

THE UNIVERSITY OF MANITOBA

Training Higher Functioning Retarded Adolescents
As Supervisors in a Sheltered Work Setting
Utilizing a Production Supervisory System

by

Glen J. Cornick

A Thesis

Submitted to the Faculty of Graduate Studies

In Partial Fulfillment of the Requirements for the Degree of

Master of Education

Faculty of Education

Winnipeg, Manitoba

June, 1980

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ABSTRACT

While an increasing amount of research in the field of mental retardation is being conducted to demonstrate the ability of the mentally retarded to perform increasingly complex production tasks, only recently have efforts been directed toward the mentally handicapped in typical work settings, performing in more than task-related roles. The purpose of this study was to demonstrate that higher-functioning retarded clients in a workshop setting could be trained to function effectively as supervisory staff. A staff supervisory system was developed for the effective management of work rates of clients in an in-school work program operating at a school in which the author worked. This system consisted of seven component supervisory behaviors: table preparation, client intake, pre-session instructions, production reinforcement, on-task reinforcement, material movement, and session termination. Two higher-functioning mentally handicapped males enrolled as pupils at the school were selected as subjects to be trained to perform the supervisory behaviors in the work program. Each subject was assigned to four existing groups of student workers. After a baseline phase, in which production data of the student workers under the supervision of the author was collected, the training program was initiated for the first subject. The author continued to supervise those groups assigned to the second subject while the first subject was trained in the supervisory behaviors in a multiple-baseline-across-behaviors. When the first subject was performing all seven component supervisory behaviors at a required level of 100%, he had completed the training

program, and assumed responsibility for supervision of those programs assigned to him. Training then commenced in the same manner for Subject 2. When each subject had supervised his groups for approximately four weeks following completion of training, a reversal component was initiated and the author resumed responsibility for the supervision of the groups. The production levels of the student workers during the baseline phase, the training phase, the subject-supervision phase, and the reversal phase were compared. It was found that both subjects, after training, were able to effectively supervise the groups of student workers. This was validated by their ability to maintain the production of the groups at levels either equal to or better than levels achieved under regular supervision by the author.

ACKNOWLEDGEMENT

I would like to thank the members of my Committee - Dr. N. Jeff Hughes, my Advisor, for his patience, understanding, and willingness to let me pursue something that was very important to me; Dr. Garry Martin, because he introduced me to an area of technology, relevant to the work I did for five years of my life, which made that work more meaningful and pleasurable; and Dr. Winston Rampaul, who was probably the first person to make me feel relaxed enough to open up and start talking. I also extend my heartfelt gratitude to the staff of the Prince Charles School, particularly Barbara Sarson and Barry Berger for believing in me as a responsible, dedicated, and effective teacher and giving me the opportunity to express myself. I especially thank Brian and John, my subjects, for being really nice guys and excellent workers.

My deepest appreciation to Maria Angela for her patience and support, love and understanding, professional assistance and advice, and to Maria Victoria who always had a smile for her Daddy no matter what time he stumbled into the bedroom and woke her up.

And, most important of all, I thank my live-in typist, Barb Roscoe Murphy, who made this whole thing possible.

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INTRODUCTION

Context of the Problem

Recently, in the field of mental retardation, there has been an increasing concern with providing normative training experiences for the mentally retarded in order to facilitate their participation in more productive and financially rewarding work activities. This development is a result of the rapidly growing acceptance of the principle of normalization (Wolfensberger, 1972) which proposes that the habilitation of the mentally retarded can be accomplished more effectively by exposing retarded individuals to a wide range of typical or normal life activities.

Several studies have been conducted which demonstrate the ability of mentally retarded individuals to perform production tasks of various levels of complexity (Gold, 1972; Bellamy, Peterson & Close, 1975; Hunter & Bellamy, 1976; Tate & Barhoff, 1967; Pallotta-Cornick, Suthons, Yu & Martin, Note 1). As well a number of studies have been conducted to investigate factors to improve production performance of the mentally retarded (Gold, 1973; Bellamy, 1976; Bellamy, Inman & Schwartz, 1978). Recently, a multiple-component production supervisory system was designed by Martin and Pallotta-Cornick (1979) and two subsequent studies were conducted which demonstrated the effectiveness of the Production Supervisory System (PSS) for increasing client production (Martin, Leonhart, Pallotta-Cornick, Yu, Suthons & Quinn, Note 2; Martin, Pallotta-Cornick, Johnstone & Goyos, 1980). Further to this, a self-contained instructional manual for use by typical staff in a vocational setting was developed by Pallotta-Cornick, Cornick and Martin (Note 3) in order to facilitate the implementation and adaptation of the PSS

by typical staff in their own work settings. A subsequent field test by Pallotta-Cornick and Martin (Note 4) of the PSS and the accompanying manual in two workshop settings demonstrated the effectiveness of the PSS in improving the work performance of mentally handicapped workers when implemented by workshop staff using a self-contained, self-instructional manual.

Much of the behavioral research with the mentally retarded in vocational settings has been concerned with the acquisition of new skills necessary to perform typical workshop tasks or the improvement and maintenance of the rates of existing work behaviors. Only recently have efforts been directed towards the training of higher-functioning workshop clients to perform in capacities other than typical task-related roles such as assembling or packaging. Goyos, Michael and Martin (Note 5) conducted a study in which mildly and moderately retarded clients working in a sheltered workshop were trained to reinforce the work behaviors of other retarded clients working at the production tables in the workshop. Their results suggest that it is feasible to train higher-functioning individuals as "quasi staff" to supervise retarded clients working on production tasks in a sheltered workshop setting.

Statement of the Problem

It has been observed that the majority of research related to vocational training of the mentally handicapped has emphasized skill development related to the performance of typical workshop tasks or the improvement of existing production rates. While this type of research may serve to improve and enhance the position of the mentally handicapped worker within the sheltered workshop environment

to some degree, very little research has been conducted which facilitates the development of skills to enable the mentally handicapped to perform in capacities other than typical task-related roles.

Purpose of the Study

The purpose of this study was to train two higher-functioning retarded subjects to supervise and maintain the performance of retarded students working in a school-based workshop program that was using the PSS. Table 1, found on page 4, summarizes the content of the PSS manual used by the staff member responsible for managing the in-school workshop program. As well, it was the intention of the author to expose the two subjects to a more normative work experience by training them to function as "quasi staff members" within the school work program.

Limitations of the Study

Certain limitations of this study were experienced by the author specifically related to the selection of subjects. In order to ensure subject participation throughout the duration of the study, possible subjects had to be involved in a school-based program on a fulltime basis. As well, candidates for this study had to be male, and between 17 and 20 years of age to ensure that they would be able to maintain a reasonable level of discipline among the student workers. In keeping with the philosophy of the school and its stated goal of providing the students with typical and normative life activities, especially in the area of vocational preparation, all senior students were expected to spend a good deal of their class time placed in regular work settings within the local business

Table 1

Table of Contents of the Self-Instruction Manual

Acknowledgement

Section I.	Introduction
Section II.	Would this manual be useful to you?
Section III.	Some information about the research background of the PSS
Section IV.	How to use the PSS manual
Section V.	Checklist for implementation of the PSS
Section VIa.	The Production Supervisory System
Section VIb.	Additional recommendations
Section VII.	PSS planning worksheet
Appendix A	Summary supervisor and staff checklists
Appendix B	Problem behaviors data sheet
Appendix C	"On-task" reinforcement data sheet
Appendix D	Payment record
Appendix E	Production data sheet
Appendix F	Individual feedback chart for clients
Appendix G	Production graphs

References

community for two to four-week periods. Therefore, this particular combination of characteristics resulted in only those students who had failed to succeed in the school's Work Experience Program being available as potential subjects. The results of this situation was that the author selected the subjects from this study from a very small pool of students, rather than from the entire senior student body. Also, this small pool of potential subjects consisted of students demonstrating poorly developed work-related skills and habits.

One other essential characteristic of the subjects of this study was that they possess well-developed verbal ability. Again, this served to severely limit the number of candidates for selection as subjects.

REVIEW OF THE LITERATURE

The purpose of this section is to provide an overview of the literature concerning the training of mentally handicapped individuals as "quasi staff" members.

Traditionally, retarded individuals have been utilized in a number of non-patient roles in institutional settings. Janitorial and maintenance-type jobs, as well as simple housekeeping tasks, are common examples. It has only been recently, however, that the feasibility of using mentally handicapped individuals as paraprofessionals has been researched in a more systematic manner.

In 1973, Craighead and Mercatoris reviewed the existing literature concerning mentally retarded residents utilized as paraprofessionals. Some of the studies reviewed by Craighead and Mercatoris indicated that retarded individuals are able to affect the behavior

of their peers. However, it was not clear that the procedures reviewed were more effective than traditional methods, since the subjects remained under direct supervision throughout the duration of the studies (Terrel & Stevenson, 1965; Dilley, 1969; Kazdin, 1971; Wilson & Watson, 1967). Other studies reviewed demonstrated that retarded individuals were able to learn how to use modelling and prompting to teach other retarded individuals, even though generalization to other environments did not occur (Whalen & Henker, 1969, 1971). Two additional studies were concerned with training retarded individuals to serve as observers and record behavior (Craighead, Mercatoris & Bellack, Note 6). Craighead and Mercatoris concluded that even though the studies reviewed indicated that mentally retarded individuals can be effective behavior-change agents, the mentally retarded had been used as paraprofessionals in a very limited way, essentially, as reinforcing agents for specific target behaviors in specific experimental settings, or as "behavioral observers".

Wagner and Sternlicht (1975) mentally retarded individuals to serve as tutors to train other mentally handicapped individuals to perform dressing and eating skills. The tutors received 30 hours of training to teach eating. The training of the tutors was accomplished through role-playing, demonstrations, and instructions. Once trained, the tutors required 20 hours to teach dressing and eating skills to the trainees. The authors examined the effects of the program on the trainees in terms of acquisition and maintenance of self-care skills, and on the tutors in terms of social and personal adjustment.

The results reported for the trainees indicated a significant improvement in self-care skills, imitative behavior, generalized attention span, and a decrease in inappropriate behaviors. For the tutors, there was no improvement in social and personal adjustment, although there was a decrease in maladaptive behaviors because of the structured situation. The tutors learned how to prompt and reinforce behaviors and some of them learned how to make decisions.

Drabman, Ross, Lynd and Cordua (1978) published a study concerning retarded children as observers, mediators, and generalization programmers using an "icing" procedure. Three subjects were selected for the study. Two recorded data, while the third applied the treatment. The target behavior to be eliminated by the procedures was a constant sucking or chewing of fingers and material by other retarded children. Modelling and instructions were used by the "peer trainer" to teach the appropriate behavior to the other children. As a result, the inappropriate behavior decreased sharply during sessions but did not generalize to other settings. Then, generalization sessions were undertaken using two of the retarded trainers. As a result of this, the inappropriate behavior of the other children decreased to very low rates. Although the program was carried out under staff supervision, it was felt that valuable time was saved. The performance of the retarded trainers was maintained solely by verbal praise. The general benefits acquired by the trainers and the trainee, and the results of the study suggested that the use of residents as behavior-change agents or "quasi staff" is a prudent strategy for institutions with staffing problems.

Goyos, Michael and Martin (Note 5) described an attempt to teach specific supervisory skills to retarded clients in a sheltered workshop for retarded residents of an institution. A mildly and a moderately retarded individual were trained to function as staff helpers to give attention to the other retarded clients in the workshop contingent upon the on-task behaviors of the other retarded residents. The training received by the two subjects consisted of instructions and a self-recording system. The subjects recorded all their interactions with the residents whenever they were on task. The results of the study showed that the frequency of subject interactions with clients who were presenting on-task behaviors increased as a result of the training program, while the frequency of subject interactions with the clients presenting off-task behaviors did not change. The authors suggested the use of higher-functioning retarded individuals as quasi staff, to supervise retarded clients in sheltered workshops, when one considers different variables to increase work rates in such settings.

The purpose of the present research was to train two subjects to function as supervisors in a workshop using a training program based on the component supervisory behaviors found in the PSS manual cited previously (Pallotta-Cornick et al., Note 3).

METHOD

Subjects

The subjects of this study were two male senior students currently enrolled in the Prince Charles School, a special education facility of the Winnipeg School Division Number One for trainable mentally

handicapped adolescents. The two subjects were randomly selected from a group of six students who had been previously identified as meeting the criteria: 17 to 20 years of age; a minimum of two years experience at the Prince Charles School; an inability to become permanently involved in a community-based work education program operating at Prince Charles School, thus leaving them with a fulltime school-based program. Although both subjects had some limited academic skills, they were considered as functionally illiterate by the school. The subjects did, however, possess well developed verbal repertoires.

Setting

This study was conducted in the work assessment room at Prince Charles School. The work assessment room measures approximately 13 m by 8 m. It contains a work bench running through most of the center of the room, three tables, shelves and cupboards along two of the walls, windows on the third wall, a blackboard on the fourth wall, a staff desk and file cabinet, and two heat sealers.

The work assessment program provides a school-based work education program for all students at Prince Charles School, utilizing simple assembly and packaging tasks. For school purposes, the students are divided into 11 different programs or streams, depending on their age and ability. The students have been identified by the School Division as in the moderate range of retardation and their chronological ages vary from 12 to 20 years. For this research, only students in programs 1 to 8 were studied as they each attended the work assessment program for one-half day per week. The average size of these programs was nine students, with a range of five to

11 students.

Independent Variables

For the purpose of this study, the supervisory behavior of a staff member working with the PSS had been identified and separated into seven distinct components. The training program used to teach these seven components included instructions, modelling, and praise. The details of the training procedures can be seen on page 17, Procedure for Phase II. The seven components are described in detail in Figure 1, pages 11-15. The training procedure was the independent variable when the subjects were considered. When considering the students, the independent variable was the type of supervision under which they worked, either the regular classroom teacher or the student supervisors.

Task

Once the two subjects had completed the training program designed to teach them to supervise other students working on production, they were responsible for supervising the work sessions in the work assessment room with the students in programs 1 through 8. This involved preparing the work tables for each work session, receiving the students in each program and ensuring that they were seated in their assigned seats, providing pre-session work instructions, providing verbal reinforcement during the work sessions to those students exhibiting on-task behavior, providing production reinforcement in the form of money as students completed pre-arranged units of work, and dispersal of the work units to heat sealers, and the termination of the work session and the dismissal of the students.

Component 1 - Table Preparation

(a) open cupboard marked "TRAYS"				
(b) remove six material trays from cupboard and place on table				
(c) open cupboard marked "MATERIALS"				
(d) remove box of sugar from cupboard				
(e) fill center sections of trays with sugar				
(f) return sugar box to cupboard				
(g) remove box of stir sticks from materials cupboard				
(h) place enough sticks in both end sections of trays to cover bottom of trays				
(i) return box of stir sticks to materials cupboard				
(j) place 1 tray at each work station in center of table				
(k) remove tray of napkins from materials cupboard				
(l) place pile of napkins equal to height of tray to the right of each student				
(m) return napkin tray to materials cupboard				
(n) remove box of plastic bags from materials cupboard				
(o) place one half of a bundle of bags to the left of each student				
(p) return box of bags to materials cupboard				

. . . continued

Figure 1. The seven component supervisory behaviors.

(q) from cupboard marked "WORKING TRAYS" remove appropriate receiver tray for each student					
(r) place appropriate receiver tray beneath feedback chart of each student					
(s) place stools and chairs in position at each work station					
(t) remove tray(s) of completed units from cupboard marked "COMPLETED WORK"					
(u) place trays of completed units on cabinet next to heat sealer					
(v) place empty tray in sink					
Component 2 - Client Intake					
(a) open classroom door					
(b) tell students outside to enter and take their seats					
(c) check names on feedback charts to ensure students are seated in proper place					
Component 3 - Pre-Session Instructions					
(a) take position in center of room by sinks					
(b) announce pre-session instructions to class (see Appendix I)					
(c) set timer for one hour (see Appendix I)					
(d) circulate among students and give individual prompts to begin working (see Appendix I)					
Component 4 - Reinforcement for Production					
(a) arrive at work table as worker completes ratio					

. . . continued

Figure 1. The seven component supervisory behaviors.

(b) verbally reinforce student for completing ratio (see Appendix I)					
(c) place "X" in appropriate box on student's feedback chart					
(d) explain placing of "X" and significance (see Appendix I)					
(e) place appropriate number of coins in student's bag					
(f) explain placing of coins and significance (see Appendix I)					
(g) remove units from receiver tray equal to student's assigned ratio					
Component 5 - Reinforcement for On-Task Behavior					
(a) when collecting the production of a student, reinforce on-task behavior of his/her co-worker (see Appendix I)					
(b) ignore any other behaviors of co-worker					
Component 6 - Material Movement					
(a) place completed units in tray located in sink					
(b) during break replace depleted materials at work stations					
Component 7 - Session Termination					
(a) when timer signals end of work session tell everyone to stop working					
(b) tell all students to clean up trays, pile up bags and napkins as they were in the beginning of work session (see Appendix I)					

. . . continued

Figure 1. The seven component supervisory behaviors.

(c) circulate among students and pick up remaining production					
(d) enter "X" for completed ratios and pay as usual					
(e) for uncompleted ratios, enter number of completed units in next available space on chart, no payment to be made					
Component 7A - Coffee Break Time					
(a) ask students to line up at door					
(b) dismiss students for coffee break with directions to return in 10 minutes (see Appendix I)					
Component 7B - End of Morning or Afternoon					
(a) get napkin tray from materials cupboard					
(b) collect all napkins from work stations in tray					
(c) return napkin tray to materials cupboard					
(d) take out box for plastic bags from materials cupboard					
(e) collect bags in bundles, placing bundles in box					
(f) return box of bags to materials cupboard					
(g) open cupboard marked "TRAYS"					
(h) ask students to bring material and receiver trays to cupboard (see Appendix I)					
(i) take trays from students and put on proper shelves					
(j) ask students to clean up floor around work station					

. . . continued

Figure 1. The seven component supervisory behaviors.

(k) ask students to take money from their bags (see Appendix I)				
(l) ask students to put away all chairs and stools				
(m) ask students to line up at door (see Appendix I)				
(n) dismiss students as a group (see Appendix I)				
(o) put tray(s) of completed units in sink(s) in cupboard marked "COMPLETED WORK"				
(p) take any tray(s) of completed work from cabinet next to sealer and place in cabinet marked "COMPLETED WORK"				

Figure 1. The seven component supervisory behaviors.

Dependent Variables

The dependent variable for the subjects was their performance on the seven component supervisory behaviors. Throughout all the phases of the study, the total production of PWA coffee packs was calculated for each work session for each group of students. From this total, an average hourly production rate for coffee packs was calculated. This was the dependent variable for the students and in relation to the subjects, the average hourly production of coffee packs was the means of socially validating the dependent variable for the subjects.

Hypothesis

This study attempted to teach an appropriate sequence of supervisory behaviors to two subjects. Once the subjects had successfully attained pre-determined criterion levels in each of the seven component supervisory behaviors, they proceeded to function as "quasi staff" in the workshop program and assumed the responsibility for supervising the work sessions assigned to them. It was hypothesized that the student supervisors would maintain the work rates of the students at the pre-treatment levels reached under supervision by the regular staff member.

Experimental Design

Phase I. Phase I involved baselining the students' performance under regular staff supervision. During this phase, the staff member simply followed the seven components outlined in Figure 1. This phase was conducted over 47 sessions for those groups assigned to Subject 1 and 64 sessions for those groups assigned to Subject 2.

Phase II. Phase II consisted of the training of the subjects.

The design used during this phase was a multiple-baseline-across-behaviors design within each subject. This was done to demonstrate that the subjects performed a component only after having been trained. The effects obtained for Subject 1 were replicated with the second subject within the same design. This phase was conducted over 16 sessions for Subject 1 and 14 sessions for Subject 2. During this phase, the staff member (the experimenter) continued to supervise and record the production of the students.

Phase III. In this phase, the subjects functioned independently as supervisors. Subject 1 supervised those groups assigned to him for 32 sessions, and Subject 2 supervised those groups assigned to him for 28 sessions. During this phase, the experimenter's activities were to post the feedback charts in their proper places at the beginning of the session, gather them at the end of the session, and record the data for the day. Generally, he gave the keys to the cupboards to the subject-in-charge and worked at the staff desk. Occasionally, he checked the performance of the subjects using the behavioral checklist and took inter-observer reliability checks with other staff members available at the time.

Phase IV. In this phase, there was a reversal to regular staff-member supervision for 18 sessions with those groups assigned to Subject 1 and 10 sessions for those groups assigned to Subject 2. Thus, an ABA design was used to demonstrate the effectiveness of the training program for preparing student supervisors to maintain the present work levels in the work setting and to socially validate the procedures by monitoring the response of the students to the different

supervisors. For a description of the designs utilized in this study, see Martin and Pear (1978).

Procedure for Phase II, Training of Subjects as Supervisors

Each subject was assigned to four programs with an average of nine students per program. In order to control for the differences in ages, and the skill levels of the student workers, Subject 1 was assigned to programs 1, 3, 5, and 7, and Subject 2 was assigned to programs 2, 4, 6, and 8.

The training program for each of the student supervisors was identical. The only variations in the training programs of the two subjects was the initial starting date, the amount of time each subject required to complete the training program, and the combination of components 4 and 5 for Subject 1, and components 4, 5, and 6 for Subject 2 as described below.

Upon commencement of training, the initial work session was used to determine the percentage of each of the seven supervisory component behaviors the subject could perform prior to training.

The second session involved training of the first component at a special training table located in one corner of the work assessment room. This special training table was an exact replica of the regular work station. Training of the first component during this session included teacher demonstrations and modelling followed by guided practice trials in which the subject was guided through the steps of the component by prompts and instructions from the teacher. In the third session, the subject moved into the regular work setting for testing of the first component. The subject performed the first

component on his own while the teacher used the behavioral checklist to assess the subject's performance. Failure by the subject to achieve criterion resulted in a return to the special training table and further training on those steps which the subject was unable to perform. The retraining was followed by another performance test at the regular work stations in the next work session.

Once the subject had achieved criterion on the first component with a score of 100%, he was immediately baselined for his performance on the second component. This was possible as testing on Component 1 was conducted prior to the arrival of the students. Following baselining of Component 2, the subject immediately began training on Component 2. This was accomplished primarily through discussion and then role-playing coupled with cognitive modelling by the teacher.

In the next work session, depending on whether it was the first or the second work session for the student workers on that day, the subject either performed the first component as a maintenance strategy and then had his performance on Component 2 tested, or simply commenced the work session with a performance test of Component 2. Again, the teacher used the behavioral checklist to determine if the subject was performing at criterion level. Failure by the subject to perform Component 2 at the designated criterion level of 100% resulted in immediate further training. Once the subject had achieved criterion on the second component, he was immediately baselined on Component 3.

In the following work session, the subject performed Components 1 and 2 and then began training on Component 3 in the special training setting. Training involved the subject becoming familiar with an

especially prepared set of instructions which he was required to deliver to the class. Training also included teacher demonstrations, practice drills in the verbal contents of the instruction sheet, and role-playing.

In the next work session, the subject performed Component 1, if necessary, and Component 2, and then performed a guided practice trial of Component 3 in the regular work setting. In the following session, the subject was tested on Component 3 after performing Components 1 and 2.

When criterion was achieved on Component 3, Subject 1's performance on Components 4 and 5 were baselined simultaneously. It was decided to combine these two components because of their related nature. In a similar fashion, once the subject had achieved criterion on Component 3, Subject 2's performance was baselined on Components 4, 5, and 6. Following successful performance of Components 1 through 3, training of components 4 and 5 for Subject 1, and Components 4, 5, and 6 for Subject 2 began with demonstrations and modelling by the teacher in the special training setting with the subject playing the role of a student worker. Training continued in the next work session following performance of Components 1 through 3 with guided practice trials in the regular work setting. Following the training session, Subject 1's performance on Components 4 and 5 were tested in the next work session. As well, he was simultaneously baselined on Component 6. Subject 2 was simply given a performance test on Components 4, 5, and 6. Criteria for Components 4 and 5 were considered to have been achieved if the subject performed the necessary behaviors on 80% of

the opportunities. Component 6, however, required 100% performance level.

Once a subject had achieved the necessary criterion level of 100% for Component 6, he was required to perform Components 1 through 6 in the next session and was baselined on Component 7. Baselineing of Component 7 was necessary in two different sessions in order to account for the two different session termination procedures. Training commenced at the special training table in the next session following performance of Components 1 through 6. Demonstrations, modelling, and role-playing were used. Following this initial training session, again to account for the two different termination procedures, the next two sessions involved guided practice trials with teacher prompts and instructions. Following these two training sessions at the regular work stations, the next two sessions involved performance tests to determine if the subject had achieved criterion on the seventh component. Failure to achieve the criterion level of 100% resulted in further training at the special training table in the next work session. This in turn was followed by performance tests in the regular work setting in the next two sessions. This procedure was repeated until the subject achieved the required criterion level in both facets of the seven components. At this point, the subject was demonstrating the ability to perform Components 1 through 7 satisfactorily and was therefore considered trained and ready to begin independent supervision of his assigned programs.

Inter-observer Reliability

Inter-observer reliability checks were taken only during the

supervision phase of the study. These reliability checks involved two observers independently recording the occurrence or non-occurrence of the supervisory behaviors as described in the behavioral checklist (see Figure 1).

Inter-observer reliability checks for the number of coffee packs produced in sessions during the different phases of the study were not taken. This was due to the fact that the PSS has a built-in recording device for production. As the supervisor recorded every occurrence of completed ratios during the work sessions and all completed and partial ratios at the end of each session, he had in effect prepared a record of production for each student in each session.

As well, given the unavailability of extra staff to assist in the work assessment area, the author felt that for the purposes of this study it would be more meaningful to conduct inter-observer reliability checks whenever possible of the subjects' performance during the supervision phase.

RESULTS

Inter-observer reliability was calculated using the formula, number of agreements divided by the number of agreements plus disagreements, multiplied by 100.

Inter-observer reliability for subject 1 averaged 96%, ranging from 92.3% to 100%. For Subject 2, the average inter-observer reliability was 98.5%, ranging from 97.2% to 100%.

Figures 2 and 3, on pages 23 and 24, respectively, show the supervisory performance of Subjects 1 and 2, respectively, during

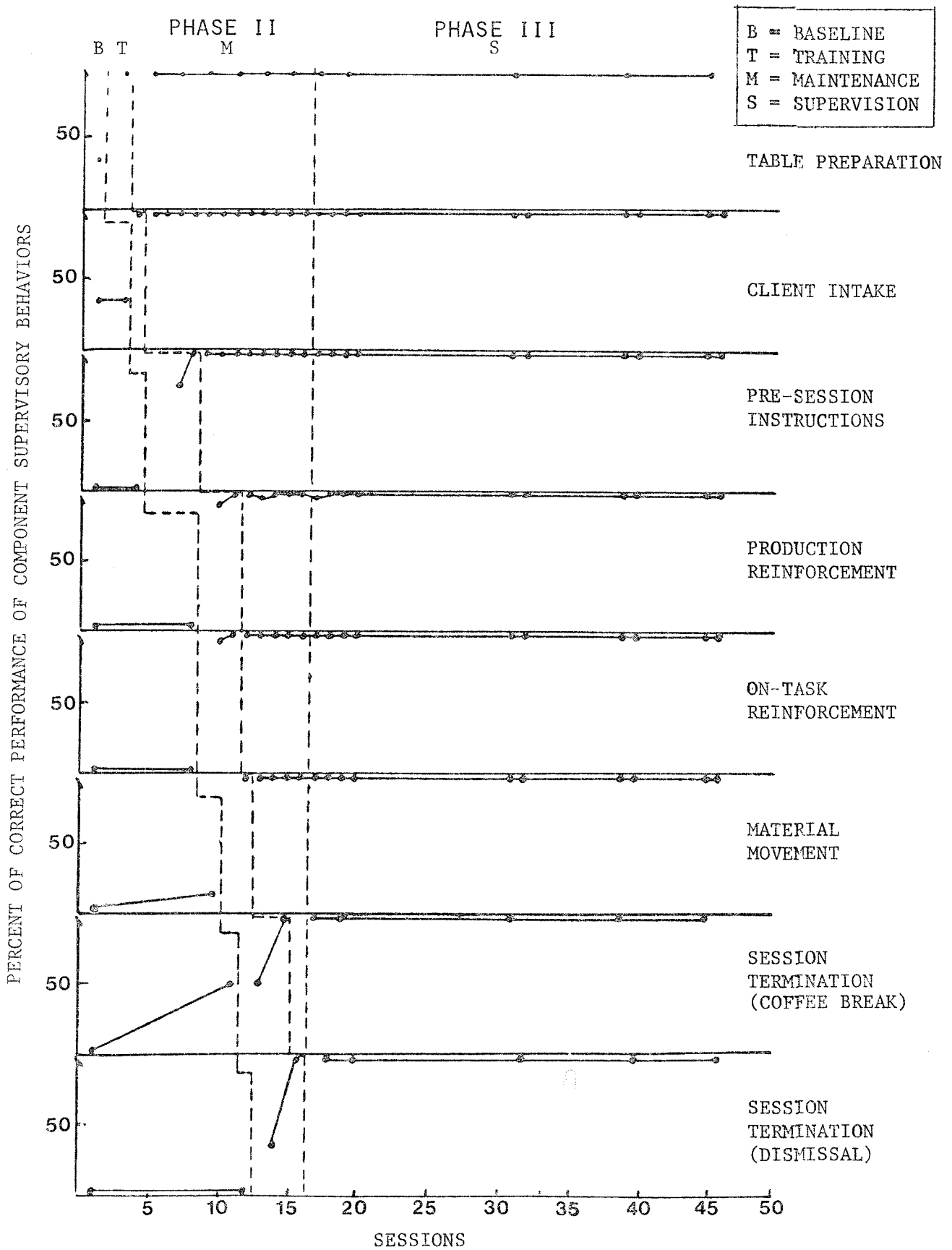


Figure 2. Component supervisory behaviors performed by Subject 1 through Phases II and III.

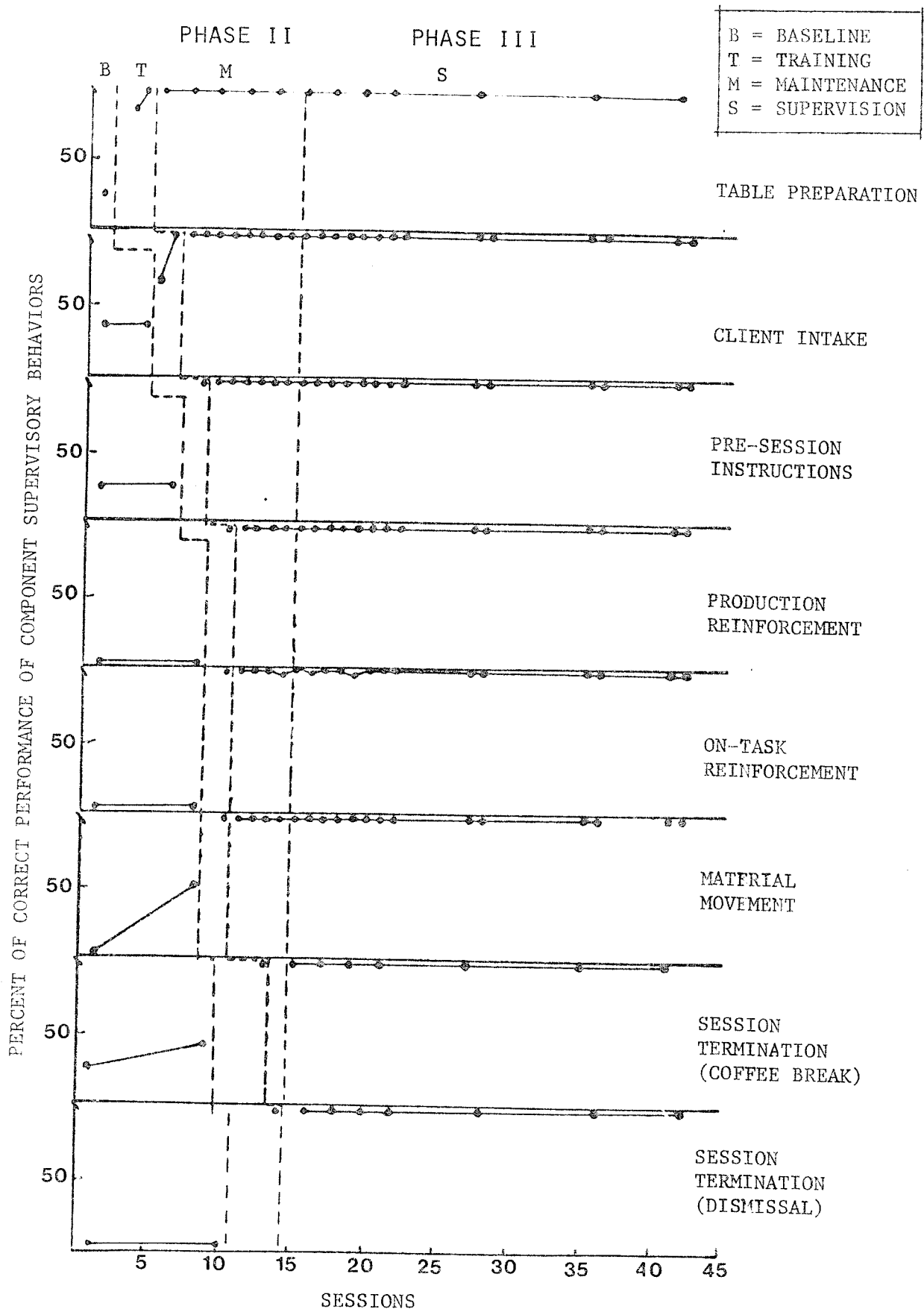


Figure 3. Component supervisory behaviors performed by Subject 2 through Phases II and III.

baseline, training, maintenance of Phase II, and during supervision of other clients in Phase III of the study. The first data point for each of the two figures corresponds to the initial baseline for all seven components. The second baseline data point corresponds to the baseline prior to training of that specific component after training criteria was achieved for the previous component. The only exceptions occur for Components 4 and 5 for Subject 1, and Components 4, 5, and 6 for Subject 2. These components were baselined, trained, and tested together because of their related nature.

In the next section of the graphs (Training), the data points represent the performance of the two subjects during testing following training of each of the seven components. The data points, after the subjects had achieved criterion of 100% during testing, represent the subjects' performance during the maintenance phase for those components. After testing criterion was reached for the last component, the subjects began the supervisory phase (Phase III) of the study.

In general, the levels of performance during baseline were very low. Typically, for both subjects, the initial baseline performance was at the zero level. Exceptions to this were Components 1 and 2 for Subject 1 who scored 36.4% and 36.3%, respectively. Subject 2's initial baseline performance was slightly better with scores above zero for four of the components. The scores for Subject 2 were as follows: Component 1, 22.7%; Component 2, 33.3%; Component 3, 25%; and Component 7A, 28.5%. For the second baseline data points, which correspond to performance prior to training for the components in

general, performance remained stable with the exception of Components 6 and 7A for both subjects. For both subjects, criteria after training was achieved after one or two tests. The performance for both subjects during maintenance in Phase II and supervision in Phase III was at the 100% level with the exception of Component 4 for Subject 1 and Component 5 for Subject 2. In these components, there were a few components below 100%, but above 90%, which met the stated level of performance acceptable for these particular components.

Figure 4, on page 27, shows the production rate of the students assembling coffee packs during Phase I under the supervision of the experimenter, in Phase II during training of the two subjects while still under experimenter supervision, in Phase II during supervision by the two subjects, and in Phase IV during reversal when the experimenter resumed supervision. The figure shows the performance of the two major groups of students supervised by each of the subjects in an approximation of a multiple-baseline-across-groups design. Each data point corresponds to the average hourly production for all groups of students per session supervised by the two subjects. A similar pattern can be observed throughout the study for both subjects. A slight increase during the supervision phase is observed for both subjects. This increase is maintained during the reversal phase.

The effects observed were replicated in the multiple-baseline-across-subjects design. If the figure is examined more closely, it is noted that the increase in production observed during Performance is greater for Subject 2, mainly in the first few data points.

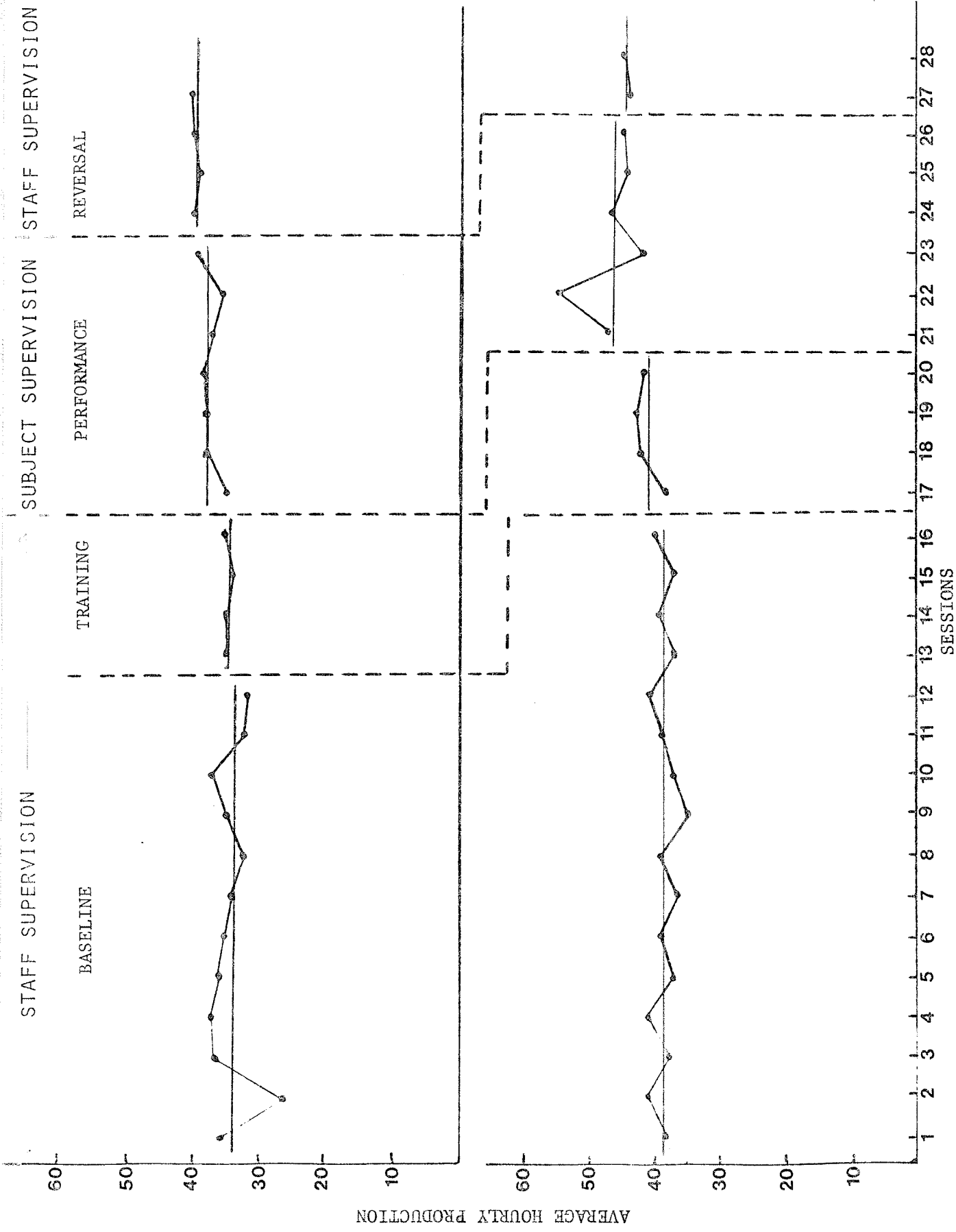


Figure 4. Average hourly production for all groups per session. During the Subject Supervision Phase (Phase III), clients in the upper panel were supervised by Subject 1 and clients in the lower panel were supervised by Subject 2.

DISCUSSION

This study clearly demonstrated that higher-functioning retarded individuals can be trained to function as supervisors in a workshop setting that has implemented a very structured strategy such as the PSS. The students performed as well or better under the supervision of the two subjects when compared to supervision by the experimenter. The fact that slight increases were observed during the supervisory phase (Phase III) of the study may be attributed to the novelty of the situation, that is, having a peer supervising the work setting. However, it may be speculated that given the length of the supervisory phase, it was not possible to observe dissipation of this effect. It is worth noting that the performance during the reversal phase was slightly above baseline levels. In conclusion, the performance of the subjects as supervisors was very successful in maintaining the production levels of the students.

Concerning the overall performance of the two subjects throughout this study, it can be seen that they responded to the procedures in a very similar fashion. As noted in the Results section, both subjects were able to emit a portion of some of the component supervisory behaviors during the baseline phase. A probable explanation for this might be that both subject, prior to this study, attended the work program on a regular basis and had been exposed to the procedures used by the experimenter. This might also provide an explanation for what appears to be a relatively short training period. Subject 1 completed his training program in 16 hours, while Subject 2 completed his training in 14 hours. If subjects with no previous experience in

a structured work setting are used, one might expect the training phase to be longer. This, however, is still a matter for investigation.

Concerning the work-related behaviors of the two subject, both demonstrated perfect attendance and punctuality. The attitude of the subjects toward their positions as supervisors was excellent. Both showed a great deal of enthusiasm and desire to perform well. At all times, their attitude toward the job appeared to be very serious and responsible. It should be noted that both subjects demonstrated a mature attitude toward their position as supervisors. This was observed in the positive manner in which they interacted with their peers during work sessions. Prior to this study, these two subjects had very poor work histories with repeated failures in adapting and adjusting to other work situations. In view of this, their performance in this study was quite surprising. This might suggest that if given more-valued positions and more responsibility, the job becomes more reinforcing in itself, and the student applies himself as required to meet the increased demands of the position. It was observed by the experimenter that the position of supervisor in the work program was indeed considered to be very reinforcing by the students. This is supported by the fact that other students approached the experimenter requesting the opportunity to participate in the program. Given that the two subjects participating in this study were not considered to be acceptable workers and yet they demonstrated excellent performance as supervisors, it remains to be investigated what results could be obtained using the best students

in similar positions. It seems reasonable to suggest that work settings with chronic staff shortages should capitalize on the possibility that higher-functioning retarded individuals can become effective para-professionals in vocational settings.

Considering the overall results of this study, it is hoped that an important contribution has been made to the emerging area of behavioral research concerned with the utilization of higher-functioning retarded individuals as quasi staff, or behavioral managers. Certainly this study suggests the possibility of new areas of vocational activity in sheltered work settings for the mentally handicapped worker. This possibility holds the promise of advantages of a dual nature. It seems reasonable to suggest that higher-functioning clients could function in quasi-staff supervisory roles to help alleviate the typical complaint of understaffing common to most sheltered workshops. More importantly, the results of this study suggest the availability of more normative and rewarding vocational activities for the mentally handicapped in the traditional sheltered work setting.

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APPENDIX I

Additional Information for Component Supervisory Behaviors

Component 3 - Pre-session Instructions

- (b) "Alright, everyone is sitting in their right place. You all have lots of napkins, bags, sugar, and stir sticks. Your charts are on the wall in front of you and your boxes are on the table underneath your charts. Okay, then we are all ready to go to work. Now remember, we are going to work for one hour and you should make as many bags as you can. Every time you fill your box up with bags, I am going to take the bags away, put your money in the plastic bag on the wall by your chart, and then put an 'X' on your chart. Remember, we want all the 'Xs' to go really high, right up to the top if you can. The more work you do, the more 'Xs' you'll get on your chart, and the more money you'll get in your bag to take home." It is necessary to point out that each subject had a different set of instruction sheets due to individual differences in their abilities to read. Although the content of both sets of instruction sheets were identical and contained the prompts listed above, the format was very different. The first subject was able to use a set of printed instructions, shown in Figure 1 on page 36. The second subject required a set of picture prompts and key words, and these are shown in Figure 2 on pages 37-39.

EVERYBODY IS SITTING IN THE RIGHT PLACE.

EVERYBODY HAS LOTS OF BAGS, NAPKINS. THE TRAYS HAVE LOTS OF SUGAR, STICKS.

CHARTS ARE ON THE WALL IN FRONT OF YOU - BOXES UNDERNEATH ON THE TABLE.

I WANT YOU ALL TO MAKE LOTS OF COFFEE PACKS AND TO FILL UP YOUR BOXES.

WHEN YOUR BOXES ARE FULL, I AM GOING TO TAKE YOUR WORK AWAY AND GIVE YOU AN "X" ON YOUR CHART AND PUT SOME MONEY IN YOUR BAG.

REMEMBER, WE WANT THE "Xs" TO GO REALLY HIGH SO EVERYBODY HAS TO WORK REALLY HARD. THE MORE WORK YOU DO THE MORE Xs YOU GET, AND THE MORE Xs YOU GET, THE MORE MONEY YOU MAKE TO TAKE HOME.

NOW I AM GOING TO SET THE TIMER FOR ONE HOUR AND WHEN IT RINGS YOU ALL STOP WORKING. (BRIAN, SET THE TIMER.)

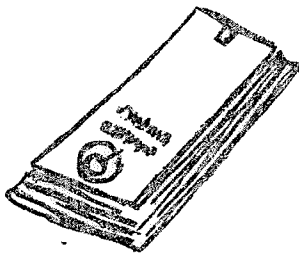
OKAY, EVERYONE, DOWN TO WORK!

Figure 1. Pre-session instructions for Subject 1.

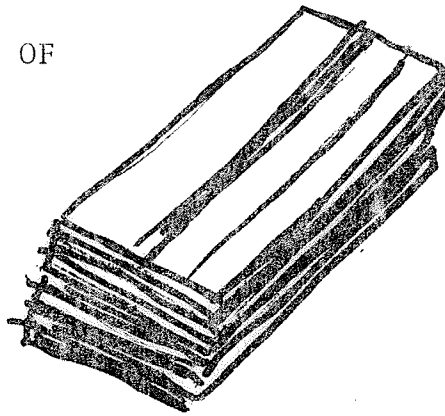


EVERYBODY SITTING IN THE RIGHT PLACE.

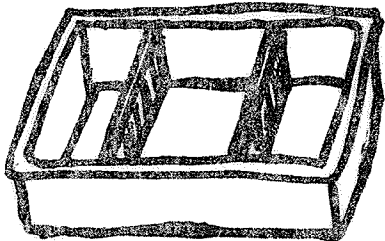
EVERYBODY HAS LOTS OF



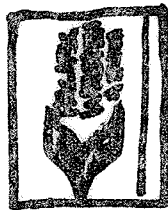
BAGS



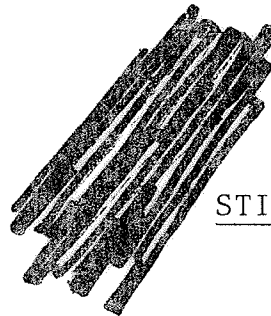
NAPKINS



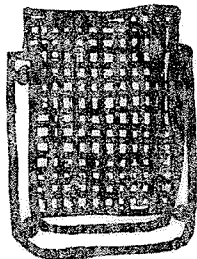
TRAYS HAVE LOTS OF



SUGAR



STICKS



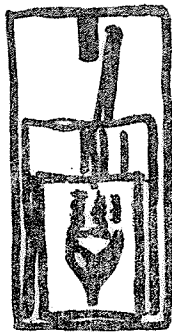
CHARTS ON THE WALL



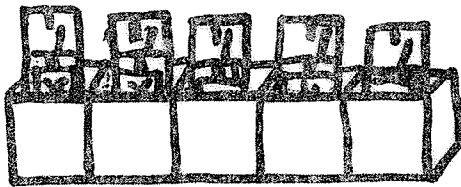
BOXES ON THE TABLE

EVERYBODY HAS EVERYTHING TO WORK!

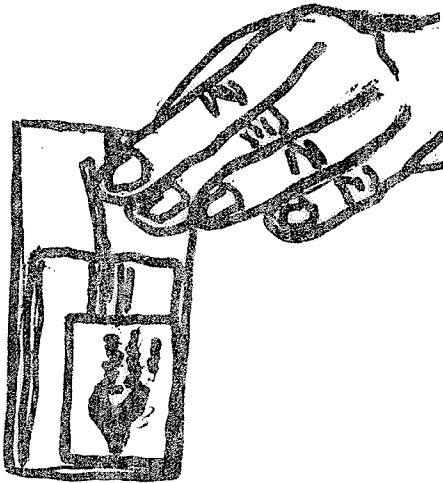
... continued



I WANT YOU TO MAKE LOTS OF
COFFEE PACKS.



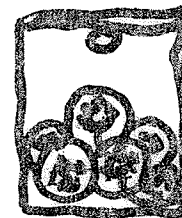
FILL UP YOUR BOXES. WHEN YOUR BOXES
ARE FULL, I AM GOING TO TAKE AWAY
YOUR WORK.



AND GIVE YOU AN



AND PUT YOUR MONEY IN YOUR BAG.



THE MORE WORK YOU DO

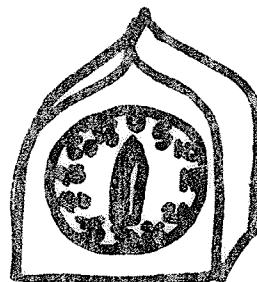
THE MORE  YOU GET.

THE MORE  YOU GET

THE MORE  YOU GET.

NOW I AM GOING TO SET THE TIMER

FOR 1 HOUR.



WHEN THE TIMER RINGS,

EVERYBODY



WORKING.

I AM SETTING THE TIMER.

EVERYBODY START WORKING!

Figure 2. Pre-session instructions for Subject 2.

- (c) "I'm setting the clock for one hour and when it goes off we all stop working."
- (d) "Okay (student's name), its time to go to work."
"Let's get to work (student's name), everyone else is already filling their boxes."

Component 4 - Reinforcement for Production

- (b) Example: "That's great (student's name), another box of work."
- (d) "There you go (student's name), another 'X' on your chart for filling your boxes. That looks great."
- (f) "Here is the money for the work you've done."

Component 5 - Reinforcement for On-Task Behavior

- (a) "You're doing great work (student's name). Keep it up and you'll fill your boxes in no time."
"That's the way (student's name), you're doing very good work."

Component 7 - Session Termination

- (b) "I want you all to pile your napkins and bags and make sure all the sugar and sticks are in the trays."

Component 7A - Coffee Break Time

- (b) "Okay, its time for your coffee break. You have 10 minutes to relax, use the washroom, have a drink. Remember to be quiet in the halls. Let's go."

Component 7B - End of Morning or Afternoon

- (g) "Okay, now will one student at each place bring up the tray and the boxes to the cupboard."
- (k) "Now you can take the money out of your bag. This is your money for all the work you did today."

(m) "Thank you for all the good work you did today. You can all go to lunch now." (morning session)

"You can all go back to your home rooms." (afternoon session)