The Effects of Frequency & Source of Feedback on Performance Under Goal-Setting Conditions

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The Effects of Frequency and Source of Feedback on Performance Under Goal-Setting Conditions

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In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
David A. Campshure
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Feedback and goal setting are both necessary for either to have an effect on performance (Erez, 1977). In the present study two attributes of feedback, frequency and source, were manipulated under goal-setting conditions to examine their effects on performance. It is generally assumed that performance can be enhanced by providing individuals with frequent feedback and by providing them with feedback that originates from a source close to themselves— that is, feedback from the task itself or self-administered feedback. A third variable of interest, subjects' perceived control over the task, was assessed via questionnaires.

Subjects worked on a problem-solving task. Each subject was placed in one of eight feedback source/frequency conditions and assigned a goal for the task based on his/her performance in a practice trial. Questionnaires designed to assess subject's perceptions of the assigned goal, the feedback provided, and the task
itself were administered at predetermined intervals.

Neither the source from which the feedback originated nor the frequency with which it was presented had an effect on performance. However, a source by frequency interaction was obtained from questionnaire data measuring subject's perceptions of control over the task. Individuals perceiving themselves as receiving infrequent feedback felt greater control when the feedback was presented by the researcher. Individuals who perceived themselves as receiving more frequent feedback felt greater control when the feedback was self-administered.

Theoretical explanations of the findings were offered along with recommendations for future research. Recommendations included the further examination of the role of feedback on individual perceptions of external control and its influence on task performance.
CHAPTER I

Introduction

The present study examined the effects of two characteristics of feedback on performance in a goal-setting context. Specifically, the two attributes of feedback that were manipulated were: (a) the frequency of feedback, and (b) the source of feedback.

Under goal setting conditions it is generally assumed that the more frequent the feedback, the better will be subsequent performance. This study attempted to support this postulate by providing varying amounts of feedback to individuals working on a problem-solving task. In addition, the feedback presented to subjects originated from either an internal or external source. Internal sources, such as self or the task, allow the person working on the task to provide themselves with feedback, while external sources, such as a supervisor or peer, require that another person provide the feedback. Greller and Herold (1975) have shown that reliance on feedback is dependent upon the perceived closeness of the source. An internal source is considered to be a closer source than an external source.

A final variable of interest was personal control. The more control the individual has over the situation, the greater should be his/her feelings of autonomy and
subsequently his/her interest in the task. The source of the feedback may also have an effect on the individual's feeling of personal control. Information from external sources may be perceived as a loss of personal control by the individual and may reduce the recipients desire to respond. Frequent feedback may also connote a loss of control to the individual. The more feedback an individual receives, the more he/she is likely to feel manipulated. Thus, Ilgen, Fisher, & Taylor (1979) suggested that more feedback is not always better, particularly with regard to the effect of frequency of feedback on the amount of perceived personal control.

The theory underlying goal setting is discussed later in this paper along with research on relevant goal attributes. Feedback and its role in goal setting is then presented with particular emphasis given to the variables of frequency and source.
CHAPTER II

Review of the Literature

Goal Setting

The basic assumption underlying Locke's theory of goal setting is that people behave rationally and consciously. The theory rests on the relationship between conscious goals, intentions, and performance on a task (Locke, 1968). The basic premise behind research on goal setting is that these conscious ideas, or goals, regulate human action and performance (Locke, Shaw, Saari, & Latham, 1981).

According to Locke (1968), goals serve two purposes: (a) they act as a source of motivation and (b) they direct behavior. Goals provide a basis for deciding how much effort to put into a task. Therefore, goals are actually behavioral intentions which influence the level of performance on a task.

Two conditions must be present before the setting of goals can be expected to enhance performance. First, individuals must be made aware of the goal and understand what is required to attain it. Second, the goal must be accepted. Acceptance of the goal implies that the individual understands the goal and intends to engage in the activities necessary for goal attainment.

In his theory of goal setting, Locke (1968) proposed that (a) setting difficult goals produces a higher level of
performance than setting easy goals; (b) specific, hard
goals result in performance levels higher than no goals or
"do-your-best" goals; and (c) behavioral intentions (i.e.,
goals) regulate human behavior.

According to goal-setting theory (Locke, 1968), the
more difficult and more specific the goal, the greater will
be the individual's motivation to achieve the goal. The
level of specificity and difficulty of goals serve to
direct an individual's level of effort on a task. Goal
difficulty is hypothesized to be directly related to goal
commitment. The harder the accepted goal, the more
committed the individual will be to its attainment and the
higher will be his/her subsequent performance (Locke, 1968;
Steers & Porter, 1974). Since goals direct behavior, a
greater degree of goal specificity will allow a more
concentrated effort toward goal attainment (Terborg, 1977).

For the goal to be motivating, however, the intention to
attain the goal must be preceded by the individual's
acceptance of the goal.

Research on goal acceptance, difficulty, and
specificity is summarized below. Following the discussion
of goal attributes, a thorough explanation of the role of
feedback in goal setting and a review of the relevant
research is provided.
Goal Difficulty

Goal difficulty is predicted to vary positively with performance (Locke, 1968). That is, under goal-setting conditions, performance is likely to be higher when the goal is difficult than when it is easy.

Locke (1968) reviewed a number of early studies which supported his theory of goal setting. In the same review, Locke reported the results of twelve studies on goal difficulty and level of performance. In each of the studies, goals were presented to the subjects in the form of a specific, quantified score that the subjects were to achieve over the course of a trial or over the task as a whole. Goal acceptance was assured in some of the studies through interviews and in the others by allowing the subjects to set their own goals. The results of the combined studies, as well as for each individual study, were very clear: in all cases more difficult goals led to increased performance.

The results of these 12 studies were consistent with the earlier studies reviewed by Locke (1968) in supporting his goal-setting theory. The combined results also showed that although subjects with difficult goals attained their goals less frequently than those with easy goals, they consistently outperformed them on level of task accomplishment. This finding is generalizable across tasks since the array of tasks used in the studies included
brainstorming, complex computation, addition, perceptual speed, toy construction, reaction time, and grade achievement in college.

In a recent review of the goal setting literature, Locke et al. (1981) summarized 59 studies that examined the goal difficulty-performance relationship. Either partial or whole support for a positive linear relationship between goal level and performance level was found in 48 of the studies. Locke et al. offered explanations why each of the remaining nine studies revealed no such relationship. The reasons provided included the use of a restricted range of difficulty between goal levels (Frost & Mahoney, 1976; Oldham, 1975), the use of expectancy ratings which were contingent upon effort (Motowildo, Loeher, & Dunnette, 1978), and the use of unrealistically high goals (Organ, 1977).

Locke (1982) further examined the effects of impossible goals on performance by employing a one-minute experiment using 14 goal levels. A curvilinear relationship between goal difficulty and performance was found. Within the easy to difficult range of goals the expected linear relationship was evident, but after the goals became impossible the relationship did not appear. Performance did not decrease as goals reached the impossible level, however, as almost all subjects within that range attempted to attain their goal.
Goal Specificity

Goal specificity refers to the extent to which goals are presented in quantified rather than vague terms. While setting difficult goals is thought to increase the level of effort directed toward performance, making goals specific is believed to focus an individual's effort at a concrete level (Frost & Mahoney, 1976; Locke, 1968). As a result, asking an individual to accomplish a specific number of tasks over a given period of time should result in better performance than simply asking the individual to do-your-best, since the specific goal will direct the individual's effort toward a higher performance level than the vague goal.

Locke (1968) summarized the results of eight studies in which specific goals were compared to do-your-best goals. Subjects receiving specific goals outperformed those with do-your-best goals in six of the eight studies. The strength of the relationship between specific goals and performance was further shown by Locke et al. (1981). Out of 53 studies reviewed, 51 provided either partial or whole support for the hypothesis that specific, hard goals lead to higher levels of performance than do-your-best or no goals.

Once again, explanations were provided concerning the two studies that failed to find support for the effectiveness of specific goals (Locke et al. 1981). It
was suggested that the negative results obtained by Latham and Yukl (1975a) were likely due to a lack of organizational and individual support for the goal setting program. The nonsupportive findings of Organ's (1977) study may have been caused by the use of moderate rather than hard goals, since moderate goals are predicted to have no more of an effect on performance than do-your-best goals.

**Goal Acceptance**

Locke et al. (1981) distinguished between goal acceptance and goal commitment. Goal acceptance means that an individual has agreed to commit him/herself to achieving an assigned goal. Goal commitment implies that an individual will try to achieve a goal, regardless of the source of the goal. The two terms are often used interchangeably since most studies on the topic have been conducted using assigned goals. Studies on goal setting typically use goals as an independent variable. However, if the goals are assigned they must be accepted before they will have an effect on performance. It is therefore important to examine whether or not goals which are assigned are accepted in order to ensure that the goals will have a positive effect on performance.

In the review by Locke et al. (1981) it was reported that almost all attempts to relate goal acceptance to performance have failed (Frost & Mahoney, 1976; Organ,
1977; Yukl & Latham, 1978). Locke et al. offered three reasons why the studies to date have not found a positive relationship between goal acceptance and performance. First, the measures used to assess goal acceptance may not be valid. There is evidence that indirect measures of goal acceptance, such as personal goals or the difference between personal goals and assigned goals, may be more accurate indicators of goal acceptance than direct measures (Mento, Cartledge, & Locke, 1980). Second, in most instances where goal acceptance has been measured, subjects have typically shown complete or near complete commitment. The restricted range of commitment level in such cases may make it difficult to attain significant results. Finally, subjects may not be able to distinguish between small differences in psychological commitment toward a goal. Thus, measures of commitment may not be sensitive enough to detect true differences.

In sum, the evidence concerning the effects of goal attributes on performance is rather clear. Performance under goal-setting conditions is enhanced when hard goals are used instead of easy goals. Improvements in performance are also greater when goals are presented in quantified, specific terms rather than in vague, do-your-best statements. Finally, it is hypothesized that goals will have an effect on performance only if they are accepted, although the relationship between goal acceptance
and performance has not received much empirical support (Frost & Mahoney, 1976; Locke et al., 1981; Mento et al., 1980; Organ, 1977; Yukl & Latham, 1975b).

For goal setting to be successful in enhancing performance, more is needed than the acceptance of specific hard goals. It is necessary that individuals receive feedback regarding their performance on the task (Erez, 1977). Feedback, or knowledge of results (KR), provides the individual with information as to whether his/her performance is "on target," or whether the amount of effort put into the task needs to be increased. There is a distinction between feedback and KR, although the two are often used interchangeably in the literature. Feedback simply refers to the presentation and receiving of information. KR implies that the information received is understood.

**Feedback**

Feedback is information provided to an individual regarding his/her past performance on a task. It gives the person an indication of the correctness, accuracy, or adequacy of a response or set of responses. The degree to which feedback provides useful information can be answered only from the recipient's point of view (Ilgen et al., 1979).

The positive effects of KR on learning and motivation have long been established (Ammons, 1956). Despite the
large body of literature on the topic, few generalizations can be made regarding the effects of feedback on individual performance (Locke, 1967; Ilgen et al., 1979).

Some theorists and researchers have argued that goal setting and conscious intentions mediate the effects of KR on performance (Locke et al., 1968). Locke (1967) hypothesized that the motivational effect attributed to feedback is actually a result of goal setting. According to this view, feedback will have a positive effect on motivation only when its leads to the setting of difficult performance goals (Becker, 1978; Locke et al., 1968; Ivancevich & McMahon, 1982). This hypothesis received support from several early studies (Locke, 1967; Locke & Bryan, 1968; Locke et al., 1968). These studies generally found only a main effect for goal setting when goal setting and KR were manipulated independently. However it was later concluded that these findings were confounded by the fact that feedback regarding performance in relation to a previously set goal was always present when the effect occurred (Locke et al., 1968).

These early studies indicated that the presence of feedback alone was not a sufficient condition to improve performance. However, showing that feedback alone is not sufficient does not answer the question of whether or not it is a necessary condition (Becker, 1978; Erez, 1977). To test the hypothesis that feedback is necessary for goals to
have an effect on performance, Erez allowed subjects to set their own goal on a task after completing a practice trial. The experimental condition received KR while the control group was given no information concerning their performance. The results obtained showed significantly more variance in the self-set goals of the KR-group than the no-KR-group. Also, performance was significantly more related to goals under the feedback condition than under the no-feedback condition. Erez concluded that feedback is necessary for goals to have a positive effect on performance.

Payne and Hauty (1955) suggested that providing individuals with KR can serve two functions: (a) it can direct action through informational cues based on past performance, and (b) it can act as an incentive, motivating individuals to perform at higher levels.

In the first instance, feedback can provide the individual with information regarding the type, extent, and direction of errors on the task. This information can then be used to make changes in behavior in an attempt to correct performance (Becker, 1978). For example, in the case of a person throwing darts at a target, knowledge of where each dart lands on the target can help the thrower improve his/her throwing accuracy.

Providing the dart thrower with their total score after tossing 10 rounds can also serve to improve
performance. This type of information is termed summary feedback. It may be of little use to the thrower in tossing bull's eyes, since it gives no cues on how to perform the task better. However, summary feedback may increase the person's motivation to try harder or to stay with a task longer (Becker, 1978; Ivancevich & McMahon, 1982).

Separating the cueing and motivational functions of performance feedback is often difficult since many types of KR can serve both purposes. Any type of KR which serves as a cue for future action can indirectly affect motivation. However, feedback aimed at increasing motivation does not necessarily provide cues on how to correct errors or improve strategy for performing a task. Summary feedback is an example of this latter type of KR. It may suggest to an individual that he/she should change strategy, but it gives no indication of what aspect of behavior to change (Locke, et al., 1968).

**Frequency of Feedback**

It is generally assumed that the more frequent the feedback, the better the subsequent performance (Cook, 1968; Ivancevich, Donnelly, & Lyon, 1970). Following from this hypothesis, it was implied that the more frequently individuals are presented with KR, the more accurate their perception of that feedback should be (Ilgen et al., 1979).
There may be an exception to this generalization, however. There is a difference between receiving information (feedback) and interpreting it (KR). According to Ilgen et al. (1979), frequency influences the degree to which the recipient is able to understand the information and make use of it. This relationship is best demonstrated in studies conducted by Hammond and Summers (1972) and Steinman (1976). Subjects were required to learn the functional relationship between two variables, a predictor and a criterion, by estimating the value of the criterion given predictor values. After each estimate, subjects received KR concerning the accuracy of their judgments. Results from these studies indicated that when the predictors and criteria were not perfectly related, presenting information after each trial led to confusion and was detrimental to the learning of the functional relationship. These findings imply that in cases where complex information must be interpreted, caution should be taken against providing too much KR (Ilgen et al., 1979).

Although Locke (1980) provided arguments against feedback as a reinforcer, many researchers consider feedback to have reinforcing properties (Anderson, Kulhavy, & Andre, 1971; Cook, 1968; Ivancevich, Donnelly, & Lyon, 1970). It follows from Thorndike's Law of Effect (Thorndike, 1932) that, if KR serves as a reinforcer, the amount of feedback should be positively related to the
frequency of correct responses on a performance task. Therefore, as the frequency with which feedback is presented increases so should the level of performance on the task.

However, assuming that any feedback per se is a positive reinforcer fails to take into consideration that feedback varies along a negative to positive continuum. The majority of research on feedback does not deal with the sign (positive or negative) of the feedback. Instead the subjects are allowed to interpret the KR as they wish, and/or the amount of negative and positive feedback presented is simply not monitored (Ilgen et al., 1979). In the first instance, the KR is evaluated either negatively or positively based on the subject's point of view. When individuals must infer the meaning or sign of the feedback, it can be misleading and can cause the feedback to be ineffective or even detrimental to performance (Hammond & Summers, 1972).

One explanation (Ilgen et al. 1979) for the positive relationship between frequency of feedback and level of performance is that feedback frequency is often confounded with the sign of the feedback. That is, recipients of KR usually have the chance to change their actions in response to negative feedback. Assuming that individuals do take such corrective measures, over a number of trials the individuals should receive more positive feedback than
negative. Another possible reason for this relationship in organizational settings is that providing employees with negative feedback is a difficult task and one that supervisors are likely to avoid. The chances are therefore good that better performers will receive more feedback than poor performers.

In most of the early lab studies concerned with the effects of KR on performance it was difficult to determine whether improvement in performance was due to the motivational effects of feedback or to extraneous factors such as other unintentional rewards (Hundal, 1969). Gibbs and Brown (1955, as cited in Chapanis, 1964) were the first to isolate and measure the motivational effects of KR. They designed an experiment in which KR was more causal and incidental than is usually the case. Specifically, they had subjects work at a repetitive, uninteresting task—copying documents. Half of the trial subjects could see a counter on the copier, while the counter was covered for the other half. No goals were set for the subjects and the experimenters made no comments regarding their performance. The results showed a significant improvement in the number of copies made under the feedback condition (Chapanis, 1964).

Support for the findings of Gibbs and Brown (1955) was found in a study by Hundal (1969). Subjects were provided feedback by the task, the frequency of which varied from
none to almost continuous. As expected, performance level was found to be positively related to the amount of feedback received. Chapanis (1964), however, questioned the hypothesis that feedback alone is reinforcing. Using a monotonous, repetitive task he found no differences in performance between groups receiving varying amounts of KR.

A good deal of research on the effects of the frequency of feedback has been conducted in organizations with MBO programs. Positive results, showing that frequent feedback is beneficial, have generally been found. Ivancevich et al. (1970) found that the frequency of goal-setting conferences between superiors and subordinates had a positive impact on consequences resulting from an MBO program. Likewise, Steers (1975) found that the amount of perceived feedback presented in an MBO program was positively related to effort toward goal attainment and overall performance ratings, although the effect occurred only in supervisors with high motivation to achieve.

Success in goal attainment was related to the amount of feedback presented in an MBO program examined by Carroll and Tosi (1971). The authors also found a positive correlation between frequency of feedback and attitudes towards the program, employee-management relations, and level of goal clarity.

A number of other studies have found support for the use of frequent feedback. Cook (1968) used a business
simulation game to examine the effects of frequency of feedback on a number of dependent variables. Summarizing the results of two studies she found that the attitude of the participants improved as KR became more frequent and that the level of performance was directly related to the frequency of feedback.

Chhokar and Wallin (1984) presented feedback to workers either weekly or once every two weeks. They found that more frequent feedback did not enhance safety performance although the introduction of feedback clearly increased performance. There are three possible reasons for the lack of a positive relationship between frequency of feedback and performance in this study. First, in either condition the feedback can hardly be called frequent. The workers simply may not have perceived a difference in the frequency of the feedback presentations. Secondly, feedback was presented to all workers once a week for seven weeks immediately prior to being presented every two weeks. During the weekly feedback period the workers may have developed internal sources of feedback or learned something about their performance that carried over into the bi-weekly feedback period. A third explanation is that the worker's safety performance may have reached a ceiling, that is they may have reached the highest level of performance possible under the conditions present.

Ilgen et al. (1979) and Latham and Yukl (1975) stated
that the notion that more feedback is always better may not always hold. One reason for their reservation is a hypothesized relationship between increases in feedback and perceptions of external control. According to Ilgen et al. (1979), the motivational value of feedback is influenced by the degree to which it conveys to the recipient (a) a sense of competence, (b) a sense of personal control, and (c) that external rewards will follow. While some feedback is needed to facilitate a sense of competence in an individual, too much feedback from either external sources or the task may be perceived as a loss of personal control. Therefore, as feedback is presented more frequently, the degree to which the individual feels controlled by the source may also increase. As a result of this perceived loss of control, the recipient may be less likely to respond to the feedback.

**Source of Feedback**

All feedback originates from a source. The source is not technically part of the feedback, but it is usually difficult to distinguish between the effects caused by the KR and those facilitated by the source. Sources of feedback fall into two categories: internal and external. Feedback originating from the task itself or from the individual performing the task is considered to be internal. External sources include feedback from supervisors and peers.
Greller and Herold (1975) found that individuals rely most on sources close to themselves for feedback. Employees from different organizations were surveyed regarding the importance of five feedback sources. The five sources, in order of reliance from most to least importance, were self, the task, supervisors, co-workers, and the organization.

According to Ilgen et al. (1979), it is reasonable to assume that persons rely more on feedback from sources psychologically close to them than on feedback from more distant sources. Kanfer, Karoly, and Newman (1974) found that when feedback from several sources was presented and subjects were later asked to recall the feedback, recall was greatest when self was the source. While it is not necessarily true that the perceptual accuracy of KR is a direct function of the closeness of the source, it seems likely that if more attention is paid to a close source the accuracy with which feedback from that source is perceived will be enhanced (Ilgen et al. 1979).

Difficulties arise, however, because of the imprecision of the closeness concept. Closeness is not the same as physical proximity, although the two are often related. Closeness is instead a psychological concept, as evidenced in the Greller and Herold (1975) study. They predicted that co-workers would be a more important source of information than would supervisors but found just the
opposite. While the supervisors are physically more distant than the co-workers, they may be psychologically closer to the task since they are closer to future desired rewards (Greller & Herold). Feedback acceptance may also be influenced by the source of the feedback. Since supervisors are likely viewed as a more credible source than peers, the feedback they provide may be perceived as being more valid and therefore more readily accepted (Ilgen et al., 1979).

**The Role of Intrinsic Motivation**

Intrinsic motivation is a factor that may influence whether or not individuals will respond to feedback. According to Deci's (1972) theory of intrinsic motivation, individuals performing a task seek a sense of competence which, in turn, is rewarding to the them. Feedback is necessary to create this sense of competence in individuals as it allows them the opportunity to evaluate their own performance. In this case both internal and external sources of feedback can be useful in aiding an individual's judgment of his/her level of performance.

Deci (1972) suggested that a task will be intrinsically motivating when the individuals performing the task feel that they have the freedom to perform the task in their own chosen manner. That is, they have to feel they have personal control over their performance (Ilgen et al., 1979). Personal control and intrinsic
motivation are highest when persons undertake a task solely because they enjoy it.

Feedback from either internal or external sources may give individuals a sense of being controlled. In addition, as the frequency of the feedback increases, the extent to which the recipient feels controlled is likely to increase. This perceived loss of control may in turn decrease the individuals' desire to respond to the feedback (Ilgen et al., 1979). If the feedback that is provided is not utilized, performance will not be improved.

**Summary**

In summary, feedback can serve either a cueing or motivational function (Payne & Hauty, 1955). Regardless of the form it takes, feedback has been shown to be necessary for goals to have a positive effect on performance (Erez, 1977). It is also generally accepted that the more feedback, the better. However, increased amounts of feedback can lessen an individual's desire to respond to the feedback, as frequent feedback may be perceived by the individual as a loss of personal control.

The source from which feedback originates may also affect the degree to which individuals feel they have control over the task. Individuals rely more on information presented by sources of feedback that are psychologically closer to themselves (internal sources) than on sources that are more distant (external sources).
(Greller & Herold, 1975). When the feedback presented originates from an external source the recipient may feel a loss of personal control over the task, thereby reducing the likelihood that the information will be used. In either condition, if increased feedback or feedback from external sources lessens the chance of the recipient utilizing the information provided, performance will not be enhanced and may even decrease.
CHAPTER III

The Present Study

The present research examined the effects of feedback on level of performance. Feedback was presented to participants working on a problem-solving task under goal-setting conditions. Two characteristics of feedback, frequency and source, were manipulated during the task.

Based on the theory and findings of Locke, the feedback in the present study was presented in relation to specific, difficult goals. Goals that are specific and difficult have been shown to enhance performance significantly over do-your-best and easy goals (Locke, 1968).

It is hypothesized that goals will affect performance only when they are accepted (Locke et al., 1981). During this study subjects' goal acceptance was measured both prior to and following their participation in the experimental trial.

The task utilized in the present study allowed for feedback of a non-cueing nature only. Therefore, the motivational function of feedback was examined. Just as specific goals were used, so was specific feedback. That is, the feedback was presented to subjects in direct relation to their assigned goal, indicating the number of problems solved within a specified period of time.
Subjects also received feedback indicating whether or not they were on target with respect to their goal. Thus, they should have been aware of the sign, positive or negative, of the feedback. This feedback was presented to subjects to preclude their having to interpret the meaning of the KR and to make the KR as straightforward as possible by reducing the subjectivity of the information. Feedback that is left open for interpretation may be detrimental to performance since vague information may be misleading and interpreted in various ways depending on the recipient's point of view (Hammond & Summers, 1972).

Subjects were provided with one of four schedules of specific feedback from either an internal or external source in relation to an assigned goal which was both specific and difficult. Given these conditions, three hypotheses were examined.

Hypothesis 1: The more frequently feedback is presented to individuals, the higher will be their resulting level of performance.

This hypothesis follows from the earlier findings of Gibbs and Brown (1955), Cook (1968), Hundal (1969), Carroll and Tosi (1971), and Steers (1975) who found that performance level was positively related to feedback.
Hypothesis 2: Feedback from sources perceived as having little control over the individual (i.e., self) will lead to higher levels of performance than will feedback from sources perceived as having more control over the individual (i.e., experimenter).

No research examining the effects manipulating the source of feedback on performance was found in the literature. It has been shown that sources of feedback recipients perceive as being closer to themselves or under their control are more important to the individuals than are sources perceived as being more distant (Greller and Herold, 1975). Based on Greller and Herold's findings it was predicted that performance level should be higher for individuals receiving feedback from an internal source than for individuals presented with feedback from an external source.

Hypothesis 3: The effect of feedback frequency on performance will differ as a function of the perceived control of the source. Specifically, as the frequency of feedback increases, the difference in performance
levels between individuals receiving feedback from internal sources and those receiving feedback from external sources will also increase.

Ilgen et al. (1979) suggested that the manner in which feedback is presented can have an effect on the degree to which an individual perceives performance as being under his/her own control. When the individual feels a loss of personal control, the desire to respond to the feedback is likely to decrease. Feedback from external sources may connote control over the individual, thereby reducing the desire to utilize and respond to the information presented. Furthermore, as the frequency of the feedback increases, the individual's perceived control may decrease. Thus, it was predicted that as feedback becomes more frequent, those individuals receiving feedback from an internal source should perform at a higher level than those receiving feedback from an external source.
CHAPTER IV
Method

Subjects

Subjects were 104 undergraduate psychology students who volunteered to participate in the research. Participation contributed to course credit.

Feedback Conditions

Feedback was presented at one of four frequencies: continuous, six times per task, four times per task, and two times per task. The feedback originated from one of two sources, internal (the task itself) or external (the researcher). Subjects were randomly placed into one of the eight treatment cells created by combining all frequency and source conditions.

Task and Procedure

Nouns four, five, or six letters in length which have Thorndike-Lorge frequencies of A or AA (Thorndike & Lorge, 1944) were extracted from a list of 925 nouns compiled by Pavio, Yuille, and Madigan (1968). Thorndike-Lorge frequencies of A and AA indicate that the words have a high frequency of usage. The 180 nouns meeting the criteria were scrambled by the researcher to form anagrams. The anagrams were stenciled on 3 x 5 cards and placed into an uncovered stimulus box in a predetermined order. Subjects worked on the task in individual sessions.
**Practice Trial.** A 4-minute practice trial preceded the experimental trial. Before beginning the practice session subjects were instructed to solve the anagrams at a "normal pace." The instructions, which were read to each subject, may be found in Appendix A.

After the instructions had been read to the participants, they were told to take the first card from the box labeled "Anagrams" and write their solution to the problem on one of the pieces of paper provided. The card was then placed in a box marked "Finished Anagrams," which was positioned on the table in front of the subjects. The piece of paper was placed through a slot in a covered box marked "Answers."

The next card in the box was completed in the same manner, and so on until four minutes had elapsed. When subjects were unable to solve a problem they were permitted to "pass" on that anagram by making an "X" on the paper and placing it through the slot in the Answers box.

Performance during the practice trial was then used to assign goals based on ability level. The assigned goal for the 24-minute experimental trial was calculated using the following formula:

$$\text{GOAL} = 6X + .25(6X)$$
where $X$ is the number of anagrams correctly solved during the practice trial. The formula used was pretested on a number of subjects to ensure that it would yield a difficult yet attainable goal.

**Experimental Trial.** Prior to the experimental trial the researcher presented each subject with his/her assigned goal. A brief questionnaire designed to assess goal awareness and acceptance was then administered to the subjects. The questionnaire may be found in Appendix B. Subjects were instructed to work on the task for a 24-minute period. The 24-minute work period included time-on-task only, that is, interruptions during the task were excluded. The instructions for the experimental trial may be found in Appendix C.

Subjects in the *continuous feedback condition* received information regarding their performance after each anagram attempted. In the external source condition, the researcher announced whether or not the problem was solved correctly and stated the number of problems solved up to that point. Under the internal feedback condition, after solving or passing the anagram, subjects were instructed to take the first card from a box marked "Solutions," which contained cards with the correct response(s) to the anagrams. Subjects were told to compare their solution to the answer card and to maintain a running tally of the number of anagrams correctly completed. The tally sheet,
which was provided for subjects in the internal feedback condition, may be found in Appendix D. In both conditions, after the feedback was given the cards were placed in the Finished Anagrams box.

Those subjects in the variable feedback conditions, that is, receiving feedback six, four, or two times during the task, were interrupted at four, six, and 12 minute intervals, respectively. At each interval the cards placed in the response box since the last interruption were collected. Feedback under the internal source condition was provided by instructing the subjects to compare their solutions against the answer cards and to count the number of problems correctly solved. The subjects were told to record the number correctly solved for both the time period that had just elapsed and for the total task up to that point. The record sheet that was provided at each interruption may be found in Appendix E. Under the external source condition, the researcher determined the number of anagrams correctly solved and informed the subjects of the total number correct during that interval. The researcher completed the record sheet and presented it to the subjects to ensure that they received the feedback.

Subjects in all conditions were interrupted and administered a brief questionnaire addressing feedback usefulness, frequency, satisfaction, and sign 12 minutes into the task (see Appendix F). After the questionnaire
was completed subjects resumed work on the task for the remaining 12 minutes.

After the 24-minute trial had been completed the subjects were presented with feedback regarding their performance during the last interval and the task as a whole. Subjects then completed the questionnaire presented in Appendix G. This questionnaire addressed perceptions of the assigned goal, the feedback provided, and the task itself.
Performance Measures

Two performance measures were examined as dependent variables. The first measure, total score, was operationally defined as the number of anagrams correctly solved during the experimental trial. The second measure, percentage of goal attained, was each subject's total score divided by his/her assigned goal.

Percentage of goal attained was selected as an a priori performance measure to control for the effect of ability. (Subjects' goals had been set based on their performance in the 4-minute practice trial). By controlling for ability, any significant changes in performance would be more directly related to the manipulations of feedback source and frequency. Contrary to what was hypothesized, an analysis of variance revealed no significant effects for source, frequency, or their interaction. The mean percentage of goal attained was .71 with a standard deviation of .28.

In an attempt to determine the amount of influence subjects' ability had on their total score, an analysis of covariance was performed with ability as the covariate. Ability was operationally defined as the number of anagrams correctly solved during the practice trial. No main effect
for either source or frequency of feedback or an interaction of the two was found. The mean total score across subjects was 36.77 with a standard deviation of 18.45. The effect of ability on total score was significant, $F(3, 95) = 60.19$, $p<.0001$, and accounted for 35.93% of the variability in performance. The test-retest reliability of the performance measure was $.67$, $p<.001$.

Complete summary tables for the analyses conducted on the performance measures are presented in Appendix H.

**Questionnaire Data**

Each item with continuous response options the three questionnaires was analyzed by analysis of covariance with ability as the covariate. The other factors in the analysis were feedback source, frequency of feedback, and their interaction. The mean response and standard deviation for each item is presented by questionnaire in Table 1. Summary tables for all significant effects from the analysis of covariance may be found in Appendix I. Items for which the responses were not continuous were analyzed by chi-square tests. Those items were Questionnaire 1-Item 1, Questionnaire 2-Item 4, and Questionnaire 3-Items 5 and 17. The results for the significant chi-square analyses are discussed later in this paper. The remaining discussion concentrate on the final
<table>
<thead>
<tr>
<th>Questionnaire 1</th>
<th>Item 1: Assigned goal</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<tbody>
<tr>
<td>Item 2: Effort toward goal achievement</td>
<td>52.50</td>
<td>17.07</td>
<td></td>
</tr>
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<th>Item 1: Information for performance improvement</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<tr>
<td>Item 2: Amount of feedback</td>
<td>4.00</td>
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<td></td>
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<td>Item 3: Performance satisfaction</td>
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<td>1.10</td>
<td></td>
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<th>Questionnaire 3</th>
<th>Item 1: Assigned goal</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 2: Effort toward goal achievement</td>
<td>52.50</td>
<td>17.07</td>
<td></td>
</tr>
<tr>
<td>Item 3: Feedback frequency</td>
<td>5.83</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Item 4: Performance satisfaction</td>
<td>2.90*</td>
<td>1.40</td>
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<tr>
<td>Item 6: Utility of feedback for task improvement</td>
<td>3.46</td>
<td>1.65</td>
<td></td>
</tr>
<tr>
<td>Item 7: Amount of feedback</td>
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<td>1.07</td>
<td></td>
</tr>
<tr>
<td>Item 8: Control over performance</td>
<td>3.03x</td>
<td>1.54</td>
<td></td>
</tr>
<tr>
<td>Item 9: Use of feedback for task improvement</td>
<td>3.75</td>
<td>1.49</td>
<td></td>
</tr>
<tr>
<td>Item 10: Control over performance rate</td>
<td>3.43</td>
<td>1.84</td>
<td></td>
</tr>
<tr>
<td>Item 11: Information for performance improvement</td>
<td>3.78</td>
<td>1.69</td>
<td></td>
</tr>
<tr>
<td>Item 12: Autonomy: In task performance</td>
<td>4.29</td>
<td>1.46</td>
<td></td>
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<tr>
<td>Item 13: Feedback accuracy</td>
<td>2.32</td>
<td>1.37</td>
<td></td>
</tr>
<tr>
<td>Item 14: Autonomy: Judgement in performance</td>
<td>5.34*x</td>
<td>1.58</td>
<td></td>
</tr>
<tr>
<td>Item 15: Goal Difficulty</td>
<td>5.38**</td>
<td>1.46</td>
<td></td>
</tr>
<tr>
<td>Item 16: Autonomy: Independence and freedom</td>
<td>2.65*x</td>
<td>1.69</td>
<td></td>
</tr>
<tr>
<td>Item 18: Task interest</td>
<td>2.57+</td>
<td>1.20</td>
<td></td>
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<tr>
<td>Item 19: Challenging task</td>
<td>1.92</td>
<td>1.01</td>
<td></td>
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continued...
Note:  
# A significant main effect for feedback source was found.
* A significant main effect for frequency of feedback was found.
 x A significant source by frequency interaction was found.
+ A significant effect for ability was found.
questionnaire as all items for which significant effects occurred were in that questionnaire.

Two items, 3 and 17, served as manipulation checks. On Item 3, subjects indicated the frequency with which feedback was received on a 7-point scale ranging from very frequently (1) to not-at-all (7). A significant main effect for frequency of feedback presentation was obtained, $F(3, 95) = 21.20, p<.01$. The mean responses for subjects receiving feedback continuously, six, four, and two times were 3.12, 2.38, 2.58, and 3.45, respectively. The direction of the means was as expected with the exception of the continuous feedback condition mean.

The second manipulation check dealt with the subject's perceptions of the feedback source. Item 17 required subjects to indicate whether the feedback they received originated from the researcher, the subject, or the task itself. The subject and task itself categories were collapsed to form one category called internal perceived source. A chi-square test was then performed to compare actual feedback source to subject's perceived source. The results were significant, as 81% of the subjects perceived the source of the feedback accurately, $\chi^2(1, N=104)=42.03, p<.001$.

Item 15 assessed subject's perceived goal difficulty on a 7-point scale ranging from extremely difficult (1) to
not-hard-at-all (7). A significant main effect for frequency of feedback was found, \( F(3, 95) = 2.51, p<.05 \); as well as a significant effect of ability, \( F(1, 95) = 3.67, p<.05 \). The respective adjusted means for subjects receiving feedback continuously, six, four, and two times were 3.01, 2.99, 3.90, and 3.62. Subjects' mean responses by ability level are shown in Table 2.

All four of the questionnaire items concerning subject's perceived control over the task (8, 10, 14, and 16) yielded significant source by frequency interactions. As shown in Figures 1 through 3, in three of these cases subjects receiving feedback either twice or on a continuous basis felt they had greater control over the task when the feedback was presented by the researcher than when it came from an internal source. Subjects receiving feedback either four or six times felt more in control of the task when the feedback came from an internal source. The three items were Item 8 \( (F(3, 95) = 3.37, p<.05) \), addressing subject's control over task performance, Item 10 \( (F(3, 95) = 3.15, p<.05) \), addressing control over how quickly the subjects worked, and Item 14, \( (F(3, 95) = 3.03, p<.05) \), addressing the subject's chance to use their own judgment in solving the anagrams.

The analysis for Item 16 also revealed a significant source by frequency interaction, \( F(3, 95) = 2.35, p<.05 \).
Table 2. Subjects mean goal difficulty by ability level: extremely difficult (1), not hard at all (7).

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Ability Level*</th>
<th>Mean Response</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td></td>
<td>4.25</td>
</tr>
<tr>
<td>3</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td>3.80</td>
</tr>
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<td>5</td>
<td></td>
<td>3.41</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>3.50</td>
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<tr>
<td>7</td>
<td></td>
<td>3.00</td>
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<tr>
<td>8</td>
<td></td>
<td>3.00</td>
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<tr>
<td>9</td>
<td></td>
<td>3.60</td>
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<td>10</td>
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<td>2.60</td>
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<tr>
<td>11</td>
<td></td>
<td>3.60</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>4.00</td>
</tr>
</tbody>
</table>

* Note: Ability level was operationally defined as the number of anagrams solved during the practice trial.
Figure 1. Mean responses to Item 8: "How much control did you have over how well you performed the task?"
Figure 2. Mean responses to Item 10: "How much control did you have over how quickly you solved the problems?"
Figure 3. Mean responses to Item 14: "How much did the task allow you a chance to use your own judgment in solving the anagrams."
Figure 4. Mean responses to Item 16: "The task allowed me independence and freedom in how I solved the anagrams."
As shown in Figure 4, subjects who received six feedback presentations felt that the task allowed them more freedom when the feedback originated from an internal source. Subjects in the remaining three frequency conditions felt they had more freedom when the feedback was presented by the researcher.

A significant main effect for frequency of feedback was obtained for Item 14, $F(3, 95) = 2.29, p<.05$. When asked to indicate whether the task allowed them to use their own judgment in solving the anagrams, mean responses on a 7-point scale ranging from very little to very much were 4.77, 5.27, 5.69, and 5.62 for subjects in the continuous, six-, four-, and two-time feedback conditions, respectively.

Item 16 also revealed a significant main effect for source, $F(1, 95) = 4.15, p<.05$. Subjects in the external source condition felt they had more freedom in solving the anagrams ($\bar{X} = 2.33$) than subjects in the internal source condition ($\bar{X} = 2.98$).

For two of the items the covariate of ability was significant although no other effects reached significance. The items dealt with the extent to which feedback was used to improve performance, Item 9, $F(1, 95) = 4.79, p<.05$, and task interest, Item 10, $F(1, 95) = 4.61, p<.05$. 
CHAPTER VI
Discussion

Performance Measures

Contrary to predictions, neither the source from which the feedback originated nor the frequency with which it was presented had an effect on performance. There are several possible explanations why the expected performance effects were not realized. First, while the test-retest reliability of the ability measure was significant, it was rather low considering that ability was being used to predict individual performance. Without a highly reliable ability measure it is difficult to make accurate predictions, since an individual's performance on one trial may not be indicative of his/her true performance.

Secondly, the task may not have been of long enough duration for the effects to be evidenced. The time difference between receiving feedback continuously, or every four, six, or 12 minutes is not great. It is possible that while subjects in the different feedback conditions perceived differences in frequency of feedback, they were not able to translate them into performance differences. A task that lasted much longer or covered several days would have allowed the presentation of feedback at greater intervals, which may subsequently have revealed effects of frequency on performance.
Thirdly, the dependent variable percentage of goal attained may not have reflected the amount of effort an individual put into the task. Depending on their anagram-solving strategy, subjects may have passed on a great number of anagrams, answering only the easy ones, or they may have spent long periods of time struggling over difficult ones. Subjects using both approaches may have exerted the same effort, however, because they adopted different problem-solving strategies the resulting number of anagrams solved may have differed. Thus, the measure may not accurately reflect the amount of effort directed toward solving the anagrams.

A fourth explanation is that goal acceptance may not have been measured accurately. It is important to assess the subject's acceptance of an assigned goal since goals must be accepted for them to be effective. When a goal is not accepted, individuals may set their own goal. This goal may differ from the one they were assigned and may differentially effect performance. Previously cited research indicated that indirect measures of goal acceptance may be more accurate than direct measures (Mento, et al., 1980). However, asking subjects to indicate "how hard they intended to work on the task" may have been too indirect. Having subjects indicate their expectancy of reaching the goal may have yielded a more
accurate indication of goal acceptance. If subjects had a low expectancy of reaching their goal, it could be inferred that the goal was being perceived as unrealistic.

A fifth possible explanation is that the assigned goals may not have been the appropriate level of difficulty. On the average, subjects solved 71% of the anagrams they were assigned as a goal. The number of subjects who attained or surpassed their goal was 15 (14.4%)--an indication that the assigned goals were difficult but attainable, as planned. However, subject's perceptions of goal difficulty were affected by the subject's ability level. As seen in Table 2, subjects had varied perceptions of the difficulty of their assigned goal. In general, persons with high and low ability viewed the goals as being easier than persons with medium ability. This discrepancy in perceived difficulty of the goal may have affected performance as well. Difficult goals have been found to have an effect on performance (Locke, 1968). Unrealistically high goals have been found to be unrelated to performance, although individuals under those conditions continue to try to achieve their goal (Locke, 1982). Moderate goals have been found to have the same effect on performance as easy or do-your-best goals (Locke, et al., 1981). Thus, in the present study goals may have had a more pronounced effect on performance among those subjects who perceived the goal as being difficult (medium ability)
than those who perceived it as being easy (high and low ability).

Finally, in retrospect, the subjects in the continuous feedback condition did not receive the same amount of time on task as subjects in the other three conditions. In the continuous condition either the subjects or the researcher determined whether their answers were correct or not following each anagram attempted. The time it took to compare their solution to the correct answer was improperly counted as time on task. Thus, the subjects in the continuous condition were at a disadvantage when the performance measures were calculated, a problem magnified by the relative short time spent on the task in the first place.

Questionnaire Data

The two questionnaire items that served as manipulations checks each yielded a significant effect indicating that subjects perceived the source of the feedback accurately and that their perceptions of the frequency of feedback were correct in three of the four frequency conditions. Subjects in the continuous feedback condition perceived themselves as receiving less frequent feedback than subjects in the other conditions. It may be that subjects who received continuous feedback did not perceive the information they received after each attempted anagram as feedback. A possible explanation for this
finding is that they interpreted the administration of the questionnaires as feedback rather than the information presented following each anagram.

Goal difficulty as assessed by Item 15 yielded a significant main effect for frequency. The more frequently subjects were interrupted to receive feedback, the more difficult they found the task. Frequent feedback presentations apparently were disruptive to the subjects due to either the relatively short work session or the high level of concentration required to perform the task.

The possibility of frequent feedback hindering motivation or performance is related to the issue of control over the task. Ilgen et al. (1979) and Latham and Yukl (1975) stated that more feedback may not always be better since there may be a relationship between increased feedback and perceptions of loss of control. The present study hypothesized that the performance level difference between those receiving feedback from internal sources and those receiving feedback from external sources would increase as the frequency of feedback increased. This hypothesis was not supported. However, questionnaire items designed to assess subject's perceptions of control over the task revealed some interesting information.

It is interesting that in three instances, Items 8, 10, and 14, subjects receiving feedback either twice or continuously felt more control when the researcher...
presented the feedback. Those subjects that received feedback four or six times felt they had greater control over the task when the feedback originated from an internal source. Subjects in the continuous and two-time frequency conditions also perceived themselves as receiving feedback less frequently than subjects in the four- and six-time frequency conditions.

Individuals who perceived themselves as receiving infrequent feedback felt more control when the feedback was presented by an outside rather than internal source. When feedback is not frequently available individuals may feel comfortable receiving the information from superiors, believing it may be more accurate or may lead more directly to rewards. However, individuals who perceive themselves as getting more frequent feedback may experience a feeling of loss of control when others interrupt to present information.

One item dealing with subject's perceptions of control over the task yielded a strange pattern of responses. Item 16 assessed subjects' perceptions of whether or not the task allowed them freedom in solving the anagrams. The significant source by frequency interaction revealed that subjects receiving six feedback presentations felt more freedom in solving the anagrams when the feedback was from an internal source. Subjects in the other three frequency conditions responded that they had more freedom when the
information was presented by the researcher. This finding is inconsistent with the other items that dealt with the issue of personal control over the task and is not readily explained on a theoretical basis.

Contrary to what was expected concerning source of feedback on Item 16, subjects in the external source condition felt more freedom in solving the anagrams than did those in the internal condition. As shown in Figure 4, three of the four feedback conditions followed this pattern. However, the significant effect for source is largely due to the discrepancy in the mean item response given by subjects who received feedback twice. Again this finding is not readily explainable on a theoretical basis.

Frequency of feedback also had an effect on subjects' perceived control over the task. Responses to Item 14 indicated that subjects receiving continuous feedback felt less able to use their own judgment in solving the anagrams than those subjects that received more feedback. Once again it appears as though subjects in the continuous feedback condition felt a lack of control over the task. This lack of control may be attributable to their perceiving themselves as not having received feedback very often.

Recommendations

Feedback rather than goal setting was the primary focus of the present study, although feedback and goal
setting are strongly tied together. Feedback is necessary for goals to have an effect on performance (Erez, 1977). Several attributes of goal setting may have played a role in this study and are discussed below.

Subject's varied perceptions of the difficulty of the assigned goal may have had an effect on performance. This finding highlights the need to assess individual perceptions of goal difficulty accurately, whether in the lab or in an organization. Some may view the goal as being easy, others as extremely difficult. Such discrepancies in perceived goal difficulty would lead to inconsistent effects on performance. Likewise, the results of this study emphasize the need to accurately measure individual's acceptance of assigned goals. Goals that are not accepted will not have the intended positive effect on performance.

The source from which feedback originated did not have the expected effect on performance. Future research is warranted in this area, as few studies addressing this issue were found in the literature. Field studies will have an advantage over laboratory studies since individuals are probably better able to differentiate between internal and external sources of feedback under field conditions. In the laboratory, subjects might perceive any feedback as originating from the researcher.

No support was found for the findings of Chapanis (1964), Cook (1968), Hundal (1969), or Ivancevich (1970) as
frequency of feedback did not have an effect on performance. However, of this study do support the contention of Ilgen et al. (1979) and Latham and Yukl (1975), who stated that more feedback may not always be better. It is also consistent with the findings of Chhokar and Wallin (1984), who found frequency of feedback to be unrelated to safety performance. It is therefore apparent that no conclusions regarding this issue can yet be drawn; further study is needed.

The results of this study suggest that perhaps the area to be examined in the frequency of feedback-performance relationship is that of the individual's perceived control over the task. Ilgen et al. (1979) hypothesized a relationship in which an increase in feedback would lead to an increase in perceived external control. The results from the questionnaire data in the present study support their hypothesis and point to the necessity of exploring the relationship further.

Overall, the present study emphasizes the need for continued research on the effects of source and frequency of feedback on individuals' feelings of control over the task. Although no effects of frequency or source on performance were found in this research, the issue is far from settled. Future laboratory studies in both areas should attempt to find tasks that are easily generalizable to the workplace. Although studies such as the present one
and those conducted by Locke (1982) and Organ (1977) have used relatively simple, short-term, laboratory-bound tasks, they are an important step in the process of understanding the theory of goal setting and feedback. While the ultimate goal is to implement goal setting and feedback in the "real world," laboratory studies provide an understanding of their underlying theory. Such an understanding will maximize the effects of feedback and goal setting in organizations.
Appendix A
Appendix A

Instructions to Subjects

Your task is to solve some problems, called anagrams, in which you have to unscramble letters to form a word. When I tell you to begin, take the first card from the box marked "Anagrams" and solve the anagram. When you have solved the anagram, write the unscrambled word on one of the pieces of paper provided and place the paper in the box labeled "Answers." Then place the card in the box marked "Finished Anagrams." Complete the next card in the box in the same manner, and so on until I tell you to stop. The cards all contain words either 4, 5, or 6 letters in length, and on each card the unscrambled letters spell a commonly used word. There are no trick cards in which the letters do not spell a word. You are to solve the anagrams at a normal pace. Do you have any questions?
Appendix B
Appendix B

Questionnaire 1

Complete the following questions by filling in the blank or circling one number along the continuum.

1. You were assigned a performance goal for this task. What is your goal?

2. How hard will you work to reach your goal for this task?
   Not Hard
   At All
   Very Hard

   1  2  3  4  5  6  7
Appendix C
Appendix C
Experimental Trial Instructions

Continuous Feedback - Internal Source.

You are to work at this task for 24 minutes. Your goal is to solve _____ anagrams correctly. After solving each anagram you are to remove the first card from the box marked Solutions and compare it to your answer. If your solution is correct make a mark on the tally sheet provided. After comparing your card to the answer place both cards in the box marked Finished Anagrams. Please repeat what your goal is for this task. Do you have any questions?

Continuous Feedback - External Source.

You are to work at this task for 24 minutes. Your goal is to solve _____ anagrams correctly. After solving each anagram you are to give the solution to me, at which time I will tell you if it is correct or not and how many you have solved correctly up to that point. After learning if the solution was correct or not place the card in the box marked Finished Anagrams. Please repeat what your goal is for this task. Do you have any questions?

Variable Frequency Conditions.

You are to work at this task for 24 minutes. Your goal is to solve _____ anagrams correctly. At various intervals during the task you will be interrupted to receive information regarding your performance. Please repeat what your goal is for this task. Do you have any questions?
Appendix D
Appendix D

Continuous Feedback Condition

Anagram Tally Sheet

Your goal for the total task is to correctly solve **anagrams**.

Keep a running count of the number of anagrams you **correctly** solve.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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Appendix E

Variable Feedback Condition

Goal Progress Sheet

Your goal for the total task is to correctly solve
_________ anagrams.

The number of anagrams you correctly solved during
the last work interval is_________.

The total number of anagrams you have correctly solved up to
this point in the task is_________.

According to your goal for this task you should have solved
_____ anagrams up this point in the task.
Appendix F
Appendix F

Questionnaire 2

Complete the following questions by circling one number along the continuum or checking the response that best represents your opinion.

1. The feedback has provided me with information I can use to improve my task performance.
   
   Strongly Agree
   Strongly Disagree
   
   1  2  3  4  5  6  7

2. How would you describe the amount of feedback you have received?
   
   Too Much
   Too Little
   
   1  2  3  4  5  6  7

3. How satisfied are you with your performance on this task?
   
   Very Disatisfied
   Very Satisfied
   
   1  2  3  4  5  6  7

4. How would you describe the feedback you have received?
   
   Positive______ Negative______
Appendix G
Appendix G

Questionnaire 3

Complete the following questions by either circling one number along the continuum, filling in the blank, or checking the response that best represents your opinion.

1. You were assigned a performance goal for this task. What was your goal?

2. How hard did you work to reach your goal for this task?
   Not Hard
   At All
   Very Hard

3. How frequently did you receive feedback on your task performance?
   Very
   Frequently
   Not At
   All

4. How satisfied are you with your performance on this task?
   Very
   Disatisfied
   Satisfied

5. How would you describe the feedback you received?
   Positive
   Negative
6. How useful was the feedback provided in improving your task performance?

Not At All Useful

1 2 3 4 5 6 7

Very Useful

7. How would you describe the amount of feedback you received?

Too Much

1 2 3 4 5 6 7

Too Little

8. How much control did you have over how well you performed the task?

A Great Deal

1 2 3 4 5 6 7

Very Little

9. To what extent did you use the feedback to change (improve) your performance on the task?

A Great Deal

1 2 3 4 5 6 7

Very Little

10. How much control did you have over how quickly you solved the problems?

A Great Deal

1 2 3 4 5 6 7

Very Little
11. The feedback provided me with information I could use to improve my task performance.

Strongly Agree

1 2 3 4 5 6 7

Strongly Disagree

12. To what extent did the task allow you to decide how to go about completing the task?

Very Little

1 2 3 4 5 6 7

Very Much

13. How accurate was the feedback you received?

Very Accurate

1 2 3 4 5 6 7

Not At All Accurate

14. How much did the task allow you a chance to use your own judgment in solving the anagrams?

Very Little

1 2 3 4 5 6 7

Very Much

15. How would you describe the goal which was set for you?

Extremely Hard

1 2 3 4 5 6 7

Not Hard At All
16. The task allowed me independence and freedom in how I solved the anagrams.

Strongly Agree
1 2 3 4 5 6 7

17. What was the source of the feedback you received on your task performance? (Check only one)

_____ The researcher told me how I was doing.

_____ Just by performing the task I knew how I was doing.

_____ I provided myself with feedback.

18. How would you describe this task?

Interesting
1 2 3 4 5 6 7

19. Challenging

1 2 3 4 5 6 7

Boring

Easy
Appendix H
### Appendix H

Summary Tables for Performance Measures

#### Analysis of Covariance on Percentage of Goal Attained

<table>
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<tr>
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<td>1</td>
<td>.01</td>
<td>.000</td>
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<td>Frequency</td>
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<td>12597.307</td>
<td>1</td>
<td>60.19*</td>
<td>.359</td>
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<td>19882.538</td>
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*p<.001.

#### Analysis of Variance on Total Score

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Appendix I
Appendix I

Summary Tables for the Significant Effects from the Analysis of the Questionnaire Data

Analysis of Covariance on Item 3: How frequently did you receive feedback on your task performance?

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<td>21.202</td>
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<td>Error</td>
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*p<.01.

Analysis of Covariance on Item 8: How much control did you have over how well you performed the task?

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<td>22.481</td>
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<td>3.37*</td>
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*p<.05.

Analysis of Covariance on Item 14: How much judgment did the task allow you a chance to use your own judgment in solving the anagrams?

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*p<.05.
Analysis of Covariance on Item 15: How would you describe the goal that was set for you?

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*p<.05.

Analysis of Covariance on Item 16: The task allowed me independence and freedom in how I solved the anagrams.

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Analysis of Covariance on Item 18: How would you describe this task?

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References


Steers, R. M. (1975). Task-goal attributes, 
n-achievement, and supervisory performance.  
Organizational Behavior and Human Performance, 13,  
392-403.

Steers, R. M. & Porter L. W. (1974). The role of  
task-goal attributes in employee performance.  
Psychological Bulletin, 81, 434-452.

Steinman, D. O. (1976). The effects of cognitive feedback  
and task complexity in multiple cue probability  
learning. Organizational Behavior and Human  
Performance, 15, 168-179.

Terborg, J. R. (1977). The motivational components of  
goal setting. Journal of Applied Psychology, 61,  
613-621.

New York: Teachers College.

Thorndike, E. L. & Lorge, A. (1944). The teacher's  
wordbook of 30,000 words. New York: Teachers  
College.

among employee participation, individual differences  
goal difficulty, goal acceptance, goal  
instrumentality, and performance. Personnel  
Psychology, 31, 305-323.