

*PROVIDING A LESS RESTRICTIVE ENVIRONMENT
FOR PROFOUNDLY RETARDED PERSONS BY
TEACHING INDEPENDENT WALKING SKILLS*

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A basic right of all handicapped persons is to live in the least restrictive environment possible. In this investigation, procedures were evaluated for teaching four institutionalized males with profound retardation necessary skills to increase their individual freedom of movement. Following baseline, a travel training program with a backward chaining format was implemented to teach each person to walk independently from his living area to school. Travel training included instructions, practice, praise, feedback, verbal reprimands, prompts, and edible reinforcers. Each resident began walking the entire distance to school independently during training and also began walking back to the living area, although the latter set of skills was not specifically trained. Following termination of the formal investigation, follow-up measures of 1 to 8 weeks showed the residents continued going to school independently. A survey of residential facilities in 43 states provided social validation for the seriousness of the problems associated with transporting seriously retarded persons to school. Also, time efficiency measures indicated that training independent travel resulted in reductions of staff time required in school transportation. Results were discussed in light of the potential contributions of behavior analysis in providing less restrictive environments for seriously handicapped persons.

DESCRIPTOR: least restrictive environment, social validation, walking behavior, travel training, adult retardates

An area of recent concern to behavior analysts is the teaching of independent travel skills to retarded persons. Developmentally delayed individuals have been taught street-crossing skills for use in community settings (Page, Iwata, & Neef, 1976) and methods of using public transportation (Neef, Iwata, & Page, 1978). The significance of research on developing travel skills is well discussed in a number of general program descriptions on travel training (Certo, Schwartz, & Brown, 1976; Sailor & Haring, 1977; Tobias & Cortazzo, 1963; Tobias & Gorelick, 1968). However, the literature has focused on training individuals with deficits above the severe range

of retardation for community living. Independent travel skills for persons with very profound retardation in institutions have not received research priority.

Providing profoundly retarded individuals with independent travel skills within residential settings is important for a variety of reasons. First, there is widespread recognition of the right to education of all handicapped children (Irvin, 1976; Martin, 1976; National Association for Retarded Citizens, 1977b), including profoundly retarded persons in institutions. If institutional residents are to receive as much education as possible, a facilitator would be independent travel to and from school. Second, commensurate with the right to education is the right to live in the least restrictive environment possible (Council for Exceptional Children, 1976; National Association for Retarded Citizens, 1977a). It is logical that independent freedom of movement is less restrictive than movement with an escort. Third, federal accreditation standards for resi-

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dential facilities require that all residents be instructed in and provided with freedom of movement within the institutional grounds (Joint Commission on Accreditation of Hospitals, 1971). Finally, the significance of travel training becomes more apparent when considering the large number of profoundly retarded persons living in institutions. Despite efforts for de-institutionalization (Berkson & Landesman-Dwyer, 1977; Close, 1977), evidence indicates that the number of retarded persons in institutions is not decreasing and a growing percentage of the institutionalized population is profoundly retarded (Davis, 1973; Scheerenberger, 1976).

Behavioral research on mobility for seriously retarded persons has previously focused on elementary ambulation skills such as teaching children to walk upright (O'Brien, Azrin, & Bugle, 1972). A logical extension would be to teach profoundly retarded persons to use walking skills to travel independently in order to come into contact with more of their environment, such as going to school. The acquisition of such skills would reduce the requirements of staff personnel to ensure the attendance of residents at school, an area of concern (Blue, 1970) for understaffed institutions. The primary purpose of this investigation was to evaluate a program to teach institutionalized, profoundly retarded persons to walk independently from their living area to school.

A segment of applied behavior analysis receiving increased amounts of attention is the social validity of various research components (e.g., see Kazdin [1977] and Wolf [1978] for reviews). However, the need for continued research with social validity components, especially with institutionalized populations, has been noted (Kazdin, 1977). A second purpose of this paper was to assess the social significance of the problem of profoundly retarded persons going to and from school within institutions. Finally, because one rationale for the project was to reduce the amount of staff assistance involved in the school transportation process, this variable was also evaluated.

METHOD

Participants and Setting

Four male residents of a state residential facility for developmentally disabled persons participated. The residents ranged in age from 18 to 26 yr (mean 22) and had resided in the institution for a mean of 10 yr prior to the study. Standard psychological evaluations indicated each person scored within the profound range of retardation, with IQ scores of 8, 9, 11, and 14. Each resident demonstrated competence in basic self-help skills, although toileting accidents still occurred. Expressive language skills were highly deficient for each participant. Two were nonvocal except for unintelligible sounds, and two displayed infrequent vocalizations in one word utterances or short phrases (e.g., "clean shirt," "in the drawer"). Each resident demonstrated a small repertoire of nonvocal expressive gestures. The participants generally spent the major portion of the day in a large, unstructured dayroom with 40 other residents. Only one of the participants was attending school at the beginning of the investigation (he was escorted the entire way by a staff member). The other three participants had all previously been to school on numerous occasions for special activities in the school building (e.g., special recreational events, different training activities using the school equipment). Each participant exhibited a high frequency of inappropriate behaviors in the living area. Three engaged in self-stimulatory behavior (rocking, repetitive facial contortions, spinning in circles), three exhibited self-injurious behavior (face slapping, head banging, self-biting), and all four periodically were aggressive toward other persons (e.g., scratching, hitting, choking). These participants were selected as a result of several factors. First, their living area was chosen because all residents in that ward attended school less frequently than any other area within the institution, apparently because of their low skill level relative to other center residents. Second, staff personnel in that living area when ques-

tioned as to which residents would benefit from a project to teach them to walk independently to school, recommended these residents. Third, participants were required to be ambulatory and to comply at least intermittently with simple commands such as "come here," "stop that." Finally, each participant had to have been previously referred to the special education department of the facility for possible participation in the adult education program.

Course Description and Dependent Variable

The course to school extended 1,000 ft. from the front door of the residents' living area to the main door of the school. The entire route was on the institutional grounds, winding among various buildings. It included an asphalt roadway and, in one part, a sidewalk. A diagram of the course and surrounding area is presented in Figure 1.

Boundaries were established to differentiate the appropriate course from the remainder of the terrain. For the straightaways on the roadway, the edges of the road constituted the outer limits of the course (19 ft. wide). For the section of the course that consisted of a sidewalk, the edges of the walkway constituted the boundaries (6½ ft. wide). At the turns natural markers, such as cracks in the road and imaginary lines between two large rocks, were used to establish course boundaries. No painted or chalked lines were drawn to designate the course more clearly. However, to assist observers in determining how far along the course the residents traveled, small lines less than 6 in. long were painted and numbered along the course every 25 ft. There was a total of 40 lines along the complete course. The markings were located in various places along the course, not necessarily at the boundaries.

The main dependent variable of interest was the percentage of the distance the residents walked to school within the course boundaries without engaging in more than one occurrence of inappropriate behavior. The percentage of the

distance to school was measured as the percentage of the 25-ft. markers surpassed. Inappropriate behavior was defined as any disruptive activities (kicking or hitting others, screaming, or throwing objects), mouthing objects, masturbation, urination, defecation, or self-injurious actions (face slapping, arm biting, etc.).

Trainers

All training was conducted by one of two staff persons (experimenters) employed at the center. Both were employed as bachelor's level psycho-

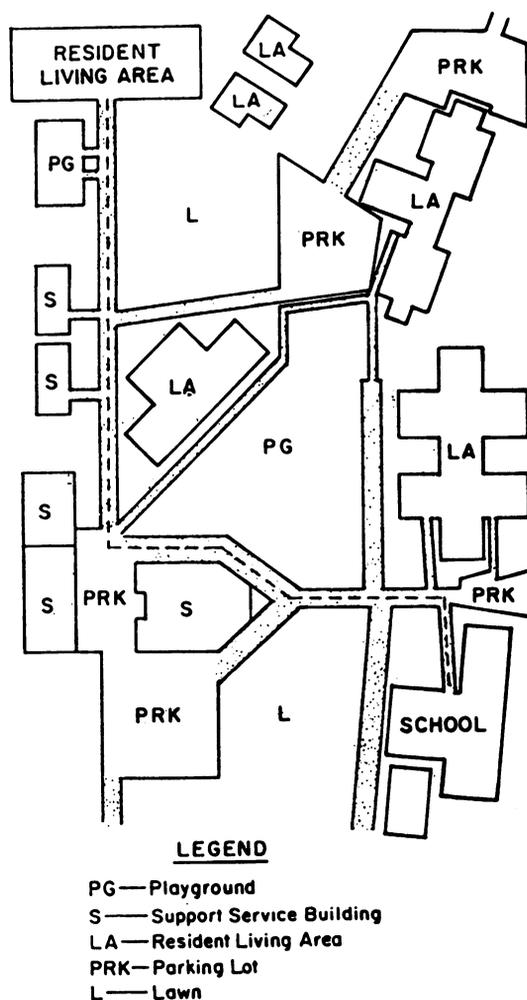


Fig. 1. Approximate diagram of the course between the resident's living area and the school. The course, indicated by the dashed line, is not drawn to scale. The shaded areas indicate roads and sidewalks.

logical assistants and had participated in numerous self-help and social skills training programs. Each trainer had also received undergraduate training in behavior analysis. One person had been employed at the center approximately 1.1 yr prior to the study, and the other had been employed 2.5 yr.

Observations and Reliability

All observations were conducted by the trainer except for reliability observations. Reliability observers included the second person who participated as a trainer, students assigned to the project as part of a practicum experience, and an administrator from the institutional school who volunteered to participate in the project. Prior to the study, observers were trained through instructions from the experimenters regarding the course description. Each observer also walked the entire course with the experimenter while he/she pointed out the boundaries and answered questions. Observers recorded the number of 25-ft. markers passed (which was later converted to percent of distance traveled to school) by the resident and the amount of time required. All observers were aware of the experimental purpose of the project.

Reliability observations were conducted by the reliability observer, recording simultaneously (but independently) with the trainer. During reliability observations, the observer paralleled the path of the trainer (see baseline), keeping a distance of about a meter behind or to the side. Using a stopwatch, the reliability observer timed the duration the resident was on the course while the trainer was not interacting with him due to inappropriate behavior or interference (see baseline). Reliability checks of the distance traveled to school and the required time were conducted at least once during each experimental condition for each resident for a total of 41 reliability checks. There were no disagreements throughout the study between the reliability observer and trainer regarding the number of 25-ft. markers successfully passed. There was never more than

a 5-sec difference between observers concerning the amount of time required on the course.

Experimental Conditions

Baseline. Baseline sessions were conducted individually with each resident by one trainer. The trainer escorted the resident to the front door of his living area and gave the command, "(Name), go to school," along with a pointing gesture in the direction of the course. The trainer then started the stopwatch, moved behind the resident, and remained between 5 and 25 ft. from him. The resident was given a maximum of 10 min to get to school. At the end of the 10 min, the length of time and the distance traveled were recorded. If, during the 10 min, the resident stepped off the course by going over any of the boundary lines, the timing was stopped. The time which had elapsed since starting the course and the distance traveled were then recorded and the resident was escorted back to the living area. If the resident engaged in any inappropriate behavior during the 10 min, the timing was stopped while the trainer intervened and provided a verbal reprimand (e.g., "Stop throwing rocks! You might hurt someone"). The trainer then escorted the resident, facing forward, back to the center of the course, moved approximately 5 ft. behind him and began timing again. If a second intervention was required during the same session because of any additional inappropriate behavior, the timing was again stopped. The time which had elapsed since starting the course and the distance traveled (determined by counting the markers passed up to the point where the resident was located when the second intervention occurred) were recorded. The resident was escorted back to the living area and the session was terminated. During all baseline sessions for all clients, only one session was terminated due to inappropriate behavior.

If, during the 10 min, the resident was confronted by any human (e.g., group of residents) or mechanical obstruction (e.g., car) which interfered with his progress, the timing was

stopped while the trainer waited for the obstruction to move or be moved. The trainer then escorted the resident back to the center of the course at the point where the interference occurred, moved 5 ft. behind, and began timing again. The session was not terminated because of interference as a result of obstruction from another person or thing. Temporary discontinuations of sessions due to interference occurred on less than 2% of all experimental sessions. Except for interventions caused by interference or inappropriate behavior, the trainer did not interact with the resident during baseline sessions after giving the initial command.

Travel training—course overview. On the first day of travel training for each resident, an overview of the entire course was conducted. The purpose was to provide instructions, with prompts where necessary, such that the resident could observe the entire path to school. In addition, this procedure was intended to bring the resident into contact with a positive consequence for completing the course, even if assistance was required. If the resident's lack of completing the course to school during baseline was caused by one or two mistakes, instructive exposure to the appropriate course with a contingent reinforcer might have eliminated the need for additional training.

At the beginning of the initial course overview, the resident was escorted to the front door of his living area and the trainer gave the instruction, "(Name), go to school," with a pointing gesture, as during baseline. The trainer then walked at the side of the resident and provided frequent praise (e.g., "I really like the way you're walking to school!" "Good walking, that's the way!"). If the resident stopped walking, went off the course, or engaged in inappropriate behavior, the trainer gave an instruction to stop that behavior and told the resident what he should be doing. For instance, if the resident walked onto the grass adjacent to the course, the trainer told him to leave the grass, go back onto the road, and walk to school. Similarly, if the

resident stopped walking and began waving his fingers in front of his face in a self-stimulating manner, the trainer instructed him to leave his hands alone and continue walking to school. Simultaneously with the vocal reprimands and instructions following a stop in appropriate walking, the trainer frequently provided physical contact in the form of light restraint or a prompt. For instance, as the resident walked off the course, the trainer put her/his hands on the resident's shoulders while talking to him. The trainer then gave a light push on the resident's arm in the direction of the school while instructing him to walk to school.

Once the resident reached the school, he was escorted through the main door into the lobby where he was seated (the lobby was used as a waiting place to which teachers came to escort students to their designated classrooms). The resident was then praised for walking to school, provided with a food treat, and escorted back to the living area. If necessary, residents were taught how to open the door to the school lobby by pulling it, through instructions, modeling, practice by the resident, and contingent praise. Each resident demonstrated the skills to open the door on command by the trainer after a few trials during the initial overview.

Travel training probes. The second major component of travel training was a series of probe trials. Four probe points along the course were located at intervals which were 25%, 50%, 75%, and 100% of the total distance to school. The purpose of the probe trials was to determine which parts of the course were already mastered by the resident and, hence, where intensive training should occur. The first probe sequence was introduced following the initial overview of the entire course. Additional probes occurred intermittently during intensive training sessions. At the onset of a probe trial, the trainer escorted the resident to the first probe point, 100% of the distance from the school (right outside the living area) and employed instructions and procedures as in baseline. If the resident

reached school successfully, verbal praise and a food treat were provided. Intensive training then began at that probe point. If the resident did not reach school, the trainer returned the resident to the starting point on the course, gave the direction to go to school and walked with him to the second probe point, providing frequent verbal praise for following the course. At the second probe, the observer stopped the resident, gave the usual instruction to go to school, began timing for 10 min, and followed baseline procedures from there. If the resident reached the school, verbal praise and treats were provided and training began at an adjacent point which was closer to the living area. If the resident did not reach school successfully, identical procedures as used at the first two probe points were implemented at the third point and, if needed, at the fourth probe point. If the resident did not reach the school from the fourth probe point, then intensive training began at the closest course marker to the school.

Travel training—intensive procedures. Following the initial overview and the first sequence of probe trials, intensive training procedures were implemented. These procedures included instructions, resident practice, contingent praise, contingent verbal reprimands, physical prompts, and edible treats. A backward chaining format was used such that each resident was trained to walk to school from a short distance, then taught to walk from a longer distance. This format was followed as more and more distance was added until the resident was starting from the door of his living area.

At the designated starting point during an intensive training session, the trainer gave the instruction to go to school. The trainer remained at the starting point, or at the point of the first turn in the course in order to view the client, until the resident reached school, walked off the course, or engaged in inappropriate behavior. If the resident successfully reached school, a training assistant (persons who participated as observers also functioned at other times as train-

ing assistants) met him in the lobby and praised him enthusiastically for walking to school by himself. Simultaneously, the trainer left his/her position at the starting point, joined the resident and training assistant in the school lobby, praised the resident, and provided an edible treat. If the resident walked off the course prior to reaching school or engaged in inappropriate behavior, the trainer intervened with firm instructions (yelled, if necessary, because of a long distance between the trainer and resident) to stop that behavior and to begin walking to school again. If the resident did not immediately begin walking along the course, the trainer left the starting point, hurried to the resident, and repeated the instructions along with a physical prompt, such as a light push on the resident's upper arm in the direction of the course. The trainer repeated the instructions and prompts, if necessary, until the resident began walking to school. The trainer then remained at that place on the course until the resident either reached school successfully, left the course again, or engaged in inappropriate behavior (then repeated the designated procedures).

Intensive training procedures were repeated at a specific marker until three consecutive successful attempts from that point were completed, either within or across sessions. Once that criterion was met, intensive training procedures were then initiated 50 ft. back from that point away from the school building. However, in order to eliminate unnecessary training whenever possible, probe trials were periodically conducted. If the resident successfully walked to school during a probe trial, then the next intensive training session began just behind that probe point instead of the marker 50 ft. behind where the resident had been previously trained. All probe trials during the intensive training were conducted with procedures identical to the probe trials conducted prior to intensive training. Hence, travel training procedures consisted of an initial overview of the course during which the resident was escorted the entire way to school,

probe trials before and during training in order to eliminate unnecessary training steps, and intensive training procedures.

While the major purpose of the project was to teach residents to walk independently to school, a more successful outcome would include the clients' learning to travel independently from the school back to the ward area. In order to evaluate whether this was achieved, measures were taken at the end of each probe trial and each intensive training session. When probe and training sessions terminated, the resident was given one trial with the command, "(Name), go back to the ward," with an accompanying pointing gesture from immediately outside the school door. Following the command, the trainer followed baseline procedures using the same course boundaries as when the resident walked from the ward to the school. The resident was required to reach the lobby of the living area (inside the main door) to have completely traveled the course. Throughout travel training, no training procedures were directed at teaching the resident to walk back to the living area.

The intensive training procedures were conducted in one or two training sessions per day for each client (mean, 1.46 sessions per day) on weekdays. Training sessions averaged 38 min, with a range of 15 to 75 min per session. The number of walking trials within each session varied according to each client's rate of walking and general progress.

Posttraining sessions. Once each client reached the criterion of walking the entire distance to school independently on at least three consecutive trials, posttraining sessions were conducted. Procedures during these sessions were initially identical to baseline procedures (however, when a resident walked the entire way to school independently, praise and edible treats were provided in the school lobby as during training sessions). Since baseline consisted of the trainer walking behind the resident from 5 to 25 ft. throughout the course, fading procedures were implemented after several posttraining sessions in which the

trainer gradually faded his/her proximity to the resident. While the close proximity between trainer and resident was viewed as a necessary precaution during baseline, it could conflict with the terminal goal of the resident walking independently as he might be controlled by the close presence of the adult walking behind him. Hence, after at least three posttraining sessions with conditions identical to baseline, the trainer began walking less and less of the distance to school behind the resident until he/she merely stood at the front door of the living area. From the living area door, the trainer could view the first half of the course; the second half was viewed by the training assistant waiting in the school lobby.

In order to incorporate the results of travel training into the daily routine of the residents, maintenance procedures were implemented for each resident during the last posttraining sessions. During maintenance, the supervision of the residents walking to school was taken over entirely by the living area staff and the school personnel. Before beginning the study, arrangements were made with the special education department of the facility that, once the four target clients demonstrated independence in walking to school, they would be admitted to specific classes if they were not already in school. Procedures were discussed with staff from the living area and the school, relating that the former would be responsible for (observe) the resident over the first half of the course and the latter would be responsible over the second half. Thus, when maintenance began, one staff person from the living area gave the instruction for the resident to go to school and observed him from the living area until he made the first turn in the course. From there, he was observed by the teacher waiting in the school lobby. When the resident reached the lobby, the teacher generally provided praise and escorted him to class. These procedures were the same as those used with more skillful residents at the center who were previously enrolled in school. During the fading

procedures and initial maintenance procedures, observers were present in the ward and in the school lobby to record the client's behavior, although they did not interact with the staff or residents.

Follow-up. Once maintenance procedures during posttraining sessions were in effect for at least three sessions, formal monitoring of the program was discontinued. Follow-up observations were conducted for each participant once per wk for periods ranging from 1 to 8 wk following termination of posttraining sessions. During follow-up, conditions were identical to those of the last sessions of posttraining (maintenance).

Experimental Design

A multiple baseline design was used in which travel training was implemented across residents. However, the design was altered from most previous investigations reported. Following nine baseline sessions for all residents, these sessions were discontinued until the first resident reached criterion during the intensive training sessions from the first marker outside the living area. Once the first resident reached criterion, training for that resident was discontinued, and baseline sessions were resumed for the other three while the first resident participated in posttraining sessions. When travel training was started with the second resident, baseline sessions with the remaining two were discontinued until the second person reached training criterion. Baseline sessions were then reinitiated, and the process was repeated for the final two residents. When posttraining sessions were implemented for a resident, these sessions were not discontinued as baseline sessions were when another resident began training.

The temporary discontinuations of baseline sessions were introduced for three reasons. First, the number of person hours of work was reduced by eliminating the occurrence of baseline sessions for all residents when one resident was simultaneously participating in training. Hence,

only one session (training) was occurring instead of four (three baseline and one training). Second, procedures employed during baseline sessions made unlikely the observations of gradual improvement in percentage of distance walked to school by the resident being trained. As baseline began immediately outside the resident's living area and residents were not trained at that point until the end of training due to the backward chaining format, it is improbable that any improvement would have been observed with the onset of training. Third, the objective of the program was to teach each resident to walk the entire distance to school. Large increases in the percentage of distance traveled would be of no value if the residents did not walk the entire way. Thus, the achievement of the terminal goal could be evaluated by comparing baseline sessions with posttraining sessions without a more detailed analysis of individual progress while other participants were simultaneously in baseline. An evaluation of individual rate of improvement was included, however, by examining the number of training sessions required to reach criterion.

Social Validity Measure

In order to estimate the pervasiveness of the difficulty of severely and profoundly retarded persons getting to and from school within an institution, a questionnaire survey was conducted. From the *Directory of Public Residential Facilities for the Mentally Retarded* (1977), 100 institutions located in 43 different states were selected nonsystematically.

The questionnaire was presented on a self-addressed postcard and sent to the special education directors of the institutions. The basic purposes were to assess how many of the centers had classrooms away from the living areas, if their severely and profoundly retarded ambulatory residents attended the classrooms, and how they went there and back. A cover letter providing a brief explanation of the purpose of the survey was also provided.

Time Efficiency Measure

In order to evaluate whether the amount of staff time involved in the school transportation process was reduced, time efficiency measures were conducted. Prior to baseline, staff personnel from the residents' living area were asked to record the time they left the ward area to escort residents to school and the time they returned. They were also requested to record the time they left to pick up residents after school and the time they returned. Records were collected at least once for each of the nine residents from that living area who were enrolled in school at that time, including one who eventually participated in the study.

After the follow-up observations, the same time efficiency measures were conducted at least once for the four participants of the study. A staff member recorded the time a resident left the living area for school and when he/she stopped observing him. Similarly, the time at which the staff member began watching for the resident to return from school and the time when the resident reached the living area were recorded. The evaluation of the change in staff time related to school transportation was indirect because of the comparison of the time required by graduates of the program with that required by residents who did not participate. Before beginning the study, the decision was made to include some persons in the study who were not enrolled in school as a method of eventually involving more residents in school without substantially increasing the effort required by living area personnel.

RESULTS

The effects of travel training on percentage of the distance independently walked to school are demonstrated in Figure 2. Preceding implementation of travel training, no resident walked the complete distance (averages were 2%, 29%, 5%, and 6% of the distance for the four partici-

pants). The most frequent cause of not completing the distance during baseline was the resident going off the course, which occurred on 61% of the sessions. Baseline sessions were terminated due to residents consuming more than the 10 min allotted without reaching school on 37% of all sessions. One session (2%) was terminated due to inappropriate behavior. During the post-training sessions, all residents increased the percentage of distance traveled. Two residents walked the entire distance on all posttraining sessions, one resident walked the entire distance on 94% of the sessions, and one resident on 86%. On the occasions when 100% of the distance was not walked, 67% was due to residents going off the course and 33% due to the residents not completing the course within the allotted 10 min. No sessions were terminated due to inappropriate behavior. There was no decrease in percentage of distance walked when the fading procedures were initiated. When the maintenance phase of the program began, each resident walked the entire distance to school (Figure 2) and back to the living area on every occasion. During follow-up sessions, each resident successfully walked to school and back on every occasion.

The rate of progress during travel training for each resident is reflected in Figure 3 which shows the most advanced training step (each 25-ft. marker along the course represented a step) passed independently per training session. On the first probe sequence preceding intensive training, no resident passed any of the probe points and, thus, began training outside the school door. The number of intensive training sessions required to reach criterion varied across clients, ranging from 6 to 19 (mean of 12.5 sessions). The training was spread across 4 to 15 days (mean of 8.75 days).

Figure 3 further depicts the point during travel training that each resident first completed the entire course back to the living area. All residents accomplished this between the 3rd and 17th training session (range of 2 to 12 days).

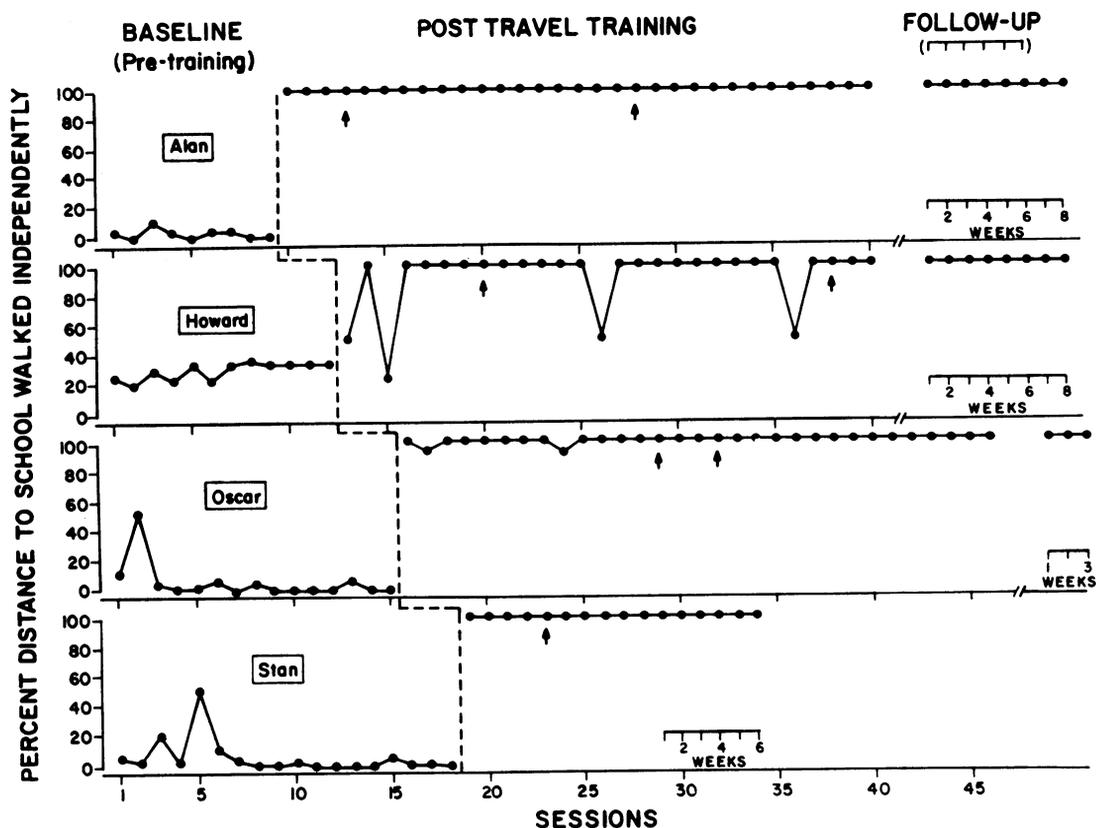


Fig. 2. Percent of the distance to school walked independently by each resident during each session in baseline, post travel training, and follow-up. The first arrow (↑) indicates where fading began and the second arrow indicates where maintenance by the living area staff began. For Stan, there was no fading, and the arrow indicates where maintenance was initiated.

Social Validity Measure

The completed questionnaire was returned by 92 of the 100 residential facilities. Of the responding centers, 98% reported that they provide school facilities separate from the resident living areas, and 89% indicated that their most seriously retarded ambulatory residents leave their living areas to attend school. Concerning how these residents traveled to school, 75% reported that staff, primarily direct care personnel, escort them. Most facilities also reported that various other personnel help in escorting; 56% indicated that vehicles help transport residents, 45% reported that some walk by themselves, and 34% reported that other residents assist in escorting them. Only 26% reported that

there are assigned staff members who have a primary responsibility of escorting residents to school.

Time Efficiency Measures

Results of the time efficiency measures indicated that less attendant staff time was required for residents who walked to school by themselves. During the pre-baseline measures of the escorted residents, a mean of 20.4 min of a staff person's time was required to escort one resident to and from school, averaged across all residents and staff sampled. For the measures when staff persons observed the residents walk to school and back but did not walk with them, an average of 4.63 min was required for one staff member with each resident.

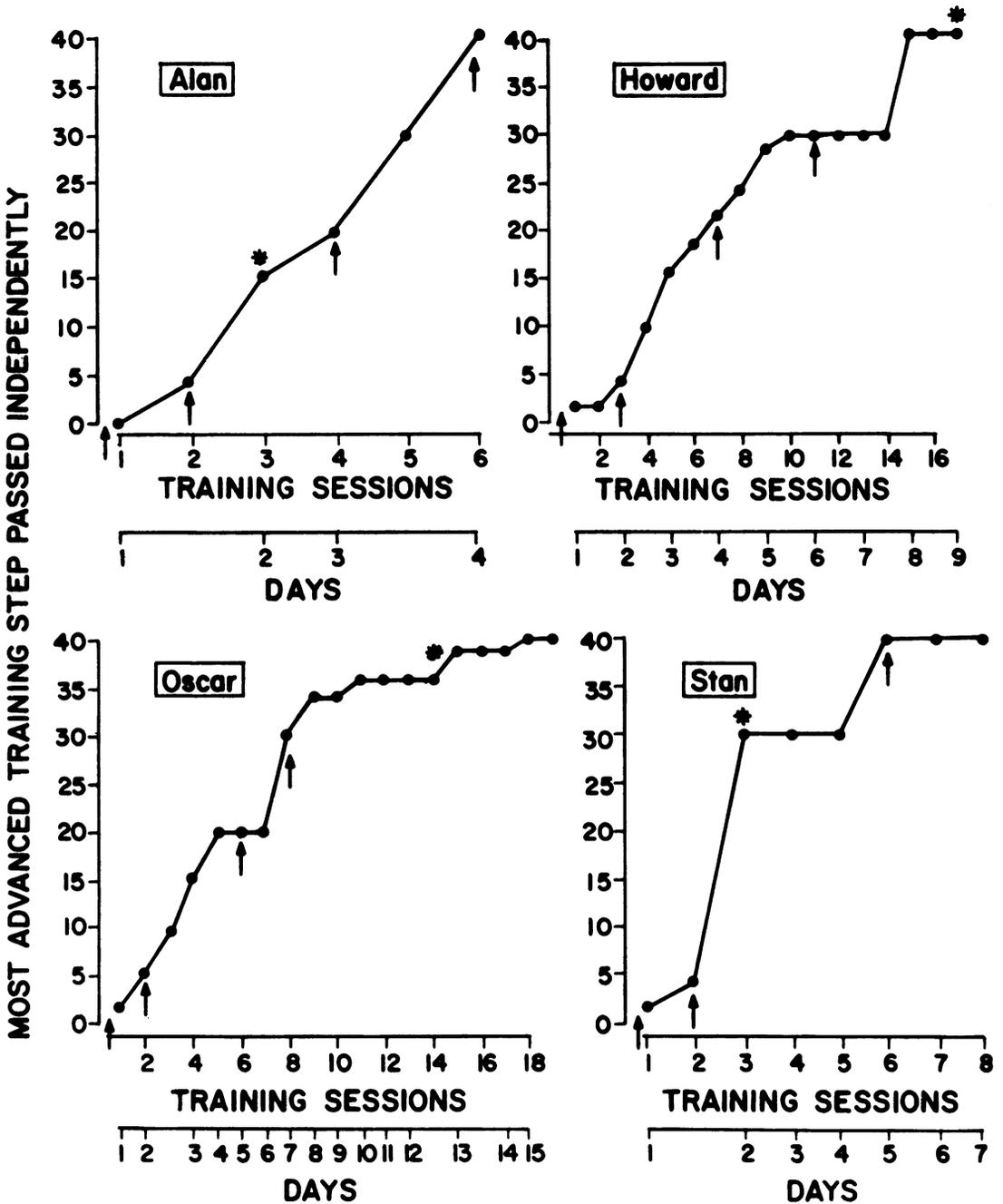


Fig. 3. The most advanced training step from which each resident walked to school independently during each intensive training session. Each 25-ft marker along the course represented one training step. The bottom abscissa on each graph depicts the number of days encompassed during training. The asterisks (*) indicate where each resident began walking the entire way back to the living area independently. The arrows (↑) indicate where probe sessions occurred.

DISCUSSION

The results demonstrated that the travel training procedures were effective in teaching institu-

tionalized persons with very profound retardation to walk to school independently. All four participants learned to comply with the request to go to school and walked the entire distance

without staff assistance after a maximum of 19 training sessions. Monitoring the program was easily incorporated into the daily staff routine such that each of the participants continued going to school independently after formal completion of the experiment. Follow-up observations ranging up to 8 wk indicated the participants were still traveling without assistance. In addition, although not directly trained, independent travel back to the living area after school was achieved by each resident during travel training and was maintained throughout all follow-up observations.

Results of the social validity measure indicated wide recognition of the problems associated with transporting seriously retarded persons to school. Perhaps the most notable indication of the pervasiveness of the difficulties is that 92 of the 100 residential facilities surveyed returned the completed questionnaire, an extremely high return rate. Three-fourths of the responding centers reported that staff escorts were involved in getting the residents to school, although only approximately one-fourth indicated that there were staff with that task as the primary job responsibility. Hence, it appears that the procedures evaluated in this study could be valuably utilized in many other institutional settings.

The results of the time efficiency measures suggested that considerably less staff time was required in the school transportation process when the residents walked independently to and from school. However, the measure of staff time to monitor the residents walking to school did not include the amount of time needed by the school personnel who waited for the residents. This was not included because the school personnel frequently were required to wait for other residents coming to school and the addition of the experimental subjects did not necessarily increase their previous time commitment. Observations after the study indicated that staff time involvement was reduced further as they began to send the residents to school without observing their travel because the school personnel ex-

pected each resident at a particular time and telephoned the living area if the resident was late, thereby instituting a form of indirect monitoring. However, when considering the reduction in staff supervision, the potential risk to clients becomes a concern. Future travel training programs must evaluate the possible harm to profoundly retarded persons in a loosely structured situation, such as independent walking, and must maintain sufficient amounts of supervision to keep the risk within acceptable levels. For instance, the amount of vehicle traffic or dangerous terrain, such as deep drainage ditches, should be taken into consideration. In this project, the form of telephone monitoring just described appeared acceptable to all personnel involved, and no injurious events occurred. Such monitoring may not be sufficient in other environments, and more involvement of staff members may be required.

A primary rationale for conducting this project was the right to the least restrictive environment of all persons, including institutionalized individuals with very profound retardation. While significant numbers of profoundly retarded individuals are being provided with the opportunity to live in more community-based settings (Berkson & Landesman-Dwyer, 1977; Close, 1977), many still remain in, or enter, institutional settings (Davis, 1973; Scheerenberger, 1976). Future research is warranted to develop other methods of facilitating educational services and providing a more enriching environment for these persons. For instance, training seriously retarded residents in socially acceptable, safe, and independent outdoor play would be beneficial. Training group cooperation and compliance skills for field-trip outings could increase the likelihood of such events conducted by recreation workers and volunteers. Behavioral research in these and similar areas could help provide the applied technology needed to comply with legislative and accreditative regulations for providing more humane services for seriously handicapped individuals.

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