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AN APPLICATION OF OPERANT CONDITIONING
IN AN ORGANIZATIONAL SETTING

BY

PATRICIA JO KNIGHT
B.A., Rollins College, 1972

THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Science
in Industrial Psychology
in the Graduate Studies Program of
Florida Technological University

Orlando, Florida
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Individual and group behavior within organizational settings has traditionally been viewed by management in the humanistic perspective of such men as McGregor (1966), and Maslow (1965), and more recently Herzberg (1968). The principles of learning theory and operant conditioning, as promoted in the work of B.F. Skinner (1953) have been largely ignored in the business world and for the most part neglected in the organizational management literature. This would not be a surprising state of affairs if there were a great deal of experimental support for the humanistic approach and little for the Skinnerian. However, the opposite situation exists. Maslow (1965) himself has questioned the application of humanistic theory to the industrial setting. He states that "if we take the whole thing from McGregor's point of view of a contrast between a Theory X view of human nature, a good deal of the evidence upon which he bases his conclusions comes from my researches and my papers on motivations, self-actualization et-cetera. But I of all people should know just how shaky this foundation is as a final foundation. My work on motivations came from the clinic, from a study of neurotic people. The carry-over of this theory to the industrial situation has some support from industrial studies, but certainly I would like to see a lot more studies of this kind before feeling finally convinced that this carry-over from the study of neurosis to the study of labor in factories is legitimate." (Maslow, 1965, p. 55)

In contrast there are literally thousands of studies which support Skinner's work in a wide variety of situations which include: clinical settings including behaviors related to crime, retardation and mental illness; educational settings widely researched by Bandura (1964) and Baer and Bijou (1968); and even some industrial settings which will be discussed later in this paper. In fact the analysis of behavior has been so extensive that an entire journal is published for the sole purpose of presenting this research (Journal of Experimental Analysis of Behavior, 1957-). Upon acknowledging that one of the major concerns of managers is the prediction and control of employee behavior one might well ask why it is that the humanistic perspective is accepted and the Skinnerian approach largely rejected. Nord (1969) presents three possible reasons for this situation. First, he suggests that "modern Americans, especially of the managerial class, prefer to think of themselves and others as being self-actualizing creatures operating near the top of Maslow's need-hierarchy, rather than as animals being controlled and even manipulated by their environment." (Nord, 1969, p. 376) Secondly he suggests that the Skinnerian S-R theory appears too limited to enable its application to complex social situations; however, experiments both in the clinical and educational fields have proven that such is not the case. Thirdly, he states that another "possible reason for the acceptance of the McGregor and Maslow school and the rejection of Skinner may stem from the fact that the two approaches have considerable, although unrecognized overlap." (Nord, 1969, P. 377) Nord goes into a thorough

analysis of the similarities and differences between McGregor and Skinner and concludes that the two do not appear to involve open conflict. He suggests that the major criterion for using one over the other in an organizational setting be the extent to which each method contributes in predicting and controlling behavior toward organizational goals. This being the criterion he concludes that the Skinnerian approach would certainly be the most useful method. (Nord, 1969, p. 380)

In order to thoroughly understand how Skinner's work can be applied to organizational situations the following paragraphs will review the most relevant principles of his work. Skinner acknowledges two types of behaviors: respondent and operant. Respondent behaviors are classified as those behaviors which are elicited by known stimuli, for example salivating at the sight of food. Operant behaviors, which Skinner considers to be of greater importance especially in an organizational setting, are voluntary behaviors which do not necessarily correlate with a known stimulus but instead are influenced by the events which follow them. That is to say that an individual's future operant behaviors are affected by the environmental consequences of his present operant behaviors. The dependent variables then are the operant behaviors and the independent variables are the environmental consequences of said behaviors. The process of operant conditioning involves the modification, over time, of operant behaviors by controlling the environmental consequences of said behaviors. Behavior rate, latency, probability, quality and appearance can all be manipulated through operant conditioning.

The independent variable or environmental consequence can be classified in one of three categories: a positive reinforcer, a negative reinforcer, or a neutral stimulus. If a positive reinforcer is applied to an operant behavior then the probability of that behavior being repeated is increased. In other words if an individual behaves in a certain way and that behavior is followed by pleasing outcomes the behavior is likely to be repeated. The opposite situation exists for a negative reinforcer. In this case the consequence of a behavior is displeasing, which decreases the likelihood of the behavior being repeated. A neutral stimulus produces no change in the probability of a behavior increasing or decreasing; however, to the extent that an individual has built up an expectation of a reward, or of a certain consequence, a neutral consequence may be viewed as punishing. Following a behavior with a neutral consequence is commonly referred to as extinction. According to Reese (1966) negative reinforcement, more commonly referred to as punishment, is the most widely used technique for controlling behavior in our society. There are many side-effects related to the use of this technique which should be carefully considered before implementing it. First of all, punishment is effective only as long as the punishing agent is present, therefore punishment is a suppressor of behavior and not an eliminator of behavior. Secondly, punishment often results in fear and anxiety which in turn lead to avoidance and dislike of the punishing agent or the entire situation. This is an especially bad set of circumstances if one's supervisor is the punishing agent. An even worse by product is the possibility

of counter aggression toward the punishing agent or some other stimulus related to the punishing agent; for example arguing with the supervisor or breaking part of a machine or even slowing down an assembly line. A third limitation is that although punishment suppresses a behavior it provides no new behavior to replace the old one. With these possible side effects in mind, Skinner strongly proposes the use of extinction instead. That is, eliminating positive reinforcers of a response rather than applying negative reinforcers to the response. By far the best technique to use is positive reinforcement which is likely to strengthen a desired response and to have favorable side-effects on organizational relationships. Positive reinforcement can also be regarded as a means of providing the individual with feedback concerning his performance. To an employee, positive rewards mean - you have made the correct response, repeat what you have done. Positive and negative reinforcers can be either primary or secondary; however, secondary reinforcers are those which are most likely to be used in an organizational setting. For example: verbal praise, promotion, demotion, increased span of control, and so on.

One very important factor in operant conditioning is the frequency with which a given consequence follows a given response. There are several possible schedules of reinforcement which may be used depending on the circumstances and the desired outcome. The two major categories are continuous and partial. Continuous means that reinforcement is applied every time the behavior occurs and partial means that the consequence follows the behav-

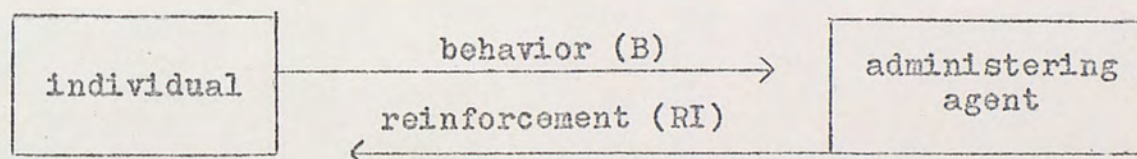
ior some of the time. Partial reinforcement may be on a ratio basis or an interval basis. On a ratio schedule the reinforcement is given after every n^{th} behavior, on an interval schedule the reinforcement is given after a certain period of time has passed. Both ratio and interval schedules may be further classified as either fixed or variable. Fixed occurs when every n^{th} response is reinforced and variable is when the responses required for reinforcement vary from one reinforcement to the next. With a ratio schedule it is the ratio itself which is either varied or constant, whereas with an interval schedule the time is either varied or constant. Jablonsky and DeVries (1972) have listed four points which should be considered when choosing between schedules of reinforcement. They are: "1. Behaviors acquired under partial reinforcement continue for longer periods of time once the positive reinforcement is discontinued than do behaviors acquired under continuous reinforcement (e.g., Underwood, 1966). 2. To reach certain performance levels, partial reinforcement requires more trials but fewer reinforcements than does continuous reinforcement (e.g., Kanfer, 1954). 3. The response rate is more constant (fewer rest breaks) under both variable-ratio and variable-interval schedules than under fixed-ratio and fixed-interval schedules (e.g., Logan and Wagner, 1965). 4. The variable-ratio schedule produces very high rates of responding and the steadiest rate of performance without breaks (e.g., Reynolds, 1968)." (Jablonsky and DeVries, 1972, p. 344)

Another aspect for consideration with regard to reinforcements is that no matter which schedule is used, when the reinforcement is

applied it should immediately follow the desired behavior in order to be most effective. If the reinforcement is delayed it may be reinforcing behaviors which have occurred after the desired behavior, instead of the desired behavior itself.

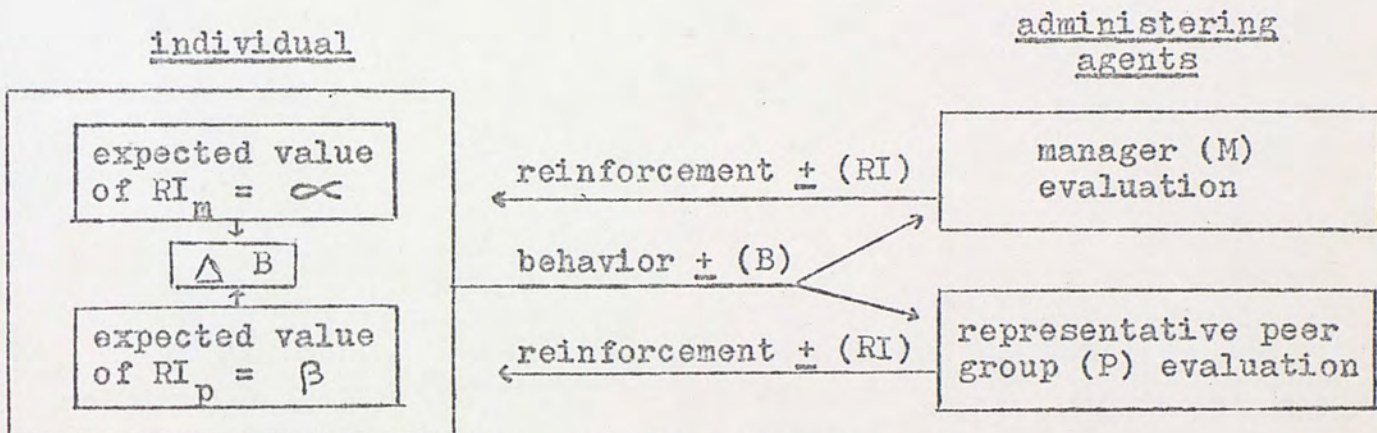
The last principle of operant conditioning which could be applied in an organizational setting is called shaping. The process of shaping begins by reinforcing a response which is merely an approximation of the desired response. Then through successive approximations the shaping method permits the finally learned behavior to be very different from that which was originally emitted. For example take an average typist and begin successively rewarding him for more words per minute and fewer mistakes until the final desired typing behavior is learned.

The major point of looking at these principles in relation to organizations is that in any organization behavior is the crucial variable. This approach demonstrates that behavior is a function of its consequences. A good manager, then, will see to it that the consequences of behavior are such as to increase the frequency of desired behavior and decrease the frequency of undesired behavior, thereby attaining organizational goals. The operant conditioning model which is shown below exemplifies this.



Jablonsky and DeVries (1972) have pointed out some limitations of this model for organizational use. First they felt that Nord omitted the mode of learning referred to as imitation.

They believe that imitation is a very important type of learning which frequently occurs within organizations. Secondly they criticize the model because there is only one administering agent for reinforcers when in reality there are probably several, for example peers, unions and managers. Their final criticism is that the model does not take into consideration such intrapersonal characteristics as awareness of the reinforcement contingencies or the value placed on the reinforcement by the individual. With these criticisms in mind, Jablonsky and DeVries developed the following extended operant conditioning model for use in organizations:



where $+ B$ = behavior desired by manager

$- B$ = behavior not desired by manager

$+RI$ = positive reinforcement

$-RI$ = negative reinforcement

∞ = expected value of RI_m

β = expected value of RI_p

where the expected value of an RI equals the absolute value of the reinforcement times the perceived contingency between B and RI

ΔB = change in the rate of behavior

For a more thorough discussion of the model, along with an algebraic representation of the system see Jablonsky and DeVries (1972).

Probably the most common argument against the use of any operant conditioning model in industry is one that closely parallels Jablonsky and DeVries third criticism. The gist of it being that putting any kind of contingencies on work related behavior may decrease the individuals internal satisfaction regarding the job and decrease his intrinsic motivation. There are studies which tend to support this argument (Deci, 1972), however they are laboratory studies and whether they would hold up in an applied situation is a question which has not as yet been determined. In posing this question one should take into consideration the types of jobs to which reinforcement contingencies would typically be applied. For example, it seems that the kinds of jobs on which operant conditioning techniques could be most useful and successful would be low-level jobs since most low-level jobs have performance criteria which are easily measured and have a wide range of possible rewards. The question then becomes, how internally satisfying are these jobs. Are employees intrinsically motivated by their work or would reinforcement actually enhance favorable feelings toward their work. This is an area which needs further research in the applied setting.

Let us briefly review some studies which have successfully applied the theories of operant conditioning and learning theory in organizational settings. Feeney (1973) has successfully applied Skinner's principles in several different situations at

Emery Air Freight Corporation to improve employee performance. In sales training, each salesman is required to complete a programmed instruction course on his own, with plenty of feedback structured into the course. In addition, sales managers have been trained to apply positive reinforcement in the form of verbal feedback and praise in their day-to-day relations with salesmen. Sales have gained at a more rapid rate since these techniques have been applied. Positive reinforcement was also applied in the Customer Service Departments at Emery. Before positive reinforcement was used, standards were met only 30 to 40% of the time, after positive reinforcement went into use the figure was 90 to 95%. The department goal was to answer customer queries within 90 minutes. This goal was being accomplished 30 to 40% of the time. A simple checklist was instituted with employees checking off on their list whether each call had been answered in 90 minutes. Supervisors provided positive reinforcement for any improvement in performance. Performance skyrocketed from 30 to 95% in a single day and after almost four years performance still averaged 90 to 95%. The same technique was applied in Emery's containerized shipping operations. Employees received praise and recognition for performance improvement in the use of containers and received regular feedback on their performance. The result was an increase in container use in their offices throughout the country from 45 to 95%, with the increase in 70% of the offices coming in a single day. Since they started using positive reinforcement, almost four years ago, Emery has saved over three million dollars. Emery states

that in those areas where they have used positive reinforcement, the behavior change has been instant, dramatic, sustained and uniformly in the desired direction. They intend to introduce positive reinforcement where it is possible throughout the organization.

LeBow and Gupton (1971) made use of behavior contingencies in a large industrial firm in order to improve performance. Their subjects were two male telephone solicitors whose job it was to sell new appliance service contracts and to renew old ones. Since renewal contract calls and sales were emitted at a higher rate than new service contract calls and sales, selling five renewal contracts was made contingent on selling one new service contract. In behavior terms, making a high rate behavior contingent on a low rate behavior is called the Premack Principle. The results were that the percentage of sales for new contracts increased an average of 10% for subject one and 21% for subject two while the contingency was in effect and dropped below baseline rate when the contingency was removed. The subjects immediately stopped making new sales calls once the contingency was removed, thus the drop below baseline. LeBow and Gupton state that the "monetary savings and effectiveness of this approach make it worth pursuing." (LeBow and Gupton, 1971, p. 82)

A leading St. Louis hardware company (Nord, 1969, p.396) has applied an approximate variable ratio schedule of reinforcement or what may be called a lottery system to reduce absenteeism and tardiness. Under this system if an employee is on time for work at the start of his day and after his breaks, he is

eligible for a drawing at the end of the month. Prizes worth about \$20 to \$25 are awarded to the winners. One prize is available for each 25 eligible employees. At the end of six months, employees who have had perfect attendance for the entire period are eligible for a drawing for a color television. The names of all winners and of those eligible are printed in the company paper, so that social reinforcement may also be a factor. Since the program was begun 16 months ago sick leave costs have been reduced about 62%.

In a study by Burroughs (1974) behavioral contingencies were applied to a group of venipuncture technicians to improve performance. In this study the entire group was given periods of time off contingent on the number of days they were able to go without having any unfilled blood test requests. For example, if they went 2 consecutive days without any unfilled requests they each got 15 minutes off, 4 consecutive days they got 45 minutes off and so on. The mean number of unfilled requests per day dropped from 1.92 to .29 during the contingency period.

The above studies give one an idea of the possible applications of operant conditioning to organizations. As can be seen the number of such studies within organizational settings is indeed limited. However, these studies give one reasonable assurance that Skinner's techniques can prove just as successful within organizational settings as they have been in educational and clinical settings. What is needed now is more supporting evidence in applied situations which is experimentally sound. Also, if skeptics are ever to be convinced of this approach

some attention must be given to how the application of these principles affects the involved employee's feelings toward his job, his co-workers and his supervisor. It is with the above considerations in mind that the following experiment was constructed.

The main hypothesis of this study is that by applying Skinnerian behavior management contingencies to a work setting employee absenteeism and tardiness will decrease. The study will also determine how the application of these contingencies affects the employees attitudes toward their work situation, their co-workers, and their supervisor.

Method

Subjects

Experimental subjects were a group of 11 venipuncture technicians employed on the day shift (6:00 to 2:30) in the laboratory of an 865 bed hospital. This particular group was chosen because the supervisor had a specific problem (tardiness and absenteeism) that needed correcting, was interested in the use of behavioral contingencies and was willing to cooperate with the experimenter.

In administering the questionnaire, which is described later in the study, a control group was needed for comparison purposes. Subjects in the control group were 9 laboratory secretaries. This group was equivalent to the experimental group in age, job level and pay. Both groups had the same supervisor and worked the same shift.

Experimental Design and Procedure

The purpose of the study was to decrease absenteeism and tardiness. The dependent variable was the number of absences and tardiness per day. Absence was defined as not reporting to work at all during the assigned shift. Tardiness was defined as reporting to work in the morning, after coffee breaks or after lunch break more than five minutes late. The independent variable consisted of offering the employees time off. The study consisted of the following three phases; the pre-contingency period, the contingency period, and the post-contingency period.

Pre-contingency period. The pre-contingency period lasted for 13 days, from April 18 to April 30. This time period was necessary in order to collect baseline data which enabled later comparisons with data collected during the contingency period. On April 18 a staff meeting was held. The purpose of this meeting was to encourage a group effort toward reducing tardiness and absenteeism without the use of external rewards. Employees were told to make a concerted effort to get to work on time, to return from lunch and breaks on time and to avoid unnecessary absences. No mention was made of time off or that records would be kept of staff members' absences as well as their tardinesses. During this time period a record was kept of the number of employees tardy and absent each day.

Contingency period. The contingency period lasted 22 days, from May 1 to May 22. The purpose of this period was to establish the time contingency and to observe its effect on the number of absences and tardinesses. On April 30 a staff meeting was held in order to inform the employees of the new time off contingencies which are presented below:

Individual Contingencies

<u>No Absenteeism or Tardiness</u>	<u>Time Off</u>
2 consecutive days	15 minutes
4 consecutive days	45 minutes
6 consecutive days	90 minutes

Group Contingencies

<u>No Absenteeism or Tardiness</u>	<u>Time Off</u>
3 consecutive days	15 minutes
5 consecutive days	45 minutes
7 consecutive days	90 minutes

The above is a fixed ratio schedule of reinforcement. Under these contingencies employees were able to earn up to $1\frac{1}{2}$ hours off in a week's time individually and up to 3 hours off in a week's time if the entire group cooperated. When an absence or tardiness occurred, that particular employee was required to start all over earning time off the next day. The groups time off was also started over if any one person was late or absent. The only stipulation was that each employee was required to schedule his or her time off in advance with the supervisor. The time off earned each day was posted at the end of the day so that all employees knew where they stood. At no time were employees told how long the time off contingencies would be in effect. The same data was collected during the contingency period as was during the pre-contingency period, the number of absences and tardiness per day.

On May 22 an attitude questionnaire was distributed to the control group and to the experimental group. This questionnaire is presented in Appendix A. The purpose of the questionnaire was to determine if there were any differences in attitudes between the experimental and control groups due to the time off contingencies. Employees were not told that the questionnaire had anything to do with the time off contingencies. The design

which was used in administering the questionnaire is called the post-test only design and is presented below (Campbell and Stanley, 1973).

	Treatment	Post-test
Experimental Group	X	X
Control Group	-	X

This design was chosen over the classical pre- and post-test design and the Solomon 4 group design for two reasons. First, the post-test only design eliminates the possibility of interaction effects between the pre-test and the treatment which exists in the classic design. Second, the post-test only design requires fewer subjects and costs less than does the 4 group design.

The questionnaire was constructed using an existing attitude survey developed for hospital employees by Michaels (1972) and from research done by Smith, Kendall and Hulin (1969). The form was designed to look at employee attitudes in three categories which the experimenter expected might be affected by the application of contingencies. These categories were: 1) Supervision, which dealt with the worker's perception of his supervisor and his interaction with and relationship to the supervisor; 2) Co-workers, which dealt with the people with whom an employee works. Personality factors as well as work factors and group spirit were included; 3) Work situation, which dealt with different aspects of the job environment and the job itself. This category included exploring the worker's perception of his job and how he felt about his work. Appendix B presents a breakdown of the individual

questionnaire items into their respective categories.

The survey was developed with half of the statements positively worded and half negatively worded in order to counter balance for response set. Forty-two questions were included in the questionnaire with boxes to be checked by the employee for True, Maybe and False to indicate whether or not the employee felt that the statement applied to his job. True answers on positively stated questions were scored as 3, Maybe answers scored as 1, and False answers scored as 0. Negatively stated questions were scored similarly; False answers received a 3, Maybe answers received a 1, and True answers received a 0. A mean score of 2 for a question or a category of questions was considered to show a favorable attitude, while a score below 2 was seen as unfavorable and a score below 1.5 as very unfavorable. The use of this scoring system is supported by Smith, Kendall and Hulin (1969) in their research regarding job satisfaction questionnaires.

Post-contingency period. On May 23 a staff meeting was held to inform employees that time off rewards would no longer be in effect. The post-contingency period lasted for 13 days, from May 23 to June 4. The purpose of this period was to remove the independent or experimental variable, time off, in order to determine if the change in the dependent variable, absenteeism and tardiness, was actually due to the manipulation of the experimental variable. If such was the case the dependent variable should return to it's pre-contingent or baseline state. The same data was once again collected.

Results

In order to answer the first part of the hypothesis of this study, that employee absenteeism and tardiness will decrease by applying Skinnerian behavior management contingencies, the following data was compiled. Means were calculated for the number of absences, the number of tardinesses, and the total number of absences and tardinesses combined per day for the pre-contingency period, the contingency period, and the post-contingency period, as well as the pre- and post-contingency periods combined. A total of nine t-tests were calculated. Three t-tests were calculated to determine if there were any significant differences between the means in the pre-contingency period and the means in the contingency period. Three additional t-tests were calculated to determine if there were significant differences between the means in the pre- and post-contingency periods. Three more t-tests were calculated to determine if there were significant differences between the means in the contingency period and the means in the pre- and post-contingency periods combined.

Three figures are presented with graphs charting the number of absences and tardinesses per day for each of the three experimental periods. Figure 1 charts the total number of absences and tardinesses per day for the pre-contingency period, the contingency period and the post-contingency period. Figure 2 charts the number of absences only per day for each of the three experimental periods and Figure 3 charts the number of tardinesses only per day for the same three periods.

FIGURE 1

Total Number of Absences and Tardinesses Per Day

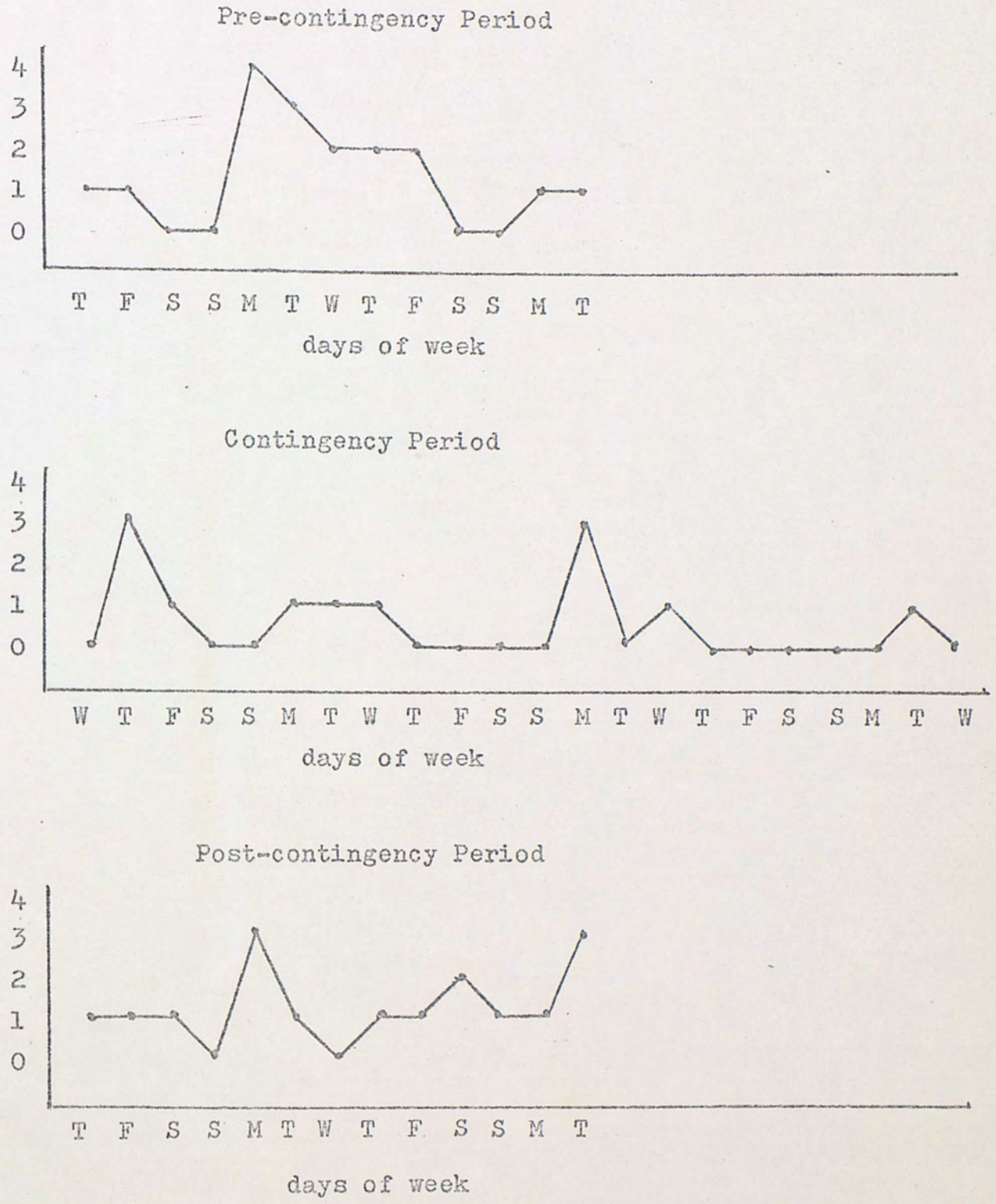
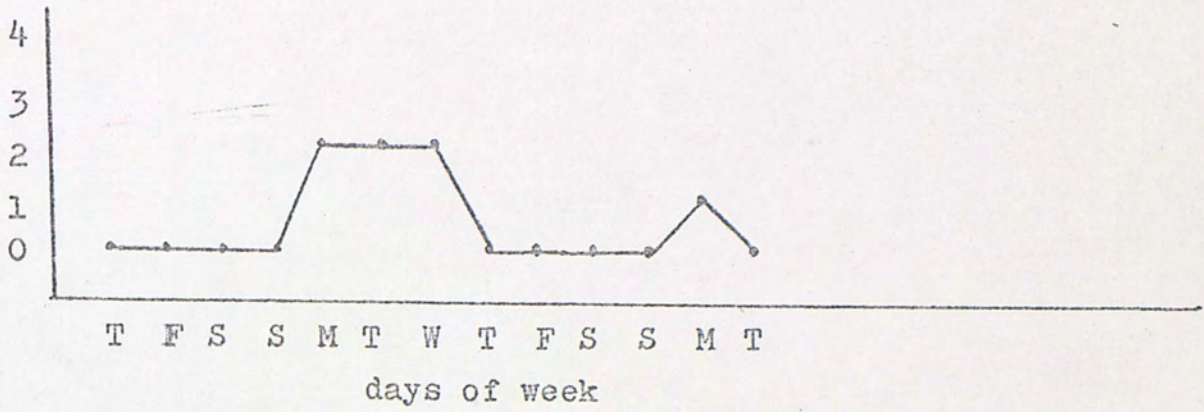


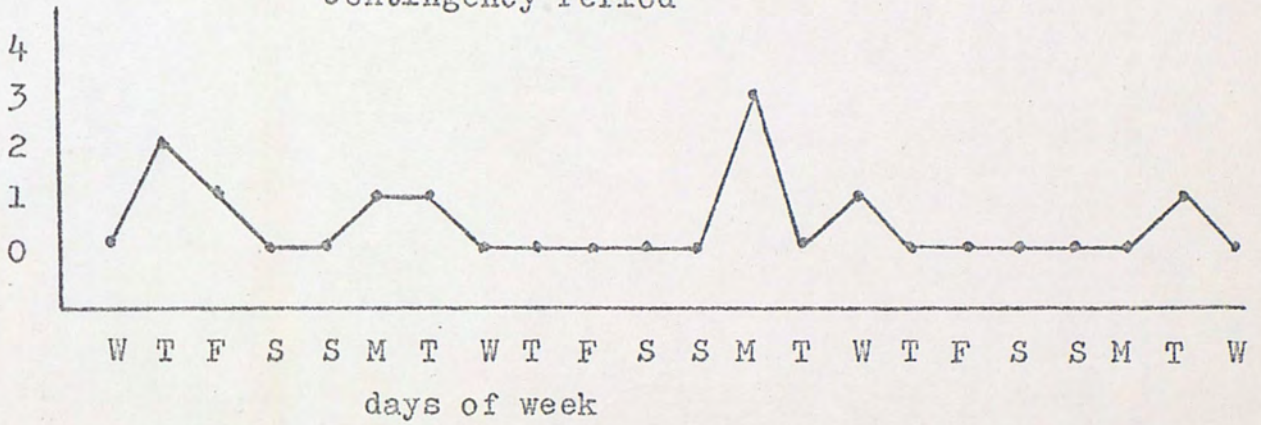
FIGURE 2

Number of Absences Only Per Day

Pre-contingency Period



Contingency Period



Post-contingency Period

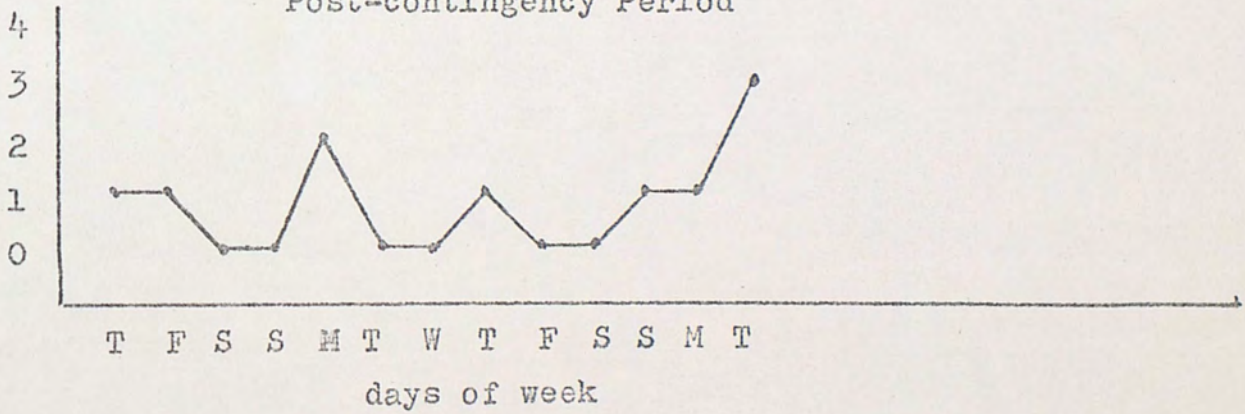
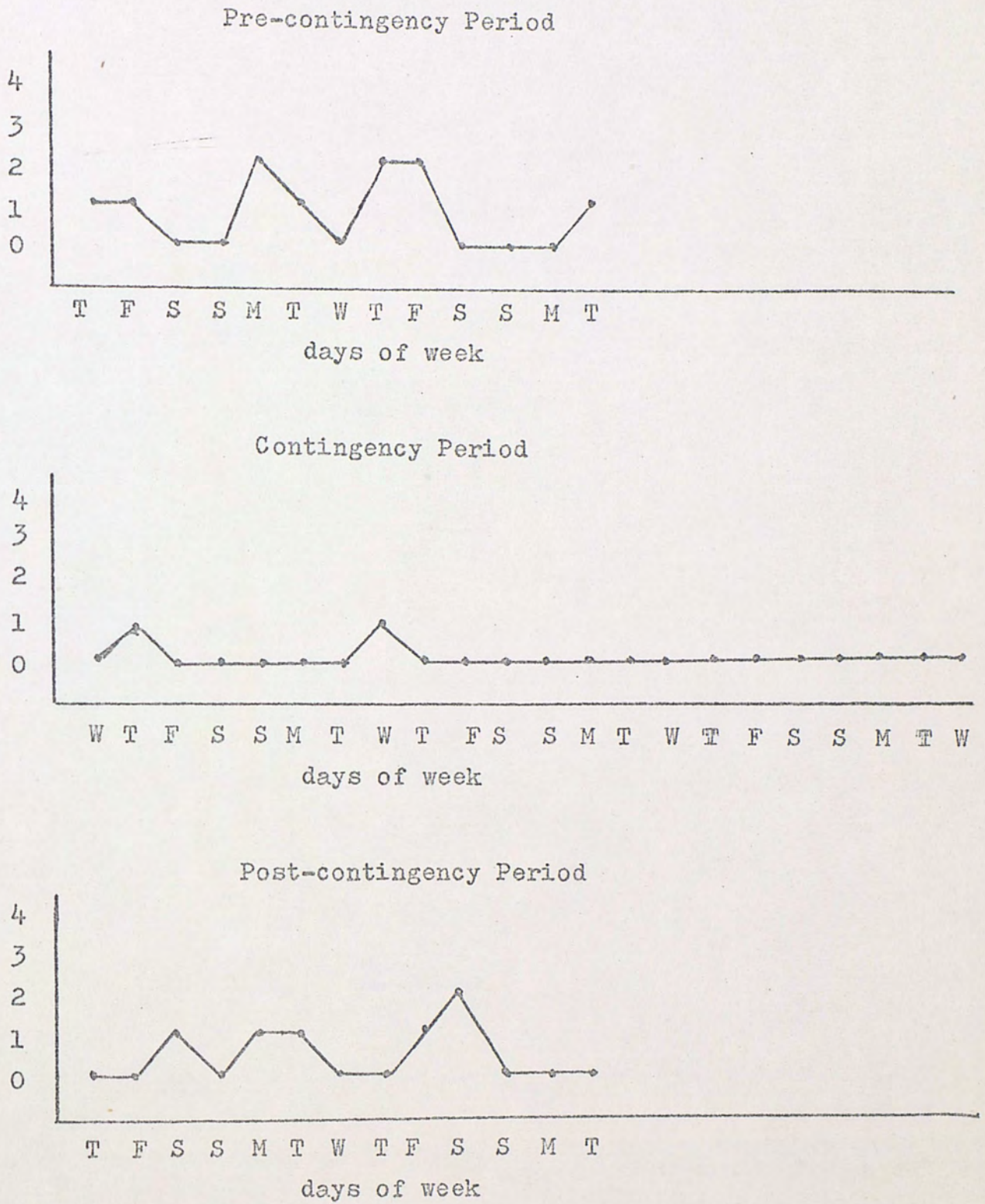


FIGURE 3

Number of Tardinesses Only Per Day



The graphs which display the greatest difference between the contingency period and the pre- and post-contingency periods are those presented in Figures 1 and 3. In Figure 1 the mean number of total absences and tardinesses was .545 for the contingency period as opposed to 1.307 and 1.230 for the pre- and post-contingency periods respectively. Looking at the contingency period graph it is clear that as the weeks progressed the total number of absences and tardinesses decreased. In the first eight day period the total was seven, in the second seven day period the total was four and in the last seven day period the total was one.

In Figure 3 the most marked difference between contingency and pre- and post-contingency is displayed. In the pre-contingency period there was a total of 10 tardinesses in a 13 day period; in the post-contingency period there was a total of 6 tardinesses for the same period of time, 13 days; however, in the contingency period, which lasted for 22 days, there were only 2 tardinesses.

The means and standard deviations for all three of the experimental periods are displayed in Table 1. It can be seen in this table that the means and the standard deviations in the contingency period are all lower than the means and standard deviations in both the pre- and post-contingency periods.

TABLE 1

Mean and Standard Deviations
for Experimental Periods

		Pre- contingent Period	Contingent Period	Post- contingent Period	Pre- and Post- contingent Periods Combined
Total Absences and Tardinesses	Mean	1.307	.545	1.230	1.269
	S.D.	1.706	.831	.859	1.164
Absences Only	Mean	.538	.454	.769	.653
	S.D.	.770	.640	.858	.795
Tardinesses Only	Mean	.769	.090	.461	.610
	S.D.	.692	.060	.435	.566

Table 2 presents the differences in means between the pre-contingency and contingency periods, between the pre-contingency and post-contingency periods, and between the contingency and the pre- and post-contingency periods combined. It also displays the t values and significance levels. The t-test for a difference between means with pooled variances (Hayes, 1963, p. 320-321) was used and significance levels were based on one-tailed tests. Table 2 clearly shows that there were no significant differences between means for the pre-contingency and post contingency periods. However, there were significant differences in means between the pre-contingency and contingency period for the total number of absences and tardinesses and for tardiness only. The most dramatic difference was the mean difference for tardiness in the pre- and post-contingency periods combined and the contingency period.

TABLE 2

Mean Differences between Pre-contingency and Contingency Periods,
 between Pre-contingency and Post-contingency Periods,
 and between Contingency and Pre- and Post-contingency
 Periods Combined
 and t Values

		Mean Difference	t Value
Differences between Pre-contingency and Contingency Periods	Total	.762	1.967*
	Absences Only	.084	.279
	Tardiness Only	.679	3.469***
Differences between Pre-contingency and Post-contingency Periods	Total	.007	.165
	Absences Only	-.231	.627
	Tardiness Only	.308	1.003
Differences between Contingency and Pre- and Post- Contingency Combined	Total	.724	2.432**
	Absences Only	.198	.788
	Tardiness Only	.520	10.038***

* p .05
 ** p .01
 *** p .001

In order to answer the second part of the hypothesis of this study, how behavioral contingencies affect employee attitudes toward the work situation, co-workers, and supervisor, the following data was collected with regard to the questionnaire. Overall means were calculated for each of the three categories; work situation, co-workers and supervisor, as well as for the total questionnaire. Four t-tests were computed to determine if there were any significant differences between the mean scores of the control group versus the mean scores of the experimental group.

Table 3 presents the means and standard deviations of the scores on the questionnaire for the experimental group and the control group. The mean scores were slightly higher in the control group which implies that the attitudes were slightly more favorable in the control group. However, the difference was not statistically significant and the sample size of the control group was smaller than the experimental group. In the categories of supervision and total score the experimental group had larger standard deviations.

Table 4 presents the differences in mean scores between the experimental and control groups, along with the t-values and significance levels. The t-test for a difference between means with pooled variances (Hayes, 1963, p. 320-321) was used. Significance levels were based on two-tailed tests. Table 4 shows that there were no significant differences in mean scores for any of the categories between the two groups.

TABLE 3

Means and Standard Deviations
for Questionnaire Scores

		Experimental Group N = 11	Control Group N = 8
Category 1 Supervision	Mean	2.007	2.588
	S.D.	.697	.082
Category 2 Co-workers	Mean	2.187	2.166
	S.D.	.236	.316
Category 3 work situation	Mean	2.085	2.374
	S.D.	.144	.178
Total Score	Mean	2.202	2.371
	S.D.	.231	.119

TABLE 4

Mean Differences between
Experimental and Control Groups and
t Values for Questionnaire

	Mean Difference	t value
Category 1 Supervision	-.581	1.786
Category 2 Co-workers	.021	-.082
Category 3 work situation	-.289	1.479
Total Score	-.169	.801

Discussion

The hypothesis of this study was that by applying Skinnerian behavior management contingencies to a work setting employee absenteeism and tardiness would decrease and that applying these contingencies would not cause employee attitudes toward the work situation, co-workers or supervisor to decrease in favorability, but may cause an increase in favorable attitudes. The former part of this hypothesis was partially supported. Tardiness was dramatically decreased by applying the time off reward. The total number of absences and tardinesses combined also decreased significantly during the contingency period. That the contingency manipulation was responsible for these changes is supported by the results of the reversal phase or the previously named post-contingency period. In the post-contingency period the contingencies were removed and the dependent variable (tardiness and absenteeism) increased to its previous pre-contingency or baseline rate. However, the mean number of absences, when considered alone, did not decrease significantly, although there was a slight decrease, during the contingency.

There are several possible explanations for this lack of a significant decrease in absenteeism. First, it is possible that the contingency period (which was in effect for 22 days) was not of long enough duration to allow the rate of absenteeism to stabilize. In referring back to the graph of the contingency period in Figure 2 it is clear that as the weeks progressed the total number of absences decreased (first week = 5 absences, second week = 2 absences and third week = 1 absence). It is

possible that if the contingency had been in effect for a longer period of time the number of absences may have stabilized at a lower mean value. This would be one area of future investigation.

A second explanation is that absenteeism may not be completely eliminated by the offering of time off. That is to say, there will always be 'real' illnesses which will require employees to be absent from work. Therefore, out of the total number of absences in any given time period the experimenter can only hope to eliminate the 'fake' absences and not the 'real' absences. The supervisor of the experimental group commented that she thought the absences which occurred during the contingency period were 'real' illnesses whereas in the pre-contingency period she did not think this was the case.

A third possible explanation for the lack of a significant decrease in absenteeism is that the reward was not highly enough valued by the employees to reduce their absenteeism behavior. for an employee to get $1\frac{1}{2}$ hours of paid time off he had to come to work and be on time for six days in a row. In order to get 3 hours off he had to depend on everyone else also coming to work and being on time for seven days in a row. To the individual employee the group contingency may have seemed unrealistic and out of his control. If such was the case his anticipated reward was only $1\frac{1}{2}$ hours paid time off, which may not have been as highly valued as was 8 hours off without pay. A possible area for future research would be to develop a method of determining the actual value of the reinforcer for each individual subject.

The second major concern of this study, how behavioral

management contingencies affect employee attitudes toward the work situation, co-workers, and supervisor, was determined through the attitude questionnaire. As seen in Table 3 and 4 there was no significant difference, as evidenced in the questionnaire, between the control group's attitudes and the experimental group's attitudes. The control group's attitudes were neither more favorable nor less favorable than the experimental groups attitudes. It is, however, inappropriate to make a definitive statement as to the effect of behavioral contingencies on employee attitudes based on this study for a number of reasons. First, the sample size was much too small to allow for generalizations (N=8 for the control group and N=11 for the experimental group). Secondly, although the experimenter matched the control and experimental groups with regard to age, pay level, job level, shift and supervisor, the actual job duties of the two groups were nonetheless different. Thirdly, the duration of the contingency period may not have been long enough to have an effect on the attitudes of the employees in the experimental group. Although this study attempted to determine how behavioral contingencies affect employee attitudes, the question remains unanswered. It is a question which is in need of future research

Another area for future research would be to determine what happens to modified behaviors over an extended time period. For example, in this study tardiness was drastically decreased over a three week period. However, could this lowered rate of tardiness be successfully maintained for one year or would the reinforcers loose their effectiveness with time.

Some employers may have qualms about using time off as a reward for their employees. They may feel that rewarding the employee by giving him time away from the job is in some way 'wrong'. Such an employer should consider that current programs such as sick pay, work breaks, employee lounges, recreation programs and numerous other personnel programs all use time off the job as a reward. However, these reward programs are not made contingent on the emission of desired responses. The Skinnerian approach to organizational planning focuses attention on the following points: 1) define the desired employee behaviors, 2) define the possible reinforcers, and 3) make the reinforcers contingent on the emission of the desired behaviors. This approach has been effectively utilized in this study and in several other experiments cited earlier in the paper and could prove to be an invaluable asset to administrators, managers and supervisors.

APPENDICES

APPENDIX A
Questionnaire

The purpose of this questionnaire is to determine how you feel about your work situation. This questionnaire will be analyzed by an outside source who will submit a report to the laboratory supervisor indicating the overall attitudes depicted by this questionnaire. All answers will be kept strictly confidential. YOUR NAME IS NOT REQUIRED.

Please indicate your feelings toward the statements on the following pages by checking the box under yes if you agree with the statement, no if you disagree or maybe if you are not sure. Your cooperation will be greatly appreciated.

		True	Maybe	False
1.	Employees in my department are fairly rewarded for their efforts.	1.		
2.	The people I work with are slow workers.	2.		
3.	My department takes pride in its work.	3.		
4.	My co-workers are boring.	4.		
5.	My work is interesting.	5.		
6.	Morale is low in my department.	6.		
7.	My supervisor asks my opinion on work matters.	7.		
8.	My work is routine or repetitive.	8.		
9.	My supervisor tells me when I do a good job.	9.		
10.	My supervisor demands too much.	10.		
11.	In this department people are willing to cooperate with each other.	11.		
12.	My supervisor doesn't notice my work.	12.		
13.	I work with responsible people.	13.		
14.	Rewards are not given fairly in this department.	14.		
15.	Employees are well informed about changes within the department.	15.		
16.	My supervisor doesn't consider my feelings.	16.		
17.	People in this department get along well with one another.	17.		
18.	My work is dull and uninteresting.	18.		
19.	The people I work with are intelligent.	19.		
20.	I do not have enough work to keep busy.	20.		
21.	My supervisor gives credit when credit is due.	21.		

		True	Maybe	False
22.	My co-workers are lazy.	22.		
23.	My supervisor has concern for the employees.	23.		
24.	My co-workers are hard to get along with.	24.		
25.	Workers in my department make good use of their time.	25.		
26.	If I have a suggestion I feel that it will be fairly considered.	26.		
27.	Employees in my department are not told about changes in the department.	27.		
28.	My supervisor only cares about getting the job done.	28.		
29.	In my department I feel like part of a team.	29.		
30.	Workers in my department waste a lot of time.	30.		
31.	I work with pleasant people.	31.		
32.	New ideas that I have will probably not be considered.	32.		
33.	My working conditions are comfortable.	33.		
34.	My supervisor is too old-fashioned.	34.		
35.	It is easy to make friends in this department.	35.		
36.	My job is not important.	36.		
37.	I know what my supervisor expects of me.	37.		
38.	Employees in my department have little pride in their work.	38.		
39.	I am required to work too hard.	39.		
40.	My supervisor is not available for help when I need it.	40.		
41.	I am proud of my work.	41.		
42.	I feel that my actions are important.	42.		

APPENDIX B

Item Breakdown for
Questionnaire Categories

Category 1 - Supervision, includes items: 1, 7, 9, 10, 12, 16,
21, 23, 26, 28, 32,
34, 37, 40.

Category 2 - Co-workers, includes items: 2, 3, 4, 11, 13, 17,
19, 22, 24, 25, 29, 30,
35, 38.

Category 3 - Work situation, includes items: 1, 3, 5, 6, 8, 14,
15, 18, 20, 21,
27, 33, 36, 39,
41, 42.

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