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Evaluation of a Behavior Modification Manual For Aiding Staff in the Supervision of Work Performance Of Retarded Clients in Sheltered Workshops

by

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EVALUATION OF A BEHAVIOR MODIFICATION MANUAL FOR AIDING STAFF IN THE SUPERVISION OF WORK PERFORMANCE OF RETARDED CLIENTS IN SHELTERED WORKSHOPS

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DEDICATION

To Ronald, Irene, Maria Cecilia, Rony,
Evaristo, Olympia, Olympio, Nair, Angelo,
Glen and Maria Victoria
who gave up so much of our time together,
and supported me with love and caring,
during the pursuit of my studies.

Abstract

A self-instruction manual to develop a multiple-component production supervisory strategy (PSS) was studied as an aid for staff responsible for supervising production of 80 retarded persons working on contract tasks in sheltered work settings. The instructional manual was introduced in a multiple-baseline across three groups of staff and clients, and was then withdrawn in a multiple-baseline across the three groups. A preference test was given to the clients to socially validate the acceptability of the procedures that were implemented. A questionnaire was given to the staff to further evaluate the procedures as well as the manual itself.

The results showed that average hourly production increased for 77 of the 80 clients under the PSS as compared to the mean production during baseline. The average percentage increase for all clients was 68%, and ranged from a few percentage points to 241%. The error rates were not affected by the changes in production rates. Mean production rates decreased when the PSS was withdrawn. The preference test showed that 95% of the choices of the clients were in favor of the PSS. The staff questionnaire indicated that all the staff recommended the use of the PSS for the benefit of the clients and as a personal preference for work conditions.

In conclusion, the study showed that "typical" vocational workshop staff can successfully implement a production supervisory strategy through the use of a self-instruction manual. Moreover, the staff and the clients preferred to work under the experimental conditions.

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INTRODUCTION

Numerous studies have demonstrated that severely and moderately retarded individuals in sheltered workshops are able to perform tasks of various levels of complexity (e.g., Bellamy, Peterson & Close, 1975; Gold, 1972; Hunter & Bellamy, 1976; Koop, Martin, Yu & Suthons, 1980; Tate & Barhoff, 1967; Yu, Martin, Suthons, Koop & Pallotta-Cornick, 1980). In making projections for sheltered workshops in the decade ahead, Whitehead (1979) documented that "sheltered workshops remain the principal, and frequently the only, source of long-term employment for the severely handicapped" (p. 71). However, after considering the data from several national surveys and other sources, Whitehead identified one of the critical needs for the 1980s as that of the development of techniques for improving the productivity of severely retarded workers in sheltered work settings. Therefore, a practical issue that must be addressed is that although the clients are able to perform workshop tasks, they might be denied the opportunity to work in sheltered workshops because they cannot perform at acceptable rates (Bellamy, 1976).

Various experiments have investigated factors to improve production performance of retarded clients working on different workshop tasks. Reviews of this literature (Gold, 1973; Bellamy, 1976) indicated that production rates of retarded individuals can be influenced by specific reinforcement contingencies, supervisor's instructions, organization of the work area, modelling and social facilitation from partners, and distractions in the work area. Based on the conclusions of the reviews concerning factors influencing the productivity of the retarded, and following the strategy described by Azrin (1977) for developing

effective treatment programs, Martin and Pallotta-Cornick (1979) outlined guidelines for a production supervisory system (PSS) along with supporting references. Following those guidelines, a pilot investigation (Martin, Leonhart, Pallotta-Cornick, Yu, Suthons & Quinn, Note 1) examined a PSS in a multiple-baseline design across tasks with lower-functioning retarded clients in a sheltered workshop. Although the PSS produced large increases in production for five of eight clients on one task, and small increases in production for seven of the same eight clients on a second task, several difficulties were noted. In a subsequent study, Martin, Pallotta-Cornick, Johnstone, and Goyos (1980) modified the PSS and investigated it using more difficult staff/client ratios (1:16) in a regular workshop setting with regular work periods. The effect of the PSS was assessed in a combined multi-element, multiple-baseline-across-groups design, with a reversal component. In addition, a preference test was conducted for social validation of the procedures in terms of their acceptability from the point of view of the clients. Increases in production, ranging from a few percentage points to 150% of baseline production, were observed for all 16 clients under PSS conditions. Also, the clients and the staff preferred to work under the PSS rather than under baseline conditions.

The results of these latter two studies suggest that the PSS is effective and can be a realistic strategy for workshops employing lower-functioning clients on sub-contract packaging and assembly tasks. However, the PSS is more likely to benefit staff and clients in typical workshops, if it is incorporated into a self-instructional package. To this end, a manual was prepared (Pallotta-Cornick, Cornick & Martin,

Note 2) incorporating all of the components of the PSS, some additional recommendations based on staff experiences with the strategy, and some prompts as to recording and graphing data. Following recommendations of Glasgow and Rosen (1978) for evaluating self-help behavioral manuals, this study examined the effects of the PSS when it was designed and implemented by sheltered workshop staff on the basis of the self-instruction manual, in terms of the production of 80 retarded clients who varied in terms of age, level of retardation, and work experience. In addition, a preference test was conducted with a sample of the clients, and a questionnaire was given to the staff participating in the research to socially validate the acceptability of the procedures and the manual itself (Kazdin, 1977; Clark, Greene, Macrae, McNees, Davis & Risley, 1977; Wolf, 1978).

METHOD

Settings

The self-instruction manual was introduced in a multiple-baseline design across three groups. Two of the groups worked in a work assessment area at a school for retarded persons, while the third group worked in a workshop at a residential institution for retarded individuals.

The work assessment area was a room measuring approximately 13 m by 8 m. It contained five tables of different sizes, shelves, cabinets along two walls, windows on a third wall, a staff desk, and contract-related equipment. The institutional workshop had an area of approximately 100 sq m and contained seven tables of different sizes, shelves, cabinets, counters, one staff desk, and contract-related equipment. Both work areas obtained subcontracts from private businesses requiring clients to perform on various packaging and assembly tasks.

Clients and Staff

A total of 80 retarded persons participated in this study.

Sixty-seven of the clients worked in the work assessment program for a portion of their educational activities at the school for retarded persons. These clients were diagnosed by the school staff as being trainable mentally handicapped, and their chronological ages varied from 12 to 20 years. These clients had been divided by the school staff into units of seven to 10 persons, and each unit worked in the work assessment area for one hour and thirty minutes per week. For the purposes of this experiment, five of these units were introduced to the various experimental phases at approximately the same time, and these five units collectively are referred to as Group 1. Two of these five units were taught by one staff member, and they will be referred to as Group 1A. The remaining three of these five units will be referred to as Group 1B, and a second staff member taught two of these units. The sixth and seventh units in the school program were taught by a third staff member, while the eighth unit was taught by a fourth staff member. These latter three units were exposed to the various experimental phases at approximately the same time, and their data is combined and referred to as Group 2.

The remaining 13 clients formed the third experimental group for this study. They worked in an institution-based sheltered workshop on a fulltime basis, five days per week. The institutional diagnoses varied from severe to mild retardation, and their ages ranged from 17 to 59 yr.

A summary of the characteristics of the clients is presented in Table 1.

Insert Table 1 about here

The four participating staff from the school for retarded persons all had university degrees and were registered teachers. One of the four staff had taken formal courses in behavior modification. At the institutional workshop, four different staff rotated to supervise the 13 clients. One of the staff had a university degree with several courses in behavior modification, one staff had completed one university course and that was in behavior modification, and the other two staff did not have university course work but had completed an institutional in-service course in behavior modification.

Prior to this research, all participating staff were contacted by the author and a formal meeting was held to discuss their participation in the study. It was explained that the researcher would visit the workshops regularly for a period of several weeks in order to gather data on production rates of clients. Thereafter, staff would be given an instruction manual which provided guidelines for a system that had increased production in previous research. Staff would be requested to read the manual and implement the production supervisory system to the best of their ability in terms of the guidelines provided in the manual. It was emphasized that throughout the research, no assistance other than the provision of the manual could be expected. All staff agreed to participate in the study under the conditions described by the author.

Tasks

All clients at the school worked on a packaging task throughout the

Table 1

Characteristics of the Clients

	School Units	Number of Clients	Mean Chronological Age	Mean Years in Vocational Program	Mean Level of Retardation[1]	Teacher (Supervisor)*
Group 1A	1	7	19	5 years	moderate	A
	2	11	18	4 years	moderate	A
Group 1B	3	8	15.5	3 years	moderate	B
	4	9	17	2 yr 6 mo	moderate	A
	5	8	16	2 years	moderate	B
Group 2	6	9	15.5	2 years	moderate	C
	7	7	14	1 yr 6 mo	moderate	C
	8	8	13	1 year	moderate	D
Group 3		13	32	2 years	moderate	E, F, G, H

[1]The mean level of retardation for each client is based on preliminary evaluation and data available at the school. Further research is being carried out.

*Each letter of the alphabet signifies a different teacher.

study. The task involved folding a napkin and putting it into a plastic bag with a sugar pack and a stir stick (PWA coffee packs).

In the workshop, three of the clients assembled rubber hoses for draining acid from car batteries. The task involved putting a metal clamp on the upper part of the hose and placing a rubber cap on the same end of the hose. Eight clients assembled caps for water jugs which involved inserting a gasket into a rubber cap after dipping it into silicone oil. The remaining two clients initially packaged water jug caps into a plastic bag. When this task was discontinued they subsequently assembled the water jug caps with the other eight clients. This task change occurred during the Baseline phase.

Baseline Conditions

During this condition, the staff continued with their usual routine and procedures which included the following activities:

Having the clients perform their specific tasks. The clients entered the room and received instructions to sit down and work. The materials necessary to perform the task were prepared and placed in trays for the clients to assemble or package.

Supplying materials. Materials were supplied by the staff whenever a client pointed out that the tray was empty, or when a staff observed the need for materials.

Collecting and counting products. In the work assessment room at the school, the products were collected and counted at the end of the work period by the staff. In the workshop the production was collected several times throughout the day by the staff. For the purposes of this study, items produced by individual clients were set aside, and were counted at various times during the day by the researcher.

Dealing with problem behaviors. The procedures usually carried out by the staff for dealing with tantrums, aggressiveness, hygiene, and off-task behaviors were maintained. They typically involved simple instructions to correct the problem behavior, a mild reprimand, or the removal of the client from the room depending on the severity of the problem. The most common procedure used was a verbal reprimand and instructions to go back to work.

General work prompts. The clients were told to start working at the beginning of the work period. This was a very casual prompt and they did not have to wait for this prompt to start working. The prompt was usually given in the initial 10 to 20 minutes after the first few clients had entered the work area. The content of the prompt basically referred to performing the task, and no reference was made to payment.

Praise. Praise occurred inconsistently, varying according to the particular staff member, the number of clients present, and the staff member's duties on any specific day.

Pay system. The clients at the school received their pay at the end of each work period after the staff member had collected, counted, and recorded the number of items assembled, and calculated the amount of money due to each client. The clients at the workshop received their pay at the end of each week. The rate of pay at both locations was kept constant during the study and was dependent on production of individual clients.

Dependent Variables and Inter-observer Reliability

At the start of the baseline phase, the staff in each work setting were provided with a book for recording the duration of work periods

and individual production of clients. Each time a staff member emptied a receiver tray of completed products of a client, the total number of products completed and the number of errors on completed products were recorded. In the various groups at the school, staff recorded individual production data on all clients throughout all phases of the study. At least once during each phase of the study for each staff member involved at the school, the experimenter visited the workshop and independently timed the work periods and counted production and errors of clients in order to obtain inter-observer reliability scores. In the institutional workshops, staff simply recorded the duration of the work periods and the total production combined of all clients during the day. Therefore, at the request of the experimenter, production of individual clients was left in the receiver trays at the end of the morning and the end of the afternoon work sessions, and the quantity produced was individually counted by the experimenter. At least once per phase, the author and one of the staff from the workshop both noted the duration of the work periods and also counted individual production in order to obtain inter-observer reliability scores. Concerning the duration of work periods, the author always agreed completely with the staff records of times for starting and terminating sessions. In all other cases, reliability was calculated by dividing the number of agreements (on the total units produced by a client in a given work session) by the number of agreements plus disagreements, and multiplying by 100.

Independent Variable

When the self-instruction manual for the PSS was introduced, each staff member involved was provided with a copy of the manual. The

content of the manual is summarized in Table 2.* The staff were asked to

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Insert Table 2 about here

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read the manual and study it carefully, to discuss as a group how they might follow the manual in implementing the PSS, and to have the PSS implemented within a three-week interval. During the three-week planning interval, the clients continued working under baseline conditions. At the initial meeting, all staff agreed to try to meet the three-week time contingency. The manual described a minimum number of components to be implemented, including; some environmental engineering to reduce distractions, a set of visual and verbal prompts to increase production, and some consequence management including reinforcement for "on-task" behaviors, as well as for production. The PSS strategies implemented at the school and the workshop were very similar to each other and to the PSS described by Martin et al. (1980), and their characteristics are summarized below.

Reduction of distractions. A large partition, approximately 70 m high, was used to divide the clients into pairs.

Initial instructions. At the start of each work period under the PSS condition, a set of instructions was given to the clients. At the school, the instructions were given only once, as soon as all the clients were in their seats ready to start working. The clients worked for a period of one and one-half hours without a break, and this constituted their work period. At the workshop, there were four work periods each day, therefore, the instructions were given four times per day. There were two work periods in the morning, one before and one after coffee break, and two in the afternoon, one before and one after coffee

*Draft copies of the manual are available upon request.

Table 2

Table of Contents of the Self-Instruction Manual

break. Work periods in the workshop varied from one to one and one-half hours in duration. Although the exact content of the instructions varied, they prompted the clients to look at the picture prompts (described below), to work hard and make lots of (name of the product) in order to make money. The instructions were given to everybody at once and the supervisor walked around the tables while giving the instructions.

Picture prompts. A set of pictures or mounted items was posted in front of each client to illustrate the relationship between the completed products and the money that could be earned for producing such items. The client's attention was drawn to the picture prompts through the use of instructions as described above.

Reinforcement system for productivity. The reinforcement system was a pay system based directly on productivity. The payment per unit was the same as in baseline, however, reinforcement was given following the completion of a fixed number of items, rather than at the end of the day or the end of the week. This fixed number varied from client to client depending on his/her average performance during baseline and the task being worked on, and was chosen so that a client would likely complete several ratios during each hour of work.

A receiver tray was used as one of the feedback tactics to establish and maintain the relationship between receipt of money and the number of items produced. Receiver trays were different for each task but all of them provided space for a certain number of items to be completed in order to receive payment. Another type of feedback used was a frequency bar graph for each client. These graph sheets were posted on the partition in a way that they were visible to the clients. Each

graph plotted the number of ratios completed by the client. At different intervals during the work period, the supervisor collected the products from completed trays of each client, paid the client accordingly, and drew the client's attention to the feedback graph as he/she marked an X for each ratio completed. The supervisor encouraged the client to try and get his/her line of X's higher than the previous day's. The money earned was placed into a plastic bag attached to the partition in front of the client.

Social reinforcement contingent upon on-task behaviors. In addition to reinforcement for production, the supervisor provided additional social praise to the clients for being on task. The clients were praised on a variable-interval schedule of approximately 10 minutes. Typically, the supervisor circulated around the production tables praising and commenting on the on-task behaviors and hard work of the clients.

Variations of the PSS for the School and the Workshop

The partitions used by the school were made up of cardboard and painted blue. Some of them were cross-shaped and some made in the shape of an "S", depending on the size of the tables. In the workshop, a cross-shaped partition made of one-inch plywood was used.

The receiver trays varied according to the task. In the school, a cardboard box divided into sections was used for coffee packs, and the payment ratio was four pennies per 10 units according to the contract for this task. The workshop used a plastic box for the water jug caps. Each box could hold about 35 caps and the clients received 11¢ per completed box. For the rubber hose task they used a cardboard box marked with a line that would hold 25 or 50 hoses, depending on the height of

the line. The clients were paid 4¢ per 10 units produced according to the specific contract. Concerning payment, the clients in the school were allowed to take their money at the end of the day. In the workshop the money earned was accumulated until the end of the week when the clients received the money to take with them.

Experimental Design

The PSS manual was assessed in a multiple-baseline-across-groups design with a reversal component. A baseline was taken for all clients. The PSS was then introduced sequentially to Group 1, then to Group 2, and finally to Group 3. After the effects of the PSS were demonstrated and maintained for a period of five to seven weeks, a reversal to baseline was implemented in a multiple-baseline across groups.

In the Reversal phase, Group 1A did not return immediately to baseline conditions. The clients in this group were exposed to a procedure for fading-out of the PSS components in order to attempt to maintain high levels of performance after the treatment was removed. These phases were introduced because the clients in Group 1A were in their final stages of training in the school and it was part of the goals of their educational program to place these students in community jobs or sheltered workshops. Therefore, the components of the PSS were removed in five staps, rather than withdrawn completely in one stap as was the case for the other groups. In the first fading step with Group 1A, the PSS remained the same with the following exceptions: payment and "on-task" reinforcement were given twice per 30-minute interval. During the second fading step, the visual cues (pictures and receiver trays) were removed, and payment and "on-task" reinforcement were given once every 30 minutes. In the

third fading step, the last visual cue (production feedback chart) was removed, and payment was given once every hour. "On-task" reinforcement was given once every 30 minutes, and this continued during all subsequent steps. During the fourth fading step, the partitions were eliminated and the clients were paid at the end of the work period (as in baseline). The final step required the clients to work under baseline conditions.

Preference Test for Clients

A preference test, similar to the one described by Martin et al. (1980) was conducted with 27 of the clients (34%). Nine clients were randomly selected from each of the three groups, and were individually tested.

On each of four occasions, a client was taken into a room where two tables were set up for work; one table was set up as in PSS condition and the other as in baseline condition. The right-left position of the tables was alternated across the four test occasions. To control for the possible influence of any preference for sitting at the right or left side of a particular table, as well as the influence of seating position from previous weeks, there was only one chair placed at each table. For the school clients the test was conducted in a different room from the work assessment area. For the workshop clients the tables were rearranged in a different position within the workshop. For each test, the experimenter placed a client equidistant from the two tables and said, "I want you to work here for a while. You can work at this table (pointing to one of the two tables), or at this table (pointing to the other table). Now, please sit down and work where you want to." After the client had worked for about three to five minutes under the

condition of his/her choice, the experimenter said, "Thank you for working. Let's go back to..." and the client was returned to his/her previous activity. Any questions by the client during the test were answered with, "Don't worry about that now. Please keep working until it is time to quit."

Inter-observer reliability checks were taken in 30% of the choice opportunities for the preference test. One of the staff independently recorded, at the same time as the researcher, the name of the client and the table (PSS or baseline) chosen. The formula used for calculation of reliability was the number of agreements divided by the number of agreements plus disagreements, multiplied by 100.

Staff Questionnaire

After the study was completed, each staff involved was given a questionnaire in regards to the PSS manual. Each item on the questionnaire was rated on a seven-point scale with the two conditions (baseline and PSS) at either end. The position of the conditions in relation to the scale were counterbalanced across questions and across staff to control for position bias. In this way, some questions for some staff members were PSS 3 2 1 0 1 2 3 Baseline, and others were Baseline 3 2 1 0 1 2 3 PSS. The staff were asked to circle the number which best represented their opinion of the relative degree to which their behavior or the clients' behavior was affected by the two conditions, with the middle number representing neutral or no influence.

RESULTS

Percent Production Increases with PSS

A comparison of the mean performance of each group during the PSS

to their respective mean production levels during baseline and reversal phases showed a substantial increase during PSS for all groups (see Figure 1). The first data point in the PSS condition for all groups

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Insert Figure 1 about here

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represents the first session under PSS. All data points during Baseline represent baseline conditions, although the data during the three sessions just prior to PSS were obtained while the staff were planning the PSS.

The overall increase in the production levels per hour for all groups under PSS conditions, as compared to the mean of all baseline sessions was 68%. The same type of comparison for each client showed a consistent difference in favor of PSS for 77 of the 80 clients. Out of the 55 clients that were exposed to the reversal conditions, 37 returned to baseline levels of production, six did not decrease at all during reversal, and the remaining 12 clients decreased during reversal but not to baseline levels.

For Group 1A, as described previously, five fading steps were carried out starting in Session 12 (see Figure 1), one fading step per session. The gradual removal of the PSS components, as opposed to an abrupt reversal to baseline (as with the other groups) showed that the mean units produced decreased after the third fading step, after which the feedback graph and partition were removed. However, the production rate during the last session, which corresponded to baseline conditions, was still higher than the initial baseline levels.

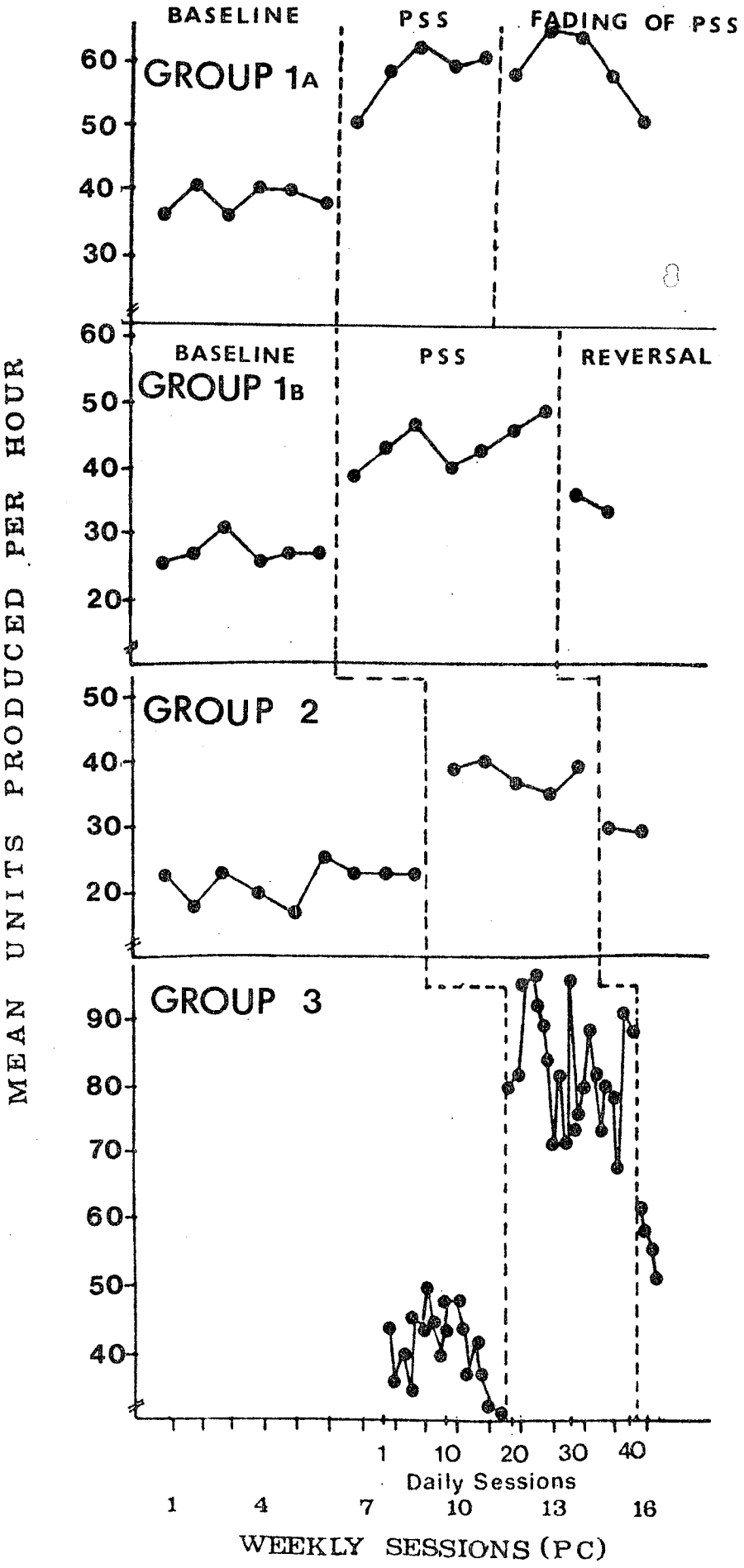

Figure 1. Average hourly production per session for the clients in each experimental group. Each data point for Groups 1 and 2 represents the mean production per hour for all clients in that group during their weekly session in the work assessment program at the school for retarded persons. Each data point for Group 3 represents the mean hourly production averaged across each work day for all the clients in the institution workshop.

Group 1 increased an average of 55% in production during PSS, with a range of -2% to 168%. One client decreased in production, six of the clients increased less than 20%, 28 increased between 20% and 100%, and seven clients increased over 100%. Group 2 showed a mean increase of 76% during PSS with a range of -30% to 128%. Two clients decreased in production, two clients increased less than 20%, 18 increased between 20% and 100%, and two clients increased over 100%. Group 3 showed a mean increase of 100% during PSS, ranging from 31% to 241%. Eleven of 13 clients increased between 30% and 100%, and two clients increased over 200%.

Percentage of Errors per Hour

The errors of the clients were minimal throughout the study, with the exception of one client in Group 3, and were completely unaffected by changes in production rates during the PSS. The mean error rate for all clients across all phases was 2.3%.

Inter-observer Reliability

The mean percentage of agreement for counting production and errors for the different tasks were as follows: 99.6% for coffee pack assembly in the school, ranging from 97% to 100%, 93% for the water jug cap assembly in the workshop, ranging from 72% to 100%, and 92% for rubber hose assembly, ranging from 83% to 100%. There was complete agreement for the preference choices.

Preference Testing

Of the total of 108 choices, four per client for 27 clients, 95% of the choices were for the PSS table. Twenty-one of 27 clients chose the PSS table on all four occasions of the preference test. The

remaining six clients chose the PSS table on three occasions and the baseline table on one occasion.

Staff Questionnaire

The questionnaire was divided into items about client performance and satisfaction, staff performance and satisfaction, and general recommendations as to whether or not to use the PSS. As can be seen in Table 3, for the questions concerning the clients (questions 3, 4,

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Insert Table 3 about here

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and 5), the PSS was strongly favored. For clients' interest, seven staff members judged the PSS to be a better procedure and one staff chose baseline.

Concerning staff satisfaction (questions 6, 7, 8, and 9), the rating was largely in favor of the PSS. For staff satisfaction with clients' performance, seven were for the PSS (six in the highest rating), and one was neutral. In rating staff time with clients, seven chose the PSS (six in the highest rating) and one chose baseline. Related to satisfaction with interaction with clients, one staff chose baseline, one was neutral, and six preferred the PSS (four rated it in the highest level). For satisfaction with setting organization, one staff favored baseline conditions, and seven preferred the PSS (five in the highest rating).

All eight supervisors preferred the PSS for themselves and for the clients (questions 10 and 11).

In general, out of the 88 possible answers to the questionnaire

Table 3

A Summary of the Results of the Staff Questionnaire*

	← Ratings →							
	Baseline	3	2	1	0	1	2	3	PSS
1. Production level		0	0	0	0	1	2	5	
2. Production errors		1	0	2	1	3	1	0	
3. Clients' interest		0	1	0	0	0	2	5	
4. Clients' happiness		0	0	0	0	2	1	5	
5. Clients's attention		1	1	0	0	0	1	5	
6. Staff satisfaction with clients' work		0	0	0	1	0	1	6	
7. Staff time with clients		0	1	0	0	1	0	6	
8. Staff satisfaction with interactions		0	1	0	1	0	2	4	
9. Staff satisfaction with organization		1	0	0	0	1	1	5	
10. Personal choice of work condition		0	0	0	0	2	0	6	
11. Choice of best condition for the clients		0	0	0	0	1	1	6	

*Each entry indicates the number of staff who gave the corresponding rating for the corresponding question.

(eight staff times 11 questions), 76 were in favor of the PSS (53 in the highest rating), three were neutral, and nine favored baseline conditions.

DISCUSSION

In general, all the groups in this study performed much better during PSS than during baseline condtions. More specifically, the average hourly production increased for 77 of the 80 clients involved in this field test. The effects produced by the PSS were successively replicated across the different groups, demonstrating the control by the independent variable, and they support previous research which concluded that the PSS was a useful tool for maintaining production in sheltered work settings (Martin et al., 1980).

Although the production increases varied among the clients, there was no consistent relationship between size of effect and degree of retardation. Lower and higher functioning clients did not systematically differ in their percentage increase in hourly production as a function of the PSS. It is worth noting that as described in the Method section the staff members acting as supervisors for the school-based group had university degrees and their qualifications may not be representative of typical workshop personnel. As well, the time the school groups spent on production activities, one and one-half hours per week, cannot be considered representative of most workshop situations. Nevertheless, the results were consistent with those obtained with Group 3 which is more representative of a typical sheltered workshop.

Different sources of data indicated that the clients and the staff preferred the PSS. The results of the preference test given to the

clients provided strong evidence that the PSS was the preferred working condition. Also, the clients earned more money, were paid more frequently, and had more opportunities to interact with their supervisors as a result of the structure of the PSS. The outcome of the questionnaire given to the staff clearly showed that the supervisors also preferred to work under PSS conditions as opposed to baseline. The great majority were more satisfied with their clients' performance, happiness, and interest; with their interactions with the clients, organization of the work setting; and their own performance in general during PSS conditions. Informal observations indicated that noise level decreased during the PSS conditions. Requests for the partition and graphs and pay system on the part of the clients during the reversal phase were also informally observed. Following the completion of this study, both the workshop and the work assessment area re-introduced the PSS. It should be pointed out that although the results strongly support the effectiveness of the experimental procedure in increasing production, the introductory meetings and the presence of the experimenter in some of the sessions may have contributed to the results. It should also be noted that, although the experimenter informally observed that staff actually implemented all of the components of the PSS cited in the Procedure section, no formal procedural reliability data was taken. Further research might consider both of these issues.

As indicated in previous research (Martin et al., 1980), if contact with the PSS was viewed as a step towards potential community placement, then the problem of programming for generalization following withdrawal of the PSS would have to be addressed (e.g., see Martin & Pear, 1978).

The results of this research clearly indicate that production decreased during the reversal phase. However, some form of sheltered work program appears to be the most realistic habilitative goal for severely handicapped workers (Bellamy et al., 1979), and it has been argued that structured employment situations should be characterized by on-going specialized production supervision techniques for improving and maintainint the productivity of the retarded clients (Horner & Bellamy, 1979). Therefore, a strategy like the PSS would appear to be a highly desirable feature of sheltered workshop supervisory systems. The present research indicated that such a system can be effectively implemented by workshop staff on the basis of a self-help manual.

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APPENDIX I

Average Hourly Production of Each Client per Phase Of the Experiment

Subject	Baseline $\bar{x}$	PSS $\bar{x}$	Reversal $\bar{x}$	Percent Increase
Group 1A				
1	35.5	43.0	46.0	21.1%
2	11.5	30.0	19.0	160.9%
3	28.0	35.0	44.4	25.0%
4	43.7	92.0	83.0	110.5%
5	30.8	44.4		44.2%
6	45.4	76.7	70.0	68.9%
7	38.5	79.8	75.0	107.3%
8	39.4	57.1	42.3	44.9%
9	37.3	62.3	65.0	67.0%
10	31.3	44.5	49.5	42.2%
11	22.5	33.0	24.6	46.7%
12	45	55.8	58.8	24%
13	59	70.3	73.2	19.2%
14	35.7	56.8	52.0	59.1%
15	53.5	88.0	102.3	64.5%
16	51.3	75.0	50.0	46.2%
17	40.0	61.3	45.5	53.3%
18	39.7	62.1		56.4%

Subject	Baseline $\bar{x}$	PSS $\bar{x}$	Reversal $\bar{x}$	Percent Increase
Group 1B				
19	44.0	55.7	52.0	26.6%
20	12.2	25.7	22.0	110.7%
21	28.5	29.7	20.0	4.2%
22	31.2	58.3	46.0	86.9%
23	22.2	34.6	17.0	55.9%
24	9.6	11.3		17.7%
25	23.2	36.0	25.0	53.4%
26	24.8	27.8	25.0	12.1%
27	88.1	98.4	85.0	11.7%
28	38.5	63.0		63.6%
29	28.6	33.9	32.0	18.5%
30	21.0	31.3	14.0	53.8%
31	45.8	56.3	52.0	22.9%
32	19.2	47.8	17.0	142.7%
33	27.5	44.4		61.5%
34	7.2	19.3	15.0	168.1%
35	41.3	60.1	27.0	45.5%
36	16.8	41.8	41.6	148.8%
37	52.8	81.4	62.0	53.8%
38	44.4	86.2	65.0	94.1%
39	34.5	49.0		42.0%
40	37.4	45.3	50.0	21.1%
41	23.3	29.4	35.0	26.2%
42	30.3	41.1	21.0	35.3%
43	40.4	39.7	38.1	-1.7%

Subject	Baseline $\bar{x}$	PSS $\bar{x}$	Reversal $\bar{x}$	Percent Increase
Group 2				
44	34.6	53.8	51.0	55.5%
45	10.4	13.9	5.0	33.7%
46	10.4	7.3	6.5	-29.8%
47	15.0	20.1	15.0	34.0%
48	5.6	4.5	4.0	-19.6%
49	22.6	33.7	27.0	49.1%
50	6.3	9.2	4.0	49.2%
51	30.7	32.3		5.2%
52	36.2	80.5	65.0	122.3%
53	17.0	38.8	11.0	128.2%
54	29.2	54.5	40.5	86.6%
55	28.4	52.1	35.0	83.5%
56	28.7	42.5	42.0	48.1%
57	8.6	12.7	8.0	47.7%
58	14.2	18.7	10.0	31.7%
59	42.8	57.6	54.0	34.6%
60	35.3	52.9		49.9%
61	27.2	36.7	32.0	34.9%
62	20.2	23.8	19.0	17.8%
63	48.5	90.5	70.0	86.6%
64	25.7	37.7	26.0	46.7%
65	21.4	33.0	29.0	54.2%
66	31.2	51.5	46.0	65.1%
67	26.2	45.7	33.0	74.4%

Subject	Baseline $\bar{x}$	PSS $\bar{x}$	Reversal $\bar{x}$	Percent Increase
Group 3				
68	31.9	60.9	39.8	91.0%
69	49.0	153.8	107.3	213.9%
70	21.8	38.7	28.2	78.4%
71	57.5	90.5	92.6	57.4%
72	26.9	47.3		75.8%
73	36.4	54.0	22.6	48.4%
74	15.4	30.3	19.9	96.8%
75	19.1	65.3	22.0	240.8%
76	32.9	58.2	33.8	76.9%
77	57.3	75.0	55.6	31.0%
78	37.4	74.2	38.2	98.4%
79	66.4	107.4	87.9	61.7%
80	58.6	95.2	52.9	62.5%

APPENDIX II

Staff Questionnaire

You will be given a series of statements reflecting your clients' performance and attitudes during this study, as well as your view of the effects of the procedures used. Please rate the items on a seven-point scale where the PSS and baseline conditions are at opposite ends of the scale. A score of zero will mean that you have not observed any difference between the two conditions for that particular item. The numbers of the scale increase in value in the direction of each condition in a 1, 2, 3 progression. This means that the higher the value you give in the direction of a specific condition, the more this condition represents the item you are rating. Please read carefully because the conditions PSS and Baseline are in reverse positions throughout the questions.

For Example:

Condition A	3	2	1	0	1	2	3	Condition B
	Strongly/Moderately/Slightly			No Difference		Slightly/Moderately/Strongly		

1. The most satisfactory productivity levels obtained were on:

   PSS 3 2 1 0 1 2 3 Baseline

2. The lowest levels of error rate obtained were on:

   Baseline 3 2 1 0 1 2 3 PSS

3. The highest levels of clients' interest observed were on:

   Baseline 3 2 1 0 1 2 3 PSS

4. The clients appeared to be happier on:

   PSS 3 2 1 0 1 2 3 Baseline

5. The highest degree of clients' attention to the job observed was on:

   Baseline 3 2 1 0 1 2 3 PSS

6. You experienced the most satisfaction with your clients' work on:

   PSS 3 2 1 0 1 2 3 Baseline

7. You spent the most time with your clients on:

   PSS 3 2 1 0 1 2 3 Baseline

8. You experienced the most satisfaction with your interaction with your client on:

   PSS 3 2 1 0 1 2 3 Baseline

9. You experienced most satisfaction with the organization of the work setting on:

   Baseline 3 2 1 0 1 2 3 PSS

10. Based on your observations and experiences, if you had to choose a condition under which you would personally prefer to work with your clients, to what degree would you choose:

    PSS 3 2 1 0 1 2 3 Baseline

11. Based on your observations and experiences, if you had to choose a condition that you think would be best for your clients, but not necessarily involving your participation, to what degree would you choose:

    Baseline 3 2 1 0 1 2 3 PSS