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GROUP INSTRUCTION WITH PROFOUNDLY RETARDED PERSONS: ACQUISITION, GENERALIZATION, AND MAINTENANCE OF A REMUNERATIVE WORK SKILL

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We evaluated a group instruction program for teaching a vocational skill to profoundly retarded adults. The program involved designated trainer roles and both individual student-directed and total group-directed procedures. Results indicated that, following the program, participants acquired the skill of stamping addresses on envelopes, the skill generalized across an untrained type of envelope, and the skill maintained over time. The group activity was incorporated into the regular classroom without increased disruption and the participants earned a wage for their productivity. Implications for the development of a group instruction technology for severely handicapped persons are discussed.

DESCRIPTORS: group training, vocational skill training, maintenance, profoundly retarded individuals, classroom

The need for research on group instruction procedures with the severely handicapped has been expressed repeatedly (Gottlieb, Alter, & Gottlieb, 1983; Williams & Cuvo, 1986). Recognition of the importance of developing group instruction strategies is due to several factors, including the recent increase in the number of classrooms serving groups of severely handicapped students (Brown et al., 1981) as well as the fact that traditional group training strategies used with less seriously handicapped students frequently are not effective with the severely handicapped (cf. Gottlieb et al., 1983).

To date, research has suggested that severely handicapped individuals can benefit from instruction provided in a group format (e.g., Rincover & Koegel, 1977). Among investigations that have compared group procedures to more traditional individual training strategies (see Reid & Favell, 1984, for a review), there appears to be no consistent superiority of one approach over another. Actually, however, in many cases the question of the relative effectiveness is moot because teachers are required to work with students in group situations due to logistical demands. Hence, effective group instruction strategies are needed regardless of whether they are superior to individual training approaches.

Recently, gaps in the existing research on group instruction have been described (Reid & Favell, 1984). In particular, two issues that have received minimal attention are the use of group instruction to teach a generalizable skill and to teach a skill that is durable over time. An additional area in need of research is the utility of group instruction for teaching a wider variety of functional skills to severely handicapped persons, such as vocational skills. Perhaps the reason for the lack of research with vocational skills is that, because of the severity of the handicapping conditions of many of these individuals (e.g., profound mental retardation), using a group approach to teach the total range of skills needed for clients to receive remuneration in a work setting would not seem feasible. However, an alternative approach might be to teach a subset of skills so that severely handicapped persons could participate in a work endeavor on a partial basis.

The purpose of this investigation was to evaluate a group instruction program for teaching a vocational skill to profoundly retarded persons. The

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intent was not to teach a skill that would result in full-time employment, but rather to teach a skill for which clients could receive remuneration on a partial participation basis. A second purpose was to evaluate whether the group strategy would result in a work skill that generalized across different work materials and maintained over time.

METHOD

Subjects and Setting

The setting was a classroom serving four women who functioned within the low range of profound mental retardation. Each woman was essentially nonverbal and complied only sporadically with simple requests. Each participant engaged in various inappropriate behaviors such as aggression and self-injury. These women were chosen for the study primarily because they were profoundly retarded and they represented an existing group of students.

Two staff members participated in the study as trainers: a teacher's aide who was the regular instructor and the school principal (experimenter). In this regard, a staff-to-student ratio of at least 2:4 is not uncommon in classrooms serving severely handicapped students (Green et al., 1986).

Materials

The primary materials were mailing envelopes (30.48 cm by 22.85 cm) and hand-held stamps that provided the address of the facility. Also, a work jig was devised to help guide the correct placement of the stamp on the envelope. Specifically, the envelope was placed in a box (no front side or top) to prevent the envelope from moving and a file cover was then closed over the envelope that had an opening through which the stamp was to be placed. In addition, different mailing envelopes (15.24 cm by 22.56 cm) were used as generalization materials.

Behavior Definitions and Measurement

The primary dependent measure was the percentage of independent steps completed in the task-analyzed process of stamping the return address on the envelope. There were three components to the process (getting the envelope ready, stamping the envelope, and preparing for the next envelope) with three, three, and two steps, respectively. A step was considered independent if it occurred in response to an initial session instruction or a nonspecific component instruction and if it occurred in the designated sequence. A secondary behavior represented an output measure in that, once the students progressed through the task analysis and began to put the stamp on the envelope, probes were conducted to determine whether or not the return address was legible (defined as each word and number being distinguishable).

Three types of trainer behaviors were targeted: (a) *instructions* (i.e., a trainer vocalization that appeared to be intended to evoke student compliance in performing a step), (b) *physical guidance* (a trainer touching a student in an apparent attempt to evoke performance of a step), and (c) *praise* (an approval statement given while the student was performing a step or within 3 s after a step).

Observations were conducted to determine whether each step occurred independently during assessments. Reliability checks occurred on 44% of all assessments, distributed across experimental conditions. As a control against observer drift and bias, a staff member unfamiliar with the project was trained to observe when the study was approximately two-thirds completed using the original observer training procedures. Reliability percentages were calculated on a step-by-step basis and were calculated using the formula of number of agreements divided by the number of agreements plus disagreements and multiplied by 100. Reliability averaged at least 92% for occurrence, nonoccurrence, and overall agreement.

Probes on the legibility of the stamped addresses were conducted for 170 envelopes drawn randomly. A secretary independently marked each address as legible or illegible and overall, occurrence and nonoccurrence reliability averaged at least 83%.

Probes of trainer behavior were conducted during 28 training sessions using continuous 1-min intervals, alternated between the two trainers to provide a rate measure. Reliability checks were

conducted on three occasions. For each behavior category, there was one or zero disagreements on the total number of occurrences for 94% of the 1-min observation intervals.

Experimental Procedures

Baseline. During baseline, experimental assessments were conducted by the secondary trainer individually with each student. Each assessment consisted of three trials, with each trial beginning when an envelope was placed beside the box-jig and the assessor gave a general instruction. As long as the student completed steps she was allowed to continue. If the student did not begin the designated step within 5 s, performed the step incorrectly, or did not complete the step within 15 s, the assessor gave an instruction to begin the first component of the task analysis. If the student did not complete the first component, the assessor removed the materials from the student's view, placed the envelope in the box-jig, closed the file cover and presented the materials to the student with an instruction to complete the second component. The materials were prepared in this manner to prevent an impasse (Williams & Cuvo, 1986) that would prohibit assessing the student's skills that may be demonstrated in later stages of the task analysis. If the student did not complete the second component, the trainer again removed the materials from the student's view, placed a stamped envelope in the box-jig, and instructed the student to complete the third component. Generalization assessments were conducted with the generalization materials in the same manner.

Group instruction. A two-phase, combination concurrent/sequential model of group instruction (Reid & Favell, 1984) was used in which some procedures (i.e., instructions) were implemented concurrently for all group members and some procedures (consequences) were implemented sequentially with each student. During Phase 1, a least-to-most intrusive prompting paradigm was used in a forward chaining sequence. The prompting strategy began with a general instruction to the entire group, followed in turn (if needed) by a general instruction with modeling (provided only during the first trial), a component instruction, a specific step instruction, and a specific instruction with physical guidance. All step completions were followed by trainer praise. Each trainer had an assigned role in the training, with the primary trainer being mainly responsible for giving instructions and secondarily for assisting the secondary trainer in providing physical guidance and praise. The secondary trainer was mainly responsible for prompting the students to look at the primary trainer, presenting contingent praise, providing physical guidance, and recording student responses.

A training trial began with the general instruction to all students. Consequences were then provided individually to each student contingent on her response and the next most intrusive prompt was provided to those students who did not respond to the preceding instruction. Once a student completed the step being addressed, she waited until the remaining student(s) completed the step with whatever prompt level was necessary. At that point, a group trial was completed and a second group trial was conducted. Sessions consisted of 10 trials.

Training trials on the next step in the task analysis began when all students completed a target step without physical guidance on at least half of the trials within a session. When all students performed the last step of a component without physical guidance on at least half of the trials, training sessions on that component were temporarily terminated and experimental assessments began.

During Phase 2, each trainer worked with only two students. The training procedures remained the same as in Phase 1 except that each trainer carried out all procedures with her respective pair of students. Phase 2 was implemented because two students were beginning to perform most steps independently and their rate of completing trials was slowed by waiting on the other two students to complete trials. During Phase 2 the secondary trainer began to fade her involvement from the group instruction by reducing the number of prompts provided and by fading her presence to the side of the room. In total there were 88 training sessions in Phase 1 and 28 in Phase 2.

Post group instruction. During post group instruction, assessments were made as in baseline assessments.

Experimental Design

The effects of the group instruction were evaluated with a multiple baseline across components within the task analysis. No training occurred with the generalization materials.

Regular Classroom Evaluation

One purpose of the study was to assist the students via group instruction in developing a work skill that could be taught by the regular trainer during the ongoing classroom routine (1:4 trainer-to-student ratio). To determine whether the teacher's aide could conduct the group activity without causing increased disruption, measures of student on-task behavior were taken during four classroom sessions prior to the group instruction and four sessions after group instruction. On-task behavior was defined as a student attending to the assigned work tasks or instructor and/or interacting with the instructor, and was observed using the process described by Green et al. (1986) which involved a 10-s observe, 5-s record system. A given student was observed for four intervals, followed by other students sequentially until all students had been observed at least twice. Reliability checks occurred before and after group instruction and reliability was calculated on an interval-by-interval basis, averaging 91% for overall, 86% for occurrence, and 78% for nonoccurrence.

Follow-up measures in terms of classroom work output were conducted for 10 weeks and then again at 53 and 54 weeks following the final experimental assessment. The vocational period in the classroom typically lasted for 15 min.

RESULTS

The performances of the four women during assessments are presented in Figure 1. During baseline, the women completed a low percentage of the steps independently, averaging 0%, 15%, and 17%, respectively, for the three components. Following Phase 1 of group instruction, increases occurred within each component, averaging 92%, 39%, and 58%, respectively. These changes maintained during Phase 2 for Component 1 and increased further for Component 2 (mean of 67%) and Component 3 (79%). Individual student data paralleled the group data; average increases between experimental conditions for independent steps ranged from 21% to 99% across participants and components. Results during assessments with the generalization materials were similar to the results with the target materials (Figure 2).

Figure 3 shows that the percent of envelopes stamped independently and legibly, as well as the number of envelopes so stamped, increased for each participant as training progressed during Phase 2 (prior to Phase 2 essentially no envelope stamps were independent and legible). Participants 1 and 2 showed the most improvement, although even Participants 3 and 4 were stamping some envelopes independently and legibly by the end of Phase 2 so that they could, at that point, partially participate in a vocational task. The address-stamping task was then incorporated into the regular classroom and the women began earning pay for their stamped envelopes.

Probes of trainer behavior indicated that the trainers fulfilled their designated training roles based on relative rates of interactions. During Phase 1 the primary trainer provided instructions at the average rate of 3.06 per min in contrast to the secondary trainer's rate of 1.45. The secondary trainer averaged 2.59 praise statements and 1.11 physical guidance interactions, whereas the respective averages for the primary trainer were 1.77 and 0.95. The observations of trainer behavior also provided information regarding the degree to which trainers interacted with the participants individually within the group (sequential component of the group instruction model) versus with two or more students simultaneously (concurrent component). Across all observations, 41% of the instructions were directed to the group and 59% were directed to individual students, although the relative amount of group-directed instructions decreased over the course of training.

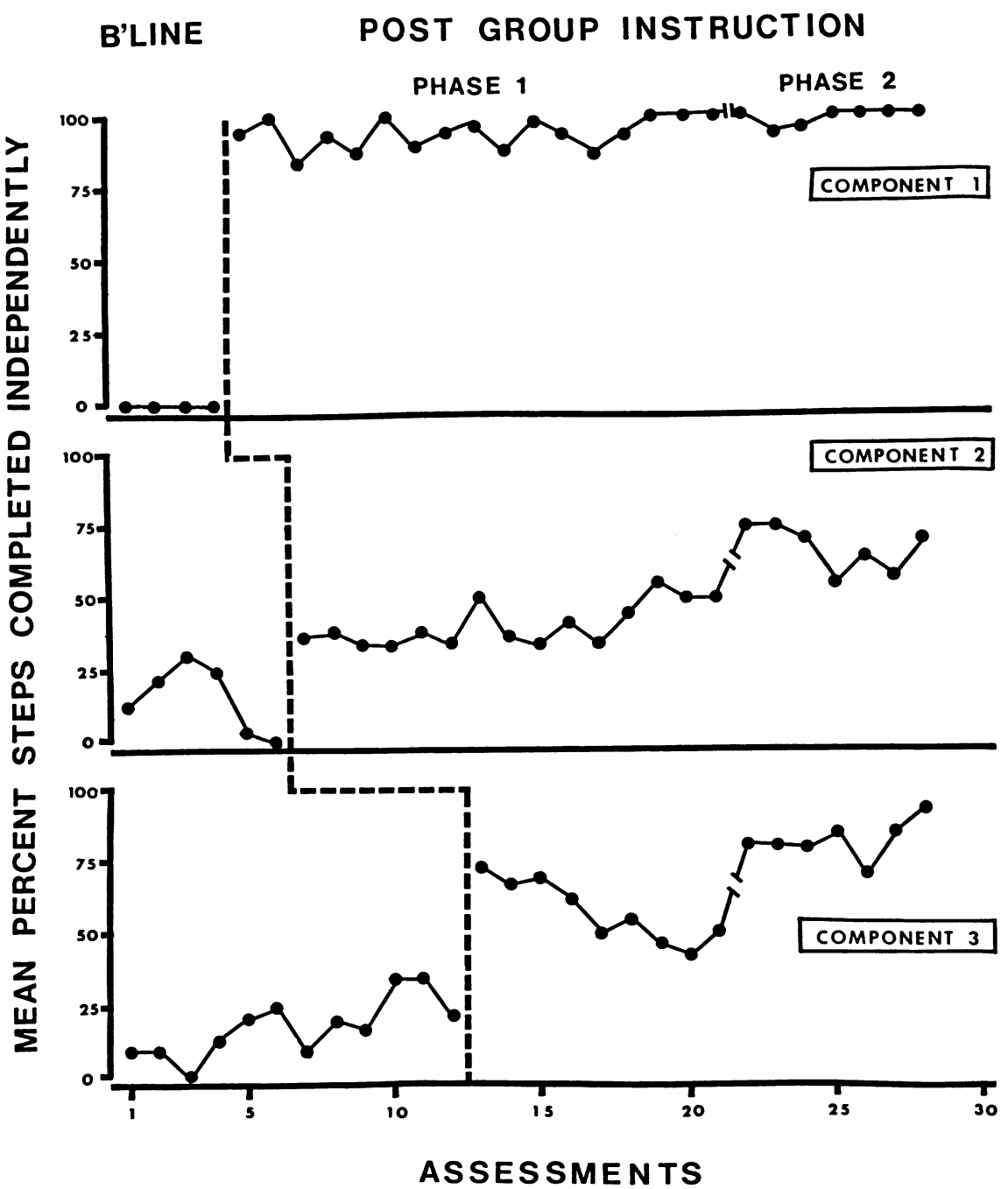

Figure 1. Mean percentage of steps of the address-stamping task completed independently for each component by the four participants during each target assessment for both experimental conditions.

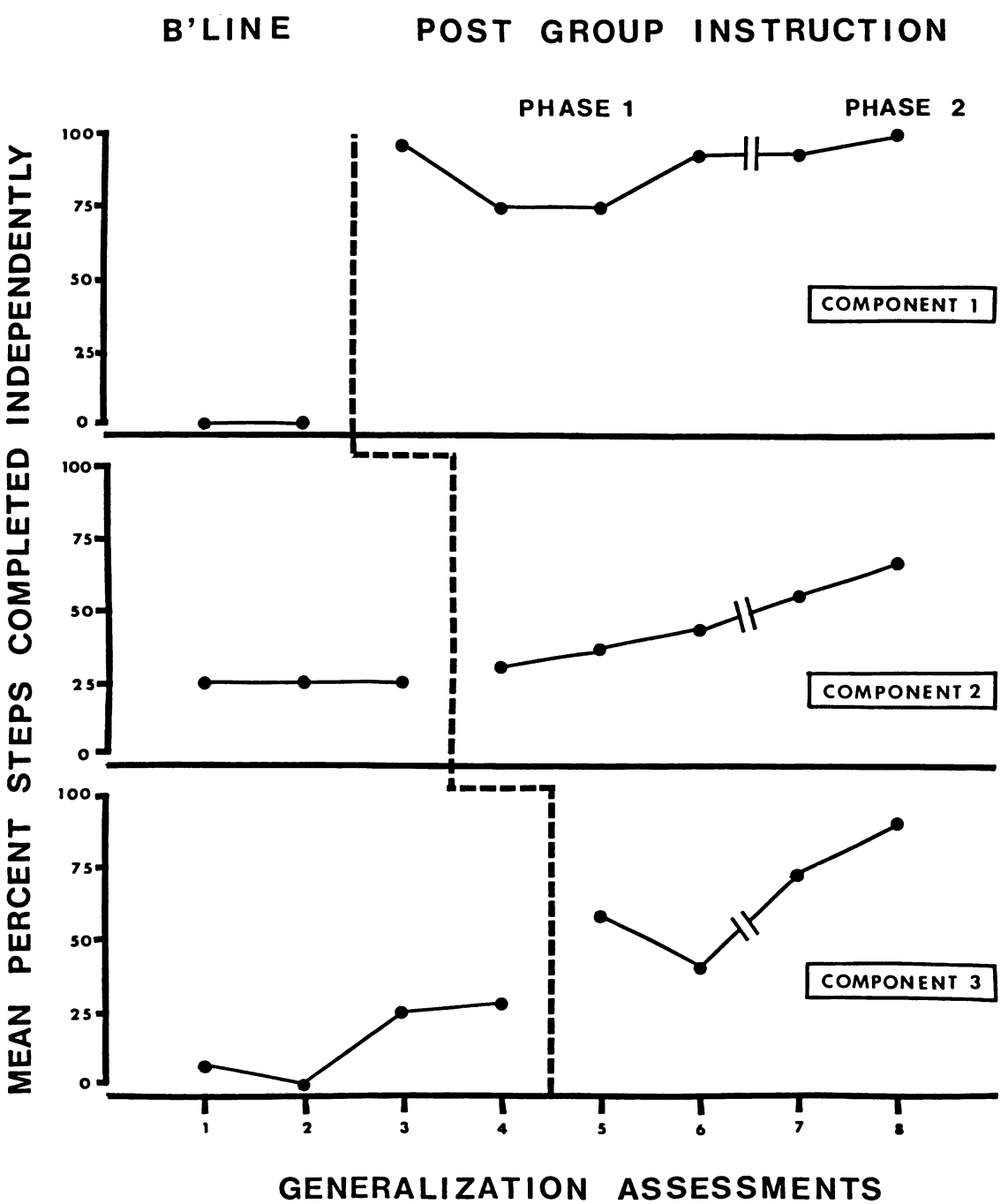

Figure 2. Mean percentage of steps of the address-stamping task completed independently for each component by the four participants during each generalization assessment for both experimental conditions.

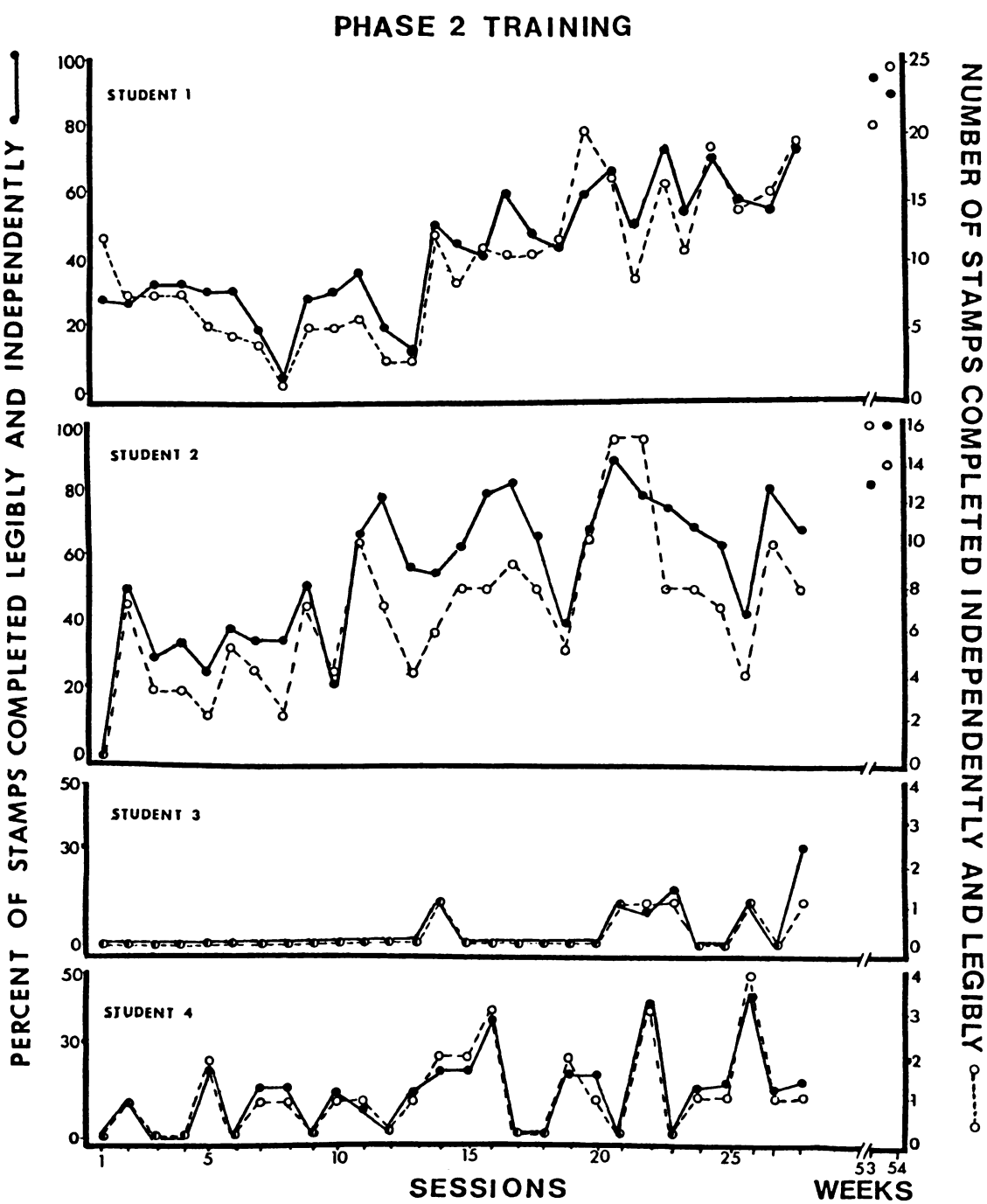

Figure 3. Percentage (solid lines and data points) and number (dashed lines and open circles) of address stamps completed legibly and independently by each student during Phase 2 training.

Regular Classroom Evaluation

For 10 weeks following the study, each participant continued to produce legible addresses independently during the vocational component of the regular classroom routine, although at varying rates (ranging from a low of 1 to a high of 20 addresses across individual participants per session). Additional address stamps were completed with minimal assistance from the trainer. During long-term follow-up checks (53 and 54 weeks) two of the participants had moved to another living unit and school program (for reasons independent of this study). For the two who remained, both continued to earn a wage and the number of appropriate stamps per session increased relative to Phase 2 (Figure 3).

Results of the classroom evaluation indicated that the teacher's aide incorporated the address-stamping activity into the regular classroom routine without increased disruption. Prior to group instruction, on-task behavior averaged 52% whereas after the program, on-task behavior averaged 62% while the students were involved with the address-stamping task.

DISCUSSION

This investigation demonstrated an effective method of teaching profoundly retarded individuals in a group format. The program represents a viable means of teaching profoundly retarded persons when reliance on one-to-one teaching is not feasible. In addition, the results should add to the developing technology of group instruction by demonstrating that a group program can result in generalized skill increases as well as skill gains that maintain. These results also extend the group instruction literature because of the focus on vocational skill development—a functional skill domain not addressed previously. In this regard, following the investigation the teacher's aide was able to incorporate the vocational training activity into her classroom without increased disruption. Consequently, the students received continued training that was helpful in further development of the skill.

One purpose of the investigation was to train a skill to the profoundly retarded individuals so that they could partially participate in a remunerative work endeavor. By taking a partial participation approach, the women began receiving payment for applying the work skill as soon as the skill was at least partially acquired, in contrast to delaying work involvement until a comprehensive, independent set of skills was acquired. In this regard, even though by the end of Phase 2 the group of residents were stamping only approximately 50% of the envelopes independently and legibly, this was still cost-efficient. Additional envelopes were stamped legibly with only verbal assistance from the trainer, and when an illegible stamp occurred, a blank address label (cost of approximately one half cent per label) was placed over it and then reused in another session so that the stamp and envelope were again usable.

Because the participants could use the address-stamping work skill during the regular classroom routine, they participated in a more functional activity than what previously existed. That is, instead of continuing to spend a portion of classroom time putting pegs in pegboards and stacking toy rings as occurred during baseline, the students produced a needed product (albeit on a small scale) by providing the agency with preaddressed envelopes. This was accomplished without any increase in staff supervision because the teacher's aide merely changed what she was supervising (i.e., from pegboards and rings to envelope address stamps).

Results of the trainer observations indicated that the two trainers fulfilled their designated roles. The results also suggested that over the course of training, there was more reliance on the sequential component of the concurrent/sequential group model. Such an outcome was expected in that initially, the participants were functioning at the same level with the stamping task and could be instructed concurrently; as students progressed through the task analysis at varying rates it became more difficult to instruct all students concurrently except for the general instruction to begin a trial.

Given the success of the program, continued research on using group formats to teach other

functional skills to severely handicapped populations is warranted. Such research is needed if a technology of group instruction is to be made available to educators working with severely handicapped students.

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