded responses, discriminative stimulus characteristics of the self-recording apparatus, and external monitoring (supervision) of the self-recorded behaviors could be incorporated into a self-recording program for institutional staff to increase the probability of desired behavior change. Such procedures would not require large monetary investments for financially limited institutions nor major administrative changes such as rearrangement of staff work schedules characteristic of previous programs (*e.g.*, Iwata *et al.*, 1976; Reid *et al.*, 1978).

One class of institutional staff behaviors that could be the focus of such self-recording and supervision procedures is the provision of personal interactions with residents by direct care personnel. The importance of interactions for institutionalized retarded persons is well accepted (Blindert, 1975; Dailey, Allen, Chinsky, and Veit, 1974; Warren and Mondy, 1971). Unfortunately, social interactions between attendant staff and residents are often very infrequent (Bensberg and Barnett, 1966; Dailey *et al.*, 1974; Warren and Mondy, 1971). The present study was conducted to determine whether a self-recording and supervision program in which direct care staff recorded their interactions with residents with intermittent supervisor monitoring would be a means of increasing such interactions.

In addition, measures of other staff responsibilities were conducted to determine whether they were altered along with staff-resident interactions. Since direct care personnel are generally charged with a variety of daily responsibilities (Iwata, Note 1), the caution expressed by behavioral ecologists (Willems, 1974) to evaluate

the effects on the total behavior system when changing one behavior seems especially warranted. A final consideration of study was the maintenance of the change in staff behavior following termination of the formal investigation. With few exceptions (*e.g.*, Fabry and Reid, 1978), behavioral research concerned with institutional staff management has neglected to address this issue, although its importance has been well discussed (Kazdin, 1973).

METHOD

Participants and Setting

Participants were eight direct care personnel in one ward of a state residential facility for the developmentally disabled. The staff comprised the entire day shift of attendant personnel on the ward and included four males and four females. Ages ranged from 22 to 50 (mean 37), educational levels from 10 to 16 years (mean 13), and length of employment at the center 1 to 10 years (mean 4). One staff member left the facility during the second experimental phase of the study.

Clients residing on the ward were 45 severely or profoundly retarded males ranging in age from 14 to 38 (mean 24). All but two of the clients were ambulatory, although several required some staff assistance to walk long distances. Thirty-eight of the clients fed themselves independently and three toileted completely independently. None of the residents exhibited vocalizations sufficient to engage in conversations. Almost all residents required assistance in all other self-care areas (*e.g.*, grooming, dressing).

This particular living area was selected for several reasons. First, it was recommended by a center administrator when questioned by an experimenter. It had traditionally been a "back ward" area, receiving the least amount of professional services relative to other living areas in the center. Second, the ward supervisor had been cooperative previously in attempting to implement new training programs and had

agreed to participate in the project as a means of increasing interactions between staff and residents. Third, the living area was viewed as being representative of institutional settings regarding the job responsibilities of the direct care personnel.

The study was conducted in the dayroom and the adjoining bathroom and shower area of the ward. The dayroom contained minimal physical stimuli except for large rocker chairs, benches lining three walls, and a television. The room totalled 144 m in area, had windows on two sides, and adjoined a nursing station which could be viewed through large Plexiglas windows. The bathroom (12 sq m) consisted of six toilets, and the shower room (8 sq m) contained sinks, a bathtub, and the showering area.

Apparatus

The self-recording apparatus consisted of a 7.62- by 12.70-cm masonite board with a 3.2-cm-diameter hole near the top. A laminated form, with the taped label, "Self-Recording Card," was taped to the front of the board. Down the left-hand side of the card were listed 15 resident names with five boxes drawn next to each name. Within each box was a blue ink dot. A white sticker on the laminated surface covered each blue dot. Self-recording consisted of the staff member peeling the appropriate white sticker next to a resident's name thereby exposing the blue dot to indicate a self-recorded interaction with that resident. The durable construction of the self-recording form permitted ease in handling (could be carried in a pocket, reinforcer apron, or tied by string around the waist). No pencils were needed for the sticker-dot system; the staff could self-record by peeling off stickers and placing them on the back of the card.

The 15 names on the self-recording card were determined by randomly dividing all 45 residents in the living area into three groups. Each staff member was then assigned to one of the groups.

Behavior Definitions

Staff behavior. Dayroom staff were observed on six mutually exclusive categories of behavior, adapted from systems previously reported (Iwata *et al.*, 1976; Montegar *et al.*, 1977).

1. Interaction with resident: Staff member maintains physical contact with, or talks to, a resident and is not engaging in a care activity or staff-to-staff interaction. Examples include calling a resident's name, tickling, and describing something to a resident. The resident's name was also recorded.

2. Direct care: Staff member is engaged in resident care activities which involve an interaction with a resident, such as taking a resident to the toilet, providing medical assistance, or breaking up fights.

3. Indirect care: Staff member is engaged in custodial activities that do not involve an interaction with a resident, such as mopping the dayroom or folding clothes.

4. Staff-to-staff interaction: Staff member is interacting with another staff member and not a resident (*e.g.*, talking to staff).

5. No demonstrable work activity: Staff member is not engaged in any of the previous activities. Examples include standing or sitting with no apparent activity and eating a sandwich.

6. Off unit: Staff member is not present in the dayroom or the adjoining bath/shower room (*e.g.*, work breaks).

Resident behavior. Observations were conducted on three mutually exclusive categories of resident behavior.

1. Disruptive/Aggressive: Resident is engaged in self-injurious behavior (*e.g.*, hitting oneself), clothes ripping, feces smearing, fighting, hitting, kicking, or throwing furniture.

2. Self-stimulatory: Resident is engaged in idiosyncratic, stereotyped behavior, such as hand weaving or finger flicking.

3. Other: Resident is not engaged in any of the previously defined behaviors.

Area cleanliness. The cleanliness of the living

area was an expressed concern of the ward supervisor and part of the staff's responsibilities in the dayroom. In order to determine if the level of cleanliness was altered during the self-recording project, data on dayroom cleanliness were collected. The dayroom was divided into two areas using a prominent physical feature of the room as a boundary. These two areas were checked according to three cleanliness dimensions each (no puddles of liquid, no feces, and no trash present). The adjoining bathroom and shower area were checked according to the same three dimensions as well as two additional dimensions in the bathroom (toilets flushed and no clothes on the floor or sink). More specific cleanliness criteria for the 14 total dimensions (three each in the two dayroom areas and shower area, and five in the bathroom) are available from the second author.

Resident cleanliness. Since most of the residents were not yet toilet trained, a major responsibility of the dayroom staff was cleaning the residents when toileting accidents occurred. To evaluate whether cleanliness care suffered during the self-recording procedure, residents were observed regarding cleanliness (no feces or urine present on them or on their clothing).

Observation System

Observers included the ward supervisor, an administrative assistant to the supervisor, practicum students assigned to the project, and one experimenter. The supervisory personnel (supervisor and administrative assistant) conducted 26% of all observations. The administrative assistant was not informed of the experimental purpose. The student observers did not participate until approximately one-third of the project had elapsed. They were not informed of the experimental purpose or the occurrence of experimental manipulations.

Observer training included reading behavior definitions and examples, question and answer periods with the experimenter, and practice observations with feedback from the experimenter prior to participation in the study. Each ob-

server was also required to learn each resident's name. Observers achieved perfect agreement with the experimenter on at least 10 consecutive observations prior to observing during the study. The training period generally encompassed training sessions on each of 3 days. The inclusion of student observers (trained identically to the initial observers) after one-third of the study had elapsed represented one control against observer drift (Kazdin, 1977).

Staff behavior. Observational data were collected from 9:00 a.m. to 11:30 a.m. and 1:30 p.m. to 2:30 p.m. each weekday. These times were selected because they were the least structured periods in the dayroom for the day shift. During other times, various activities (meal-times, school preparation, and different training programs) occupied most of the staff's time, although they generally involved only a few residents at any given time. Utilizing a variable time, 15-minute time sampling procedure (Powell, Martindale, and Kulp, 1975), 14 observations were conducted each day. Hence, the time between observations varied, averaging 15 minutes. Five such observation schedules were generated to correspond to each of the five weekdays on which observations were conducted.

At each observation time, the observer entered the nurses' station at one corner of the dayroom. From the nursing station, which generally included one or two other persons, the observer could watch the dayroom without the staff necessarily being aware of the observer's presence. The observer first viewed one section of the dayroom through a window and then observed a second section through another window. The observer noted the first distinguishable behavior of the first staff member seen and repeated the process for the other staff member in the dayroom. If a staff member could not be seen (one section of the dayroom could not be viewed through the nurses' station), the observer entered the dayroom, looked for the staff according to a predetermined route, and noted the first distinguishable behavior. In the event of a staff-resident interaction, the resident's name was also

noted. Observers were instructed to record the behavior of the staff person within 5 seconds of when he/she first located the staff member.

Area cleanliness. Cleanliness data for the physical areas were collected at 9:00, 10:00, 11:00, and 2:00 each weekday. The observer entered the dayroom at a specific entrance and scored the first designated area, followed by the second area, the bathroom, and the shower room according to each cleanliness dimension described previously.

Resident observations. In order to observe resident behavior, 10 lists of 10 randomly selected residents were generated. One of these lists was randomly selected four times a day on each weekday for resident observations. These observations immediately followed the observations of area cleanliness. The observer re-entered the dayroom from the bathroom, located the first resident on the list, and recorded the first distinguishable behavior observed according to the three categories described previously. The observer then walked up to the resident until he/she was within touching distance and noted whether his pants appeared wet or soiled. This process was repeated for the next nine residents on the list.

Reliability

Reliability checks on staff behavior were conducted by two observers independently and simultaneously observing the same staff member. At a given hand signal or head nod by one designated observer, observations began through one window of the nursing station. After the designated observer counted 5 seconds, observations were switched to the next window, and if necessary, into the dayroom. Observers were instructed not to interact during the observations. Periodic monitoring by the experimenter(s) indicated that observers did not discuss their recordings during the observations. Interobserver agreement was calculated for each behavior category by dividing the number of agreements as to the occurrence of a behavior by the number

of agreements plus disagreements (this formula was used for reliability calculations for staff, resident, and cleanliness observations). An agreement was counted only if both observers scored the same behavior category during the same observation.

Reliability checks for staff behavior occurred on 461 of the observations throughout the course of the study, representing 36% of the total number of observations made. Reliability checks occurred during 41% of baseline observations and 26% of observations while staff were self-recording. Reliability observations were conducted during both experimental conditions for all staff members (except for Cal, who only participated in baseline). Reliabilities for all categories of staff behavior were .90 or above.

Reliability observations for resident behavior were conducted in the same manner as with staff and occurred during both experimental conditions (total of 22 checks). Reliability was calculated as with staff behavior, with an agreement scored only if both observers recorded the same category on a given observation for a specific resident. For the disruptive/aggressive category, a mean reliability of .75 (range 0 to 1.00) resulted, with a total of 9 agreements and 3 disagreements during the entire study. Self-stimulatory behavior averaged .87 (.50 to 1.00), with a total of 71 agreements and 11 disagreements. Other behavior averaged .92 (.50 to 1.00), with 98 agreements and 8 disagreements.

Reliability checks for area cleanliness were conducted on the same occasions as the reliability observations for resident behavior. Two observers independently scored each of the 14 dimensions on each reliability check. An agreement was scored for the cleanliness category only if both observers recorded "clean" for a specific dimension in the same physical area on a given observation. Similarly, an agreement for "not clean" was counted only if both observers recorded such on a given observation. For the 22 checks, reliability averaged (mean) .93 for the clean category and ranged from .75 to 1.00.

Throughout all reliability observations, there was a total of 206 agreements and 15 disagreements. For the "not clean" category, reliability averaged .95 with a range of .75 to 1.00 and a total of 95 agreements and 10 disagreements.

Reliability checks for resident cleanliness also were conducted on the same occasions as resident behavior. Agreements for categories were scored as in area cleanliness calculations. Reliability averaged .99 for resident cleanliness, with a range of .89 to 1.00 and a total of 187 agreements and 1 disagreement throughout the entire study. There was also only 1 disagreement for the "not clean" category.

Experimental Procedures

Baseline. Staff members were informed during a weekly meeting at the beginning of baseline that observations would be made of dayroom interactions with residents and of general cleanliness. Assurance was provided that the data collected would not be used for personnel evaluative purposes and that it would be available to staff any time if they so desired (no staff persons requested to see the data on their behavior during the study). Throughout baseline, staff engaged in their usual dayroom responsibilities which included maintaining the cleanliness of the area, maintaining the cleanliness of the residents, general social interactions with all residents, escorting residents to and from the bathroom, and general supervision of all resident activities. These had been the traditional dayroom responsibilities and had been repeatedly discussed with all staff members prior to the study. Generally, an individual staff person was assigned to the dayroom for 1.5 to 2 hours. However, this varied according to number of staff present and other tasks scheduled for the day. There were always two staff working in the dayroom at a given time. For approximately 1½ years prior to the study, observers had been entering the dayroom for various purposes other than this study. Hence, the presence of observers did not create a new situation.

The assignment of persons to the dayroom was determined by the shift supervisor, who reported to the unit supervisor. At the beginning of each day, the shift supervisor surveyed the number of staff present, reviewed the planned activities, and assigned two persons to dayroom duty for the morning and afternoon. The frequency of individual staff being assigned to the dayroom varied each week due to varying days off and use of leave time by staff. Because of the variable rate of individual dayroom assignments and the varying length of time of shifts (afternoon shifts were longer than morning shifts), there was no easily determined unit of time to represent an experimental session. Due to the lack of a predefined session, it was decided prior to beginning the experiment that the proportion of observations during which specific behaviors occurred would be the dimension used to evaluate the effects of the self-recording and supervision.

Self-recording and supervision program. The self-recording and supervision program included several components. First, staff were *instructed* how to use the self-recording form and how to define an interaction. Second, a *criterion* of desired number of interactions was established and explained. Third, staff were provided with the *self-recording stimulus*, the card. In addition, the *observations* of the staff during baseline (of which the staff had been informed) continued during this condition, including the participation of the supervisor in the observation process.

Staff were informed at a weekly group meeting at the beginning of the self-recording and supervision condition that a new procedure would be instituted gradually in the dayroom. It was explained that they would be requested individually to keep a record of their interactions with specific residents. It was further explained that these records would be placed in the resident's file, serving as an indication of the amount of social interaction each resident received. They were once again assured that the data collected would not be used for evaluative

purposes and would be available to them upon request. A sample recording card was also displayed.

On the day that each individual staff member began the self-recording procedure, a meeting was conducted involving that individual, the ward supervisor, and one experimenter to further explain the system. The staff member was shown the card, was instructed on the removal of a white sticker and exposure of a blue dot (to indicate an interaction with a resident), and was told what constituted an interaction.

Also in the initial meeting, the staff member was instructed to attempt to interact with each of the 15 target residents listed on the card four times during each morning assignment in the dayroom (usually 1½ hours per staff assigned) and five times during each afternoon assignment (usually 2 hours). However, it was explained that these numbers were a goal to strive for and that the usual personal care of the residents was still a priority. The staff member was told not to let the frequency of interactions jeopardize his/her other responsibilities. Questions by the staff person were then solicited and answered, and instructions to turn in the self-recording card to the ward supervisor's office at the end of the dayroom shift were provided.

After the initial meeting, the ward supervisor gave the self-recording form to the staff member at the beginning of his/her shift for each day he/she was assigned to the dayroom, and at the end of the shift, the card was returned to the ward supervisor's office. When the card was handed in, the ward supervisor and/or experimenter thanked the staff for self-recording with the card each day. Special care was taken to ensure that the praise was contingent on using the card and not on number of interactions with residents. Hence, the praise statements were made regardless of how many blue dots were exposed on the card as long as at least one blue dot was exposed. After the staff person had recorded on several days, the supervisor and/or experimenter discontinued the daily praise for

self-recording and gave praise intermittently for using the card during the remainder of the study.

The establishment of the criteria for number of interactions was based on several guidelines. Criteria were sought which would significantly increase the frequency of staff-resident interactions but not seriously interfere with other dayroom responsibilities. It was decided that spending one-third of the dayroom shift interacting with residents was reasonable. Allowing an average of 30 seconds per interaction, the criteria of four interactions for morning shifts per each of the 15 residents and five for afternoon shifts were set.

Follow-up. Staff continued to receive the self-recording card as part of their daily dayroom responsibilities following termination of the self-recording and supervision as part of the formal investigation. That is, no data collection or formal observations of the staff, residents, or dayroom cleanliness were conducted, but the supervisor continued to dispense and collect the self-recording card. Follow-up observations were conducted 7 weeks (18th calendar week for all staff from the beginning of the study) after termination of the experimental condition and again after 11 weeks (22nd calendar week). Staff members were not told when follow-up observations would occur. All procedures during the follow-up periods were identical to those during the self-recording and supervision condition.

Experimental Design

A multiple baseline across seven staff members constituted the experimental design (see Figure 1). The procedure was not introduced for one staff person, as he was to be transferred to another unit at the approximate time that he was scheduled to be asked to self-record. Baseline observations encompassed a range of 2 to 10 calendar weeks across staff members, whereas the self-recording and supervision condition ranged from 1 to 9 weeks across staff.

RESULTS

Staff Behavior

The effects of the self-recording and supervision program on the rate of staff-resident interactions are shown in Figure 1. During baseline, the mean number of interactions averaged across staff members was .07 per observation (range of .02 for the staff person with the lowest baseline number to .16 for the staff person with the highest). Increases occurred for each staff member as the self-recording procedures were introduced. The mean number of interactions during the self-recording and supervision for all staff members was .54 per observation, with a range of .34 to .65 across staff persons. During the 7-week follow-up observations, two persons continued interacting at a rate above baseline, while four were not observed to interact. During the 11-week follow-up, all six persons observed were interacting at a rate above baseline and similar to the self-recording and supervision condition (mean of .55 interactions per observation, range of .44 to .70 for all six persons).

An analysis to determine with whom staff were interacting indicated that the increased interaction rate was due primarily to interactions

between staff members and their 15 targeted residents on the self-recording card. During baseline, 13% of the interactions were between a staff person and the residents who were later targeted for that particular staff member, whereas after baseline 92% of all interactions were between a staff member and his/her target group of residents.

An alternative analysis of the effects of the self-recording and supervision program on staff-resident interactions was accomplished by analyzing the occurrence of interactions relative to how many persons in the dayroom were self-recording. Because of the multiple baseline across staff members and the variable scheduling of individual staff in the dayroom, the number of persons in the dayroom who were self-recording at a given time could have been 0, 1, or 2 (there were always two staff in the dayroom regardless of how many of them were self-recording). Figure 2 reflects the percentage of all observations that were scored as interactions when there were 0, 1, or 2 staff persons self-recording. The percentage of interactions increased as the number of staff who were self-recording increased. Figure 2 also reflects the decrease in percentage of observations scored

Table 1

Mean rates of occurrence per observation and ranges across staff members for staff behavior.

	<i>Baseline</i> \bar{X} (Range)	<i>Self-Recording and Supervision</i> \bar{X} (Range)	<i>Follow-up (7 wk)</i> \bar{X} (Range)	<i>Follow-up (11 wk)</i> \bar{X} (Range)
Interactions	.07 (.02-.16)	.54 (.34-.65)	.08 (.00-.21)	.55 (.44-.70)
No demonstrable activity	.35 (.27-.50)	.06 (.05-.26)	.44 (.31-.52)	.02 (.00-.06)
Direct custodial	.25 (.14-.35)	.24 (.16-.43)	.23 (.10-.37)	.38 (.30-.50)
Indirect custodial	.20 (.12-.36)	.09 (.03-.13)	.12 (.05-.18)	.03 (.00-.09)
Staff-staff interactions	.07 (.03-.13)	.02 (.00-.04)	.11 (.05-.17)	.03 (.00-.12)
Off unit	.03 (.00-.04)	.02 (.00-.05)	.02 (.00-.13)	.01 (.00-.05)

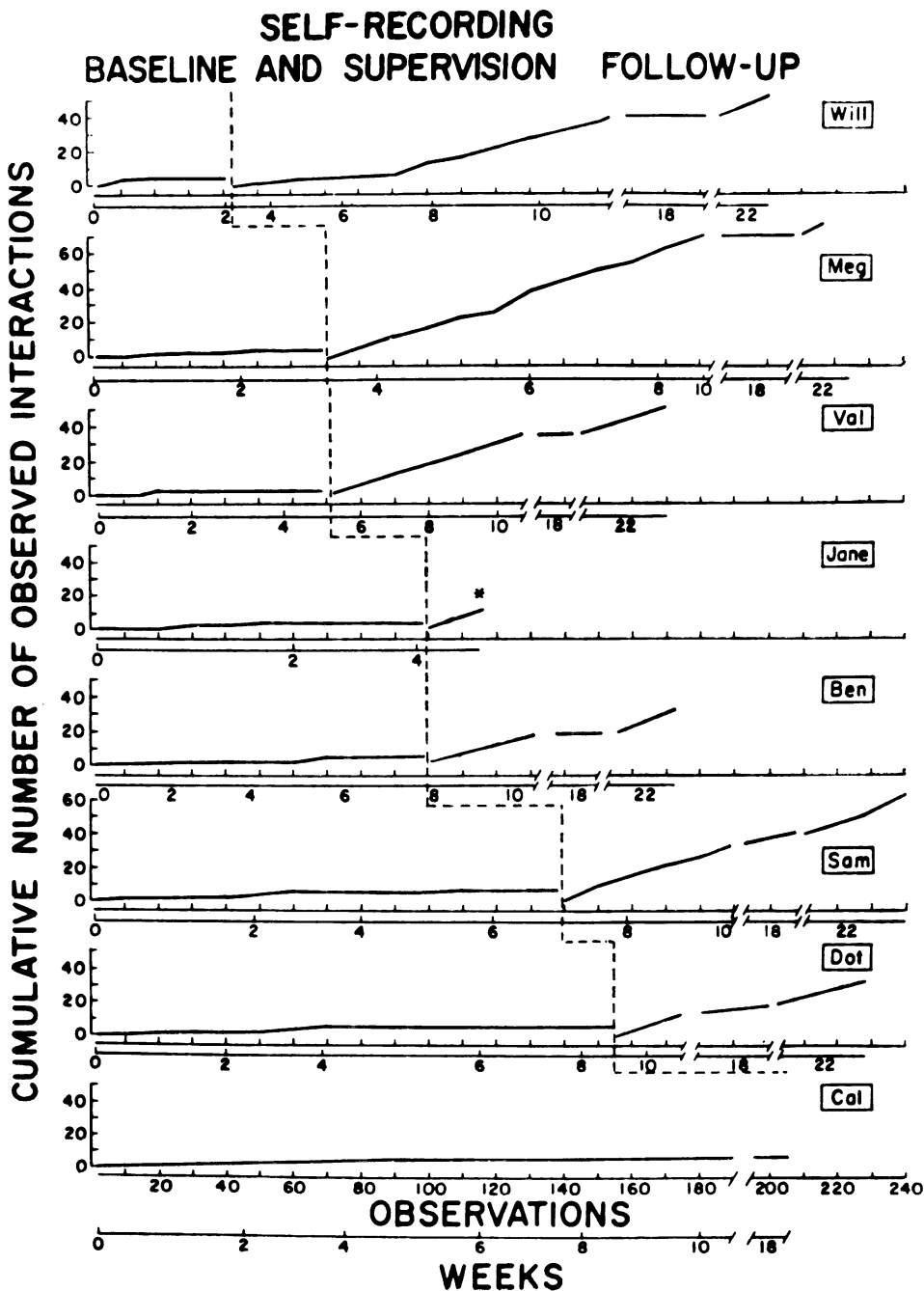


Fig. 1. Cumulative number of interactions observed during baseline, self-recording and supervision, and follow-up for individual staff members. The top abscissa for each person represents the number of observations and the bottom abscissa represents the number of calendar weeks encompassed. The breaks (//) in the abscissa indicate when observations were terminated although the self-recording continued. The asterisk (*) indicates where Jane resigned from the facility.

as no demonstrable work activity as the number of staff in the dayroom who were self-recording increased from 0 to 2.

Results for other staff behavior categories reflected no changes across conditions on the magnitude of the changes for interactions and

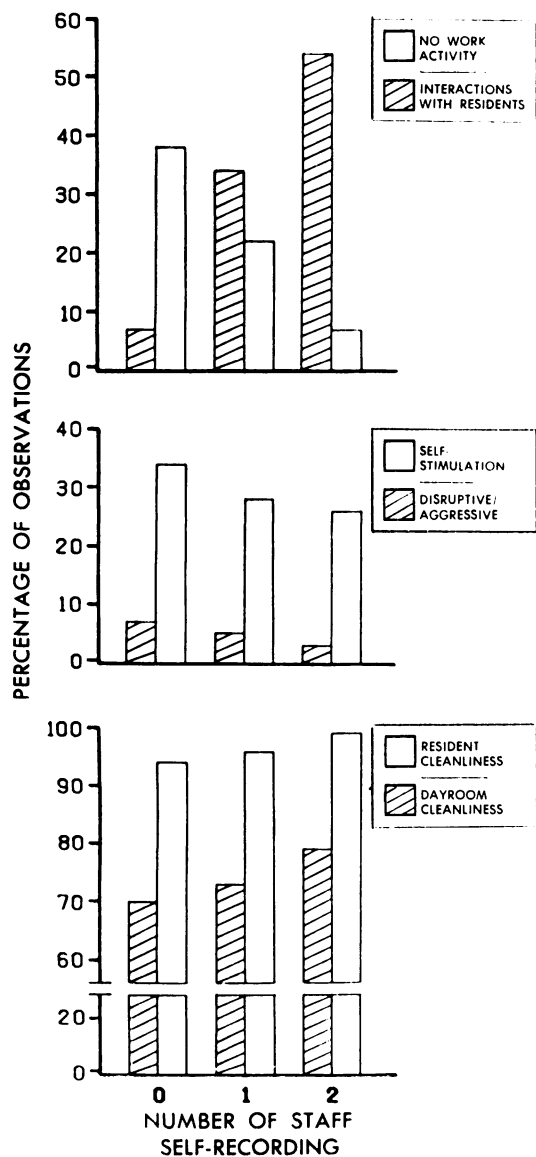


Fig. 2. Percentage of all observations scored according to the legends in the boxes when there were 0, 1, and 2 staff persons in the dayroom self-recording. There were always two persons scheduled in the dayroom regardless of how many were self-recording their interactions with residents. The top section presents staff behavior; the middle section resident behavior; and the bottom section clean scores for residents and dayroom area.

no demonstrable activity. Table 1 presents the means averaged across all staff persons, and the ranges across all staff, of the rate of occurrence for each behavior category throughout all experimental conditions.

Resident Behavior

The relationship between resident disruptive-aggressive and self-stimulatory behavior, and the number of dayroom staff self-recording are also shown in Figure 2. As the number of staff self-recording increased, the percentage of observed self-stimulation and disruptive/aggressive behavior decreased.

Cleanliness

An increase in resident and dayroom cleanliness occurred as more staff were self-recording. The percentage of residents found clean increased from 93% to 99%, while dayroom cleanliness increased from 71% to 79% when the number of staff self-recording in the dayroom increased from 0 to 2, respectively (Figure 2).

Independent Variable

As a measure of the self-recording component of the independent variable, records were maintained concerning the number of self-recordings made on the recording card. During the self-recording and supervision condition, a mean of 23 recordings of interactions was made during each hour a staff member was in the dayroom with the recording card. During the 7-week follow-up, this decreased to a mean of eight recordings per hour averaged for all staff members. During the 11-week follow-up, the number of recordings turned in increased to 22 per hour.

DISCUSSION

The results demonstrate that a self-recording and supervision program can be an effective staff management technique. The rate of staff-resident interactions increased noticeably for each staff person when the program was implemented. During baseline, an interaction occurred on an average of 1 every 14 observations for all staff, whereas during self-recording and supervision, an interaction occurred on an aver-

age of 1 of every 2 observations. The procedures were incorporated into the daily ward routine and required minimal financial investment. In addition, the package did not involve major administrative changes, such as rearranging of work schedules characteristic of previous research (e.g., Iwata *et al.*, 1976; Reid *et al.*, 1978), and hence, should evoke more administrative willingness to adopt the procedures.

The behavioral ecology measures indicated that the increased rate of staff-resident interactions was not accompanied by detrimental changes in other targeted staff responsibilities. Actually, small improvements appeared in both area and resident cleanliness (and a decrease in nonwork activity) when the number of staff who were self-recording in the dayroom increased from 0 to 1 to 2, even though the total number of staff in the dayroom was always 2. The increased number of interactions between staff and residents may have served to increase the staff's immediate awareness of residents being soiled or wet. These data assume more importance when considering the wide variety of responsibilities of direct care staff and the possible administrative concern that increasing socialization activities will detract from the basic custodial care. The data in this study indicate that this is not the case.

Although the decreases in resident self-stimulation and disruptiveness which occurred as more staff were self-recording were relatively small, they do support the contention that social interactions are beneficial for institutionalized residents (Blindert, 1975; Dailey *et al.*, 1974; Warren & Mondy, 1971). Future research might investigate more sophisticated interaction methods (e.g., providing interactions contingently for appropriate resident behavior). However, the practicality of implementing more sophisticated interaction procedures is questionable in traditional "back ward" areas where two staff members are responsible for 40 to 45 severely and profoundly retarded persons in a large dayroom setting. Using the resources at hand to increase general social interactions through the

self-recording and supervision program in this study provided one step toward a more enriched environment. More significant improvements in client behavior would be unlikely without an increased staff-resident ratio and a more stimulating physical environment.

Explanations as to why self-recording can function as a behavior change procedure have been widely discussed, although a consensus of opinion has not been reached (Jones *et al.*, 1977; Mahoney, 1977; Nelson, 1977). Because the intervention in this investigation involved other components (*i.e.*, instructions, criterion setting, possible discriminative stimuli associated with the recording card, and external monitoring), all of which reportedly enhance the reactivity of self-recording (see Nelson, 1977), the precise cause of the behavior changes cannot be determined. Also, staff may have been responding to contingencies implied in the procedures. For instance, the overt involvement of the supervisor in explaining the interaction criteria, the self-recording process, and the monitoring should have been a clear indication of the supervisor's desire that the staff interact more frequently with the clients. Staff might have been more likely to respond to her involvement in the self-recording condition than to the involvement of nonsupervisory personnel. The role of supervisory versus nonsupervisory personnel in implementing self-recording procedures for staff warrants further research. However, the question as to which specific components were most significant in the intervention does not detract from the effectiveness of the entire self-recording and supervision program, but additional research is warranted for component analyses. This need for research on different variables associated with self-recording procedures with institutional staff is similar to the recognized need for such research with other populations (Jones *et al.*, 1977).

The majority of previous staff management research has failed to include follow-up data. The results of the follow-up measures in this study were somewhat ambiguous. The 7-week

results were similar to baseline, whereas the 11-week results were consistent with the self-recording and supervision condition. Analyses of the rates of self-recording by examining the number of blue dots exposed, indicated that during the first follow-up the staff members essentially stopped self-recording, whereas their rate during the second follow-up was similar to that of the first self-recording and supervision condition. During the first follow-up period, there were major changes in the physical environment of the dayroom which may have resulted in the discontinuation of the self-recording. That follow-up period occurred for all staff during the 18th calendar week, a very hot weather spell. The dayroom air conditioning system was not functioning and residents were required to spend their usual dayroom hours in a separate air-conditioned part of the ward (the dormitory with beds pushed aside). The dormitory area was approximately only half the size of the usual dayroom. During this time, informal observations indicated changes in resident behavior, possibly due to the increased crowding or the different physical environment. For example, there appeared to be more fighting among residents and more disruptive behavior involving furniture (turning things over, throwing, *etc.*). Such resident behaviors seemed to affect staff behavior, in that staff spent more time observing and monitoring (which was included under the definition of "no demonstrable activity"). Also, the interactions that did occur included a different type of custodial care than usual (breaking up aggressive resident-resident interactions, stopping inappropriate use of furniture, *etc.*). These results offer a tentative explanation as to which behaviors interfered with self-recording.

Other factors may have also affected the self-recording during the first follow-up, but the results do not necessarily detract from the efficacy of a self-recording and supervision program as a behavior change technique. These results do suggest, however, that maintaining the self-recording behavior with institutional staff could

be a major problem. Also, the results emphasize the importance of follow-up data in staff management and raise questions about most management techniques previously reported which changed staff behavior initially but did not evaluate maintenance of those changes.

The reliability of self-recording was not evaluated. Investigations of this procedure have shown that although reliability between self-recorder and objective observer may be low and variable, significant behavior change can still occur (see Nelson, 1977, for a review). However, future research regarding the reliability of self-recording and its effects in institutional staff management might be fruitful. Additional research might also focus on other staff behaviors that could be altered through similar self-recording and supervision procedures. If successful, self-recording could be included with other staff management procedures to form a comprehensive behavioral system and help alleviate the noted problems in institutional staff management.

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