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The use of goal setting by a mentally retarded woman to increase productivity and reduce errors in a competitive job training site

Rita J. Yasson
University of Nebraska at Omaha

THE USE OF GOAL SETTING BY A MENTALLY RETARDED WOMAN TO INCREASE PRODUCTIVITY AND REDUCE ERRORS IN A COMPETITIVE JOB TRAINING SITE

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Rita J. Yasson
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ProQuest LLC.
789 East Eisenhower Parkway
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THESIS ACCEPTANCE

Accepted for the faculty of the Graduate College, University of Nebraska at Omaha, in partial fulfillment of the requirements for the degree of Master of Arts in Mental Retardation.

Committee

Name	Department
John W. Hill	SPED
Jack A. Hill	Management

Sandra K. Squires
Chairperson

July 29, 1987
Date

TABLE OF CONTENTS

LIST OF TABLES

Figure

CHAPTER 1

INTRODUCTION

What students who have mental retardation do upon graduation has become a major concern of the 80's. Over fifteen years ago parents of moderately retarded adults expressed concerns about the quality of life their children experienced after graduation (Stanfield, 1973). Data from 120 parent interviews showed that 40% of their children worked in a sheltered work setting, 2% worked for a family business, 11% attended an activity center and a large portion of them, 44% were not employed or were in a habilitation program. Over ten years later, another follow-up study indicated unemployment at a rate of 67% in the moderately and severely handicapped population (Wehman, 1981).

Other studies viewed this issue statewide and across all special education programs. Of Colorado's 1978 and 1979 special education graduates 82% had jobs upon graduation, but by the time of their follow-up interview only 69% of them were working (Mithaug, 1985). A sample of 1976-1984 graduates from Washington State programs revealed that of the 59% employed, 61% of those labeled moderately and severely and 57% of the mildly mentally retarded had no jobs (Edgar, 1985). Of the 65% employed upon graduating from Vermont special education programs, only 36% of the students coming from special class programs were employed compared to

62% from resource rooms and 78% of students who qualified for special education services but were neither in resource rooms or special class programs (Hasazi, 1985).

Recent national statistics indicate that these are not isolated cases. For the school year ending in 1984, there were 4,298,000 handicapped students in public elementary and secondary programs in the United States of which 16.9% were diagnosed mentally retarded (U.S. Bureau of the Census, 1985). An estimated 60,000 disabled children graduate from school each year (Parrino, 1985). On the national level 50-80% of working age adults who report a disability are unemployed (Geletka, 1986). This unemployment rate is 17.3% for persons with a disability compared to 9.6% for those without a work disability (U.S. Bureau of the Census, 1985). This same report compared the percentages of disabled (32.8%) versus nondisabled (76.1%) populations in the labor force. "Jean Elder, commissioner on developmental disabilities at the Department of Health and Human Services, says that only 10 percent of the retarded hold jobs that pay the minimum wage or more." (U.S. News and World Report, 1984).

Schools and agencies have rallied to provide a solution to the problem of unemployment by attempting to provide better vocational training for mentally retarded persons in the competitive environment. Successful school programs include Project AMES (Iowa) and the Madison Public Schools

Special Education program, Wisconsin (Taylor, 1982). Examples of postschool training programs include Project Employability (Wehman, 1982), Project Job (Watson, 1983), the University of Illinois Food Service and the Seattle Food Service Training Programs (Rusch and Schutz, 1979), and the McDonald's Project (Brickey, 1981).

Background of the Problem

Successful employment can be determined by individual factors. Krauss and MacEachron (1982) concluded that placement was significantly related to productivity, attendance, the amount of required supervision, behavior and monetary reinforcement.

Mental and Physical Disabilities

The degree of mental and physical disability has an effect on the opportunity for employment. From Stanfield's survey (1973) parents reported that of the 44% of those graduates who had no work or habilitation services, 55% of those cases were a result of the severity of their handicap. Other restricting factors affecting employment include architectural barriers at work sites, problems accessing public transportation, necessary equipment or machinery modifications, and problems obtaining insurance and union membership (D'Alonzo, 1977).

Social Skills

Appropriate social skills are important in securing and maintaining employment. Chaney (1972) concluded from interviews with graduates of Omaha Public Schools' work-study program, their parents, employers, and school vocational counselors that problems with social and interpersonal relationships were a major cause of failure in the first work experience. Becker, Widener, and Soforenko (1979) reported adjustment problems related to social skills as the major factor leading to job failure for trainable mentally retarded workers. In a questionnaire presented to 100 educable mentally retarded students Coonley (1977) found that flattering personality characteristics described successfully employed students while less flattering terms described those students whose employment had been unsuccessful.

Employer Attitudes

Steinmiller and Retish (1980) felt that attitudes of coworkers and employers formulated without accurate information had a direct effect on the successful employment of mentally retarded individuals. A survey of employers revealed the following concerns about hiring mentally retarded individuals: the ability to do the job, safety factors, the type of disability, and how much training time would be required (Ebert, 1986). Gruenhagen (1982) surveyed area managers of fast food restaurants and found that

although most employers had had direct experiences with people who are mentally retarded and felt that they should be hired to work competitively, most of them were undecided about whether they would hire a mentally retarded person. When mentally retarded individuals were hired, Dennis (1986) found that employers viewed the first six months as crucial to job success with the chances for success increasing the more employers knew about their disabilities. Job stability is not only affected by employers' attitudes toward the mentally retarded. The chances for successful employment decreased when employers had limited input into the job training or instructed employees in job skills that opposed those learned in school (Steinmiller, 1980).

School Programs

School programming appears to effect the need for postschool training and employment of mentally retarded individuals upon graduation. Of the 23 special education programs surveyed in a small northeastern state 75% of the graduates from EMH, TMR, and severe and profound programs needed postschool training. Projected percentages for 1981 and 1984 were 61% and 50% respectively (Vogelsberg, 1980). A follow-up study of the 1966-1980 graduates from North Kansas City Public School indicated the impact of their work-study program (Coonley, 1980). Eighty-nine percent of the graduates from this program were employed, 8% worked in a sheltered workshop, while only 3% were unemployed.

Interviews with graduates from Colorado's special education programs indicated that being enrolled in special school programs, i.e. self-contained classroom, resource room, or vocational education classes, were more useful to them upon graduation than their classes in regular education (Mithaug, 1985). There were significant differences between students who felt that this school programming was enough and those students who felt they needed more training in the following two areas: job skill, i.e. getting along with others; understanding their own abilities; or being able to perform acceptable work, and job seeking, i.e. how to find and secure a job. Parents, relatives, and special education teachers were considered most helpful in preparing the respondents for their future. In order of significance those individuals considered responsible for finding employment were self, special education teacher, and friends.

In a study of Vermont graduates those who were enrolled in a vocational education school program were more likely to be employed (Hasazi, 1985). This same study found a significant relationship between having a part-time or summer job in relation to post-school employment. Also those students who graduated from school were more likely to be employed. Although there appears to be a direct relationship between school programming and employment, school personnel were not credited with finding employment.

Competitive Standards

Workers who are mentally retarded are found in sheltered workshops in many communities. More of these individuals are seeking employment in the competitive job markets for which there are skill requirements. To be successful mentally retarded individuals must compete with nonhandicapped workers; however, matching the skill expectations of these jobs is not enough. The mentally retarded workers must also meet the competitive standards of production and quality. Foss and Bostwick (1981) found the concerns of mentally retarded workshop employees, the workshop personnel, and rehabilitation counselors to go beyond finding employment to include production requirements once employed.

Stodden and Browder (1986) studied twenty-eight mentally retarded individuals who had been trained for competitive employment. Employers identified worker strengths and weaknesses in both behavior and production indicating that the two categories are considered important for successful employment. The most frequently mentioned strengths were in the worker-behavior category. Improvements were needed in the category of production involving better judgment, speed, consistency, handling pressure, and work quality. Of the fourteen who were not successfully employed, five resulted directly from their lack of speed and proficiency. Dennis, Ebert, and Mueller

(1986) reported employers' most commonly cited reasons for job failure were slow worker/low production rate (31%) and poor work quality (17.2%).

Employer perceptions of mentally retarded workers' production are important in determining whether the employment can be considered a success. When employers judged the production rate of their employees who have mental retardation as too low, the employers felt that the term of employment was unsuccessful (Chaffin, 1969). When employees judged successful in one situation had lowered production rates in another, employers judged their employment as unsuccessful.

Statement of the Problem

Physical disabilities, a lack of social skills, coworkers' and employers' misconceptions about mental retardation, and inadequate school programming can cause mentally retarded individuals to be unemployed. However, eliminating these factors will not ensure successful employment. Learning the technical skills of the job is not enough, termination will result if the productivity is considered too low or the error rate too high.

Setting performance goals had improved the work performance of mentally retarded individuals working in a sheltered environment (Bates, 1980). It had also improved the performance of a mentally retarded woman working competitively in a service occupation (Davis, 1983). What

impact would goal setting have on the performance of a mentally retarded individual working in an atypical occupation?

Purpose of the Study

The purpose of this study is to increase the productivity of a mentally retarded worker who has been trained to complete a job while holding the error rate at an acceptable level. This will be accomplished through goal setting with verbal, graphic, and visual feedback, but without extrinsic reinforcement. The research questions to be answered are:

1. Is this mentally retarded individual capable of increasing her productivity to competitive standards?
2. Can her productivity be increased with little or no effect on error rate?
3. Will goal setting with feedback and without extrinsic reinforcement have a positive effect on production and error rate for this mentally retarded person?

Hypotheses

The hypotheses to be tested in this study are:

1.a. Null hypothesis - There will be no change in the work productivity of a mentally retarded individual who sets her own production goals.

b. Alternate hypothesis - There will be a change in the work productivity of a mentally retarded individual who sets her own production goals.

2.a. Null hypothesis - There will be no change in the work error rate of a mentally retarded individual who sets her own error rate goal.

b. Alternate hypothesis - There will be a change in the work error rate of a mentally retarded individual who sets her own error rate goal.

Limitations of the Study

The single subject design of this study will limit the generalizability to other individuals and other situations. The subject's performance on production rate and error rate will only be compared to herself under conditions of goal setting with feedback and no extrinsic reinforcement.

Chapter II

Review of Literature

Increasing the productivity of workers who are mentally retarded had been a subject of study among researchers. The techniques used to increase productivity will be explored in this review of literature. Increasing speed of a learned task does not ensure maintaining an acceptable level of work quality therefore, several studies included work quality in their research (Bates, 1980; Davis, 1983; Gold, 1973; Kliebhahn, 1967; Shapira, 1985; and Zohn, 1980).

Worker Characteristics

Breaking tasks into their simplest components enabled Presnall (1979) to find a relationship between manual dexterity and productivity. He found that after 32 clients in an activity center were trained to perform the tasks of a workshop contract, there was a significant relationship between dexterity and potential vocational ability in productivity and error rate. These worksamples were more accurate predictors of future error rate than standard dexterity tests, however, dexterity tests did relate individually with productivity.

Mentally retarded workers' attitudes of the job itself or toward the supervisor can affect their job performance (Shapira, 1985). Interviews with the mentally retarded workers were used to determine a "low growth-need" group, those workers not wanting more complex work or advancement,

and a "high growth-need" group, those workers wanting more complex work and advancement. Data were then collected from past production records and supervisor ratings. Results indicated that workers with "high growth-needs" showed more effort, had higher productivity and had fewer errors than workers with "low growth-needs."

Task Characteristics

The following two studies examined productivity when completing work individually, in cooperation with a peer, and in competition with a peer. Gordon, O'Connor, and Tizard (1955) ran three experiments to study the effects of incentives and work arrangements. In all three experiments the goal group was the most productive, followed by competitive, cooperative, and control groups, respectively. When goals were assigned to the competitive, cooperative, and control groups in the second experiment, production improved and their differences were not significant. Money had no significant effect on productivity in any groups. Huddle (1967) did a similar study, but without goal setting and found no significant difference among the groups. He did find those groups who received monetary rewards performed better than those who received no money.

Another way to view work arrangement is "individual," one person completing the whole work unit, versus "assembly-line," one person completing a fraction of the whole work unit. Brown, Johnson, Gadberry, and Fenwick

(1971) investigated production under these conditions. Workers consistently produced more when working individually than when working assembly-line.

One study viewed still another type of work arrangement, simple versus complex tasks, and their effects on the work productivity of mentally retarded workers. Morris, Martin, and Nowak (1981) investigated the effects of enriching the jobs of 14 mentally retarded workers. One group performed the simplified job first and then changed to the enriched job after 24 days. The second group performed the jobs in reverse. Six of the 14 clients performed the enriched job better than the simplified job with a decrease in production when moved from the enriched job to the simplified one; one client performed both tasks the same; and seven performed the simplified task better than the enriched one. Workers with lower intelligence could perform the enriched task, but did so at a low rate. This study supports Wade's and Gold's (1978) beliefs that individuals with mental retardation are capable of performing complex tasks if the steps are simplified.

Reinforcement

In one of the studies noted above extrinsic reinforcement had a positive effect on improving productivity (Huddle, 1967) while it had no effect in another study (Gordon, 1955). This section examines the effects of extrinsic reinforcement which are tangible

(a needed or desired item usually a food item), token (something nonprecious that is later exchanged for a food item or money), or monetary. It also examines the effects of intrinsic reinforcement: modeling (subject observation of the desired behavior), feedback (verbal and graphic administered by the researcher), and self-monitoring (verbal, graphic, and extrinsic reinforcers administered by the subject himself/herself).

Modeling

The following two studies indicate that direct, rather than indirect, reinforcement of specified behaviors will cause change. In a study on modeling, mentally retarded workers, who observed higher functioning special education students' performance receive verbal feedback and praise, did not increase their own productivity; however, productivity increased when the mentally retarded workers were given praise and feedback on their own work (Brown, 1970). Kliebhahn (1967) also studied the effects of modeling on productivity and work quality of mentally retarded workers. He compared modeling to goal setting and found that both techniques significantly improved production over baseline rates. There was no significant difference between the two in regard to productivity, but goal setting was superior to modeling in work quality.

Behavior

In order to determine the effect of reinforcement on behavior, researchers learned it was important to pinpoint which behavior was being reinforced. Rusch (1979) studied productivity under two conditions, reinforcing the speed to complete a task and reinforcing attending to the task. Their results indicated that attending to task was necessary for task completion, but reinforcing attending to task alone did not ensure that the task would be completed.

In their study Crapps, Kregel, and Stoneman (1983) differentiated between reinforcing on-task behavior and reinforcing productivity. They also studied the effects of task complexity and the relationship between visual attention to the task and purposeful movement to complete the task. Verbal and token reinforcers were used. Their results indicated that reinforcement of production was more effective in increasing productivity than reinforcement of on-task behavior. Increased productivity resulted from the amount of time a mentally retarded worker was exposed to a complex task. The type of task determined whether visual attention or purposeful movement was more important to productivity.

Zohn and Bernstein (1980) concluded that mentally retarded individuals were capable of monitoring their own on-task behavior. Not only did on-task behavior improve,

but there were improvements in productivity and work quality as well. Crouch, Rusch, and Karlan (1984) were able to increase the productivity of three mentally retarded employees by training them to verbalize beginning and ending times of their assigned tasks. They concluded that there was a relationship between verbal behavior and nonverbal, manual behavior.

Praise

Social praise had a significant effect on the amount of time mentally retarded individuals would spend doing a task (Heitman, 1982). In another study social praise was sufficient to increase productivity, but when the reinforcement was changed to a tangible one, the improvement in productivity was significantly greater than praise alone, suggesting that results can be improved by more meaningful reinforcements (Brown, 1971).

Token Reinforcement

Verbal and graphic feedback had a positive effect on the work quality of a mentally retarded woman working competitively (Davis, 1983). Several studies discussed showed that verbal praise combined with feedback had a positive effect on productivity (Brown, 1970; Flexer, 1979; Principato, 1983). To assess the effects of token reinforcement on productivity Zimmerman, Stuckey, Garlick, and Miller (1969) put mentally retarded subjects to work with feedback and no points or feedback and points.

Productivity increased over baseline under both conditions, however, the more effective condition was work with feedback and points.

Goal Setting

In the following studies feedback was combined with goal setting. Goal setting was defined two ways. First, it was something tangible and external to the individual, e.g. food, money, or privileges. The second definition which was more abstract, was related to setting a work performance criterion. Both conditions required keeping daily records of the data to determine progress toward the worker's goal (Schloss, 1982).

Tangible Goal Setting

Flexer, Martin, and Friedenberg (1977) studied the effects of tangible goal setting on productivity. They determined that mentally retarded individuals were capable of making an association between money and purchasing goods. They were able to delay immediate reinforcement without having a negative effect on productivity, thus concluding that mentally retarded individuals were also capable of setting long-term goals.

Later Flexer, Newberry and Martin (1979) used long-range, worker-selected tangible goals by themselves or in combination with daily production goals. Feedback was given on progress as was praise or a monetary bonus for exceeding daily production goals. They concluded that all

conditions improved performance over the baseline, but that praise caused the greatest production change.

The purpose of a later study was to determine the effects of goal setting on maintaining productivity (Flexer, 1982). Workers first established and worked toward tangible goals. These were later made contingent upon meeting a performance criterion and then faded to a fixed interval schedule. The researchers concluded that setting performance goals was the most effective method of maintaining and changing productivity. This final study led to the second definition of goal setting, that of working toward a performance criterion.

Criterion Goal Setting

Setting goals was a superior means to improving productivity over working cooperatively, working competitively, or no intervention (Gordon, 1955). Hoover, Wade, and Newell (1981) conducted two experiments to improve reaction and movement times. The first experiment resulted in improved performance of the task, but training did not shorten reaction time. In the second experiment specific goals were targeted which had a positive effect on decreasing reaction time. Reinforcement was given only when the reaction time was at least 10% faster than the previous day. While setting a performance goal was sufficient to increase productivity, adding a time limit on the task had an even more positive effect (Miltenberger, 1983).

In two experiments by Renzaglia, Wehman, Schutz, and Karan (1978), researchers changed the work rate of two profoundly retarded workers by using feedback on their performance. Verbal cues were not sufficient to modify the behavior of the subject in the first experiment. The introduction of a time limit for the completion of one item and a paper device enabled this worker to increased his work rate 150% over baseline. The second worker met a performance goal after selecting a tangible reward. His work rate increased 80% over baseline with the aid of a paper device.

Goal setting and feedback on results without other reinforcement have improved productivity (Principato, 1983). The subjects in this study selected their own performance goals. Verbal feedback was given on the speed in which they were reaching their goal. A decrease in production resulted when subjects reverted back to baseline conditions, but production still remained higher than the original baseline production.

Another study in which the subjects made their own goal statements and were given feedback was conducted by Warner and Mills (1980). When subjects were given feedback on the number of items completed in reference to their goal, they had superior productivity to subjects who received no feedback and to those who had but without a set performance goal.

Setting goals of increasing difficulty improved the productivity of subjects in two studies. The first of these studies (Bates, 1980) involved three subjects in three separate experiments. After the first subject had been trained to self-administer a reward, a production quota was imposed in which she had to meet to keep her reward. The production criterion was changed and became progressively more demanding. The results of this experiment showed that the subject was able to increase her work productivity with each new and demanding goal change. The second subject's criterion was set by a supervisor with a gradually decreasing time limit given for the completion of the task. This subject gradually increased his work rate from 42% to 180% of minimum sheltered standard. The third subject had initially been rewarded on a fixed ratio schedule regardless of quantity or quality. After introducing a work goal, reinforcement was dependent on meeting his quota. The quota changed as production criteria had been met. An additional criterion was then introduced involving not only quantity, but also quality. This subject demonstrated an improvement in productivity; however, quality was poor until it became a part of the work goal.

Davis, Bates, and Cuvo (1983) studied changing goal criteria. In preparation for competitive work employment a mentally retarded woman was required to go through three criterion changes. Graphic feedback was given on her

progress. Verbal feedback was given on work quality. The use of the changing criterion design increased her productivity from an unacceptable performance to a competitive rate. Additional feedback was sufficient to change her work rate with no other reinforcers.

Summary

Although dexterity can be an indicator of future production and error rate (Presnall, 1979), mentally retarded workers are capable of producing more and reducing their mistakes. Specific training procedures can be used to improve reaction and movement times to complete a task (Hoover, 1981). Attitude concerning the task and supervision plays an important role (Shapira, 1985) as well as how the work is arranged (Gordon, 1955; Brown, 1971; Morris, 1981).

Mentally retarded workers respond positively to reinforcement, but the literature indicates there is no single reinforcer that motivates all mentally retarded individuals to improve their performance. Extrinsic reinforcers, e.g. money, food and tokens, have produced positive results. There is some indication, however, that externally administered reinforcement is not necessary. When establishing a base rate of sheltered workshop employees Gold (1973) found a general increase in production and quality of work in the absence of any reinforcement. He concluded that work may have reinforcing properties to

mentally retarded workers. In comparing the results of self reinforcement versus external reinforcement in sheltered workshop employees, Helland, Patuck, and Klein (1976) concluded that there was no significant differences between the two strategies.

Internal reinforcers, e.g. praise, modeling, feedback, and goal setting, increase productivity and decrease error rate. Praise improved the amount of time mentally retarded individuals spent on tasks (Heitman, 1982) and when combined with feedback there were improvements in the quality (Davis, 1983) and quantity (Brown, 1970; Flexer, 1979; Principato, 1983). The effects that modeling had on work performance varied. It had no effect in Brown and Pearce's study (1970) while in Kliebhahn's study (1967) modeling did improve production.

Setting a time limit on the task (Miltenberger, 1983; Renzaglia, 1978) and feedback on results (Principato, 1983; Warner, 1980) as well as setting a goal improves performance. At first Flexer, Bihm, Shaw, Sigelman, Raney, and Jansson (1982) established a tangible item for which their subjects worked. Later, obtaining this item was made contingent upon meeting a performance goal. They concluded that goal setting was an effective method for improving and maintaining work performance. While Kleibhahn (1967) did not find a significant difference in productivity between

goal setting and modeling, he did find goal setting to be superior for improving work quality.

Changing the goal criteria by gradually increasing production demands improves performance. Bates, Renzaglia, and Clees (1980) increased the productivity and quality of severely/profoundly sheltered workshop employees and Davis, Bates, and Cuvo (1983) prepared a mentally retarded woman for competitive employment using this design.

CHAPTER III

METHODOLOGY

Subject

This thesis will study the effects of criterion goal setting on the productivity and error rate of a single subject who is mentally retarded. The subject will set her own production goal to be completed within a 15 minute time limit. A change in the goal criteria will result when she has met her goal a specified number sessions while meeting an acceptable error rate. The subject will set her own error rate goal. A change in the error goal criteria will result when she has met but not exceeded the number of errors set as her goal.

The subject, Cindy, is a 20-year-old female diagnosed as educable mentally handicapped. On the Wechsler Adult Intelligence Scale-Revised (WAIS-R) she earned a verbal IQ of 58; a performance IQ of 67; and a full scale IQ of 62. On the Woodcock-Johnson Tests of Achievement she received a standard score of 65 (1 percentile rank) in reading, a standard score of below 65 (below 1 percentile rank) in mathematics, and a standard score of below 65 (below 1 percentile rank) in the written language. In the Peabody Picture Vocabulary Test she received a percentile rank of below 1 with a standard score of 43 and a mental age of 7-4.

These test results suggest that in the basic skills areas of reading, mathematics, and written language, Cindy's

achievement appears to be severely deficient when compared to peers of her same age. Cindy identifies basic sight vocabulary and comprehends reading material at about a third grade level. She calculates two digit addition and subtraction problems with regrouping. She has poor performance on applied math problems by having difficulty understanding the concept of "two more," money skills, and can tell time only to the hour.

On the Woodcock-Johnson Scales of Adaptive Behavior she received the following scores in the following clusters: Motor Skills - age score 10-8, 2 percentile rank, and a standard score of 69; Social and Communication Skills - age score 9-2, 1 percentile rank, and a standard score of 55; Personal Living Skills - age score 12-9, 5 percentile rank, and a standard score of 75; Community Living - age score 8-5, 1 percentile rank, and a standard score of below 40; and Broad Independence - age score 9-11, 1 percentile rank, and a standard score of 42.

At the time of the study the subject was placed in a work training program in a large information processing firm in the community. She had been trained to perform the functions of the job, but with no specific interventions directed at increasing productivity and lowering her error rate to competitive standards. She worked in the same environment as employed workers. She received no pay for this training.

Setting

The subject performed the job of an envelope opener which is a job within the company. There were approximately 30 part-time to full-time employees in this department, all of whom were expected to meet daily production quotas. Daily production was recorded in ranked order of productivity on a board displayed in the work area. Individual progress was recorded on charts which were given to the individual workers on a weekly basis. Termination resulted if individual productivity was too low or error rate was too high. Individual productivity determined the amount of money each employee earned.

The business firm had set a 10 week time constraint for completion of this study.

Description of the Task

Envelopes were arranged in sequentially numbered bundles in boxes 24 inches deep. The task required opening envelopes containing credit card sales slips from merchants. The envelope opener was required to remove any excess material and duplicate information, staples, and paper clips. The following were examples of errors: failing to remove staples, adding machine tapes, and duplicate copies; failing to stuff soft copies in carriers, record letter information, and mend torn sales slips; having no header or sales slip, items out of numerical sequence, a header behind a sales slip; or having sales slips upsidedown or backwards.

The work was very routine, but complex because personal judgments had to be made regarding each set of materials. A task analysis of this job can be found in Appendix A.

Employee production was counted as the number of items opened per hour with this number recorded electronically as the work was processed. There were approximately 2,500 items per box. The minimally acceptable production goal was 1800 items per hour. Errors were costly in terms of worker production since for each error noted, 150 opened items were subtracted from the total of opened items. Three errors per box was considered minimally acceptable.

In this study productivity and error rate were recorded and maintained separately. Cindy's productivity was recorded as inches of work opened per 15 minute session in one box of work. Error rate was the total number or errors in one box of work.

Design

A single-subject, A-B-C-D-C-E-C design with four interventions "B," "C," "D," and "E" were used to measure Cindy's productivity. A baseline "A" was taken. During intervention "B" Cindy set her own production goal with assistance from the researcher. Intervention "B" measured productivity without regard to error rate. Interventions "C" and "D" represent a changing criterion design. As the first criterion was met including an acceptable error rate, a new more demanding one was set. Cindy was responsible for

setting her own goal with assistance from the researcher. Intervention "E" began at the point where productivity was challenging and attainable. It focused on decreasing errors to a consistent rate.

This research design returned twice to intervention "C" in which to compare results of the preceding interventions. During the season of the year the study was done, the work load lessened. If Cindy had returned to baseline, she would not have enough time to complete a box of work. The business firm also imposed a time constraint for completion of this study.

Procedures for Increasing Productivity

Intervention "B"

During Intervention "B" Cindy set her own production goal without regard to error rate. A half-inch measuring chart representing amount of work to be completed in a 15 minute session was introduced and taped at the front of the Cindy's job station. The bottom darkened line indicated her baseline rate. The green line near the top of the chart indicated the minimal acceptable competitive production of 6 inches of unopened envelopes. By marking a colored line Cindy determined her first goal. Using this goal, the researcher measured and marked the bundles in the box of work. After removing the bundles from the box, Cindy set a timer at 15 minutes.

At the end of each work session the researcher verbalized to Cindy whether she had or had not met her goal. Results of each session were recorded on a graph and shared with Cindy at the end of each work day and at the beginning of the next day's first work session. Review of daily production was the only reinforcement provided.

Intervention "C"

Intervention "C" continued with the production rate set by Cindy in Intervention "B". During Intervention "C" Cindy additionally set a goal for error rate.

Intervention "D"

Intervention "D" began when Cindy's production goal was met by opening the designated amount of envelopes 4 times within 15 minutes with no more than 3 errors in the same box during Intervention "C".

Using the same half-inch measuring chart Cindy determined a new production goal. Feedback was given to Cindy as during interventions "B" and "C".

Intervention "E"

When Cindy reached a production plateau, the measuring chart was removed and a new chart was introduced. The purpose of this chart was to decrease or stabilize her error rate while maintaining her maximum production rate. This chart represented a box of work divided into the 15 minute sessions. A line was drawn at her maximum production level. As each session was completed a graph line representing her

level of productivity for that session was placed on the chart. The researcher indicated to Cindy that the line was at or above (had met her goal) or below (had not met her goal) her maximum productivity.

Procedures for Decreasing Error Rate

Intervention "C" and "D"

Three stacks of poker chips were placed at the subject's work station. Each stack was a different color and represented the following:

1. Goal errors (red) - the maximum amount of errors that she had set for her goal per box.
2. The errors from the previous day's work (blue).
3. An ongoing account of the current day's errors (white).

Cindy determined the maximum number of errors she would allow in a box of work. For each error, a poker chip was added to the third stack. As her work was checked, errors were flagged so that at the end of that box of work, the researcher could explain each chip placed on this stack. Cindy was responsible for correcting her own errors.

The researcher and subject made a comparison of the stacks at the beginning and end of each work day. The researcher kept a daily record of her progress toward minimal acceptable errors. This graph was shared with the subject. No other reinforcement was given other than that she had or had not met her goal.

The quality control personnel inspected the subject's work and recorded any errors missed by the researcher. These additional errors were added to the stack of previous day's errors and to the chart.

The subject determined a new goal for errors when she had met and not exceeded her daily goal. Three errors per box was minimally acceptable for setting a new production goal.

Intervention "E"

When Cindy reached a maximum production rate the poker chips were removed. A number chart representing amount of errors from 0 (bottom) to 20 (top) was introduced and taped to the front of her work station. Beside each number was a word which described that amount of errors, e.g., 0 - Outrageous, 1 - Terrific, 5 - not bad, 12 - awful, 17 - thumbs down, 20 - Boo hiss. Cindy began each work day with 0 errors ("Outrageous"). As her work was checked and errors were discovered the previous amount was covered and the additional number of errors and its descriptor was uncovered. Errors were flagged and Cindy was responsible for correcting her errors. Negative descriptors began at 6 errors. Minimally acceptable error rate remained at 3 errors per box.

CHAPTER IV

RESULTS

Throughout the study Cindy completed one box of work per day. The total number of days for each intervention was Baseline (8 days), Intervention "B" 3.5 inch goal, no error rate goal (3 days), Intervention "C" 3.5 inch goal, error rate goal (5 days), Intervention "D" 4.5 inch goal (6 days), second Intervention "C" (4 days), Intervention "E" (8 days), third Intervention "C" (4 days).

Baseline

During baseline the average time of box completion was 2 hours 38 minutes. The average productivity per session was 2.33 inches of work. Her average error rate was 7.5 errors per box.

Intervention "B"

Cindy set her first goal at 3.5 inches per session. For the first three days of the 3.5 inch goal, no goal was set for errors. During this time Cindy completed three boxes of work at an average of 1 hour 28 minutes. Her average productivity per session was 4.08 inches of work. Her average error rate was 20.7 errors per box.

Intervention "C"

During the next 5 days of the 3.5 inch goal Cindy set a goal for errors at 7. Her actual error rate per box was 16, 10, 12, 9, and 0 respectively. Her average error rate was 9.4 per box. Her average time of box completion was 1 hour

48 minutes with an average productivity per session of 3.33 inches of work.

Intervention "D"

Cindy's production goal changed when she met her goal of 3.5 inches of work per session 4 times in one box with no more than 3 errors. On the sixteenth day she completed a box meeting her goal 4 times with 0 errors. She set her new production goal at 4.5 inches of work per session. Her average productivity at the end of the 4.5 inch session goal was 3.32 inches of work per session. The average rate of box completion at the 4.5 inch goal was 1 hour 52 minutes.

Cindy initially set her error rate goal at 10. During subsequent days it was set at 9,9,4,5, and 9. Her actual error rate per box was 10, 25, 5, 9, 5, and 12 respectively. Her average error rate was 11 per box.

During the six days of the 4.5 inch production goal, Cindy was able to meet it 10% of the time. At this time her production goal was moved back to 3.5 inches per session.

Intervention "C"

At the second 3.5 inch goal the average time of box completion was 1 hour 58 minutes. The average productivity per session was 3.08 inches of work. Cindy set the goal for errors at 5, 4, 5, and 4 per box, respectively. Her actual error rates were 5, 4, 6, and 3 errors per box respectively. Her average error rate was 4.5 per box.

Intervention "E"

At the end of 4 days a new chart was introduced for productivity and error rate. Her productivity goal remained at 3.5 inches per session. During this intervention the average time of box completion was 1 hour 55 minutes. The average productivity per session was 3.21 inches of work. Her average rate of errors per box was 9.

Intervention "C"

The last 3.5 inch goal phase of the study was 4 days. The average time of box completion was 1 hour 54 minutes with an average of 3.17 inches per session. Cindy set her error goal at 5. Her actual error rate per box was 7, 5, 7, and 9 respectively. Her average rate of errors per box was 7.

Other Findings

The longest time in which Cindy completed a box was 3 hours 2 minutes. This occurred twice during Baseline. The first box had 7 errors. The second box had 10 errors. The shortest time in which Cindy completed a box was 1 hour 17 minutes (5 errors) which occurred during the Intervention "D".

The most errors made in one box was 25. This occurred twice, once during the Intervention "B" (box completion time of 1 hour 29 minutes), and once during the Intervention "D" (box completion time of 2 hours 8 minutes). The least amount of errors in one box was 0 which occurred during the

first Intervention "C" (box completion time of 1 hour 44 minutes).

Analysis of Graphs

The significance of the results were done by visually comparing points among the baseline and interventions displayed in each of the graphs or chart as indicated in Figures 1-7.

Baseline and the interventions were represented on the horizonal line in the following manner: Baseline - days 1-8 or A, Intervention "B" - days 9-11 or B, Intervention "C" - days 12-16 or C, Intervention "D" - days 17-22 or D, second Intervention "C" - days 23-26 or C, Intervention "E" - days 26-34 or E, and third Intervention "C" - days 35-38 or C.

Figure 1

TOTAL TIME OF BOX COMPLETION

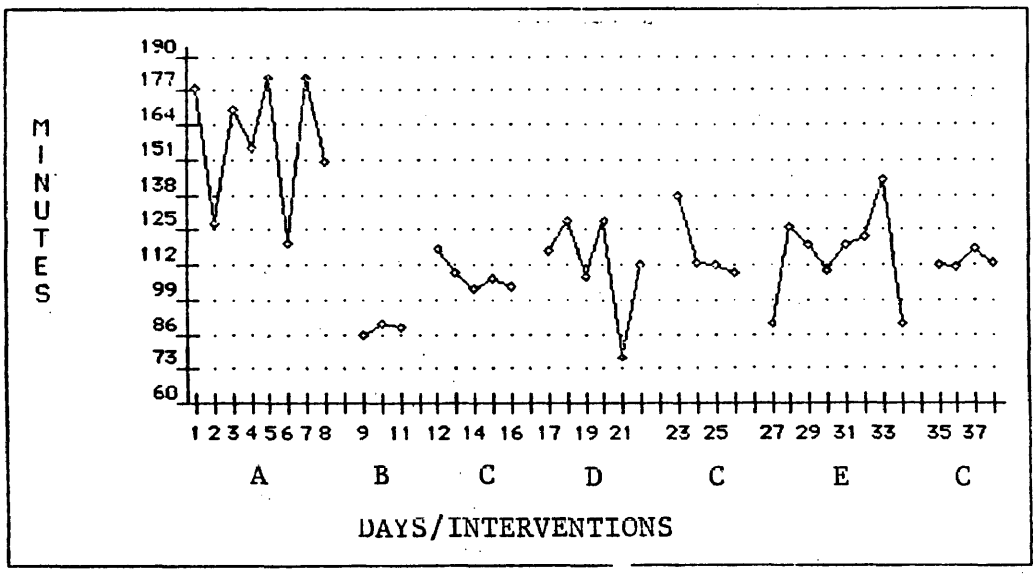


Figure 1 represented the total time of box completion. When comparing the range of baseline averages of 120-182 minutes (days 1-8) with those of subsequent intervention days of 77-144 minutes (days 9-38), the drop in the graph line indicated that boxes of work were completed more quickly during times of the interventions.

The sharp drop that occurred between the baseline (day 8) and Intervention "B" when no error goal had been set (days 9-11) indicated that goal setting was successful in increasing productivity. An incline in the line occurred when errors were included as part of the subject's goal setting from 89 minutes (day 11) to 118 minutes (day 12). This indicated that the subject's awareness of errors caused a decrease in productivity.

Most fluctuations in the graph occurred during Baseline, Intervention "D", and Intervention "E". The fluctuations appeared minor or stabilized during Interventions "B" and "C"of the 3.5 inch goal which indicated a more realistic productivity at this goal.

The first day of each intervention showed a decrease in productivity when compared to the last day of the previous intervention (day 16, 104 minutes - day 17, 117 minutes; day 22, 112 minutes - day 23, 138 minutes; day 34, 90 minutes - day 35, 112 minutes) with the exception of day 26 (109 minutes) and day 27 (90 minutes). This suggested that

change in expectations or the work environment had an effect on the behavior of this individual.

Figure 2

TOTAL ERRORS

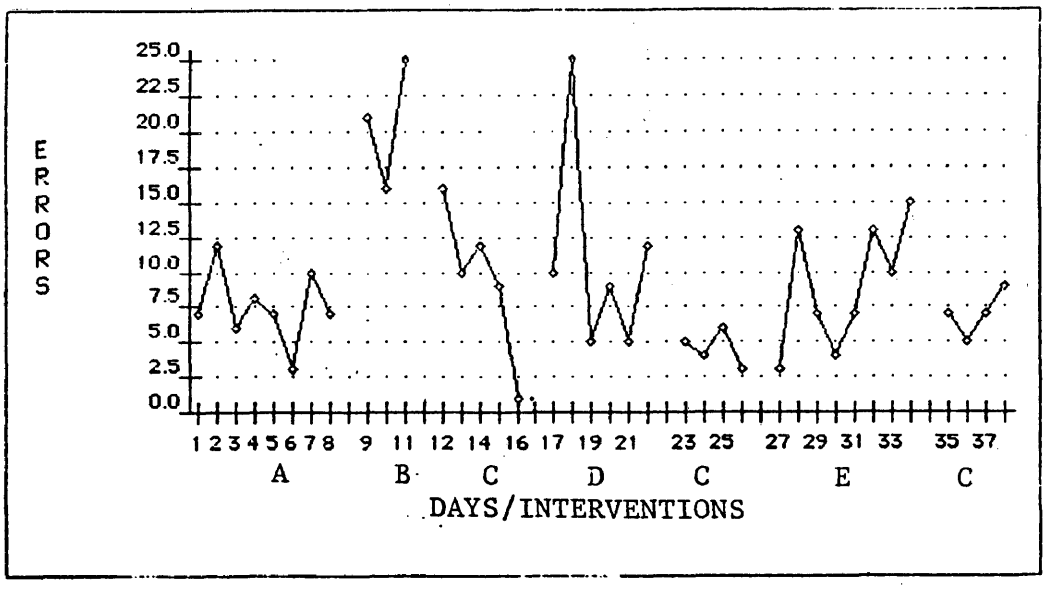


Figure 2 represented the total number of errors per box during Baseline and subsequent interventions. There occurred a sharp increase in errors when comparing the points from Baseline to Intervention "B". During Intervention "B" a goal had been set for productivity, but no goal was set for errors. With an increase in productivity came an increase in errors.

During Intervention "C" (days 12-16) a goal for error rate was introduced. The decline in the graph line suggested that goal setting decreased error rate from Intervention "B". On day 16 Cindy had no errors.

During Interventions "D" error rate appeared to fluctuate, but settled near Baseline levels.

During Intervention "E" The responsiblity was no longer Cindy's to set an error rate goal, but to maintain an acceptable error rate level. During this time her error rate fluctuated greatly.

During the second and third Intervention "C" error rate appeared to stabilize around Baseline levels.

Figure 3

TOTAL TIME OF BOX COMPLETION
VS.
TOTAL ERRORS

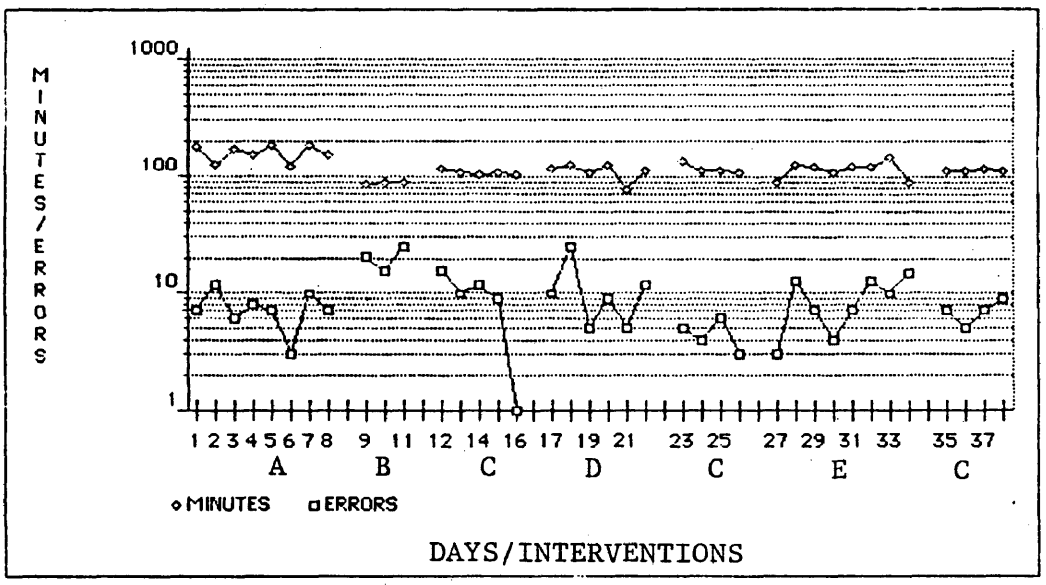


Figure 3 represented the total time to complete each box (diamond) compared to the total errors for each box (square). The diamonds showed a decline from the baseline to the subsequent interventions. Most points of subsequent interventions fall below the fastest box completed during baseline (day 6 - 2 hours) which indicated that the subject completed boxes of work faster during interventions.

During "B" interventions the time it took to complete a box became more stable after the initial day at that goal. During the baseline, Intervention "D" and Intervention "E" the amount of time it took to complete a box of work fluctuated greater than during Interventions "B" and "C".

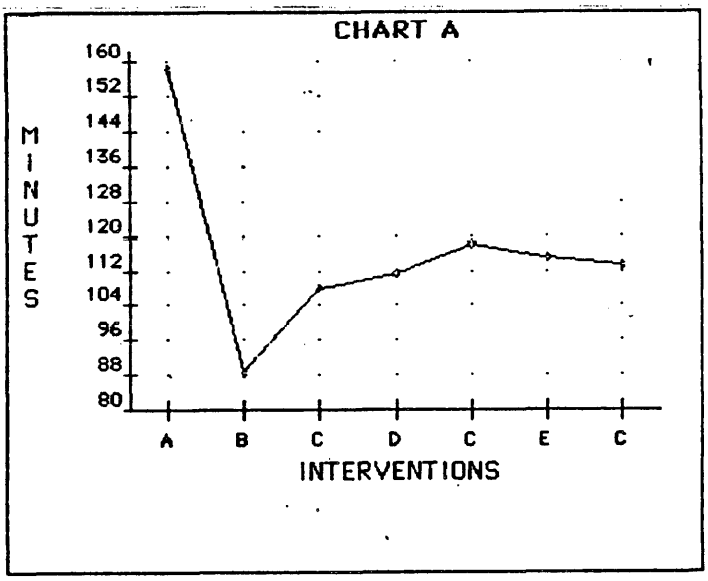
The squares showed that errors rose sharply from baseline to days 9, 10, 11 when a production goal was set, but no goal for errors was set. During days 12-16 the number of errors declined to 0 on day 16. A new production goal was set on day 17 in which error rate rose. Error rate dropped at the second Intervention "C" (days 23-26). It steadly rose during intervention "D". During the final Intervention "C" (days 35-38) error rate dropped from intervention "E", but stayed around baseline levels.

In general Figure 3 showed a relationship between productivity and error rate. When productivity increased during Intervention "B", error rate rose sharply. During Intervention "C" when a goal was set for errors productivity decreased and was followed by a decrease in error rate.

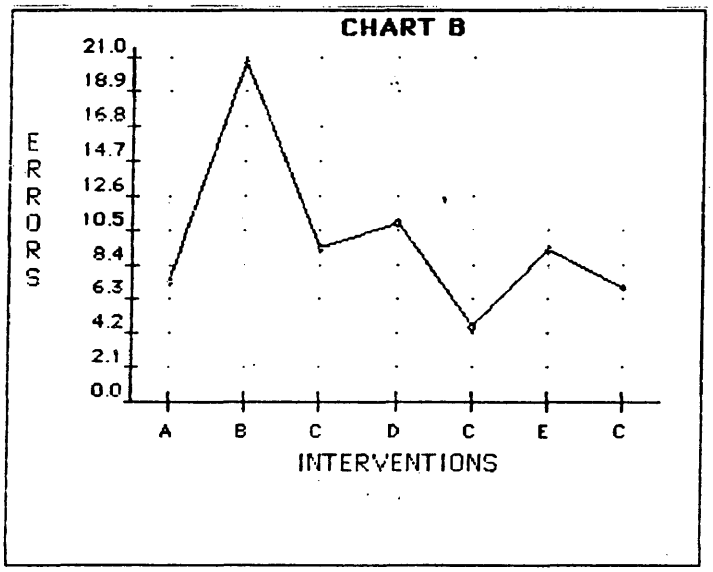
Both error rate and productivity fluctuated during Interventions "D" and "E". In general less productivity produced fewer errors, more productivity produced more errors.

During the second and third Intervention "C" productivity stabilized and error rate settled around baseline levels.

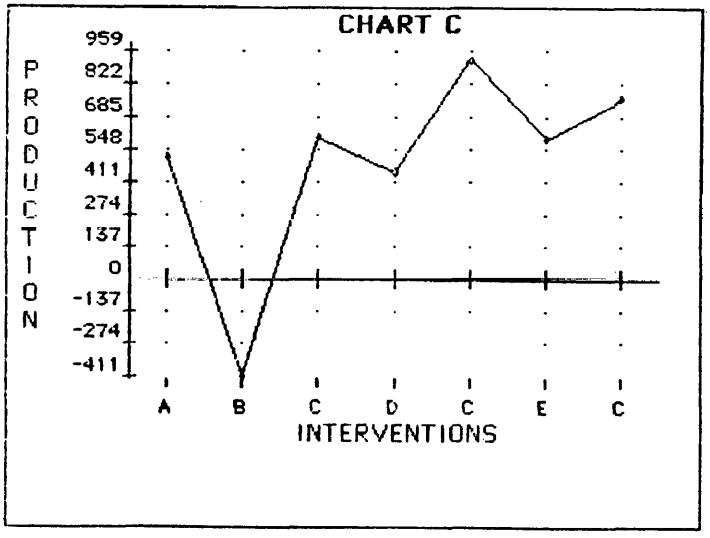
Figure 4



MEAN TIME
OF
BOX COMPLETION



MEAN
ERRORS



MEAN PRODUCTIVITY
(BUSINESS STANDARD)

Figure 4 displayed three separate charts. Chart A was the mean time of box completion during baseline and each intervention. Chart B was the mean errors during baseline and each intervention. Chart C was the mean productivity determined by business standards by the following formula: total of items opened per box (2500 average was used in this study) minus the number of errors which are multiplied by 150 (each error is counted as 150 opened items), divided by total minutes of box completion.

Chart A and Chart B showed a direct relationship between speed and error rate. Speed showed an increase/decrease with a respective increase/decrease in error rate. The exceptions were between Intervention "C" (108 minutes - Chart A, 9.4 errors - Chart B) and Intervention "D" (112 minutes - Chart A, 11 errors - Chart B) when a decrease in speed showed an increase in error rate and between Intervention "E" and the third Intervention "C" when an increase in speed (from 115 minutes to 114 minutes - Chart A) resulted in a decrease in error rate (from 9 errors to 7 errors - Chart B).

Chart C showed how this relationship influenced productivity as figured by business terms. As speed decreased (chart A), errors decreased (chart B), productivity increased (Chart C). An increase in speed followed an increase in errors and a decrease in productivity.

Productivity (Chart C) took a sharp decline from baseline to the Intervention "B" which showed a sharp increase in speed (Chart A) and errors (Chart B). Productivity rose above baseline during the "C" intervention phases. Productivity was also above baseline level during Intervention "E", but not as great as the second and third "C" interventions as there was an increase in errors during that phase.

Chart A showed that speed increased above the baseline levels during all interventions while Chart B showed that errors decreased below baseline levels during the second and third "C" interventions.

Although goal setting had an influence on increasing speed over baseline (Chart A), it was less effective on decreasing error rate (Chart B), however the second and third "C" interventions did show a decline.

Figure 5

DIFFERENCE
FASTEST - SLOWEST
BOX

DIFFERENCE
MOST - LEAST
ERRORS

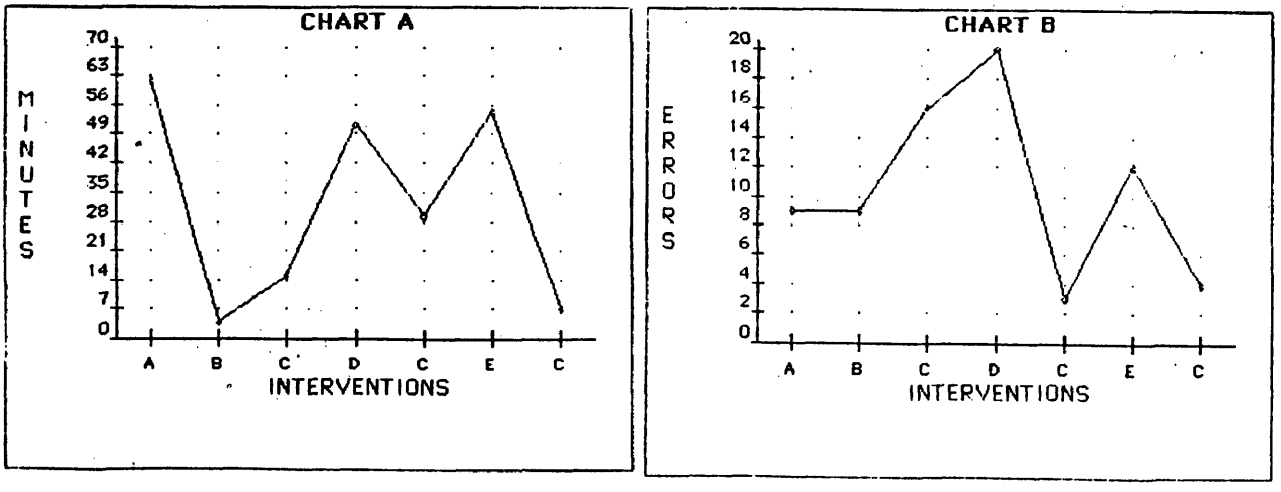


Figure 5 showed two charts. Chart A showed the difference between the fastest and slowest boxes completed during baseline and each intervention. The difference was less during Intervention "B" and Interventions "C" than Baseline or "D" and "E" interventions.

Chart B showed the difference between the box with the most errors and the box with the least errors for Baseline and each subsequent intervention. The difference was less and below baseline levels during the second and third "C" interventions.

These charts suggested that productivity and error rate was more stable during "B" and "C" interventions.

Figure 6

DIFFERENCE
SET ERROR GOAL - ACTUAL ERRORS

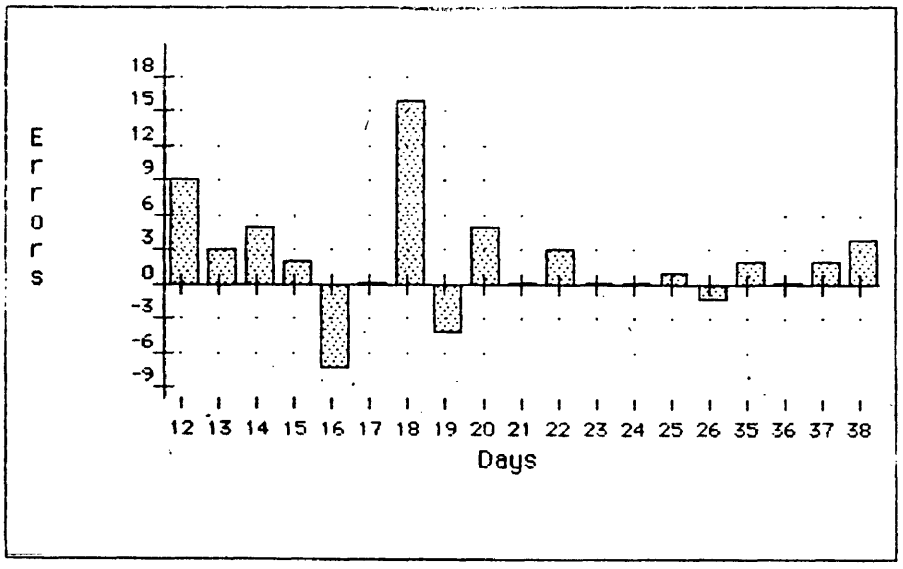


Figure 6 showed the difference between set error goal and actual errors. Zero to a negative number indicated at

or below the set goal. Any numbers above 0 indicated that more errors were made than the set goal.

During days 12-16 (Intervention "C") Cindy set her error rate at 7. On day 12 she had 9 errors above those predicted. Days 13-15 there was a general decline in the difference between her predicted rate of errors and her actual amount of errors. On day 16 she had predicted 7 errors, but had 0 errors.

During days 17-29 at the 4.5 inch production goal (Intervention "D") Cindy had set her errors rate at 10, 9, 9, 4, 5, and 9 respectively. Although on day 18 the difference between her predicted and actual rate was 16 errors over, the days that followed showed a decrease.

On days 23-26 (second Intervention "C") the predicted error rate was 5, 4, 5, 4 respectively. Actual error rate remained very close to the predicted.

Days 35-38 (third Intervention "C") showed a slight increase in the difference between predicted (5 errors) and actual error rate, but the greatest on day 38 was 4 errors above predicted rate.

Figure 7

Production Goal Setting

Intervention	At/Above	Below	Percent Difference
B	88.9%	11.1%	77.8%
C	46.7%	53.3%	6.6%
D	10.0%	90.0%	80.0%
C	37.5%	62.5%	25.0%
E	35.4%	64.6%	29.2%
C	37.5%	62.5%	25.0%

Figure 7 showed the percentage of time at each intervention that the production goal of 3.5 inches or 4.5 inches per 15 minute session was or was not met. After the initial 3.5 inch intervention (B) this goal was attainable nearly one-half to one-third of the time. The 4.5 inch goal (D) was attainable 10% of the time.

When no goal for error was set during Intervention "B" Cindy was able to meet her production goal 88.9% of the time. When a goal for error rate was introduced her productivity dropped to 46.7%.

Hypothesis Restatement

Null hypothesis 1. There will be no change in the work productivity of a mentally retarded individual who sets her own production goals.

Alternate hypothesis 1. There will be a change in the work productivity of a mentally retarded individual who sets her own production goals.

Null hypothesis 2. There will be no change in the work error rate of a mentally retarded individual who sets her own error rate goal.

Alternate hypothesis 2. There will be a change in the work error rate of a mentally retarded individual who sets her own error rate goal.

Findings

The findings of this study does not support null hypothesis 1, but did support alternate hypothesis 1. The change in productivity can be seen in Figure 1, Figure 4 - Chart A and Chart C.

The findings of this study did not support null hypothesis 2, therefore, providing evidence that supported alternate hypothesis 2. In Figure 2 the error rate during baseline and each subsequent intervention varied. A sharp increase in errors occurred from baseline to the first intervention of 3.5 inch production goal with no goal set for error rate (Intervention "B"). From days 12-16 (Intervention "C") a steady decrease in error rate occurred giving evidence that goal setting for error rate was effective for changing error rate. An increase in error rate occurred during days 17-22 (4.5 inch production goal, Intervention "D") but decreased days 23-26 (second

Intervention "C"). Intervention "E" showed an increase in error rate while the last intervention "C" returned error rate to baseline levels.

Figure 6 showed a tendency to produce a number of errors within the boundaries set by a determined error goal.

CHAPTER V

SUMMARY, DISCUSSION, FURTHER RESEARCH

This study attempted to find the answers to three questions. Is this mentally retarded individual capable of increasing her productivity to competitive standards? Can her productivity be increased with little or no effect on error rate? Will goal setting with feedback and without extrinsic reinforcement have a positive effect on production and error rate for this mentally retarded person? The answers are discussed in this section.

Summary

Productivity

Competitive standards for the job of envelope opener was opening an average of one box per hour or 6 inches of work per 15 minutes and having no more than 3 errors. Although Cindy did increase her speed over baseline using goal setting, she was unable to meet this competitive standard. As shown in Figure 1 the most realistic rate of work appeared to be Cindy's first chosen goal of 3.5 inches of work (Interventions "B" and "C"). When she chose a higher goal at 4.5 inches productivity (Intervention "D") her productivity became erratic. During all subsequent interventions Cindy's productivity remained below baseline levels which indicated that goal setting without extrinsic reinforcement positively influenced productivity.

A minimally acceptable competitive standard was set at 1800 opened items per hour. Figure 4 - Chart C represented productivity defined in business terms. When finding the mean production of the baseline and each intervention, one-half of competitive standards occurred during the second Intervention "C" (939 opened items). Interventions "D" and "E" and the first Intervention "C" showed productivity close to baseline levels, while the final intervention "C" showed an increase toward one-half of standard.

Error Rate

There was a direct relationship between productivity and error rate as seen in Figure 4 - charts A and B. As speed increased/decreased, errors increased/decreased respectively. When no goal was set for errors there was a sharp increase in productivity (Figure 1 - days 9-11) and a sharp increase in error rate (Figure 2 - days 9-11). As a goal was set for error rate at day 12 there was a decrease in productivity as well as a decrease in error rate in subsequent days that followed. When the production goal was set at 3.5, a more stable rate of production developed as well as a more stable error rate.

Goal Setting

Goal setting without extrinsic reinforcement had a positive effect on increasing the productivity of this individual who is mentally retarded. She reduced the time of box completion from a mean of 158 minutes during Baseline

to a mean of 88 minutes (44.3%) during Intervention "B", 108 minutes (37.3%) during the first Intervention "C", 112 minutes (29.1%) during "D" intervention, 118 minutes (25.3%) the second "C" intervention, 115 minutes (27.2%) during the "E" intervention, and 114 minutes (27.8%) during the final "C" intervention (Figure 4 - Chart A).

Goal setting without extrinsic reinforcement had a positive effect on decreasing Cindy's error rate (Figure 2). When no goal was set for error rate, but a goal was set for productivity, Cindy's rate of error was 21, 16, and 25 errors respectively (days 9-11). When a goal for error was introduced (7 errors) she immediately reduced her rate of error over subsequent days with one exception. Although error rate did not drop below baseline rates, Cindy increased her rate of productivity without increasing her error rate above baseline rates.

The mean number of errors fell below baseline rate during the second and final interventions of 3.5 inches of work per session (Figure 4 - Chart C).

Conclusions

There are several conclusions that can be drawn from this study for Cindy. First, the use of goal setting without extrinsic reinforcement was an effective motivator to increase work speed and decrease the error rate of this individual who is mentally retarded. Because increasing

work speed increased errors, both must be included in goal statements.

Second, goal setting was more effective at a level where the goal was realistic and attainable for increasing work productivity of this individual. As this study continued she got better at predicting her capability.

Third, goal setting appeared to be more effective when this individual was responsible for setting her own goals as opposed to some outside agent setting the goals for her.

Discussion

Previous research indicated that goal setting without extrinsic reinforcement was an effective motivator to increase productivity of individuals who are mentally retarded (Davis, 1983; Gordon, 1955; Principato, 1983; Warner, 1980). This researcher concluded that goal setting was successful in increasing productivity and reducing error rate of an individual who is mentally retarded. What made goal setting successful?

First, goal setting was not used alone. Davis, Bates, and Cuvo (1983) required their subject to move through three production criterion changes with graphic feedback on her progress and verbal feedback on work quality. Gordon, O'Connor, and Tizard (1955) concluded that knowledge of results not monetary rewards produced significant changes in productivity. Principato (1983) gave the subjects verbal feedback as they worked toward a production goal that they

had set. Warner and Mills (1980) concluded that goal setting combined with verbal feedback was more effective than feedback alone. What appears to be one of the keys was that goal setting was combined with some form of feedback. This study combined verbal and graphic feedback on the subject's progress toward a production and error rate goal.

Second, the goals that were set were realistic and attainable. Both Warner and Mills' (1980) and Principato's (1983) subjects selected their own production goals. Their productivity improved which suggested that mentally retarded individuals had a realistic indication of their own capabilities. This study supported this premise. The first subject selected goal was 3.5 inches of work. When the subject was required to select a higher goal (4.5 inches) she was unable to meet it 90% of the time. When the subject was no longer responsible for setting a goal, her productivity became erratic. This was also supported by her error rate which became erratic when she no longer set a goal.

Third, there was some indication that the tasks, themselves, may be reinforcing to mentally retarded individuals (Gold, 1973). There were performance improvements in simple tasks (Gordon, 1955; Principato, 1983). Some tasks were considered complex by sheltered workshop standards (Warner, 1980). Davis, Bates, and Cuvo

(1983) trained a mentally retarded woman to perform an actual job in a service occupation. In this study the subject performed an atypical job within the actual competitive environment.

The business firm set time constraints for completion of this study. Additional time may have produced different results. The subject did not meet competitive standards for productivity or error rate. There was some indication that she was capable of producing half of competitive standards, but due to the time limitation, the researcher was unable to accurately determine if this was a stable condition.

Goal setting without extrinsic reinforcement increased the work skills of this mentally retarded individual thereby possibly increasing her employability. Because goal setting increased productivity and decreased the error rate of a mentally retarded individual performing an actual job within industry, it became a preferable training tool since it simulates conditions that presently exist within the competitive working environment

This researcher believes this mentally retarded person is capable of learning a job in the competitive industry that is atypical of jobs for which she is presently trained. Although Cindy was unable to meet competitive standards for productivity and error rate when performing a job in an information processing industry, she showed strong evidence that with limited academic skills, she may be able to master

other types of occupational opportunities available outside of service occupations (food, custodial, and laundry).

Further Research

Research indicated that goal setting was an effective incentive to increase the productivity of an individual who is mentally retarded. Because this was a single subject study a larger sample would indicate its potency with other individuals similar to Cindy.

Because there was some indication that worker-selected goals were more effective than goals selected by another agent other than the individual worker, additional research specifically studying both could find a significant difference.

Most of the research literature indicated that goal setting was studied within sheltered working environments. Because more individuals who are mentally retarded are beginning to seek employment within the competitive working environment, more research should be conducted in this more natural environment.

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Appendix A

The Basic Work Approach

Vocabulary (Taken from the business training manual)

1. Monetary Transmittal Letter - The bank sends a monetary transmittal letter form along with all the tickets that are to be processed. This form is important because it identifies the sending bank and gives the total dollar amount of the batches that are being sent. It contains the following information: system number, principal bank number, letter number, gross amount presented, document identifier.
2. Batch - Each merchant submits the credit card sales slips to his/her bank daily in an envelope. Each envelope is considered one merchant's batch.
3. Batch Header - Each batch (envelope) is identified by a batch header form. This form indicates how many details are in the batch, who they are from, and their total. There are two types of batch headers and cash advance batch headers. They also can be titled "deposit transmittal" and "summary."
4. Bundle - Batches for a single monetary transmittal letter are wrapped into bundles. Each bundle contains approximately 200 tickets. A letter may have one or more bundles.

5. Details - These follow the batch header. They are also called sales slips or tickets. They add up to the total amount that was shown on the batch header and the necessary customer information. There are three types of details. They are sale, refund and cash advance.
6. Tapes - Usually a merchant will submit a tape with each batch as verification of the details that are sent and the batch header amount.
7. Substitute Source Document - Each batch should include a batch header and one or more details. Sometimes a merchant may fail to include a batch header or details. When this happens, a substitute source document must be completed and placed where the detail or header should be.
8. Source Document Carrier - This is like an envelope that opens across the top. The front of it is transparent so the contents may be seen. It is used when tickets are torn or damaged. It is also used when there are tissue or photocopies of tickets.
9. Tape Envelope - Merchant tapes that are received with batches are used by another department in a later phase of processing. For this reason, merchants tapes must be stored in this envelope. Each letter has a tape envelope even if there are no merchant tapes.

10. Operator I.D. Cards - Each operator gets a certain amount of credit for the work he/she does. This is an automated process. Each operator is assigned a set of operator I.D. cards with a number on it from 500-999. Two of these cards are placed before new work.
11. Letter Dividers - These are colored blue. They separate monetary letter transmittals.
12. Bundle Dividers - These are colored salmon. They separate the bundles in a monetary letter transmittal.
13. Operator Code - Two initials that are assigned to each worker. Cindy's operator code was "AV."

Materials

1. Operator I.D. cards
2. One red pen
3. Stapler
4. Staple remover
5. Substitute source documents
6. Source document carriers
7. One box of sliced envelopes. They are placed in a box in numerical order and must be opened in the same order.

Task Analysis

1. Remove bundle from the box.
2. Place two of the operator I.D. cards between the transmittal and the tape envelope of the first letter.
3. Place the two blue letter dividers face down, top toward the individual.
4. Grab the unopened bundle. Flip them face down opened bottom toward individual. The envelopes should be staggered so envelopes can be easily grabbed.
5. Grab the opening of the first envelope.
6. Open the envelope - one hand grabs the contents, the other hand places the empty envelope off to the side.
7. Check that the top item identifies as one of the following: header, summary, deposit or transmittal. If none, use a substitute source document - stand vertical for quality control inspection.
8. Lift the header, turn it over to check for duplicate copies and/or a tape. Sometimes the tape is behind the batch; sometimes it is between items of a batch.
9. If there are any soft, nonduplicate tickets, stuff them into a document carrier.
10. Remove tapes and duplicate copies. Put them off to the side.
11. If a tape was included, mark a "T" with a red pen on the front of the batch header.

12. Stack batches of the same bundle face up, one on top of each other.
13. When all batches of the same bundle have been opened, arrange neatly.
14. Hold opened bundle in one hand and flip through to check for:
    a. Duplicate copies missed earlier
    b. Soft copies to be placed into a document carrier
    c. Tapes
    d. Inverted tickets
    e. Paper clips
    f. Staples
    g. Torn tickets
    h. Anything "out of the ordinary"
15. When satisfied with the results, wrap a rubber band around the bundle.
16. Using the red pen record the following on the front of the last batch header:
    a. Letter number
    b. Bundle number
    c. System number
    d. Principal bank number
    e. Operator code
17. Place this bundle face down, the top toward the individual or back into the box maintaining numerical order.

18. Gather duplicate copies and tapes of this bundle. Staple these together. Record the Letter number and the bundle number on the top. Place this inside of the tape envelope.
19. Open the next bundle and repeat the process.
20. It is important to keep all letters, bundles, and batches in order.
21. Divide letters with 2 blue dividers.
22. Divide bundles with 2 salmon dividers.
23. Any questions should be directed to designated personnel.