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A COMPARATIVE ANALYSIS OF THE IMPACT OF TYPES OF REINFORCEMENT INTERVENTIONS ON EMPLOYEE PERFORMANCE: A FIELD EXPERIMENT

by

Alisa L. Mosley

A DISSERTATION

Presented to the Faculty of

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Major: Interdepartmental Area of Business (Management)

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Lincoln, Nebraska

July, 1998

DISSERTATION TITLE

A Comparative Analysis of the Impact of Types of Reinforcement Interventions on Employee Performance: A Field Experiment

BY

Alisa L. Mosley

SUPERVISORY COMMITTEE:

	APPROVED	DATE
Signature	Fred Luthans	7/8/98
Typed Name	Dr. Fred Luthans	
Signature	Douglas R. May	7/8/98
Typed Name	Dr. Douglas May	
Signature	Cary Thorp	7-8-98
Typed Name	Dr. Cary Thorp	
Signature	Jerry Z. Petr	7-8-98
Typed Name	Dr. Jerry Petr	
Signature		
Typed Name		
Signature		
Typed Name		

GRADUATE COLLEGE
UNIVERSITY OF NEBRASKA

A COMPARATIVE ANALYSIS OF THE IMPACT OF TYPES OF REINFORCEMENT INTERVENTIONS ON EMPLOYEE PERFORMANCE: A FIELD EXPERIMENT

Alisa L. Mosley, Ph.D.

University of Nebraska, 1998

Adviser: Fred Luthans

Research on positive reinforcement has established its utility in areas such as education and mental health organizations. However, this technique had not been used as frequently in the work organization as a method to increase performance. Luthans and Kreitner's organizational behavior modification model (1975) included the principles of positive reinforcement and served as a systematic means by which to increase performance behaviors. A meta-analysis conducted by Stajkovic and Luthans (1997) statistically demonstrated O. B. Mod.'s effectiveness by reviewing over twenty years of field research.

As a means to further the findings of the meta-analysis, this study examined four positive reinforcement interventions and the subsequent effects on employee performance. Further, the study analyzed how positive reinforcement interventions were administered in traditional versus behavioral management approaches. It was hypothesized that traditional pay-for-performance (PFP) and behaviorally-managed interventions of monetary rewards, feedback, and supervisor attention/recognition would increase productivity levels. However, behaviorally-managed interventions were hypothesized to increase performance more than traditional PFP methods. It was also hypothesized that there would be no significant differences associated with any

interventions administered with a behavioral approach. These three hypotheses represented a test of the findings from the meta-analysis.

Using two manufacturing facilities in a large organization, the reinforcement interventions of monetary rewards (with and without O. B. Mod.), feedback, and supervisor attention/recognition were administered to four groups of workers (n=182) over an intervention period of four weeks. An analysis of the data demonstrated that both traditional and behavioral management-driven interventions have a significant, positive effect on employee performance. Further, performance levels under the monetary reward (with O. B. Mod.) condition were higher than the performance associated with the traditional pay-for-performance condition. Evidence also showed that there were no significant effect magnitude differences with the administration of reinforcement interventions using the organizational behavior modification model. Based on the study's findings, a discussion of future directions for research and practice were discussed.

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

One of the most significant challenges faced by organizations has been employee performance. In order to accomplish the objectives of the organization, managers must use techniques by which employees can be productive at a high level, while maintaining superior levels of quality. A variety of methods have been suggested that encompass both cognitive (Locke, 1968) and behavioral (Luthans & Kreitner, 1975) approaches.

As the debate between cognitive and behavioral approaches continues, there has also been discussion on motivation per se. There is a premise among some researchers (Deci, 1972, 1975) that extrinsic rewards can be detrimental to intrinsic motivation and resulting performance, while intrinsic motivation is positively related to performance. This prevailing notion was discounted in a study that examined the impact of intrinsic and extrinsic reinforcement contingencies on task behavior (Scott, Farh, & Podsakoff, 1988). The authors conducted a laboratory study in which the sample performed different types of tasks. Scott et. al hypothesized that extrinsic motivation would not decrease subsequent intrinsic motivation in subjects. Subjects were given monetary as well as nonfinancial rewards in the form of feedback that they termed "sensory" reinforcement. The authors concluded that financial rewards do significantly increase task performance. Further, subjects, through self-report, perceived an increased level of intrinsic motivation.

Using meta-analysis, Wiersma (1992) studied the impact of intrinsic and extrinsic motivation on performance. This comprehensive analysis concluded that extrinsic

rewards do not have a negative impact on task performance. Other studies have attained similar findings (Mawhinney, 1990). Thus, there was considerable empirical evidence that supported the use of rewards as being positively related to task performance.

Throughout history, organizations grappled with methods by which managers can make their employees more productive. As far back as Taylorism (Peach & Wren, 1992; Taylor, 1911) and up to the present, those techniques included the management of the individual's cognition or the management of an individual's behavior. Although researchers in organizational behavior sometimes focused on managing the attitudes of the individual (Ajzen & Fishbein, 1977), management of behavior seems to be an effective means of improving performance. In particular, the organizational behavior modification or O. B. Mod. approach (Luthans & Kreitner, 1975, 1985) has been shown to provide an effective means of increasing task performance (Stajkovic & Luthans, 1997).

This study was an answer to a call made by Stajkovic and Luthans (1997) in their meta-analysis of organizational behavior modification research. The authors evaluated the research conducted on organizational behavior management over the span of twenty years since the publishing of the seminal book on the topic (Luthans & Kreitner, 1975). In order to advance scientific research, a meta-analysis should be conducted over a stream of research. Although literature reviews can be helpful in integrating different studies (Andrasik, 1979, 1989), the meta-analysis has more potency because of its power in evaluating the progress or need for re-direction within a discipline (Hunter & Schmidt, 1990).

The results of the study conducted by Stajkovic and Luthans revealed several interesting findings. Using the tool of meta-analysis developed by Hedges and Olkin (1985), the authors concluded that there was theoretical support for a significant moderating effect between the type of reinforcement and task performance. The interventions of reinforcement studied include supervisor attention and recognition, monetary rewards, and the use of immediate performance feedback.

The meta-analysis explored the differences in the types of positive reinforcement. The types of reinforcement interventions revealed as significant (in changing performance) in the meta-analysis were supervisor attention/recognition, feedback, and financial rewards. The analysis revealed all of these interventions were effective in increasing performance; however, there may be varying degrees of effectiveness among the three methods. This study explored which reinforcement intervention had the most significant effect.

One of the benefits of using meta-analysis in a discipline was that it advances the literature by revealing the validity of previous studies (Hedges & Olkin, 1985). It also served as a guide for future research. Thus, the purpose of this study was to test the findings derived in the meta-analysis. Using the meta-analysis as a point of departure, this study sought to answer the following research question:

> What type of reinforcement intervention will have the most significant impact on employee performance in a manufacturing setting?

Significance of the Study

The major contribution of the study was that the field experiment made a direct comparison among different types of reinforcement interventions. Instead of conducting a study that gave no credence to prior research, this study was more focused because it was based on the results of a meta-analysis (Stajkovic & Luthans, 1997). Thus, the study added value to a body of knowledge (organizational behavior modification or O. B. Mod.) because of its directed emphasis on taking the results of the past and concentrating on future research that was a function of the past literature. Subsequently, this study was in line with the manner by which scientific knowledge is produced (Stone, 1978).

This study not only made a contribution to the body of knowledge of the academic area of O. B. Mod., but it also had applicability and value for managers. First, the study provided a comparative analysis of the impact that low-cost reinforcement interventions can have on employee performance. Supervisor attention/recognition was a type of intervention sometimes ignored by organizations because the human relations side of management was viewed as a side issue to productivity levels.

Performance feedback was another reinforcement intervention utilized by managers for little or no expenditure. Feedback may provide valuable information to employees about the behavioral dimensions of their performance (Ashford & Cummings, 1983; Kluger & DeNisi, 1996). This feedback can be accomplished by managers through the use of charts depicting frequencies of desirable behaviors versus undesirable behaviors. By demonstrating quantifiable data to employees with the use of user-friendly graphs, there may be an increase in performance at a significant level. Often, employees

do want to know how they are doing (Ashford & Cummings, 1983). Thus, receiving feedback from a supervisor can serve as helpful information at a low cost or no cost to the organization.

This study also provides analysis of the effectiveness of pay-for-performance systems. Organizations are exploring these pay techniques as a method by which money could be tied to performance measures. This study investigated the use of monetary rewards as a contingent reinforcement intervention to increase productivity and quality. Thus, this study added to the needed area of literature that tests the pay and performance relationship.

There may be some organizations that are hesitant to implement a reward system for their employees. However, the interventions proposed in this study only reward employees that increase their performance. Thus, these interventions can provide a win-win situation for the organization and its employees. In addition, these interventions have the potential of giving a competitive advantage to organizations in challenging industries.

This study also demonstrates how the focus on organizational objectives and specific performance behaviors can promote an equitable environment. Organizations often struggle with issues of providing an environment where discrimination on any basis is not accepted. Using a performance-oriented system of operations diminishes the focus on negative informal dynamics that have plagued some organizations and have resulted in litigation. Therefore, this study has some indirect implications for the means by which organizations conduct operations with a direct focus on performance only.

Definitions Used in the Study

It is important that the definitions for this study be carefully delineated right at the beginning. The study's definitions will be as follows:

- **Feedback**: Feedback refers to specific and immediate information about employee performance behaviors delivered by immediate supervisors in a positive, immediate, graphic, and specific manner (PIGS) (Luthans, 1998)
- **Supervisor private recognition/attention**: Verbal attention and praise on critical performance behaviors delivered through interpersonal interaction between supervisors and employees
- **Monetary reward**: The use of money to contingently reward above average performance
- **Productivity**: Units produced as defined by the organization
- **Quality**: The elimination of major or minor errors as defined by the organization

Proposed Research Design

The purpose of this study was to make a direct comparison between the different types of reinforcement interventions. They included 1) monetary rewards administered with a traditional pay for performance system, 2) monetary rewards with O. B. Mod. training, 3) feedback with O. B. Mod. training, and 4) supervisor recognition/attention with O. B. Mod. training. Compared to a pre-intervention baseline, it was proposed that each type of reinforcement intervention will have a positive effect on employee performance. However, in the comparative analysis, the strongest reinforcement intervention was hypothesized to be financial rewards with O. B. Mod. training. A comparative analysis was utilized in order to examine effect magnitude differences among the positive reinforcement interventions administered with O. B. Mod. training.

This study was designed to implement the four types of reinforcement interventions in four intact groups. These groups were the shifts of the largest division of a manufacturing firm at two sites in the same city. Archival data was used to form a baseline for comparison among the groups. The researcher was responsible for ensuring the interventions were properly implemented. During the intervention period of four weeks, task performance data will continue to be gathered.

This dissertation was organized in the following manner. Chapter II provided a literature review of reinforcement theory and application and the research streams built on reinforcement principles that have empirically demonstrated the success of the intervention. Chapter III explained the scope of the study, the data collection procedures, and the proposed methodology for the study. Chapter IV explained the results of the study through the use of statistical analysis. Chapter V inferred conclusions based on the results and proposed some future directions for research.

CHAPTER II

LITERATURE REVIEW RELEVANT TO THE STUDY

Historical Foundation

The theory related to behaviorism has a long history. Before the famous "Pavlov's Dog" experiment, there were academicians developing the discipline of behavioral psychology. Edwin Guthrie, Clark Hull, and Edward Tolman were the predecessors to B. F. Skinner and their seminal research constructed what is referred to as the "Golden Age of Theory" (Leahy & Harris, 1985). This era of research was based on a principle known as formal behaviorism. Formal behaviorism denoted theories grounded on the logical positivism perspective.

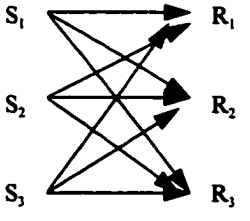
Guthrie developed his theory from the notion that only one type of learning could occur (Leahy & Harris, 1985). His simple theory was based on an association between a stimulus and response, as many of the other psychological theories promoted at that time. However, his theory said that learning occurred simultaneously between the stimulus evoked and the behavior connected to the stimulus. Guthrie was a connectivist in that he proposed that a response will produce a stimulus which will lead to another response making a chain (R-S-R-S). In essence, he was proposing a theory incorporating both notions of classical and operant conditioning.

Guthrie's premise was that learning can take place all at once (Guthrie, 1952). In order to test his theory, Guthrie conducted puzzle box studies with cats and used photography in order to observe them activating levers to be released. The results of his experiment were that after each trial, the cats behaved in similar ways in order to escape

from the box. Guthrie concluded that the cats had learned what they needed to know after the first trial. Thus, learning can fully occur the first time and that learning was registered by the subject. Guthrie did not have many experiments to substantiate his theory; so, many academicians have criticized the soundness of his argument. Compared to Hull, Guthrie's framework was too simplistic and lacks rigor (Leahy & Harris, 1985).

Clark Hull provided the most comprehensive framework of formal behaviorism. In keeping with the positivist tradition, this researcher applied mathematical expressions in order to quantify his theories of behavior. His form of "logical behaviorism" stated that a stimulus will lead to a response (S-R) (Hull, 1952). Moreover, Hull asserted that an intervening variable existed; there was an internal motivation component that would guide the response. Hull differed from Guthrie in that he did not believe that all learning occurred at the time a stimulus is associated with a response. Hull believed that learning occurred over a continuum.

A contribution made by Hull as part of logical behaviorism was the theory of a habit-family hierarchy (Hull, 1930). For every stimulus or response, there was a series of responses or stimuli that can be evoked/elicited. The pairing of stimuli to sets of responses and vice versa set up divergent and convergent hierarchies which together form compound habit-family hierarchies. An example of these hierarchies was as follows:



These connections were arranged in some manner that was a part of learning by trial and error. In the case of stimulus-response or divergent habit-family hierarchies, some responses (Hull referred to them as habits) weakened in strength as the subject searched for the correct response. Eventually, those weakened habits were extinguished as possible responses to the stimuli. It was when a response occurred and was reinforced that learning took place. Future reinforcement further strengthens the correct response. The aforementioned process was the manner by which Hull explained behavior.

Edward Tolman dismissed Hullian propositions and based his behaviorist theories on what he purported to be a common sense approach (Leahy & Harris, 1985; Tolman, 1959). Tolman's premise was that behavior had to be based on some purpose. The purpose, which he referred to as a goal, was the driving mechanism for behavior. Guthrie used the tool of observation to study the specific movements made by his subjects in order to make connections between stimulus and response. Tolman, however, felt this method was useless, because it distracted the researcher from a focus on the purpose of the action.

In addition to the premise of purpose, Tolman was also a proponent of the importance of cognition. The emphasis Tolman placed on purpose and cognition was the distinguishing factor of his research from that of Guthrie and Hull (Leahy & Harris, 1985). The researcher acknowledged that environmental contingencies influence or control behavior. However, Tolman asserted that behavior would not be repeated if the individual did not believe the reinforcement associated with the response would be repeated in the same manner. As the rats used in his experiments developed correct

responses, Tolman proposed that the subjects were developing cognitive maps that could be relied upon in future situations. The interesting aspect of Tolman's research was that he always relied on his own common sense; he often determined his theories by considering his own purpose for action. From that perspective, he then developed hypotheses and subsequently, experiments to test his assumptions. In many of his experiments, Tolman proved his theories.

The theories of Guthrie, Hull, and Tolman were formulated to explain behavior in different types of animals. The researchers primarily used animals such as cats and rats to test their hypotheses. Their hope was to eventually transfer their learning about animals to explain behavior of all organisms. However, successors to these researchers thought their goals were much too grandiose to be attainable (Leahy & Harris, 1985). Although some of the assumptions and experimental procedures made in the Golden Age of Theory were still used, the view of behaviorism drastically changed. B. F. Skinner followed these theorists and pushed aside their emphasis on cognition to develop behaviorism founded on observation as a means to predict behavior, not a theory contingent on inference.

The manner by which individuals will react to a situation was an issue of reinforcement, one aspect of learning (Bower & Hilgard, 1981). Over time, several theories of learning have developed, and a researcher cannot depend on only one theory with any certainty. However, it has been empirically shown that reinforcement principles can effectively be used in the organizational environment. The literature on reinforcement theory can be largely attributed to the work of Skinner. In his seminal

work, Skinner (1969) conducted several laboratory experiments to reveal the manner by which animals respond to reinforcement. His findings were contrary to the classical conditioning research promoted by Pavlov.

Pavlov, using laboratory animals, concluded that a stimulus can elicit a response. His original intent was to study the psychology associated with digestion in dogs. He constructed a system in which the amount of salivation emitted by a dog could be measured when a stimulus (food) was presented. In the experiment referred to as "Pavlov's Dog", Pavlov discovered that the dog would salivate when he came close to the animal, even though the dog had not seen the food. Using a bell, he linked the bell as a conditioned stimulus with the food, an unconditioned stimulus. The dog was conditioned to associate the bell with the response of salivation, without the presence of the food. Pavlov demonstrated that an animal can be conditioned to respond based on learned patterns, despite the absence of the initial stimulus.

Skinner approached the topic of conditioning from a different perspective. While Pavlov subscribed to a respondent conditioning approach to psychology, Skinner supported an operant approach. Skinner's primary goal was to determine the manner by which to control and predict behavior because the understanding of behavior was too complex to uncover (Bower & Hilgard, 1981). His contribution to science was operant conditioning. In other words, the stimulus emitted the behavior based upon the presence of a reinforcer. The discriminant stimulus represented a cue to perform an action. In essence, if the consequences were not present, then the discriminant stimulus lost control.

A reinforcer is defined by its effects (Skinner, 1969, 1974). Positive reinforcement and negative reinforcement represent the two types of reinforcement. Positive reinforcement is a consequence that strengthens the preceding behavior and increases its subsequent frequency. The more positive reinforcement occurs, the more likely the desired behavior will occur. Negative reinforcement attempts to predict and control behavior by presenting a stimulus that will be avoided by subjects. In other words, under negative reinforcement the desired behavior is strengthened because the individual is attempting to avoid a negative consequence. With both positive and negative reinforcement, behavior can be strengthened and increased (Luthans, 1998).

After his initial experiments on animals, Skinner expanded his research to study humans (Skinner, 1969, 1974). Using operant conditioning, the researcher demonstrated that individuals can reform their deviant behavior in order to be more conducive to a given environment. In order to predict and control human behavior, Skinner recommended that consideration be given to reinforcement history (Luthans & Kreitner, 1974; Skinner, 1969). Reinforcement history consisted of past experiences that may have influenced behavior, events that precede current behavior, the behavior itself, and its consequences. This history served as a baseline for the researcher or manager to modify behavior.

By studying the reinforcement history of an individual, the prediction and control of behavior is more easily accomplished. Since behavior is emphasized, it is possible to focus on the implementation of appropriate reinforcers, instead of a focus on understanding behavior through the motivation and desires of the individ ual (Bower &

Hilgard, 1981). Consequently, the ability to solve behavioral problems may be accomplished with more success than other methods of change.

Skinner's (1969) work on reinforcement was the catalyst for research and application on providing incentives to people who respond with the appropriate behavior specific to a particular organization. However, the proposition that people will perform at higher levels if they received a benefit is not new in the field of management. Frederick W. Taylor (1911) conducted extensive work on increasing performance in a manufacturing setting. In his discussion of the "Pig Tales", Taylor emphasized that his ability to increase productivity in the loading of iron ore can be attributed to his recognition that people will work if they receive positive reinforcement.

In order to improve productivity at the steel plant, Taylor concluded that every job could be analyzed to a fine science. It was from this perspective that Taylor also viewed the worker. The researcher was convinced that he could manipulate the worker so the individual would be swayed by a positive reinforcer. In this situation, Taylor concluded that money would be an important operationalization of a reinforcer. When he interacted with a workman, he relied on the promise of increased compensation as reinforcement for increased performance. Taylor emphasized that in order to receive the reward of higher wages, the appropriate behavior was to handle more iron ore. Subsequently, his study demonstrated that an extrinsic reward reinforcer could be used to emit improved performance in the form of monetary incentive.

Although an unintentional result, the famous Hawthorne studies highlighted the power of reinforcement and its effect on performance (Parsons, 1992). Several

experiments were conducted to comprise the Hawthorne studies; however, the one experiment that was of interest to behavioral management was the relay assembly test room. The Hawthorne studies (Roethlisberger & Dickson, 1939) initially began as an experiment on illumination to demonstrate the effectiveness of General Electric products. The varying degrees of illumination did not result in any significant differences in productivity. The researchers then realized that there were human dynamics involved that contributed to the performance of the workers. This realization led to a series of experiments such as the relay assembly test room.

Like other behavioral management studies conducted after the Hawthorne study, a within-groups design was utilized. Although it was not expressly done for this reason, each employee received feedback on the total output accumulated every half hour. A member of the group calculated totals across all of the workers, but each employee also examined her individual productivity. The unexplained phenomena, known as the Hawthorne effect, also explained the effect of feedback on the group (Parsons, 1992). Studies conducted after the Hawthorne study have indicated the positive impact of feedback on performance (Ashford & Cummings, 1983; Locke, 1968; Locke & Latham, 1990)

Although Taylor, at the initial beginnings of management theory and practice, advocated the use of positive reinforcement interventions, the use of behavior modification as a tool was limited to hospitals and educational settings. Nord (1969) made an excellent case for the use of reinforcement theory in organizational settings. Management theory was centered around more cognitive approaches to behavior

supported by researchers Abraham Maslow and Douglas McGregor. These theorists focused on the internal states within the individual. Similar to later theorists such as Deci (1972), Maslow and McGregor were primarily concerned with understanding the inherent needs and innate nature of humans in order to uncover issues of motivation. By understanding what drives individuals to act, organizations could prompt inner states and increase internal motivation; thus, yielding higher levels of productivity. Subsequently, the researchers dismissed theories that used external motivation as a tool for employees.

Nord (1969) argued that the theories of Maslow and McGregor have enjoyed such wide acceptance among management researchers and practitioners due to intuitive validity. The principles involved in Maslow's need hierarchy make sense to people. Similarly, McGregor's Theory X-Theory Y discussed the importance of intrinsic motivation as being a catalyst to the achievement of individual and subsequently, organizational goals and objectives. However, neither theory gave enough credit to the manipulation of environmental factors that were under the control of the manager and/or the organization. Maslow and McGregor were supported by those managers and researchers who believed humans can and should perform at a high performance level without regard to environmental factors. Nord goes on to say,

> ...The conditioning approach does not postulate internal states but rather deals with the manipulation of environmental factors which influence the rate of behavior. Actually, some combination of the two approaches may be most useful as Vinacke (1962) has suggested. However, if both approaches are viewed only at the operational level, it is quite probable that rates of behavior could be greed as an acceptable criterion. Certainly from the practitioner's viewpoint, behavior is the crucial variable. When a manager talks about a motivated worker, he often means one who frequently makes desired responses at a high rate without external prompting from the boss. The traditional view of motivation as an inner-drive is of limited practical and theoretical value. (390)

The above quote signified that some researchers and managers believe that employees can perform in a vacuum and not account for the context in which they are working. Essentially, this premise became more of a hope than a reality because situational factors do matter. Organizations have to take responsibility for the environment in which employees work. Therefore, managers must develop techniques by which to predict and manage behavior.

The literature on positive reinforcement appears to focus on financial and nonfinancial interventions and the effect on performance outcomes (Daniels, 1994). In terms of nonfinancial interventions as an operationalization of positive reinforcement, research indicates that the two primary types of interventions used are feedback and recognition and attention. The following sections below describe some of the research conducted on nonfinancial interventions and their effects on performance outcomes.

Private/Public Recognition and Performance

Private or public recognition by the supervisor to his or her subordinates can have a significant impact on performance. There are a variety of ways by which organizations can recognize employees. Most often, these recognition measures take the form of plaques and awards which typically become very public forms of honor. At the surface, managers intuitively feel that these methods are successful in motivating and rewarding employees. However, the research on recognition is mixed for a number of reasons.

Public recognition, while acknowledging the contribution made by employees, can cease to become a motivator. One issue is that often employees do not understand the

dynamics of the reward or the requirements necessary to attain recognition (Daniels, 1994). If no information on the specific criteria for the award is made available to all eligible employees, the award takes on a mysterious quality. Employees then assume that the award is based on popularity, not actual performance measures.

Another problem that occurs with public recognition is that the reinforcement is not given immediately following the performance. One of the essential elements of positive reinforcement is that it be immediate. Research findings have all noted the positive effect of immediate feedback on performance (Locke, 1968; Locke & Latham, 1990; Luthans, 1998). This premise also applies to recognition. For instance, organizations use a traditional recognition method such as the employee of the month given to the employee for goals such as high productivity, perfect attendance, and no accidents. However, the employee who is performing well at the beginning of the month may not be the same person with good performance at the end of the month. However, because the recognition only takes place at the end of the month, the time lag becomes a very inefficient means of rewarding employees.

Competition error is another problem with public recognition (Daniels, 1994). Due to the nature of competition, most organizations give a huge prize to one person, while other employees vying for the same prize, are left with no recognition. While it is a novel idea to have monthly events such as contests to encourage high levels of productivity, there is an inherent risk with rewarding only a few individuals. Instead of promoting competition and motivating employees, this type of recognition could possibly hamper the efforts of other employees because only one or two people win a prize. If

some employees work very hard and still lose, then they may feel less motivated to perform in the future.

Public recognition may not be a motivator because of the employees who "always" receive the award (Daniels, 1994). If an organization is going to reward the employee with the highest productivity, then one person may be eligible due to a certain level of knowledge, skill, or abilities. The organization may try to modify the rules of the award so that over time, every employee receives this recognition. At this point, the award ceases to be effective. In some work environments, each employee will receive recognition for some achievement. However, employees may not feel special about the award because everyone has received some type of public recognition. Therefore, efforts to reward employees are not perceived by the recipients as positive reinforcement.

Perception error is another problem associated with public recognition (Daniels, 1994). What one person considers to be recognition could be perceived to be humiliating by another person. For instance, a manager may recognize a good performer in a staff meeting. That employee may feel embarrassed about being publicly recognized. He or she might also be ridiculed by co-workers about being singled out or becoming the favorite of the manager. An otherwise high performer may start to slack off in productivity because he or she does not value the public recognition provided by the manager. Therefore, public recognition can de-motivate an employee.

Research on public or private recognition in organizations is, for the most part, characterized in the literature as forms of praise. Praise, in the research, is characterized in a variety of ways as a form of constructive feedback to encouragement to motivate

employees into performing at higher levels. The research findings on praise and its effect on employee attitudes and performance are mixed.

Earley (1986) conducted a cross-cultural study on U.S. and English workers to examine the effects of praise and criticism on performance measures. The author also wanted to evaluate the level of trust as a mediator between feedback and subsequent performance. Praise was used as a form of positive feedback and criticism as negative feedback. The subjects were asked to work in a simulated environment performing operational activities similar to a manager's duties.

The sample consisted of a group of management trainees from both England and the United States. Each trainee received different forms of feedback (praise, criticism, no feedback) on their assignments. The regression analysis revealed that differences existed between the U.S. and English subjects. For both groups of workers, praise had a positive impact on performance. However, criticism had a similar effect as praise did with the U.S. workers. In the second phase of the study, Earley used an instrument with two additional samples of workers in the U.S. and England as a tool to assess trust. Based on his analysis, Earley inferred that trust can mediate the relationship between the feedback and its subsequent effect on performance outcomes. Thus, this study provided evidence to advocate the use of praise in organizations, but also noted the cultural differences that can exist across countries.

There has been some research that provided evidence against the use of praise on performance. Baumeister, Hutton, and Cairns (1990) hypothesized that praise can be detrimental to task performance. The authors noted that praise can lead to reduced effort,

added pressure on the feedback receiver to improve performance, and a distraction to the worker from utilizing his or her skills on the task itself. Baumeister et. al used a sample of undergraduate students in a laboratory setting. They were assigned skilled tasks to perform and received task-relevant praise, task-irrelevant praise, or no praise. The authors did not find support for their hypothesis that praise would lead to reduced levels of performance. Partial support was found for the hypothesis that praise led to perceived increased demand for good performance. However, Baumeister et. al did demonstrate the model of self-attention as being related to diminished performance. Therefore, careful consideration must be given to the manner by which praise is administered.

Sports teams often use feedback as a means of increasing performance levels. However, praise is not often used as a positive reinforcement intervention in collegiate and professional sports. Anderson, Crowell, Doman, and Howard (1988) examined the effect of different types of interventions on the success of a collegiate hockey team which had experienced losing seasons. The different types of feedback included posted individual feedback, the use of goal setting, and praise. Each coach received training on administering praise to his team members. The study took place over two seasons. While all of the interventions studied had positive effects on performance, the positive impact of praise on performance was significant because coaches had to undergo specific, intense training in order to execute this intervention. Anderson et. al demonstrated that if praise was administered as a measure of performance feedback, praise can have a positive effect on performance.

There are some occupational fields which require a high level of accuracy because the well-being of the customer is at stake. One such industry is the justice system and the occupation of court reporting. Judges and lawyers frequently refer back to in-court documents in order to prepare strategy and procedure. While interventions such as feedback and goal setting are effective, praise is often overlooked as a tool to motivate employees.

Godbey and White (1992) examined the impact of reinforcement interventions on the accuracy of court filing documents. Praise was utilized as a reinforcement intervention in addition to feedback and setting goals among the employees. The authors found that accuracy increased 45 percent and continued to increase when the researchers followed up with the subjects' progress. Godbey and White were able to provide further indication that praise can indeed motivate workers to perform at higher levels.

Verbal or written praise can be an effective means of promoting functional behavior. A study that examined the effects of verbal and/or written feedback was conducted by Hawkins, Burgio, Langford, and Engel (1992). The authors hypothesized that combined verbal and written feedback would encourage a group of nursing assistants to perform a critical duty. All subjects were given verbal and graphic feedback about their performance behavior. In addition to this feedback, subjects were given letters of praise or criticism about their performance. The authors found that the addition of the written feedback of praise was successful in promoting functional behavior.

Similar to the previously discussed research, studies indicated that feedback combined with praise was effective in performance improvement. Langeland, Johnson,

and Mawhinney (1998) conducted a study to examine the effects of feedback and praise on increasing critical performance behaviors. The study took place in a community mental health organization. The researchers worked with the staff to identify the functional behaviors needed for performance. The job description of each staff member was clarified to ensure the correct behaviors would be evaluated. An intervention of feedback, goal setting, and praise was implemented. Langeland et. al evaluated performance behaviors bi-weekly and each year for four years. The authors found that many of the identified task behaviors continued to improve over time. The study also demonstrated that costs associated with performing the job were lowered. The study's findings added to the growing body of literature that supported the use of positive reinforcement interventions.

Feedback and Performance

The impact of feedback on organizational phenomena is one of the most researched areas in organizational behavior. Areas such as control theory and goal setting both pertain to the effect of feedback on future behavior (Klein, 1989; Locke, 1968; Locke & Latham, 1990). These research streams reflect that positive feedback can result in increased motivation to perform a task. Similarly, feedback has been used as a tool of reinforcement whereby information about an employee's progress is given and as a result, the employee is able to assess how he or she is doing and is empowered to make changes about his or her performance.

Several studies have examined the effect of feedback interventions on performance; however, part of the building of knowledge is evaluating what has been

done in order to establish future directions for research. Meta-analysis has been a useful statistical tool in summarizing a body of research (Hedges & Olkin, 1985; Hunter & Schmidt, 1990; Stajkovic & Luthans, 1997). Kluger and DeNisi (1996) conducted a meta-analysis to assess the research on feedback interventions and the effects on performance. Because the findings on feedback and performance were variable, the authors attempted to determine the results from the preponderance of evidence.

Kluger and DeNisi reviewed over 100 articles that satisfied their inclusion criteria. The primary purpose of the study was to provide some explanation as to the large variance in findings of the feedback-performance relationship in the literature. The meta-analysis demonstrated that feedback interventions did lead to significant increases in performance. The authors determined through additional analysis that variability found in the research may be partially due to some moderators influencing the findings. Those moderators included variables such as the nature of the task and the type of feedback intervention. These findings were in alignment with results from previous studies (Komaki, Heinzmann, & Lawson, 1980; Welsh, Luthans, & Sommer, 1993a).

Feedback can be provided to employees if they know the criteria from which they are being evaluated. Wilson, Boni, and Hogg (1997) conducted a study of a law enforcement organization. Because the employees and police officers heavily interact with the public, the purpose of the study was to determine if customer service behaviors could be improved by task clarification training, positive reinforcement, and corrective feedback.

Task clarification training occurred by a process of interacting with the employees of the organization to ascertain the behaviors needed to provide quality customer service. This training was similar to training in organizational behavior modification, where functional performance behaviors are delineated and supervisors are trained to manage their employees with the goal of promoting those behaviors. The study demonstrated that the customer service behaviors of the subjects improved at a significant level. Further, the study highlighted the importance of obtaining input from employees in order to develop a list of behaviors needed for performance.

Studies have demonstrated that feedback can have a significant effect on performance in the retail industry. Newby and Robinson (1983) investigated the impact of individual and grouped feedback on promoting functional performance behaviors. In addition, the study was constructed so that a reward became a reinforcement intervention in the last phase of the study and served as a catalyst for future employee behavior. Based on information received from the organization, a number of functional performance behaviors were identified. Those behaviors included punctuality, check-out proficiency, the manner by which a cashier/employee balanced his or her cash drawer, and accuracy of the cash drawer (no shortages). These three factors became the dependent variables in the study.

The sample of the study consisted of employees in one drug store. One of the benefits of the setting was the equipment utilized by each employee. The equipment had an excellent measurement feature which tracked the amount of cash collected by the employee. Thus, more accurate performance data could be maintained. Newby and

Robinson utilized a modified reversal design (AB_1B_2AC). The phase B_1 referred to the intervention of grouped feedback and B_2 represented individual feedback. Phase C was the reinforcement intervention and individual feedback.

Data analysis demonstrated that individual feedback significantly increased functional performance behaviors when it was used alone and also when combined with the reward condition. The interesting aspect of the study was that the grouped feedback condition did not result in a significant increase in performance measures. The group-feedback intervention was developed so that the progress of all employees was posted publicly on the dependent variables. However, the insignificant results supported the strength of individual, specific feedback. It was possible that employees could not properly evaluate how their performance assisted or hindered the product of the group. Therefore, Newby and Robinson demonstrated that it was essential each employee know about his or her specific progress in order to reach higher performance levels.

Waldersee and Luthans (1994) evaluated the impact of positive and corrective feedback on performance. The study was quasi-experimental, and the setting of the study was a group of restaurants. The authors wanted to examine two types of feedback: positive and corrective. Similar to studies discussed in this section, the data indicated that the corrective feedback group was more successful in performance improvement than the positive feedback group. Both types of feedback were instructed to be specific, but the managers did have difficulty administering the corrective feedback based on their endorsement of more positive feedback models. Moreover, the corrective feedback group did not improve more significantly than the control group used in the study. However,

Waldersee and Luthans were able to contribute to the feedback literature through the data's evidence of self-regulation by individuals when receiving feedback and using that information to improve or maintain performance.

One of the issues in feedback research is the timing of the feedback. A study was done by Reid and Parsons (1996) that analyzed this issue. The authors' interest was different than traditional feedback studies because they were interested in a person's preference for the type of feedback he or she would receive. The sample consisted of employees who had the primary responsibility of teaching people with disabilities. The study was executed in two phases. During the first phase, the subjects made a choice as to whether they received immediate or delayed feedback in verbal form. In the next part of the study, the subjects received both types of feedback. At the end of the intervention, the subjects all noted that given the choice, they would prefer receiving immediate feedback.

The tool of feedback allows managers to control their workers in a positive manner. Some of the feedback studies have focused on the end goals of performance without regard to the desire of the employee. The primary contribution of Reid and Parsons (1996) is to demonstrate that the use of feedback is a win-win situation for the organization and the employee. Immediate feedback, administered properly through techniques like organizational behavior modification, can result in higher performance levels. Research indicates that employees prefer to receive information about their performance in this manner.

Certain industries must be conscious of the manner by which its managers provide feedback to its employees because of the direct implications to servicing clients. Human services is an industry that requires employees to give special attention to detail and quality is an important variable due to the dependency of clients on services. Working with the disabled requires a special type of training. Much of reinforcement literature centered around work in education and hospitals. With mentally retarded patients, reinforcement can be a tool to manage behavior. In a study by Fleming, Oliver, and Bolton (1996), the authors wanted to evaluate training given to supervisors who in turn would be responsible for the training of staff. The training received by the supervisors was based on a set of competencies essential to the operation of mental health group homes.

The supervisors, through the use of functional analysis, were trained to teach their staff how to work with disabled clients. Baseline levels of both the supervisors and staff were measured. The results of the Fleming et. al study were that supervisors were able to teach correct performance behaviors and that training translated into better performance among staff members. Thus, the use of behavioral management can be associated across industries and departments, including training and development.

Few studies have examined the use of feedback on the performance of graduate students. Houmanfar and Hayes (1998) conducted a study to evaluate the impact of feedback on the ability of graduate students to complete certain tasks. The tasks were specific to functional performance behaviors expected of graduate students at Research I institutions such as writing grant proposals, reporting to their advisors/supervisors, and

preparing conference presentations. The sample was composed of students who were either receiving a grade or stipend as part of their interaction with the graduate supervisors. The study was divided into two experiments.

In the first experiment, the researchers arranged for students to be given private and public feedback by their graduate supervisors. The primary research question was whether task feedback has any significant effect on the completion of tasks. Private feedback was in the form of written memos from the supervisors which provided information to the students about their progress towards completing their assigned tasks. Public feedback was given to the students in the form of posted graphs highlighting the progress of all subjects in the study. Instead of using names, each student was given a private code name so a level of anonymity was maintained.

Using a within-group reversal design, the researchers conducted the experiment over three to four weeks. The independent variable was the feedback intervention and the dependent variable was the extent to which the task had been completed. Baseline conditions were measured where supervisors provided no feedback. The data analysis revealed that feedback resulted in higher levels of completion than no feedback. However, during the reversal condition, the task completion rates did not return fully to baseline conditions. This finding was problematic with many reversal design studies where it has been difficult to construct an experiment in which conditions would return to the baseline after a reversal.

The next phase of the Houmanfar and Hayes (1998) study was to address any distinct differences between public versus private feedback on task completion. In other

words, the authors sought to answer whether one type of feedback would be more effective than the other. In addition, the authors wanted to measure how a certain type of feedback could affect the amount of verbal interaction between the student and his or her supervisor.

Again using a reversal design (ABAB), the data analysis revealed inconclusive results. When treated separately, neither public nor private feedback yielded any higher levels of task completion when compared to baseline conditions. Although there were no distinct effects among the performance measures of graduate students separated by feedback type, the study highlighted how valuable the effect of feedback can be on performance.

The effect of feedback on performance measures was also evaluated by Wilk and Redmon (1998). The primary objective with the study was to evaluate the impact of graphic versus verbal feedback. In addition, the authors wanted to evaluate the impact of goal setting and verbal feedback on employee performance. The researchers used a sample composed of employees with varying responsibilities of evaluating college applications. The setting was an undergraduate admissions department where there was a concern about declining college enrollment. Thus, it was very important that an admissions office paid particular attention to its efficiency and effectiveness of each application.

Each supervisor completed intervention training where the researchers provided instruction about feedback administration. The study consisted of several phases:

Phase 1: Baseline (no intervention)
Phase 2: Verbal feedback and goal setting
Phase 3: Graphic feedback and goal setting

The study lasted over four months in duration. Although Phase 2 of verbal feedback and goal setting revealed significant increases in performance across group type, the interesting aspect about the study was the phase of graphic feedback. The data analysis revealed the significant power in the use of graphic feedback as a method by which to increase performance. However, Wilk and Redmon (1998) remarked that it was the combination of graphic feedback and goal setting that enhanced performance, not graphic feedback alone. The present study sets out to prove that feedback, administered with techniques similar to goal setting, can be sufficient in the increase of performance.

Financial Rewards and Performance

Monetary rewards are frequently implemented in an organization as a means by which employees can improve on certain performance variables. Absenteeism and turnover are performance measures used by many organizations. Organizations are not only concerned about the financial costs associated with payroll and health care; there are also enormous losses of productivity and training costs when employees are not able to perform their assigned tasks due to absenteeism or they leave the organization. Thus, absenteeism and turnover are variables often examined by researchers.

One of the interesting studies that highlighted the compensation-performance relationship was conducted by Zenger (1992). The author studied two groups of engineers that worked for different firms. Zenger's premise was that pay-for-performance (PFP) and similar compensation systems only reward performance at the higher ends of

the continuum. Due to the unstable levels of compensation derived from these unequal pay systems, certain groups of employees were more likely to turnover.

Using a sample of over 900 subjects, Zenger determined that employees who performed at the extremely low levels were more likely to leave while those who have reached very high levels were more likely to stay. This conclusion was predictable based on other compensation research. However, the interesting finding was that performers who were earning moderate levels of compensation were also at risk of leaving the organization. With this study, Zenger verified the theory that many organizations only reward extreme levels of performance.

Landau (1993) conducted a study to evaluate the effectiveness of an intervention based on financial rewards. The researcher utilized a manufacturing setting. The value associated with this study was the organization first implemented a stricter disciplinary system to address absenteeism and tardiness. This type of policy was indicative of how organizations typically handle personnel issues. Over the period of 200 weeks, the researcher studied approximately 470 employees in the manufacturing organization.

Using a within-group design (ABC), Landau measured the dependent variables of absenteeism and tardiness over three phases in the study: A-baseline data, B-implementation of disciplinary system, and C-the addition of the reward system. The regression analysis revealed the disciplinary system did not have a significant effect on lowering levels of absenteeism and tardiness. A paired comparison t-test demonstrated that absenteeism was lowered by the system of interventions, but not at a significant level. Therefore, Landau provided a case for using reinforcement interventions which have been

proven, in this case, to be a valuable addition to personnel policies devised by management.

Behavioral research examines several aspects of performance; however, one of the important contributions behaviorists have made to the discipline is the improvement of safety. The costs associated with accidents, health care, and loss of personnel can be rather expensive. Austin, Kessler, Riccobono, and Bailey (1996) examined the effects of two types of reinforcement interventions to improve safety of a roofing crew. Feedback was used by Austin et. al to furnish information to roofers about their progress on the primary goal of safety. The subjects were also given the task of cost reduction and they received feedback as to the extent to which they had lowered labor costs. As the subjects lowered their labor costs, they were given monetary rewards. The subjects were able to improve their safety standards through the use of time off. In both parts of the study, Austin et. al showed the use of reinforcement interventions as a method by which to affect bottom line performance measures in the organization.

The trend in compensation research has been geared towards how to more effectively pay people, or how to tie pay to actual performance as opposed to position or organizational tenure (Gerhart, Trevor, & Graham, 1996). As organizations struggle with this issue, one of the primary concerns is the argument of the extent to which a job should be evaluated solely on incentive, as opposed to a base salary. As a result, some researchers have focused their efforts on the amount of compensation that is based on incentive and the resulting effect on performance.

Sundby, Dickinson, and Michael (1996) examined the preference of subjects to varying levels of incentive pay. They utilized a laboratory setting and subjects were undergraduate students. As a task, the students were involved in computer simulations and were able to choose pay systems based on different levels of incentive pay. The authors also incorporated the aspect of being responsible for expenses to be paid after their compensation. Sundby et. al's contribution to the compensation research was the recognition that choice in pay systems is related to the living expenses of the employee.

Using a within-group reversal design (ABAB), the authors were able to simulate a two year experiment. The choices available to the employees were 85% or 95% monthly living expenses as a percentage of pay. The incentive as a percentage of the pay system varied from 0 to 100% in 25% increments. As the percentage of the subjects' expenses increased, they preferred to choose a lower amount of incentive pay. One conclusion that can be inferred is that employees were concerned about their compensation due to their living expenses. Therefore, organizations must examine the issue of living expenses such as cost of living within the host city and determine an appropriate pay system. If employees cannot pay their living expenses because a large portion of their compensation is tied to performance and perhaps unrealistic goals, organizations run the risk of losing employees to turnover as they attempt to obtain jobs where the pay system has more base pay.

The aforementioned studies discuss the effect of positive reinforcement interventions on performance variables such as productivity, safety, and absenteeism. However, research indicates that although very successful tools, managers do not use

these interventions in the organization (Komaki, 1982). One of the primary factors in managers' hesitancy to implement positive reinforcement is centered around their inability to successfully apply those interventions. While there are other factors mentioned in the article related to personality and various cognitive factors, it would be extremely difficult for top management to modify those factors.

Although the organization could devise training programs to evoke attitude change within the individual, attitude change does not necessarily translate to behavior change (Ajzen & Fishbein, 1977). There is no simple way to determine if an attitude change has occurred during training and in many cases, the training does not have the desired effect. Cognitive theories like trait theory have not been successful in providing researchers and practitioners with the prediction and management of behavior, despite several decades of research (Pervin, 1994). Thus, organizations could provide training about how to manage the environment through the use of external contingencies. Administration becomes a key element in the effectiveness of positive reinforcement because without proper training, managers will still be unable to provide positive reinforcement to their subordinates in a manner that results in performance improvement.

The use of effective positive reinforcement in organizations has been most associated with organizational behavior modification (Luthans & Kreitner, 1975). The technique of organizational behavior modification, or O. B. Mod., has been empirically demonstrated to be very effective at increasing desirable performance behaviors and decreasing dysfunctional behaviors that hinder performance.

Background on O. B. Mod.

As an alternative to managing the cognition of the individual, O. B. Mod. provides a means by which behavior can be predicted and managed. Organizational behavior modification (O.B. Mod.) has provided a process by which mangers can positively affect performance (Andrasik, 1979, 1989; Hamner & Hamner, 1976; Kreitner & Luthans, 1984; Luthans & Kreitner, 1975; Luthans & Martinko, 1987; Luthans, Paul, & Taylor, 1986). A combination of organizational behavior and behavior modification, this technique had its initial roots in Skinnerian operant conditioning and later Bandura's social learning theory (Luthans & Kreitner, 1985).

O.B. Mod. differs from the traditional training offered by cognitivists who focus on the psychological framework for each organizational member. While Nord (1969) advocated the use of operant conditioning in management theory and practice, Luthans sought to develop a model that could provide practitioners with an application model that could manage the performance of the worker (Luthans & Martinko, 1981). However, because of the complexities of cognition and the inability to change and manage attitudes of the individual, it is important for organizations to choose management tools that will allow them more predictive and management control over their employees.

The primary focus of the initial O.B. Mod. model is derived from Skinnerian principles that behavior is a function of its consequences (Luthans & Kreitner, 1975). This premise shifts the emphasis away from cognition which cannot be predicted with a significant degree of reliability compared to the prediction of behavior. Edward Thorndike (1911) conducted research which explored the "connection" between the

stimulus and response which focused on the consequence of behavior. Thorndike (1913) stated:

> When a modifiable connection between a situation and a response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased. When made and accompanied or followed by an annoying state of affairs, its strength is decreased. (4)

He found that certain situations or stimuli would be associated with rewards or punishments. His work provided an important contribution to behavioral psychology because it demonstrated a association between the situation and the effect. The basic premise can be discussed in terms of the Law of Effect which can be stated as follows (Luthans & Kreitner, 1975):

> 1. Behavior followed by positive consequences will increase the subsequent frequency of that behavior.
>
> 2. Behavior followed by negative consequences will decrease the subsequent frequency of that behavior.
>
> 3. Behavior followed by no consequences (positive or negative) will at first increase the subsequent frequency of that behavior, but then will decrease the subsequent frequency of that behavior.

A positive consequence (or reinforcer) is defined as anything that leads to an increase in desired behavior frequency. Conversely, anything that leads to a decrease in behavior frequency can be referred to as a negative consequence (or punisher, not negative reinforcer).

In order to utilize O. B. Mod. as an application model, a series of five steps are suggested (see Figure 1). The useful aspect about this model is that O.B. Mod. has applicability across cultures (Welsh, Luthans, & Sommer, 1993a, 1993b), across

performance measures (Pedalino & Gamboa, 1974), across functions such as marketing (Martinko, 1986), and across industries such as manufacturing and service (Luthans & Martinko, 1987; Luthans, Paul, & Baker, 1981). In addition, the technique has been tested in content analyses (Andrasik, 1989) and most importantly by a recently completed meta-analysis (Stajkovic & Luthans, 1997) as having a positive impact on performance in organizations.

Steps in O. B. Mod.

The first step in organizational behavior modification is an identification of the critical performance behaviors for the organization (Luthans & Kreitner, 1975). This identification can be accomplished through planning of overall and departmental objectives for the organization. These objectives can be developed through the organization's top management and/or with input from all employees. It will be difficult for this tool to be useful if the objectives are too broad because of the difficulty in measurement that can occur. In terms of this study, an identification of behaviors must be made in order to determine the functional behaviors in this manufacturing operation. It is essential that the identification of behaviors be very specific to the needs of the organization.

The next step of behavioral management is to measure a baseline of the appropriate behavior as well as the inappropriate behavior. This is accomplished by measuring the frequency or how often the behavior occurs. For the purposes of this study, it is important that measurement (quantitative data) of the performance of the employees be gathered. In terms of functional behavior, the baseline measure provides a

starting point for the manager to measure subsequent progress after the intervention as well as to reveal the extent to which the problem or appropriate behavior is occurring.

The next step of O. B. Mod is to conduct a functional analysis that would identify the antecedents to behavior, the behavior itself, and the consequences of that behavior [ABC analysis] (Luthans & Kreitner, 1975). An examination of antecedents to the identified behavior may identify deficiencies that prevent the workers from doing the appropriate behaviors leading to effective performance. Most importantly, however, are the consequences of the behavior. Are these consequences appropriate for the behavior to lead to performance?

The fourth step of O. B. Mod is to develop an intervention strategy. The intervention strategy serves as the tool used to enact positive change within the organization. These will be the interventions tested in this study: (1) monetary rewards administered through a traditional pay for performance system, (2) feedback administered with a behavioral approach, (3) supervisor attention and recognition administered with a behavioral approach, and (4) monetary rewards administered with a behavioral approach. The last step of organizational behavior modification is to evaluate the interventions to make sure there is the desired impact on performance. This is the primary purpose of the study.

Several studies have been conducted to demonstrate the value of positive reinforcement interventions on performance measures. However, managers are still reluctant to utilize these techniques in the work environment. Komaki (1982) conducted interviews of 60 managers as to the reasons why positive reinforcement was not

incorporated into the daily operations of the organization. One of the reasons that managers did not reinforce was due to cognitive factors. Many respondents felt that to give positive reinforcement would be to diminish their feeling of authority. These respondents did not want to be perceived as weak by their subordinates. Therefore, they associated positive reinforcement with "soft" management skills, implying ineffective techniques.

Another reason positive reinforcement was not given by surveyed managers was due to the reactions of the employees. The study's subjects commented that employees were very suspicious when their managers gave them positive feedback or recognition. Moreover, respondents reflected that recognition of their employees was not appreciated by the subordinates. For instance, a supervisor may have commented on an employee's performance improvement; however, the employee either did not respond or perceived the compliment as an insult. These sentiments highlight the miscommunication that occurs within organizations. The aforementioned factors can inhibit positive reinforcement from being administered, but these factors also emphasize cognitive issues. The cognition of an individual is very difficult to change and is not easily addressed by the organization or managers.

Another set of factors given in the Komaki (1982) study was the organizational environment. Managers did not perceive that they had enough time to convey positive reinforcement. The respondents noted the number of assignments in their daily activities and how time constraints prevented them from attending to their employees. Another reason dealt with the manner by which they could provide positive reinforcement. The

respondent noted that they did not possess the tools or resources necessary to evaluate performance of their employees. Thus, it was difficult for them to use graphical feedback if they 1) did not have good, objective measures of performance and 2) they did not have the tools via appraisal forms or instruments to provide feedback to the employees.

The final set of the factors cited by the respondents in the Komaki (1982) study was the lack of skills the managers had in providing positive reinforcement. Managers did not know how to give positive reinforcement to their employees. Subsequently, the subjects surveyed did not recognize employees because they were lacking the skills needed to administer reinforcement. The manager's lack of information as to how positive reinforcement can benefit the organization was another factor related to the problem of reinforcement.

It is not difficult to understand why if managers could not see the utility in positive reinforcement, they would not use the tools. This set of factors reflects a lack of information on the part of the manager and it is this set of factors that is easier to handle by researchers and consultants. The section above explains the method by which managers can administer positive reinforcement more effectively, organizational behavior modification. The next section provides research which demonstrates the benefits associated with using positive reinforcement interventions.

Previous Research on Reinforcement Interventions Administered with Behavioral Management

Studies to date have been conducted that support the use of behavioral management. For example, Luthans, Paul, and Baker (1981) examined the effect of

contingent reinforcement on a group of sales clerks. The researchers chose a research design of one experimental and one control group. A set of categories were established in order to measure a baseline level for each group. Using observation techniques of data gathering, a trained group of individuals was responsible for unobtrusively assessing current performance.

After assessing the current situation of the salespeople, a set of functional and dysfunctional behaviors were denoted and explained to each salesperson in both groups; thus, satisfying the first step of the O. B. Mod. model. A functional analysis was conducted and the researchers discovered that salespeople were often managed with negative reinforcement. As a result, positive reinforcement was suggested and approved as a new method by which salespeople could be managed. The experimental group was given the possibility of rewards with the execution of functional behaviors.

After a contingent positive reinforcement plan was instituted, the results revealed the experimental group outperformed the control group in the area of performing appropriate retailing behaviors. In addition, the frequency of dysfunctional performance behaviors decreased in the experimental group. Even when the intervention concluded and performance measures were taken, the experimental group continued to behave with more appropriate behavior than the control group and did not return to baseline levels of initial measurement.

Several explanations were derived from the maintenance of performance levels. Employees were given rewards such as time off, money, and drawings for paid vacations. After the intervention was withdrawn, supervisors, who had been trained with a

behavioral approach, administered other types of positive reinforcement interventions such as feedback and social recognition. Subsequently, the expected performance decline after intervention withdrawal did not take place. However, the authors were able to empirically demonstrate that the use of positive reinforcement interventions can translate into successful performance levels within an organization.

This experiment was replicated by Luthans, Paul, and Taylor (1986). The authors attempted to replicate the study and to develop a research design that would yield better reversal once the intervention had ceased. In the initial experiment, the termination of the intervention did not result in a decrease in performance, as would be the case with other reversals. The researchers instituted tighter experimental controls by ensuring that supervisors administered no type of positive reinforcement intervention. The researchers found that indeed the reversal could be demonstrated after the intervention's removal. This reversal provided empirical evidence that the intervention of positive reinforcement was responsible for the adjustments in the behavior frequency. The replication of the earlier experiment also followed the traditional method of building knowledge in the sciences (Stone, 1978) and increasing a better of understanding of the phenomena of behavioral techniques.

Luthans, Kemmerer, Paul, and Taylor (1987) examined the impact of a job redesign intervention on the functional performance behaviors in the retail industry. Integrating concepts prevalent in traditional job design theories, the authors promoted the use of observation as a research design tool in order to enhance the effectiveness of the quasi-experimental design. The sample consisted of two groups, one experimental and

one control group. The experimental group were trained according to specific behaviors necessary for good performance.

The study used an ABA design. The baseline data were measured for two weeks, the intervention took place for two weeks, and the intervention was withdrawn and data were taken for an additional two weeks. Luthans et. al found that the behavioral intervention was positively related to an increase in the level of functional performance behaviors and a decrease in the appearance of dysfunctional behaviors. One of the key contributions made by this study was the increased methodological rigor as it related to the use of observation, which was a more quantifiable method as opposed to the use of instruments which were characteristic of traditional job design studies.

Luthans and Davis (1990) discussed the power of behavioral management within the context of other service organizations. The authors, in an extensive literature review, discussed the findings of the behavioral management model in the improvement of performance in service industries. They provided evidence of O. B. Mod.'s success in the retail, restaurant, and banking industries. Luthans and Davis denoted the importance of identifying functional performance behaviors as being an essential element in the success of the model. Further, they noted that although service and manufacturing may different along some dimensions, the use of the behavioral management can still be very effective in the objective of performance improvement.

A study that supported the use of feedback as an effective reinforcement technique was conducted by Williams and Luthans (1993). This laboratory experiment utilized a 2X2X2 factorial research design with conditions varying as it related to choice of reward,

feedback/ no feedback, and an activity reward (the opportunity to take breaks) versus an outcome reward (time-off pay, bonus pay). Some subjects were able to choose their rewards and type of feedback. In cases where subjects chose their rewards and/or feedback, it was hypothesized that choice would lead to increases in performance because the individuals would feel that they had more control.

The sample consisted of 149 business students. An AB experimental design was incorporated. Performance measures were the quantity of output and the quality of output. There were manipulation checks to ensure that subjects felt they had a choice of rewards. It was found that subjects in the choice condition performed better than no-choice subjects. Those students who had no choice and no feedback were lower performers than those who had choice, feedback, or choice and feedback. The study's significant findings provided more evidence for the effectiveness of participation and feedback on performance.

Reinforcement was also the basis for a study conducted by Welsh, Bernstein, and Luthans (1992). Based on the Premack principle of reinforcement, this study was based on the premise that there was a hierarchy of reinforcement in alignment with the behavior of individuals. In order to test this principle, the researchers studied the behavior of workers in a fast food restaurant. Using an observation method of data collection with a multiple baseline within-subjects design, trained observers watched workers in the environment and denoted raw frequency data as it related to the error ratings received by each worker.

The Premack principle was verified in this organizational setting because as the worker's error rating decreased, the individual received the opportunity of working at a preferred work station. The data analysis of Welsh et. al's study indicated support for the Premack principle. When the individual received a higher consequence associated with lower errors, the worker emitted appropriate behaviors that might be lower on the hierarchy. Thus, the premise that managers can utilize a positive reinforcement intervention in conjunction with the Premack principle provided more support for O.B. Mod.'s increased usage in organizations.

The presence of the Premack principle was also shown in a study conducted by Makin and Hoyle (1993). In their study using engineers as the sample, the authors used a longitudinal design over the span of one year. The data from the study indicated that the Premack principle was valid in the engineering environment. The authors also concluded that reinforcement interventions of social recognition as well as positive feedback were successful in improving performance. Subsequently, this study provided a case for using feedback and social recognition as positive reinforcers.

Similar studies supporting the use of feedback and supervisor attention like praise have been generalized to other settings (Nordstrom, Hall, Lorenzi, & Delquadri, 1988). Using a government as the setting, the authors investigated the use of organizational behavior modification training in a three-part study. O. B. Mod. training was given to a group managers responsible for supervising the group in each sample. The sample was different for each part of the study in terms of job type, duties, and responsibilities. In the first experiment, Nordstrom et. al demonstrated an increase in performance for a group

of clerk-typists through the use of goal setting and reward. Using the proven intervention of feedback and praise, the sample in the second part of the study consisted of two typists. The analysis revealed an increase in the performance behaviors of typing speed and quality (reduction of errors, accuracy). The sample in the last part of the study was a group of inspectors whose primary performance behavior was the number of inspections completed. Using a positive reinforcement intervention of time off, the performance of the inspectors increased significantly. The contribution of Nordstrom et. al was to demonstrate the implementation of O. B. Mod. as a guide for managers while sustaining and improving the organization's operational activities.

The use of reinforcement techniques has been shown to be effective not only in service organizations (Luthans et. al, 1981; Luthans et. al, 1986; Luthans & Davis, 1990), but in the manufacturing sector as well. Welsh, Luthans, and Sommer (1993b) conducted a study to replicate techniques implemented in the retail industry and subsequently transfer those techniques to another culture. Using a group of textile workers in Russia for the sample, the researchers implemented an intervention that would utilize positive reinforcement techniques such as praise and social recognition, as well as corrective feedback. The supervisors were responsible for providing the reinforcement and were trained by a researcher to do so.

Welsh et. al also utilized a reversal design and observation for their study. Allowing the sample to serve as the experimental group and its own control group, the researchers found a decrease in dysfunctional behaviors and an increase in functional behaviors. However, when the intervention was withdrawn, the researchers did not find a

complete reversal back to the baseline measurement. There were explanations that could be attributed to the lack of reversal such as the impact of the intervention was so strong that the residual effects impacted the ability to see changes in behaviors. Despite the absence of a strong reversal, Welsh et. al provided empirical evidence that positive contingent reinforcement can be effective in changing employee behavior.

Welsh, Luthans, and Sommer (1993a) also examined the transferability of U.S. motivation techniques to a Russian manufacturing setting. The authors used a within-subjects design in order to assess the following techniques: behavioral management, extrinsic rewards as operationalization of positive reinforcement, and participative management. A reversal design was used as is common with reinforcement and O. B. Mod. studies. A data analysis found that positive reinforcement and behavioral management interventions such as feedback can significantly improve the performance of manufacturing workers. Thus, it can be inferred that reinforcement and behavioral management interventions have validity cross-culturally. The U.S. participative management technique did not fare as well in the Russian plant possibly due to cultural differences. The cultural environment of Russia did not provide a climate conducive to a management style where workers are invited to participate in the decision making process. Therefore, this Welsh et. al study signified the power of reinforcement interventions, the success of behavioral management, and the cross-cultural validity of O. B. Mod.

Komaki, Heinzmann, and Lawson (1980) conducted a study that examined the impact of feedback and training on issues of safety improvement. Using four groups that

comprised a sample of 55 subjects, the authors used observation in a multiple baseline research design. In addition, the researchers conducted a functional analysis to reveal the antecedents and consequences of behavior, similar to the O. B. Mod. third step of A-B-C functional analysis. In this experiment, the feedback given to employees took the form of graphs representing improvements in safety. Komaki et. al found groups that experienced only safety training did not perform functional behaviors as well as groups that experienced training and feedback. This study empirically found that reinforcement is an effective intervention in behavior modification in a manufacturing setting. This conclusion has been supported when reinforcement techniques like O. B. Mod. have been compared with other theories such as Theory D (Luthans & Thompson, 1987).

Zohar and Fussfeld (1981) conducted an O. B. Mod. type of study in a manufacturing setting. Taking their research setting as this textile plant, a reinforcement intervention of a financial reward system was implemented to increase the use of safety precautions. Zohar and Fussfeld utilized a longitudinal design in a span of over a year. The data obtained, with the use of observation, was analyzed and it was concluded that the utilization of safety precautions increased in the presence of a positive reinforcer such as monetary rewards. Thus, this study added to the literature that a positive reinforcement intervention of monetary rewards can positively impact safety behaviors in addition to performance. Improvements to safety have also been improved in the presence of social reinforcers (Smith, Anger, & Uslan, 1978).

The method of reinforcement can also impact the effectiveness of the technique (Ferster & Skinner, 1957). Yukl, Latham, and Pursell (1976) investigated the impact of

continuous versus variable ratio schedules of reinforcement. The authors used a sample of 28 workers who were reinforced monetarily according to different schedules. Yukl et. al found that continuous reinforcement yielded higher levels of productivity. This finding was in keeping with the principles in O. B. Mod. that support the notion that feedback must be immediate. Thus, more effective interventions may be those in which there is immediate, as opposed to delayed, reinforcement.

Using a multiple baseline design, TaFleur and Hyten (1995) studied the performance of hotel banquet servers based on several conditions, including monetary rewards. The rewards were extended to the worker based on performance measures of accuracy, customer ratings, and timeliness. The performance of the workers increased significantly along these dimensions. When the intervention was withdrawn and returned to the baseline on two occasions, the performance decreased. This withdrawal method substantiates the case for the success of the positive reinforcement intervention.

Smoot and Duncan (1997) evaluated the use of different pay incentive systems on task performance. The systems studied were flat (much like traditional systems), linear-accelerating, and a system that negatively accelerated as performance increased. Students were assigned to the three pay systems and were asked to produce a simple widget. The results from this study were very interesting. The authors found the three pay incentive systems did have a positive impact on task performance. However, the negative-accelerating incentive system had the most significant positive impact on performance, supporting the premise that pay-for-performance compensation is an effective method to increase task performance.

The present study is similar to Smoot and Duncan (1997) in that it does evaluate a monetary incentive system. However, it is more comprehensive for three reasons. One, the present study is based on the results of a meta-analysis (Stajkovic & Luthans, 1997), while the other study is an attempt to add to the growing literature of reinforcement. In addition, the present study takes place in a field setting, while the Smoot and Duncan study uses subjects in a controlled study without the contextual issues of a "real world" situation. Finally, the present study also incorporates the use of non-financial reinforcement interventions. Smoot and Duncan give little consideration to the power of feedback and attention and recognition as important reinforcement interventions that can positively impact performance. Therefore, the present study has more possible value to researchers and practitioners.

The above literature review has provided a base for the field study. This study explores the following specific hypotheses derived from the literature and specifically the Stajkovic and Luthans (1997) meta-analysis:

Hypothesis 1: Each reinforcement intervention will significantly increase worker performance outcomes.

Hypothesis 2: The monetary reward intervention, administered using the O.B. Mod. model, will have a greater impact on worker performance than will traditionally administered (no systematic application approach to it) pay for performance.

Hypothesis 3: There are no significant effect magnitude differences in worker performance among the O.B. Mod. administered reward interventions of money, performance feedback, and supervisor private recognition/attention.

This study examines the use of three types of reinforcement interventions as having a direct effect on individually measured performance and quality. The next chapter evaluates the design of the study to test these hypotheses.

CHAPTER III

DESIGN OF STUDY

Research Design

The two primary research designs utilized in behavioral management studies are control-group and within-group designs (Komaki & Jensen, 1986). In many behavioral studies where reinforcement interventions are used, it is essential that every effort must be made to rule out alternatives that could confound significant results, in order for the researcher to draw any conclusions. If these research designs are not used, possible factors can act as alternative explanations as why the results are significant or not significant. The section below outlines possible problems associated with traditional research designs, the benefits and disadvantages of using both types of research design, and a justification of the research design chosen for this study.

When conducting research in the organization, normal daily operations are being executed, in spite of the study that is being done. Therefore, a study has the risk of being impacted by situational factors resulting from life in the organization. Ideally, the organization presents a wonderful opportunity to test theories without the sterile environment of the laboratory. However, because these contextual factors can adversely affect the results of the study, researchers view the following variables as contaminants.

Maturation refers to the possibility that during the course of the intervention, subjects will be affected by time and gain wisdom (Cook and Campbell, 1976). If this wisdom is not part of the treatment, then maturation becomes a threat to internal validity.

In order to reduce this possibility, the experimental design should be one in which both groups utilized have equal chance of exposure to maturation.

Regression is another possible contaminant in a field setting study (Cook & Campbell, 1976). There are cases where members of the treatment groups are randomized on the basis of some pretest or baseline measure. Thus, certain groups are stratified according to some level of achievement. Regression is a threat to internal validity because those lower-pretest score groups will probably have lower-posttest scores relative to other groups. It would be difficult to infer conclusions about populations based on a treatment because of the contaminant of regression in the findings. Careful consideration should be given to the placement of subjects into groups so that the ability of members will not be the primary factor of selection, unless that is part of the intervention.

Another potential threat to internal validity is the factor of history (Cook & Campbell, 1976). In a field setting, there are situations and events which could take place during the study, between the baseline measurement and the intervention. For instance, a change in leadership, a decrease in the amount of work available, or the introduction of new equipment are all possible events that could alter the results of a study. As with the aforementioned threats of maturation and regression, history can also be a contaminant and interfere with the interpretation of the study's results. History is also difficult to avoid, depending on the nature of the event.

A longitudinal design can affect the study because of changes in the organization and/or society that will occur over time. One potential risk with time is the threat of

economic recession/change. There is always the possibility that an organization could be debilitated financially during the course of the study. However, longitudinal studies are needed to study the impact of time. Interventions such as those administered in this study bring more value to academic research and to the organization if implemented over a period of time.

Support from top management is a key factor in the success of the study. During a study where interventions have to be administered and researchers may need to be on-site for role clarification purposes, organizational participants may feel the pressure of being observed. The obtrusive manner by which data are collected can be detrimental to the effects on the dependent variables and the overall study, including an increased pressure from top management to end the study before its completion. Therefore, it is essential that management be supportive of the study's objectives, which will then pass down to the lower levels of the organization.

Traditional Design

Control group design is widely used in scientific research in a number of disciplines such as biology and psychology (Komaki & Jensen, 1986). This type of design allows the random assignment of treatment and control groups where one group experiences the intervention and the other group is treated with no special condition. The design equalizes the groups on all dimensions except the treatment. In the case of behavioral sciences like organizational behavior, the working conditions are maintained; however, one group experiences a treatment.

The major issue concerning control group design in organizational research is that it is difficult to arrange this setup in work settings. First, it is difficult to convince management to allow disparate treatment among their employees for any period of time. If treatment is given to one set of employees and another group is held constant, there is the potential for demoralization of human subjects. In order to use control groups, there must be a commitment among researchers and the organization's managers that either 1) the duration of the intervention is short, 2) both groups will reverse the treatments and the treatment group will then become the control, or 3) eventually, the intervention, if successful, will be expanded to include all groups.

Another problem with control group design is the environmental changes within the workplace. During the period of the intervention, there could be personnel changes where a employee formally in the control group now becomes a part of the intervention group (Komaki & Jensen, 1986). The reverse could also occur. This contamination in the experimental groups could lead to erroneous conclusions after the data analysis has been run because there may be subjects that have experienced both conditions.

Within-Groups Design

While the control group design has several advantages, the within-group design can be a more useful tool when conducting research in work settings (Luthans & Davis, 1982). This design allows one to use a group who can serve as its own control group. The comparisons across different interventions are made with the same group. This design also assists in the continuous monitoring of the group that is often needed with intervention administration.

The decision to use a within-group design is based on different reasons specific to the researcher's goals. In work settings, consideration should be given as to the ability of the researcher to use random assignment and the administration of the intervention to a treatment group while there is a control group receiving nothing. While the researcher and management can work together to decide on the use of the control, ultimately, the decision is made by the organization. Another consideration when using the within-group design is the potential for collecting information on certain areas of interest. The research with this design has been used to study issues like safety, quality, and performance.

A third consideration of using within-group design is the possibility of returning to baseline conditions. Management in the organization may be fearful of ending certain treatments such as a monetary incentives program, or a withdrawal of an important safety program. There are certain areas of research where the design, subject to its implementation, could have detrimental effects on the organization's performance measures. Thus, a cost-benefit analysis must be conducted to evaluate the inherent risks in the intervention and the manner by which it is implemented.

One type of the within-group design is the reversal. There are different reasons why reversal designs are utilized. Large group sample sizes work well with reversal design. This design also has been used when measuring various behaviors such as sales performance and safety. Reversal designs can also be used with a control group. The reversal within-group design (also referred to as ABA) consists of three phases. First, baseline data is collected prior to intervention on all the dependent variables to be

measured throughout the study. Second, the intervention is administered and the dependent variables are measured. Next, a reversal occurs which is a cessation on the administration of the intervention. Finally data on dependent variables are collected.

Some advantages exist with the reversal design. First, this design allows cause-effect relationships to be inferred without a control group (Stone, 1978). Thus, this design is easier to construct in a work setting because fewer people will be needed, one group is easier to manage, and there may be more agreement of its use with management because it is not intrusive into the daily working environment. Second, because measure of the group occurs twice sans the intervention, the design allows the researcher to evaluate the soundness of the intervention. If, in fact, the reversal data indicates a return to baseline levels, the researcher can infer the treatment caused the differences in performance during the intervention period.

The multiple-baseline within-group design is an alternative to the reversal design. As with the reversal design, this tool does not require a control group to draw conclusions about an intervention's success. Researchers use multiple-baseline design because two or more baseline measures can be taken simultaneously and the researcher can choose when to introduce the intervention period across the different groups. The multiple-baseline design has more flexibility than the reversal design. Types of multiple-baseline design include 1) across groups, 2) across people, 3) across behaviors, and 4) across settings.

Based on the availability of groups for the present study and the guidelines of the organization, several groups could be utilized, separated only by shift. One of the positive reinforcement interventions is monetary rewards. This intervention would be

difficult to study with the reversal design because of the requirement that the intervention be withdrawn. As management indicated, once a monetary incentive is provided, the withdrawal of the reward could lower motivation in the staff as well as pose potential personnel issues. The organization used in the study is very hesitant to end an intervention like money because of the ramifications on subsequent performance. In addition, different reinforcement intervention types were being implemented (money, feedback, and supervisor recognition). Therefore, a reversal design would not be appropriate.

Study Site

The study took place within a large manufacturing operation located in two facilities in one metropolitan area. The largest division of this operation that had three shifts in both facilities was the site of the study. The facilities were located several miles from each other in one large city. This division was responsible for processing billing and mailing work for the organization's several hundred financial institution customers. High productivity and quality were very important for the organization and errors could not be risked without significant loss to the company's reputation for high performance.

This organization's commitment to quality and high performance can be easily demonstrated. It allowed itself to be included in benchmarking studies among its peers and outperformed all competitors. The organization attempted to be very responsive to employee needs and to have the flexibility needed for the changes of the 21st century. Thus, the organization was agreeable to explore the comparison of different types of reinforcement interventions in order to potentially improve performance.

This organization had detailed procedure to measure performance. One benefit in using this organization is that the company has the ability to obtain very accurate measures. Productivity was measured at the division, team, and individual level. In keeping with its strategic goals, this organization accounted for its costs and its performance measures in great detail. Important to this study was the fact that individual data can be obtained for each employee on a daily basis, tracked by employee number. This was accomplished by electronic meters at each employee's work station. As the product was printed, the meter adjusts accordingly. Work was performed during three schedule shifts that were relatively equivalent in terms of the workload assigned to each shift and each location.

Study Design

The nature of this study suggested that a within-groups, A-B design be used. Because the effect of a reinforcement intervention is being examined, it would be more appropriate to use a longitudinal design so that the effects over time can be studied. Part of this study included an analysis of archival performance data in this division. The archival data will serve as the baseline measure which will be compared to the performance data collected during the intervention. In addition, collecting data over a four-week period will increase the strength of the results in terms of the power of the four reinforcement interventions.

A pre-post design of measurement was needed with this type of study (Cook & Campbell, 1976; Komaki & Jensen, 1986; Stone, 1978). A baseline measurement was taken of the productivity and quality over a two-month period. This assisted in

accounting for variability due to cyclicality of the business in this division. The pre-post measure of performance was taken in order to effectively judge the performance levels of the workers. In some cases, an increase in performance could be observed; however, the increase may not be statistically significant. A measurement must be attained of the extent to which there was a increase over the baseline average for each group.

The type of work, experience and skill of the workers, and company policies and management were held constant for all groups. The type of reinforcement intervention was the independent variable and the quantifiable measures of performance were the dependent variables. Dependent variable performance measures were the hard data on productivity. This measure was very important to the success of this organization.

Approximately 182 workers in three shifts of two facilities in the largest division of this production operation were used as subjects. The four groups of approximately 50 workers in each shift at the two facilities were as follows:

1. Monetary Rewards using a Traditional Pay for Performance Approach
2. Monetary Rewards using a Behavioral Management Approach
3. Feedback on Performance Behaviors (PIGS)
4. Supervisor Private Recognition/Attention

The supervisors and team leaders in all four intervention groups received O. B. Mod. training before the intervention went into effect. This O. B. Mod. training ensured that the background principles and specific steps were clearly understood and the intervention was executed properly. This training workshop involved instruction on the means by which each intervention is properly administered. In addition, the researcher

worked with each supervisor throughout the four-week period as a coach and facilitator to ensure these interventions were being executed according to training guidelines.

O.B. Mod. Training

Three groups of managers and supervisors took a two and a half hour training session about behavioral management. In addition, staff specialists also participated in the training. Each training session was identical; however, the reinforcement intervention they were trained to use differed among the three groups.

Identify

In this first step the supervisors in the three groups were asked to identify critical performance-related behaviors that would improve worker performance. The means by which these behaviors could be identified were briefly discussed. However, supervisors were instructed to consult staff specialists and obtain input from the workers themselves. Often, workers who know the most about their jobs, can be instrumental in this process because they can assist in identifying those performance behaviors that make a positive difference. After a discussion during the training session and before the intervention began, the identification of performance behaviors included: (1) the examination of all orders at the beginning of a run, (2) the choosing of "like" setups, (3) verification that all needed materials are present before the beginning a run, (4) verification that equipment is set properly (correction and detection are set), (5) verification of regular quality and sequence checks, (6) providing assistance to others during down time created by defective machines or waiting for new materials, and (7) maximizing time (e.g., when to schedule

and punctuality from breaks and lunch). The aforementioned behaviors are observable, measurable, and most importantly, performance-related.

Measure

Measurement involved two levels. At the micro behavioral level such as those mentioned above, the supervisors were instructed to get frequency counts (usually on a work sampling basis that they were familiar with) in order to get a baseline measure of the performance behaviors identified in step one. The purpose of this procedure was to get objective measures of how often the critical behaviors were occurring under existing conditions. Sometimes these measures revealed that there was a bigger deficit than expected and sometimes it was found that there was really no problem. The measured micro level behaviors played an especially important role in the performance feedback intervention group where the supervisors provided the information gathered directly to their workers. In the monetary reward and supervisor attention/recognition interventions, the supervisors used the frequency data primarily for their own information, without presenting it to the workers. The second-level of measurement in this step deals with the products of the performance behaviors, the performance outcomes gathered from objective production records from each individual's work station. This second-level baseline was gathered from archival records for a representative one month period preceding the experiment.

Analyze

In this step, the supervisors in all three O.B. Mod. groups were trained on how to perform a functional analysis which involves identifying the antecedents and the

consequences of the behavior identified in step one. This A-B-C analysis examines antecedents such as equipment, materials, training, and communicated expectations. The so-called "gun-to-the-head" question served as a guideline. The supervisors were to analyze the antecedents to their workers' behaviors with the question, "Can he or she perform the identified critical behavior with a gun to his or her head?" If the answer is no, then this is an antecedent's problem (e.g., faulty equipment, ineffective training, unknown expectations) and it must be corrected.

Most often, however, the answer to the hypothetical gun-to-the-head question is that, yes, the worker can perform the functional behavior if his or her life depended on it, but they are not doing it. The supervisor trainees were reminded from behavioral theory that antecedent cues only set the occasion for the behavior to be emitted, the reinforcing consequences must be there for these cues to take on stimulus control properties. Thus, in this analysis, the consequences of the performance behaviors became most critical. The supervisors were trained in identifying the consequences (or their absence) of the performance behaviors. Remembering the basic premise that behavior is a function of its consequences, the usual reward systems of being paid every two weeks or month or with a year-end bonus or profit share, are noncontingent consequences for the behaviors identified in step one. The supervisors used this functional analysis as background for developing the intervention in the next step.

Intervene

This is the action step in O.B. Mod. and was the experimental manipulation in this study. Each of the three O.B. Mod. groups were trained in and used a different reward

intervention to manage the performance behaviors that were identified, measured, and analyzed in the first three steps. The procedures are outlined below.

Monetary Reward. The reinforcement interventions of monetary rewards (no O. B. Mod.) and the monetary rewards using O. B. Mod. will occur at one site in order to minimize the threat to internal validity of diffusion of treatment and lessen the risk of resentful demoralization (Stone, 1978). Because both groups will receive monetary rewards, interventions one and two will be conducted at the same site. For the purposes of the study, the researcher, in conjunction with management, developed a monetary reward system called Average Plus. Using the baseline month's average performance for each individual, there was a 20 dollar payout for each 500 unit per day increase. Thus, if a worker has historically produced at a level of 11,500 in the baseline month and after the intervention produces at a rate of 12,000, he or she will receive an extra $20. A worker who produced 46,000 units per day during the baseline month and 48,000 units during the intervention would received an extra $80. Thus, this intervention allows each individual to be judged on his or her performance only, which can reduce the amount of peer pressure experienced by individuals when a select group of people are rewarded for superior performance.

The monetary group not subjected to the O.B. Mod. approach to behavioral management simply had this pay-for-performance plan announced at the beginning of the month through regular organizational channels. In contrast, the supervisors in the O.B. Mod. monetary group carefully communicated at the beginning of the month and then continuously throughout to their individual workers that the monetary contingency

consequence would be forthcoming when they exhibited the critical performance behaviors identified in step one. Workers were also provided with ongoing assistance if they needed further clarification regarding the specifics of the program. As a manipulation, the on-site researcher verified that the supervisor clearly pointed out the types of behaviors that would increase workers' performance and that this would result in the monetary benefit.

Feedback on Performance Behaviors. During the O.B. Mod. training workshop the supervisors/ team leaders were asked to identify a set of critically important, high impact behaviors necessary for task performance. Each supervisor/ team leader used the PIGS (positive, immediate, graphic, and specific) approach to administer this feedback intervention. This approach served as a feedback guideline for supervisors in this group (Luthans, Hodgetts, & Rosenkrantz, 1988). Each supervisor was responsible for identifying functional performance behaviors specific to the employee. The administration of the intervention allowed the supervisor to graphically present feedback to the employee on a private, individual basis. The on-site researcher verified that the supervisors were indeed contingently providing performance feedback in a prescribed manner.

Supervisor Private Recognition/Attention. The intervention of supervisor private recognition, similar to the feedback intervention, depended on carefully training the supervisors/ lead people in this group. They were given instruction on the use of contingent social rewards for the identified critical performance behaviors. Supervisors were explicitly instructed that administering attention and recognition was not to be

"sugary" praise or a "pat on the back." Rather, the intention was to simply let the worker know that the supervisor "knew" that he or she was doing the behaviors previously communicated to be important to performance.

The organization had a history of recognizing employees for certain performance goals. However, the organization ran into the aforementioned problem because the recognition/attention given by the organization as a whole was considered to be fake. For instance, there was a wall that showcased different types of public rewards that tried to exemplify various goals accomplished. However, in speaking with many of the employees, one of the recurring comments was, "Well, anybody can be on the wall. If you're not recognized on the wall for something, that's when you know there's a problem." Thus, the process by which management had attempted to reward employees had ceased to become a positive reinforcer. The primary issue associated with positive reinforcement is the determination of what will be reinforcing to employees in a significant way to increase performance.

Because of the problems with giving effective reinforcement, the supervisors had to learn through training the manner by which appropriate recognition can be given. For example, the supervisor should say things such as, "I noticed that when we were doing preventive maintenance on your machine, you went over and helped out the new person," or "When I was walking through your area on my way to the office this morning, I saw you making a sequence check, that's what we're really concentrating on." As with the feedback intervention, the researcher monitored and coached the effectiveness of each

supervisor/lead person in his or her execution of this intervention throughout the four-week period.

Evaluate

In this fifth and final step of O.B. Mod., the supervisors in all three groups were instructed to monitor if the identified behaviors are increasing and performance is improving. The baseline measures at both the micro behavioral and overall performance levels gathered in step two were gathered used as the input and comparison in making this evaluation. If the behaviors and/or performance were not improving over these baseline measures, then the supervisors were to increase the intensity or try a slightly different style in administering their respective interventions. Also, if the evaluations did show increases in overall performance, they are to reexamine existing and/or identify other possible critical step one behaviors.

Data Analysis

Because of the use of hard performance data, the first part of the analysis outlined the descriptive statistics associated among the four groups as well as the baseline versus intervention data. The primary tool for analysis consisted of a t-test analysis. Paired-samples t-tests were used to compare the within-group baseline month performance with the intervention month to capture individual employee effects. Independent-samples t-tests was used to determine the between-group differences in relative performance changes of the two monetary rewards groups.

CHAPTER IV

DATA ANALYSIS

Manipulation Checks

Following the administration of the four week intervention, each supervisor was asked to denote the type of reinforcement he or she was using for his or her group. In other words, did each supervisor know the intervention he or she was supposed to be using for their respective group? Due to the fact that the reinforcement interventions were administered according to shift, there was a lessened opportunity for confusion. However, special care had to be given so that the feedback and supervisor recognition would not be contaminated. Often, managers wanted to issue some type of recognition/attention with feedback. Thus, it was very important that the researcher be at the site periodically so that supervisors administered the correct intervention. The responses to the manipulation check question indicated that the supervisors were aware of their reinforcement interventions, specific to the group.

Descriptives

Types of Parametric Tests Used. When evaluating data, researchers are attempting to use samples that could be representative of the larger population (Bryman & Cramer, 1994). Therefore, one of the assumptions when calculating parametric statistics is the concept of normality. Data used in an analysis should be similar to data obtained with different samples of the population studied. As part of the analysis, one of the parametric tests is the concept of skewness. Skewness attempts to evaluate the distribution of the data for normality and how data values fall in relation to the mean.

Along with the value of skewness, kurtosis refers to the extent to which the data points cluster around a central point. A leptokurtic distribution refers to a curve more peaked and a platykurtic distribution characterizes a flatter distribution than a normal curve would display.

The data collected in this study required that an examination be made of within-group and between group differences. In order to evaluate within group differences (baseline to intervention), the primary tool of evaluation of the data was the t-test of related means. This parametric test allowed for the performance measures of the same subjects to be evaluated for their differences, the first measure taken at the baseline and the second measure taken after the administration of the intervention (Bryman & Cramer, 1994). A t-value is calculated by comparing the pairs of means by subject and computing a difference value. This difference value is then divided by the standard error associated with this difference in means. In order to reject the null hypothesis which states that no differences exist between the two conditions, there is a hurdle value or range statistic with which the t-value is compared. If the calculated t-value is greater than the hurdle value, the null hypothesis is rejected and support is found for the study's hypothesis.

In order to explore the between-group differences, a t-test for unrelated means was applied. The test allowed for means from different samples to be compared. In this study, the samples utilized were the different work groups evaluated. The t-value is determined by finding the difference between the means and then dividing that difference by a standard error of the difference in means. In a normal distribution, the standard error of the difference in means would also be normally distributed. The closer the t-value is to

zero, the higher the probability that a conclusion can be made that the mean difference is due to chance and not due to the intervention administered.

Statistics. Sample sizes for the four groups were as follows:

Type of Group	Sample Size (n)
Money-no O.B. Mod.	50
Money-O.B. Mod. training	43
Feedback	39
Supervisor recognition	50

Analysis of sample size revealed no significant differences due to size. The data revealed that from baseline to intervention, all groups experienced an increase in performance levels. Comparing raw numbers from baseline to intervention, the group receiving financial rewards using a behavioral approach experienced the largest increase (See Figure 2).

Performance, the dependent variable, was measured based on the number of units produced. Each employee was responsible for printing credit card statements for various bank card institutions. In the group with monetary rewards administered through a traditional pay for performance system (PFP), the average performance for the group during the baseline period was 163,157.40 units, σ=64,621.68. The minimum value in the baseline group was 23,530 units while the maximum value was 338,439 units. The baseline distribution had a skewness value of .501 which indicated a positively skewed distribution where there were fewer data points close to higher values. The kurtosis for the baseline group was .517 which signified a slightly peaked distribution than a normal curve, a leptokurtic distribution. Most of the productivity numbers were at the closer to lower values of 100,000 to 175,000 units.

This traditional pay-for-performance group increased performance during the intervention period and raised their mean productivity level to 181, 272.25 units, σ=52,601.99. The performance data during the intervention had less deviation from the mean than the measurement during the baseline. The difference from baseline to intervention was 18,114.85 units. The minimum during the intervention period rose significantly to 100,226 units and the maximum dropped slightly to 285,784 units. In reference to the distribution, the intervention values formulated a normal curve with a slight skewness value of .124. The positive value was indicative of the fact that most of the values center around the mean value of the group. The kurtosis value for the intervention of this group was -1.061 which indicated that the data are distributed with a more platykurtic distribution. Therefore, the distribution of the traditional pay-for-performance group went from a peaked to a flatter distribution. However, based on these parametric tests, the data only formed a slightly skewed distribution.

The group with monetary rewards administered through O. B. Mod. started at a lower baseline level with a performance of 132,147.49 units, σ=50,712.80. When evaluating the skewness of the baseline measure, the value for this statistics was .748 and a kurtosis value of 1.294, denoting a peaked distribution where the distribution was positively skewed. During the baseline measure of performance, the set of data values ranged from a minimum of 26,459 units to a maximum statistic of 289,012 units, signifying a wide performance difference within the group which was also apparent in the PFP group.

However, this same group experienced higher levels of performance during the intervention period by reaching 174,055.51 units, σ=61,448.71. Consequently, there was more variation from the mean than in the baseline measurement. The group with O. B. Mod training had more performance improvement with a unit difference of 41,908.02 units. With the intervention, the minimum productivity value in the intervention group was 17,441 units and the maximum statistic rose to 320,401 units. The distribution in the intervention group was negatively skewed, which indicated that the data values tended to lean towards the higher values in the plot. The baseline distribution was more leptokurtic than the intervention's data values because the kurtosis value was .367. Thus, although the monetary rewards group (administered with traditional PFP) produced the highest number of units, its baseline score was much higher than the other groups. Consideration must be given to the level of performance improvement which can be observed in mean differences.

The groups with nonfinancial positive reinforcement interventions also experienced higher mean differences than the monetary rewards group (administered with traditional PFP). Feedback administered with O. B. Mod. produced an average of 107,915.69 units (σ=68,035.56) at the baseline, increased their performance to a mean level of 129,194.68 (σ=79,898.37), with a difference of 21,278.99 units. The minimum data value during the baseline period was 15,747 units while the maximum value was 158,383 units. When evaluating the distribution, the baseline period yielded a positively skewed, platykurtic distribution. The baseline distribution had a skewness value of .708 and the kurtosis value was -.361.

The intervention period of the feedback group had a minimum data value of 16,554 units which was slightly higher than the baseline minimum value. The maximum statistic in the feedback intervention group was 348,411 units. The distribution of the intervention was positively skewed with a slightly peaked distribution. The skewness value was .982, not substantially different than the skewness of the baseline and the kurtosis was computed to be .490. Therefore, when comparing the baseline to the intervention feedback group, many of the data points were towards the higher values in the distribution.

The group with the supervisor recognition intervention had a mean baseline performance of 106,910.70 (σ=55,519.46), but increased to a productivity level of 132,635.12 units (σ=91,262.29) during the intervention period. During the baseline period, the minimum statistic was extremely low with a value of 1,806 units of performance while the maximum value was 212,677 units. The data distribution was negatively skewed with a platykurtic distribution. During the intervention period, performance increased the minimum and maximum values to 3,352 and 426,647 units, respectively. The intervention distribution yielded a very positively skewed plot of the data that is very leptokurtic. The skewness value was -.281 in the intervention group and kurtosis was calculated to be .986. Thus, from the baseline period to the intervention, the skewness in the data shifted from more productivity measures at the lower values to more data points at the higher values in the distribution.

Summary of Results

The use of positive reinforcement interventions administered with O.B. Mod. resulted in a substantial increase in worker performance similar to the Stajkovic and Luthans' (1997) meta-analysis of 20 years of O.B. Mod. research. The average increase for the three groups was 25 percent. Broken down per group, the performance increase was as follows: (1) money administered as traditional pay for performance-11 percent, (2) O.B. Mod. administered monetary rewards-31.7 percent, (3) O.B. Mod. administered supervisor attention/recognition-24 percent, and (4) O.B. Mod. administered performance feedback-20 percent. These increases are significant because they are directly related to bottom line issues.

Another dependent variable was the incidence of errors made by employees. The errors of concern to the organization were issues such as the orders being inserted incorrectly. In addition, a major error would be if the error was caught outside the organization; by a customer or another recipient of the organization's service such as a bank card holder received two statements, one of another customer. These errors could mean a significant loss of business, including the termination of a contract. Thus, millions of dollars are at stake. When the baseline measure was taken, the organization had sustained three errors of significance. However, during the month of intervention, there were no errors detected. Therefore, quality had increased significantly, thereby increasing the level of customer service.

Table 1 detailed the increase in performance across the four reinforcement interventions at a significant level when making comparisons of the baseline performance

measurement to the worker performance in the intervention month. It was hypothesized that all groups would experience a significant increase in performance. Each group experienced positive increases in productivity after the intervention was administered. The monetary rewards group under the traditional pay-for-performance system ($t=2.01$, $p<.05$), and the three positive reinforcement interventions (administered with O.B. Mod.) of monetary rewards ($t=4.35$, $p<.05$), performance feedback ($t=2.04$, $p<.05$), and supervisor attention/recognition ($t=2.42$, $p<.05$), had significant increases in employee performance. Thus, Hypothesis 1 was supported.

In order to test Hypothesis 2, a between-groups t-test analysis was conducted in order to assess the differences between the two monetary rewards groups, the traditional pay-for-performance system and the O.B. Mod. approach. The second hypothesis anticipated that money administered with a behavioral management approach would yield greater results in performance than money administered in the traditional manner. The analysis revealed that monetary rewards administered using a systematic O.B. Mod. approach was significantly different than using traditional pay-for-performance administration ($t=1.80$, $p<.05$). Thus, supervisors trained under the O.B. Mod. process were able to experience higher levels of performance from their employees than those without the O.B. Mod. training. Therefore, support was found for Hypothesis 2.

Hypothesis 3 was tested through examining the magnitude differences among the reinforcement interventions administered with O.B. Mod. Planned comparisons revealed that there were no significant differences among the three groups of O.B. Mod. administered monetary rewards, performance feedback, and supervisor

attention/recognition. In order to test this hypothesis, a between-groups analysis was conducted by comparing the three reinforcement interventions administered with a behavioral management approach. When comparing the money (O. B. Mod.) group and performance feedback (both administered with a behavioral approach), a t-test revealed that there were no significant differences between the two groups ($t=1.45$, $p<.20$). The data revealed that using a behavioral approach to administer monetary rewards and performance feedback can yield similar results. Thus, the first part of Hypothesis 3 was supported.

Next, the between-group differences of money and supervisor recognition/attention administered with O. B. Mod. were examined. The t-test also revealed no significant differences between the two groups ($t=1.11$, $p<.30$). The second part of Hypothesis 3 was also supported. The data indicated that distributing monetary rewards using a behavioral approach can be just as effective as a supervisor providing some private recognition to individuals, both interventions strictly performance-based.

Thirdly, a t-test analysis was conducted to evaluate any differences between performance feedback and supervisor attention/recognition. The analysis demonstrated that no significant differences existed between the two groups ($t=1.16$, $p<.25$). Thus, the analysis provided support to the use of nonfinancial positive reinforcement interventions without inferring superiority to any particular method. It may be that the administration of those interventions was the significant factor in this analysis. Workers in the study desired positive reinforcement and were able to perform at a significant increase; however, there were no significant differences among the type applied to the group.

A post-hoc analysis was processed in order to solidify the findings obtained through the analysis of the t-test. A one-way analysis of variance (ANOVA) was initially conducted to evaluate any between-group differences between the baseline and the intervention. Essentially, the question was to determine if the intervention period administered by the supervisors had any significant effect on the productivity level of employees when compared to the baseline measure of the four groups or simply, to determine if any difference existed between the two conditions. The analysis of variance revealed that there were differences between the baseline and intervention groups ($F(5,270)=6.351$, $p<.01$). Thus, the ANOVA revealed that beyond chance, there was a factor that accounted for the differences in productivity in the baseline versus the intervention measure. This analysis expanded to include the sample as a whole.

Another part of the analysis was to conduct comparisons between the groups studied. The F-test used with one-way analysis of variance allowed the researcher to determine the existence of difference; however, the procedure did not denote the specific groups of difference. Although the t-test analysis demonstrated the specific differences found, additional examination was used to verify the groups. The Tukey test allowed those comparisons to be examined. The Tukey procedure can allow comparisons between groups that are a part of a larger group by utilizing a mean difference score (Bryman & Cramer, 1994; Hopkins & Glass, 1978; Keppel, 1991). This method conducts the comparison by determining the minimum difference between the group means that would allow the null hypothesis to be rejected. In conjunction, the Bonferroni test was also applied on the data. The Bonferroni test was similar to the Tukey procedure;

however, the test raised the standard by adjusting the significance level applied to the different comparisons made (Bryman & Cramer, 1994). Namely, if a mean difference is calculated and compared to a range statistic evaluated with a different significance level, the ability of the data to still indicate data significance was more pronounced.

A Tukey procedure was performed and the findings were analogous to those revealed with the t-test procedure. In the baseline measurement, the group that earned monetary rewards through a traditional pay-for-performance system was found to be significantly different from the group under both feedback and supervisor recognition/attention conditions at the $p<.001$ level. The Bonferroni test, with the adjusted significance level, revealed similar findings. In this case, under the baseline measurement of the monetary rewards group (with no O.B. Mod.) was significantly different from the feedback and recognition groups.

Our primary interest was to determine the effect of the intervention on those four groups. Using the Tukey test, the monetary rewards group (with no O. B. Mod.) was determined to be significantly different than the feedback and social groups. The Bonferroni test yielded similar results to the Tukey test. The aforementioned findings were effective supplementary analysis to the study due to the results computed with the t-test analysis. The group that earned monetary rewards administered with O. B. Mod. was not significantly different than the feedback and supervisor attention/recognition groups under the O. B. Mod. system when the post-hoc comparisons were calculated. However, O. B. Mod. was found to be effective when comparing feedback and recognition to

conditions without O. B. Mod. Thus, the post-hoc comparisons provided support that administration of positive reinforcement interventions does matter.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Results of this study provide evidence about the effect of positive reinforcement interventions on the performance of workers in a manufacturing setting. The findings add to the body of literature that indicates positive reinforcement interventions can significantly increase task performance. The results also demonstrate the results of different administration techniques and provide evidence that it is the manner by which interventions are implemented that distinguishes the performance increases from other techniques.

Monetary Rewards-Pay for Performance

The data analysis indicates that workers had higher levels of productivity under this intervention. This finding provides additional evidence to support the growing body of knowledge of pay-for-performance literature (Lawler, 1990). However, this intervention supports a pay system that, while distributing compensation based on performance levels, still does not apply an approach that will yield greater benefits. As has been supported throughout the study, using a behavioral approach can enhance a traditional pay-for-performance system by providing more focus in its administration because this approach is based on performance behavior, not performance through any means.

Without empirical research, it would be difficult to justify to practitioners why these traditional methods are not as effective because the literature used by most managers under a PFP system is that the monetary incentive alone is the key factor. One

of the contributions of this study is that a comparison is made of the two methods. The data infers that monetary incentives administered with O. B. Mod. provide a more effective method of implementing an intervention. Thus, managers should consider models like O. B. Mod. when training to use positive reinforcement.

Feedback with O.B. Mod. Training

Data analysis revealed that feedback with O.B. Mod. training can be an effective means of improving task performance. Through the training, supervisors were given assistance as to how to provide good feedback-feedback that is positive, immediate, graphic, and specific (PIGS). They used graphical charts for each employee to illustrate some functional behavior for improvement. This proved to be very beneficial for supervisors and employees because the intervention forced supervisors to evaluate their employees' performance behaviors and it also assisted the employees in managing themselves. Through between groups analysis, feedback was just an effective means of increasing performance as recognition and monetary rewards with the same training.

Supervisor Recognition with O.B. Mod. Training

Often employees are not recognized for their performance or they are recognized so much and so publicly that the effect of attention on performance is negligible. This organization attempted to do several public recognition events and there were several indications that almost everyone in the organization had been awarded some certificate for menial accomplishments that were not performance related. As a result, employees did not care about those recognition devices and hated the publicness of that attention.

With this intervention, as cited earlier in the chapter, supervisors issued private recognition to their employees. This private acknowledgment was very instrumental in the increase of task performance. The distinguishing aspect of this recognition was that it was performance related. Further, the recognition was done periodically, so, the acknowledgment becomes more meaningful to the employee. Subsequently, this intervention was as statistically significant as feedback and monetary rewards with O.B. Mod. training.

Monetary Rewards with O.B. Mod. Training

The data analysis indicated that this intervention had the highest levels of productivity, with just an initial inspection of the data. This finding demonstrates that administration of compensation matters. The results correspond to Lawler's (1990) argument that money cannot be distributed without an effective strategy. However, although organizations realize that money given cavalierly will not necessarily translate into higher performance outcomes, there is still no systematic manner to distribute money based on functional performance behaviors which will lead to outcomes. This study, in addition to previous research, advocates the use of behavioral management as a consistent and effective means of promoting higher performance levels.

Analysis of Validity

Construct validity is supported due to the type of study utilized. The dependent variable of performance was quantified and directly measured calculated by the machines worked on by each employee. The independent variable was the type of intervention administered. Extensive training was provided to each supervisor administering the

intervention to ensure the intervention was implemented properly. Thus, there is confidence in the implementation of the independent variable and what was being measured.

Data collection is an important aspect of any study due to issues of validity. Without an effective data collection method, it would be difficult to draw any sound conclusions about proposed relationships among variables. There is strength in the study's findings due to the manner by which the data was obtained. Data for the dependent variable of task performance was gathered through the performance records kept by the organization. Each machine used by the employees had the capability of recording their output very precisely. Through the use of this unobtrusive measure, there was a reduced likelihood of error than if employees were responsible for recording their own performance. The use of directly measured productivity as the dependent variable enhances the construct validity of performance.

A threat to the internal validity of the study was due to mortality. In order to find archival data to use for a pretest measure, there was consideration given to cyclicality resulting from the type of work done in the division. As a result of finding representative and equivalent data, there were some subjects that had pre-test measures but left their jobs by the time posttest measures were taken. In order to reduce the effects of mortality, only employees working during both measures were kept in the study for the data analysis.

Maturation is another threat to internal validity. This threat pertains to the issue of effects that will be a function of time as opposed to treatment factors. Some managers

were concerned about administering interventions to those people with shorter versus longer organizational tenure. The idea was that employees might not be eligible for the financial rewards due to the fact that they were newer and would not be able to attain the high productivity levels of others within their respective groups. However, one of the benefits of the financial reward program developed (Average Plus) was that it evaluated the employee according to his or her increase in performance. Therefore, the employee's competition was his or her own past performance, not those of more seasoned employees.

The O.B. Mod. training extended to the organization's supervisors was very detailed. Supervisors were given explicit instructions as to the reinforcement intervention he or she was administering and how that administration was to take place. However, there was a possibility that supervisors might forget what they were to supposed to do or that they might administer the wrong intervention. In order to lessen the threat of heterogeneity in the extent of the treatment implementation (Stone, 1978), researchers periodically worked with the supervisors across shifts to ensure proper intervention administration. This diminished this threat of internal validity. Manipulation checks at the end of the intervention period revealed that the supervisors understood their role in the study.

Another threat to internal validity was the potential of compensatory rivalry (Cook & Campbell, 1976). This threat dealt with the fact that the groups might start to compete with each other if there is any public recognition of what each group is receiving in its intervention. There was a risk with the study because some groups received monetary rewards and some groups did not. In addition, the site where the nonfinancial

interventions occurred was relatively new to the organization and work allocation between the two sites was very competitive. This threat to internal validity was diminished because the sites were a significant distance away from each other. In addition, top managers were very supportive of maintaining a level of confidentiality throughout the duration of the intervention.

There is a threat to external validity due to the use of one organization for the sample. It is not certain that the results obtained with this sample can be generalized to different organizations. There may be circumstances that are unique to this organization such as their best-in-class status that may be factored into the findings. Future studies should replicate this study in different sectors, including those in the service industry. However, the use of the behavioral management intervention has proven to have an effective impact on performance measures (Stajkovic & Luthans, 1997).

With field setting research, there is the possibility of treatment contamination in the sample. It is possible that subjects will find out about the other treatments and then one might encounter the issue of demoralization of subjects. In the study, financial and nonfinancial reinforcement interventions were used; thus, some treatment groups did not receive the Average Plus program or additional financial rewards. In order to lessen the effects from the intervention differences, there was one treatment per shift. Further, the financial and nonfinancial interventions were administered at different sites. This proved to be very helpful because in interaction with subjects during all shifts at both sites, no subjects inquired as to the other treatments being administered or seemed to have knowledge of the other interventions being conducted.

CONCLUSIONS

Implications for Research

This study follows the process of building knowledge. In order for organizational behavior to develop as a strong field of study, careful consideration must be given to the way by which we "come to know." Stone (1978) discusses the scientific method which consists of 1) observation of phenomena in the "real world", 2) development of an explanation of those relationships among variables, 3) prediction about those relationships, and 4) verification of those predictions. The scientific method is a continuous, iterative process. In this vein, researchers must answer the call of future research proposals such as the one made by Stajkovic and Luthans (1997). Their meta-analysis was based on over 20 years of research. Based on the meta-analysis, the authors were able to verify the behavioral approach's impact on task performance. Using the tool of meta-analysis assists us in the assessment of our knowledge in a particular area. The results of the meta-analysis subsequently became inputs for the present study.

This study provides additional support for the behavioral approach to management. Organizational behavior modification, though often ignored in the literature, remains an effective and proven approach to managing behavior in organizations. Stajkovic and Luthans (1997) demonstrated that this approach can lead to significant increases in task performance. Therefore, the benefits of this approach are evident. Future research should consider the other call these authors made in their article- the impact of O.B. Mod. in service organizations. This study is limited to the manufacturing sector.

Future Research

There are some areas of future research. One implication is that when employees are managed so that only critical performance behaviors are reinforced, the non-essential dysfunctional behaviors have the potential of being diminished. Reinforcement theory should be used to handle other organizational issues like the development and maintenance of an equitable work environment. Managers and supervisors could be trained on how to reward employees who are demonstrating the proper performance behaviors associated with a diverse work environment. A behavioral approach to diversity could yield bottom-line benefits to the organization.

Another area of future research would be to study the impact of developing and implementing intervention strategies that are composed of multiple interventions. It was originally proposed that a combination of monetary rewards, feedback, and supervisor attention/recognition would yield the most productive results. However, the scope of the study and the guidelines of the management did not allow for the testing of that hypothesis. It would be interesting to examine the impact of a combination intervention on performance outcomes.

Implications for Practice

This study answers a call from managers and professionals to link theory with practice. Researchers are often accused of developing frameworks which have no utility in organizations. The use of a behavioral management approach allows managers to be trained to motivate employees which results in higher levels of performance. This study's results demonstrate that behavioral management can work if supervisors have the proper

training. Further, the study advances the body of research relating to compensation administration.

One interesting finding of this study concerns the impact of nonfinancial reinforcement interventions on task performance. Based on the between-groups analysis, the study demonstrates the power of feedback and supervisor recognition. Under the groups receiving financial and nonfinancial rewards through O.B. Mod. training, there were no significant differences among these interventions. As organizations search for ways to motivate employees without substantial increases in their costs, nonfinancial methods such as feedback and recognition/attention will become more powerful tools in terms of cost reduction while at the same time, maintaining high productivity levels.

This study responds to the findings of a meta-analysis. The study's findings demonstrate the power of positive reinforcement interventions on task performance in a manufacturing setting. The study also demonstrated that financial and nonfinancial interventions can be equally effective when administered with a behavioral management approach. With the constant changing environment in which employees are working, there is a chance that they will feel less motivated to perform when issues of fragile employment exists. Using interventions such as those in the study can offset the reduced motivation employees may feel. This study also provides proven tools for managers who want systematic procedures to increase performance levels, which subsequently impact bottom-line outcomes.

As organizations search for methods by which to reward employees, researchers have a responsibility to work in tandem. Consequently, statistical methods such as the

meta-analysis and re-examination such as the present study allow managers and researchers to uncover solutions to the growing pay-for-performance dilemma. One of the intentions of this study is to assist both parties in developing a body of knowledge. In addition, the use of positive reinforcement can be transferred to other issues in the organization, such as the creation and enforcement of diverse and equitable environments. As organizations transition into the next century, managers will be faced with the challenge of promoting functional behaviors among all employees in order to improve performance outcomes.

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Table 1

Descriptive Statistics

Type of Group	Mean (measured in productivity units per group)	Standard Deviation
Monetary (no O. B. Mod.)		
Baseline	163,157	64,622
Intervention	181,272	52,602
Monetary (with O. B. Mod.)		
Baseline	132,148	50,713
Intervention	174,055	61,449
Feedback		
Baseline	107,916	68,036
Intervention	129,194	79,898
Supervisor Attention		
Baseline	106,911	55,519
Intervention	132,635	91,262

Table 2

Paired Comparison T-tests for Performance

Four Week Intervention Period

Comparisons	t
Monetary Rewards (PFP vs. O. B. Mod.	1.80*
Monetary Rewards with O. B. Mod. vs. Performance Feedback	1.45
Monetary Rewards with O. B. Mod. vs. Supervisor Recognition/Attention	1.11
Performance Feedback vs. Supervisor Recognition/Attention	1.16

*p<.05

Figure 1
Luthans' Organizational Behavior Modification Model

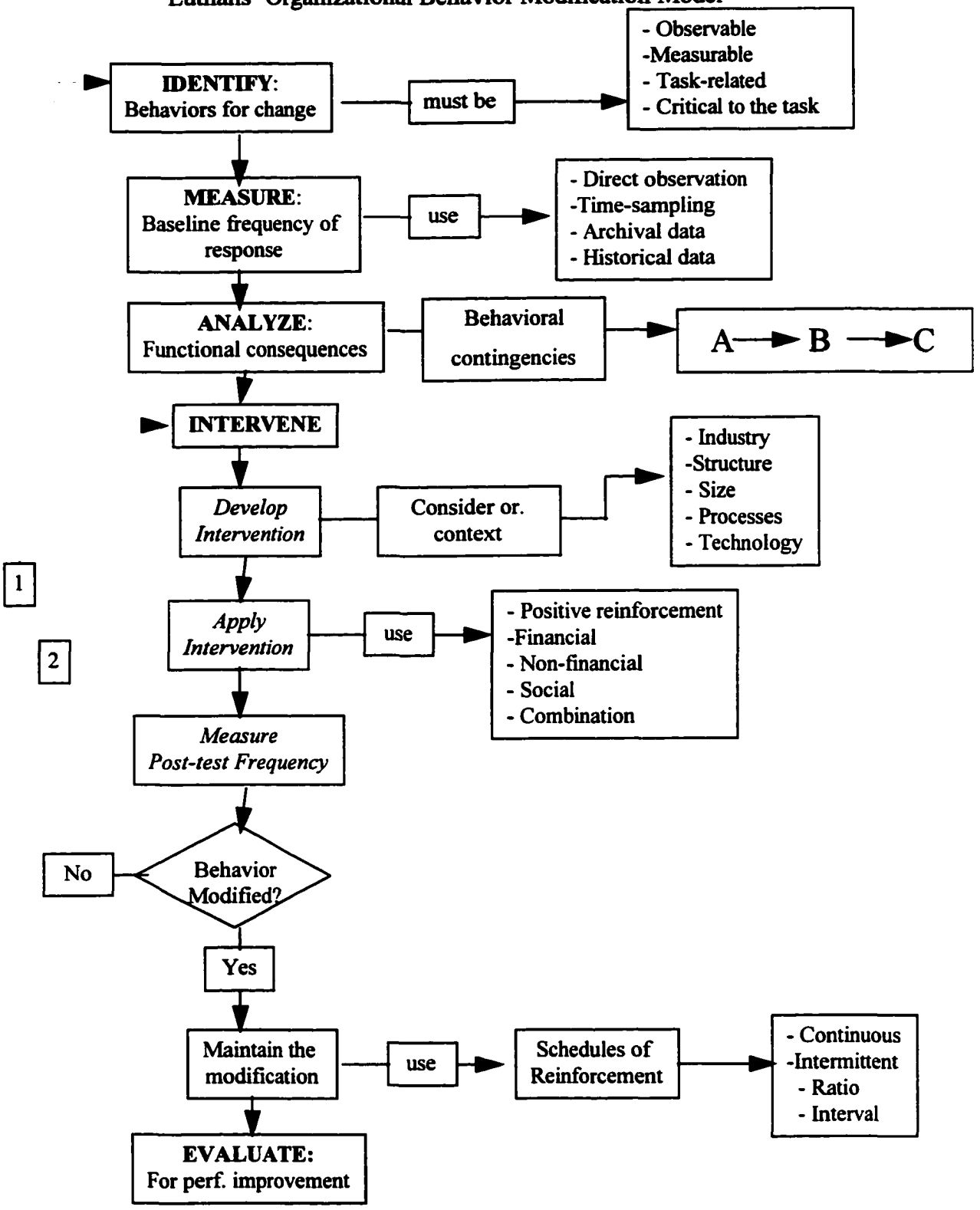


Figure 2

Graph of Relative Performance Improvement after Intervention

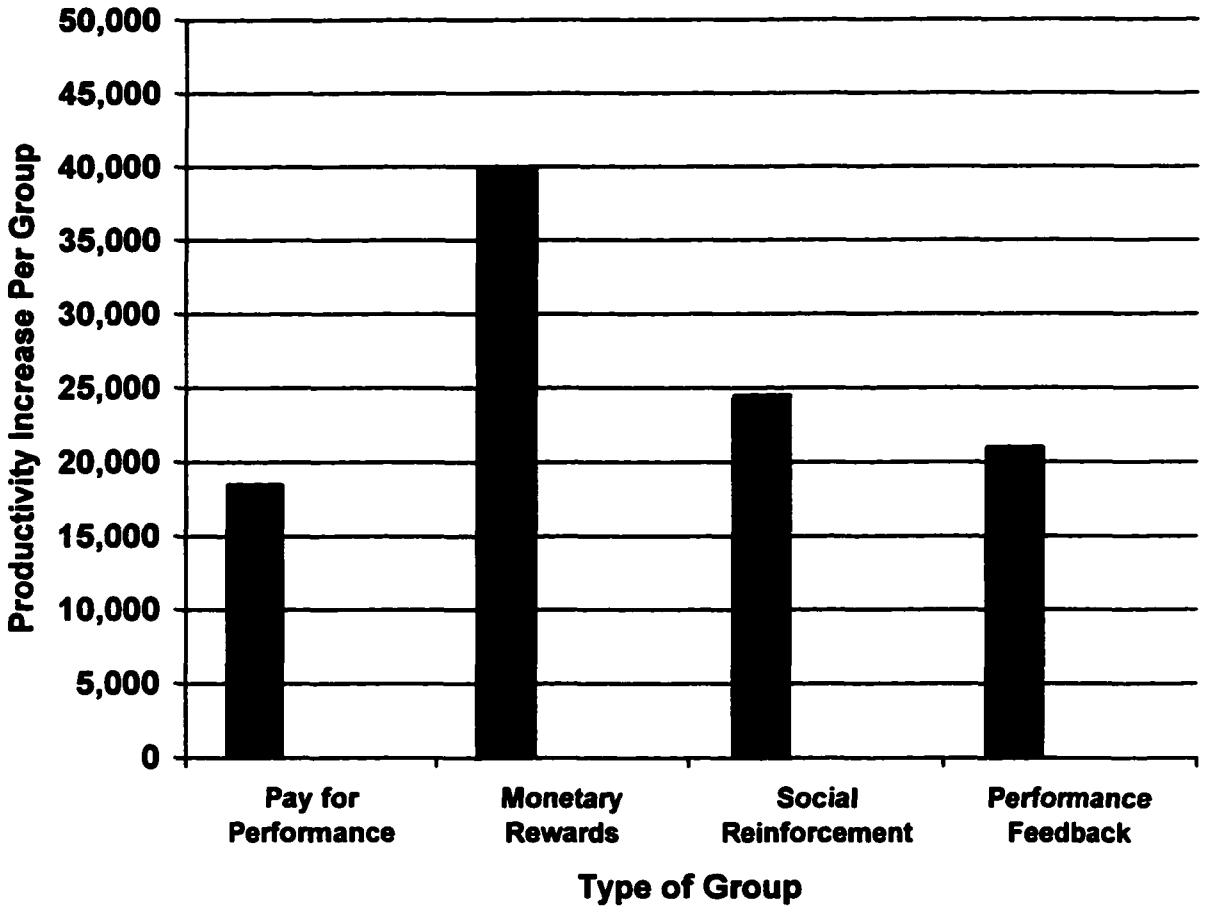
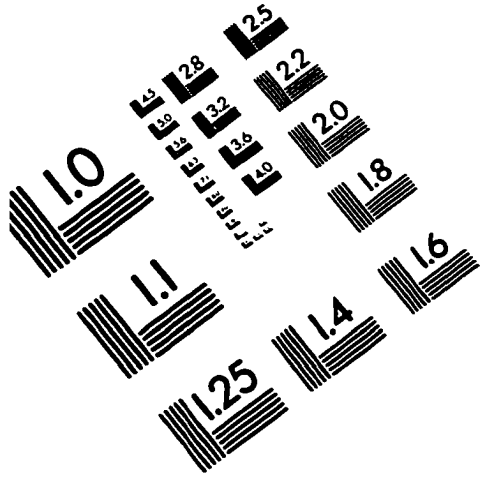
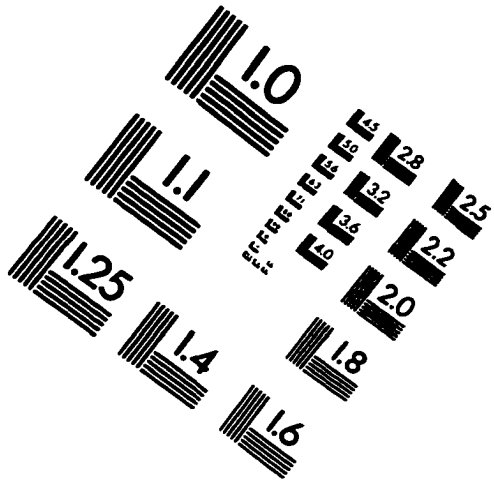
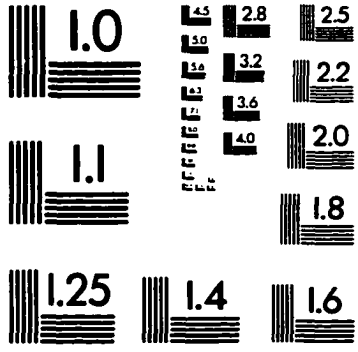
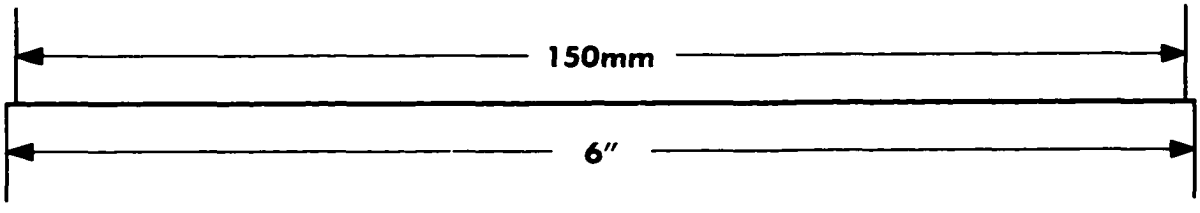


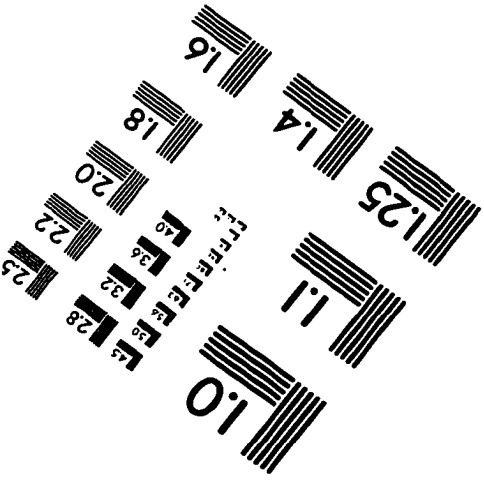
IMAGE EVALUATION
TEST TARGET (QA-3)











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1653 East Main Street
Rochester, NY 14609 USA
Phone: 716/482-0300
Fax: 716/288-5989