Quality Enhancement Through Goal-Setting: Examining the Effects of Goal Attributes and Feedback on Performance.

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Quality enhancement through goal-setting: Examining the effects of goal attributes and feedback on performance

Phillips, Paula Lynne, Ph.D.
The Louisiana State University and Agricultural and Mechanical Col., 1992
QUALITY ENHANCEMENT THROUGH GOAL-SETTING: EXAMINING THE EFFECTS OF GOAL ATTRIBUTES AND FEEDBACK ON PERFORMANCE

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in The Interdepartmental Program in Business Administration

by
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ABSTRACT

A laboratory experiment, using 165 students, was conducted to assess the effects of goal type (quantity vs quality), goal difficulty (difficult vs easy), goal specificity (specific vs nonspecific), and feedback type (goal-discrepant vs strategic) on performance. Subjects were asked to perform a heuristic task, appropriate for the assessment of both quantity and quality performance. Results indicated: (a) the provision of quality feedback will increase effort and will improve quality performance; (b) individuals value quality feedback more than they value quantity feedback; (c) individuals are more accurate in their prediction if quantity performance than they are in their prediction of quality performance; (d) the provision of strategic feedback results in better quality performance than the provision of only goal-discrepant feedback. However, strategic feedback does not encourage any more planning than goal-discrepant feedback; (e) quality goal specificity does not reduce inter-individual quality performance variability, but does reduce intra-individual quality performance variability; (f) providing a quality goal will improve quality performance, even before feedback is provided, (g) before feedback, individuals with difficult quality goals will not perform any better qualitatively than individuals with easy
quality goals. However, after feedback, quality goal difficulty does make a difference; (h) feedback can help individuals accurately direct attention to areas of performance deficiency; and (i) multiple goals which are easy evoke more positive affective reactions (higher goal commitment and performance satisfaction, less goal conflict, and lower perceptions of goal difficulty) than multiple goals which are difficult. The results of this study not only contribute to the theoretical refinement of the goal-setting paradigm, but also suggest directions for including quality goal-setting within a "total quality management" paradigm.
CHAPTER ONE

The Dissertation Topic

Overview of Chapter

Chapter One reviews the development of and research on the motivational technique of goal-setting (Locke, 1968). Attention will focus specifically on research utilizing quality goals within the goal-setting framework. Boundary conditions of quality goal-setting are presented. This is followed by a discussion of the research problem and an outline of the proposed dissertation research.

Review of Goal-Setting Theory

Goal-setting theory originated from two distinct traditions (Lee, Locke, & Latham, 1988). One tradition is the applied model of scientific management (Taylor, 1911) and its descendent, Management by Objectives (Odiorne, 1978). A second tradition is the academic model of the Wurzburg School and research conducted by Kurt Lewin, focusing on level of aspiration, intention, and task. In 1968, Edwin A. Locke synthesized these two models and proposed the motivational technique of goal-setting. Since that time, over 400 studies have been conducted testing and applying the theory in eight countries, using more than 40,000 subjects, and 88 different tasks (Locke & Latham, 1990a).
In the two decades following Locke's (1968) conceptualization of goal-setting theory, researchers and practitioners alike have been astounded by its success. Both traditional and empirical literature reviews have confirmed increases in productivity and improvements in performance directly attributable to goal-setting (Latham & Yukl, 1975; Locke & Latham, 1990b; Locke, Shaw, Saari, & Latham, 1981; Steers & Porter, 1974; Tubbs, 1986). Meta-analytic effect sizes, representing the strength of the relationship between difficult, specific quantity goals and performance, range from $r = .42$ (Mento, Steel, & Karren, 1987) to $r = .80$ (Hunter & Schmidt, 1983). In their comprehensive review of goal-setting studies, Locke et al. (1981) reported 90% of 110 field and laboratory studies showed positive or partially positive increments in performance attributable to goal-setting. By 1990, the number of studies supporting the goal-setting paradigm had nearly quadrupled (Locke & Latham, 1990a). However, potential boundary conditions surround the goal-setting research paradigm (Austin & Bobko, 1985).

Boundary conditions are areas of theoretical significance which have been insufficiently investigated, either empirically or conceptually. These boundary conditions limit the explanatory power of goal-setting theory (cf. Kaplan, 1964), raising concerns about the technique and encouraging potential organizational misuse.
(Garvin, 1987). Currently, the most significant boundary condition of the goal-setting literature may be the limited emphasis placed upon quality goals (Austin & Bobko, 1985).

Review of Quality Goal-Setting Literature

The overwhelming majority of both laboratory and field studies on goal-setting have emphasized quantitative aspects of performance, not qualitative aspects. Justification for such a narrow focus has been that "quantity is an objective, unambiguous concept which can be assessed directly" (Austin & Bobko, 1985, p. 291). Conversely, quality goals have been found to be difficult to articulate and to measure, in that some quality index or norm is needed to operationalize the construct (cf. Muckler, 1982). Thus, it is difficult to provide performance feedback on quality. Similar problems are prevalent in organizations. Individuals must often depend upon external evaluations of quality performance (Vance & Colella, 1990). In some cases, quality feedback in organizations may not be available at all. Furthermore, if available, there is often a lengthy time delay between performance and feedback due to the ambiguity associated with measuring quality (Bourne, 1966).
The majority of the extant goal-setting literature has avoided these problems by focusing only on quantity performance. For example, Locke (1982) noted that the determination of performance on a brainstorming task used in one study was scored "without regard to quality" (p. 512). Other goal-setting researchers have similarly assessed only quantity, ignoring qualitative aspects of performance altogether (cf. Latham & Lee, 1986). This gap in the research has caused some organizations to avoid applying goal-setting theory in practice. Many outspoken practitioners, including Deming (1986) and Peters and Waterman (1982), specifically argue that any motivational technique which places an overemphasis on quantity at the expense of quality may be dysfunctional for organizations, especially since performance quality can lead to competitive advantages (Gilbert & Strebel, 1986; Porter, 1980).

Performance quality is increasingly being recognized as a crucial determinant of organizational effectiveness (Deming, 1986; Gabor, 1990; Gitlow & Gitlow, 1987; Walton, 1986). Accordingly, there is growing interest in determining how employees can be motivated to improve and maintain quality (Feigenbaum, 1983; Garvin, 1986). Attempting to assess the efficacy of the goal-setting technique for such quality improvements, Latham and Lee
(1986) surveyed the limited goal-setting research which utilized quality goals and measured quality performance. At the time of their review, few studies had been conducted investigating quality goal-setting. Since that review, despite calls to focus on quality as an outcome in the goal-setting process (Austin & Bobko, 1985), little has been done.

Some of the earliest studies on quality goal-setting were conducted by Terborg and his associates (Terborg, 1976; Terborg & Miller, 1978). He found the establishment of a test score goal (accuracy on a knowledge test) was positively related to test score performance (Terborg, 1976). In a later study, difficult quality goals on a model construction task were assigned (Terborg & Miller, 1978). They found the presence of a quality goal was positively correlated with quality performance and "concern for quality". Weldon, Martzke, and Hamilton (1989) used the "concern for quality" measure as a surrogate for actual quality performance on a group construction task. Concern for quality was operationalized as discussion of issues related to quality and efforts to improve the appearance of models. These authors found the assignment of nonspecific quality goals resulted in higher concern for quality.

Some researchers have evaluated performance quality although no quality goal was assigned. Garland (1982)
assigned only quantity goals, but found quality was slightly lower under difficult quantity goal than easy quantity goal conditions. He used a brainstorming task where responses that were in compliance with task rules were considered quality responses. Similarly, Jackson and Zedeck (1982) measured quality performance following the assignment of quantity goals on both a manual (model-building) and a cognitive task. However, these authors indicated the correlations between quantity and quality were so high ($r = .90$ on manual task and $r = .92$ on cognitive task), only quantity performance results should be reported. Bavelas and Lee (1978) also assigned only quantity goals on a brainstorming task and found an inverse relationship between quantity and quality.

Although Erez and Arad (1986) did not assign any goals in their study (subjects self-set goals), they also found an inverse relationship between quantity and quality on an in-basket exercise.

Finally, there have been some studies that have assigned interdependent quantity and quality goals. For example, Erez (1990) asked subjects to complete a certain number of correct mathematical problems. Again, she found an inverse relationship between quantity and quality. Gilliland and Landis (1991) assigned both quantity and quality goals on a financial simulation task. These authors found on this complex task, subjects with a
quality goal and an easy quantity goals had higher performance quality than subjects with a quality goal and a difficult quantity goal. From these few studies, it would appear the presence of a quality goal has some functional effect on performance quality. However even this basic finding is suspect, due to three common limitations which characterize the majority of this research on quality goal-setting. First, quality has often been inadequately conceptualized and operationalized. Second, feedback on quality performance has typically not been provided. Third, research has failed to investigate whether the effective goal attributes associated with quantity goals are effective attributes for either quality or multiple goals. A more detailed discussion of each of these limitations follows.

Conceptualization and Operationalization of Performance Quality

The ambiguity associated with operationalizing quality is exemplified in the numerous conceptualizations proposed. Garvin (1984) indicates there have been five major approaches to conceptualizing quality, including: (a) the transcendent approach of philosophy, which posits that quality is synonymous with "innate excellence" and cannot be defined or measured precisely, but can be recognized through experience; (b) the product-based
approach of economics, which views quality as a precise and measurable variable based on specific product attributes; (c) the user-based approach of marketing, which defines quality as the capacity to satisfy consumer wants; (d) the value-based approach of accounting, which indicates quality is a function of cost-benefit analysis, and; (e) the manufacturing-based approach of production/operations management, which contends quality means conformance to design, specifications, or requirements.

Despite the existence of these varied definitions, quality goal-setting researchers have typically adhered only to the manufacturing-based, or conformance approach, to defining quality (cf. Barbour & Barbour, 1978; Deming, 1986; Garvin, 1984; 1987; Juran, 1988). This approach assumes quality is a function of the degree to which a product conforms to design or specification. Since past efforts at investigating quality goal-setting have not expanded beyond the conformity approach to defining quality, several empirical problems have arisen. Quality has often been too narrowly defined; that is, operationalized by adjusting quantity performance for errors or rule violations (e.g., Garland, 1982, Jackson & Zedeck, 1982). Specifically, the number of errors has typically been subtracted from total quantity or number of responses to determine quality performance. This
technique has resulted in spurious correlations between quantity and quality. Other problems similarly exist resulting from this limited conceptualization of quality. Goal-setting researchers have generally treated quality as a dichotomous construct rather than as a continuous construct (e.g., Erez & Arad, 1986; Garland, 1982; Jackson & Zedeck, 1982). That is, researchers typically define quality as any level of performance that meets (or conforms to) a minimum standard. This practice has resulted in range restriction of the quality measure (e.g., Crocker & Aligina, 1986).

To illustrate the existence of these common limitations, a goal-setting study conducted by Garland (1982) is examined. Garland’s (1982) study, however, is by no means an exception. Other goal-setting studies examining quality performance have suffered from a similar set of limitations (e.g., Bavelas & Lee, 1978; Erez & Arad, 1986; Jackson & Zedeck, 1982; Terborg, 1976). Garland (1982) asked subjects to perform a brainstorming task in accordance with a set of guidelines. Quantity performance was measured by the total number of task responses while quality performance was simply operationalized as the total number of task responses in compliance with the specified guidelines. Quality then was regarded as unidimensional, comprised only of rule compliance, when "creativity" or other performance dimensions could have
been equally appropriate (cf. Muckler, 1982). Any response in accordance with the guidelines was deemed to be of equal quality, resulting in responses being categorized as either "quality" or "no quality". Finally, defining quality as quantity minus errors resulted in a strong positive correlation between quantity and "corrected quantity", or quality.

In their recent article on boundary conditions in the goal-setting domain, Austin and Bobko (1985) suggest Muckler's (1982) categorization of performance quality be applied. Muckler's (1982) framework for conceptualizing quality expands beyond the limited conformance definition, and can be used to mitigate against the common problems found in most quality goal-setting studies (cf. Austin & Bobko, 1985). According to Muckler, the most important determinant of performance quality is accuracy, which is defined as the degree to which an accomplishment matches a standard. Muckler's (1982) conceptualization of accuracy, therefore, is synonymous with the commonly used conformance definition of quality.

Muckler (1982) then expands his conceptualization of quality to include components of the product-based approach of economics, which views quality as a precise and measurable variable based on specific product features or attributes. Following the assessment of accuracy or conformity, Muckler contends that quality measurement
should next consider product "novelty" as an attribute or feature of a product. When ascertaining whether a product can be novel, Muckler suggests the following question be asked, "Are there degrees of quality beyond standards of accuracy, and if so, can the task be performed in original ways?" Muckler defines novelty as comparative superiority of an accomplishment, beyond mere accuracy. Other goal-setting researchers concur with this conceptualization, defining quality as the degree of excellence of what is produced (cf. Erez, 1990). Furthermore, these definitions allow quality to be distinguished from quantity, which is the total amount of what is produced.

Interestingly, Muckler's (1982) recommended (cf. Austin & Bobko, 1985) quality conceptualization seems to be theoretically grounded in research conducted on creativity. Creativity is defined as a process involving "responses or ideas that are novel or statistically infrequent." But novelty or originality of response, while a necessary aspect of creativity, is not sufficient. If a response lay a claim to being part of a creative process, it must to some extent be adaptive of, or of, reality. It must serve to solve a problem, fit a situation, or accomplish some recognizable goal" (MacKinnon, 1962, p.485). Thus, creativity is the process of generating solutions that are both appropriate (conforming to standards) and unusual (an attribute or
feature desirable on many non-algorithmic tasks). This combination yields high quality responses on creativity tasks. Creativity may then be considered as a process of original problem-solving: that is, a process by which original products are generated. A product however, should not be defined too narrowly - it may be a response, an idea, a solution, or an actual product (Amabile, 1990).

Creativity tasks are usually characterized as both divergent and heuristic. Divergent thinking tasks require expanding or elaborating to come up with responses (Guilford, 1962). Divergent thinking can be contrasted with convergent thinking, in which information can and does lead to one right or recognizably best answer. Similarly, if a problem can be defined through a straightforward recipe, the problem has an algorithmic solution (Clark, 1980). An algorithmic procedure is one that is often guaranteed to find the best solution to the stated problem. Algorithmic or convergent tasks are those having a clear, straightforward path to solution. Heuristic tasks are those with no such clear, straightforward path. In heuristic, divergent-thinking tasks, some exploration or creativity is required (Amabile, 1983; 1990). To study motivation of creativity, behavioral heuristic or divergent thinking tasks are necessary. Creativity can only be measured on a heuristic task, as novel or unusual products can be generated.
Using such tasks for goal-setting research can facilitate overcoming the previously identified problems characterizing many of the extant quality goal-setting studies (cf. Frost & Mahoney, 1979).

For example, performance quantity on a creativity task can be distinguished from performance quality, eliminating spurious correlations between the two constructs. The rate at which ideas are produced on a divergent-thinking heuristic task reflects ‘verbal fluency’. The person who produces ten responses per minute is said to be more fluent than the one who produces only two responses. Fluency (cf. Thurstone, 1947) - the facility for which ideas can be generated or the ability to think of words rapidly (Guilford, 1962) - is a commonly used measure of quantity on a heuristic creativity task (Clark, 1980). Fluency (a measure of the total number of ideas) can then be distinguished from originality. Originality is a measure of both the appropriateness of a response as well as the unusualness (i.e., statistically uncommon responses). Using a norm, originality can be empirically studied and measured by how many times a previous respondent provided the same response. The fewer times an idea appears, the greater its originality (Clark, 1980). Performance quantity (fluency) on a creativity task is then statistically independent of performance quality (originality). It may be easy to generate a
number of possible solutions of low quality in response to a problem and end up with qualitative mediocrity despite acceptable quantity (Kim, 1990). This independent relationship between quantity and quality is a characteristic of creativity tasks, making them appropriate to study both quantity and quality without any confounding effects.

Measuring creativity as an attribute of quality also can overcome problems of quality range restriction associated with dichotomous operationalizations of quality. Creativity researchers contend the construct is continuous. As Amabile (1990, p.32) writes, "the highest levels of creativity that we see in the world - the greatest scientific advances, the most startling artistic achievements - lie on the high end of the continuum on which we see everyday 'garden variety' creativity - ideas and responses that are modestly novel and less earth shattering. I do not believe that there is a discontinuous break in differing level of creativity." Creativity should be operationalized along a continuum, and products do vary in degrees of quality (Nicholls, 1972; Cattell & Butcher, 1968). "Creativity is a matter of degree. The operant question is not "is this creative?" but rather "how creative?" (Kim, 1990, p.85).

As indicated above, one way to overcome problems typically associated with quality goal-setting research
and remain consistent with Muckler's (1982) operationalization is to recognize creativity as an essential component of quality on some tasks. This framework would be especially compatible with the experimental heuristic tasks typically used in quality goal-setting research. Using Muckler's (1982) quality framework also has implications for motivating creativity. Research on creativity has been conducted most often in the educational, arts, and humanities domains, and to a slight extent in some of the psychological sciences (Simon, 1985). Yet, even in the psychology literature, little attention has been paid to management or motivation of creativity. Most creativity research has focused on personality variables or constellations of traits characterizing creative individuals (Barron, 1955; Helson, 1965; MacKinnon, 1962), cognitive abilities involved in creative achievement (Guilford, 1956), the development of creativity tests (Torrance, 1966), or methods for training creativity skills in children (Parnes, 1967; Stein, 1974). Notably, there has been a concentration on the creative person to the exclusion of "creative situation" - that is, circumstances conducive to creativity (Simonton, 1975). As a result, extant knowledge about internal determinants of creativity is much greater than knowledge about external, contextual determinants (Amabile, 1983). This state has impeded the management of creativity, for
although "creative employees" can be identified in organizational settings, we know little about how individuals can be motivated to be creative.

Such a state is unfortunate, as creativity is desirable in many organizational settings. Creativity is an essential step in the innovation process (Smeltz & Cross, 1984), and may contribute to the long-term productivity and effectiveness of the workplace (Galbraith, 1982). While recognizing quality is task-dependent - in that what constitutes quality performance on one task may not on another - creativity does seem to be intricately linked with quality under many circumstances (Garvin, 1984). For example, "Total Quality Management" (TQM) advocates (Deming, 1986) contend organizational productivity is ultimately dependent upon quality maintenance and enhancement, which results from innovation fueled by creativity (Botkin, 1985). "Creativity is directly linked to quality in that helps bring about innovation" (Raudesepp, 1987, p. 177). Creative thinking results in original solutions to problems that continually arise in the personal and vocational spheres (Milgram, 1990). In turn, "creative activity is essential in the current competitive business environment" (Zaleznick, 1985, p.41).

Such a contention becomes more evident as we consider what innovation means. Too often the interpretation of
this term has been overly narrow. Kanter (1987) indicates that many erroneously equate innovation with technological advances, such as the development of a new invention or piece of high-tech machinery. However, innovation could be more broadly conceptualized, as it refers to the process of bringing any new problem-solving or opportunity-addressing idea to use (Kanter, 1987). Research and development personnel or scientists are not the only organizational agents who can 'innovate'. Since creativity can result in innovations throughout the organization, it is especially meaningful to investigate ways in which the environment can be structured to stimulate creativity.

Despite recognition that creativity is often vital to organizational effectiveness, very few specific guidelines have been offered for encouraging, improving, or managing creativity. Axioms such as "challenge tradition and seek new perspectives", "invest in people" (Porter, 1985, p.63), and "prevent people from feeling too comfortable with the status quo" (Miller, 1987, p.22) have been offered. Others have avoided the issue of managing creativity. As Bensinger (1965, p.149), the General Manager of the Brunswick Company states, "we have not drifted into free-wheeling, idea-association techniques such as 'group-think', 'buzz session', [or] 'imagineering'...Even though our people are constantly at
work at idea production, we have not set forth any specialized training program on 'imagineering' or creative thinking" (p.149). Thus extant literature seems to recognize that creativity is an essential component of quality, yet practical management of creativity is an issue which has not yet been addressed. This is particularly evident in the extant quality goal-setting literature, although the motivational technique of goal-setting may be a mechanism through which creativity, and ultimately quality, can be motivated and managed.

**Goal Attributes and Quality Performance: Goal Difficulty and Goal Specificity**

Overwhelming evidence exists showing quantitative goals are most effective for increasing performance when they are difficult and specific (Locke & Latham, 1990b). Accordingly, goal attributes of difficulty and specificity are the most important characteristics to be considered in establishing quantity goals. Based on goal-setting theory, difficult goals are those which can be attained ten percent of the time (Locke & Latham, 1990b). The effect of goal difficulty is manifested through its influence on performance level. That is, performance is a function of how difficult a goal is, such that more difficult goals result in higher levels of performance than easier goals.
However, the attribute of difficulty has only been investigated under quantity goal conditions. That is, there is no extant empirical evidence showing that quality goal difficulty increases the level of quality performance. Currently, research indicates the presence of a quality goal can prime individuals to be attuned to that construct (Latham & Lee, 1986), ultimately increasing quality performance. However, there is no evidence suggesting that individuals assigned difficult quality goals will outperform those assigned easy quality goals. In fact, we might expect that the level of quality goal difficulty will not have an initial effect on performance level due to the ambiguous nature of the construct. Within a control theory framework, it will be difficult for individuals to detect discrepancies between actual and desired quality performance, as the construct is quite vague as compared to quantity. Until individuals are provided with feedback decreasing ambiguity associated with quality goals, it may be priming by the mere presence of a quality goal - not the level of difficulty of the quality goal - which increases quality performance. Following feedback, when quality goals become more concrete and performance expectations and discrepancies are clarified, level of quality goal difficulty may serve the same function under qualitative goal conditions as it does under quantitative goal conditions. Currently,
however, research investigating the attribute of goal difficulty under qualitative goal conditions is missing from the literature.

A second attribute of goals, goal specificity, refers to how detailed or explicit a goal is. Naylor and Ilgen (1984) define specificity as the ambiguity or diffuseness of a goal. For example, a goal of producing 10 units is more specific than a goal of producing between 8 and 12 units, which is even more specific than a goal of producing a "large number" of units (cf. Locke & Latham, 1990b). Although each of these goals may be of similar difficulty, resulting in similar level of performance, the variability of performance will be different. That is, the effect of goal specificity is manifested through a decrease in performance variability. According to goal-setting theory, goal specificity does not affect performance level, but rather, performance variance. Again, the advantages of goal specificity have been shown under quantity goal conditions (Locke, Chah, Harrison, & Lustgarten, 1989), but never within a quality goal framework. It would be advantageous to establish such a finding, as reduction in the variability of quality performance would have functional effects on organizational production.

Another question arising from consideration of goal attributes is how should multiple goals be assigned (Locke
& Latham, 1990b). That is, if goals are to be assigned for more than a single performance dimension, what attributes should characterize the goals. Decades ago, psychologists working outside the goal-setting paradigm identified a phenomena known as the "quantity-quality performance trade-off" by examining the relationship between speed and accuracy. Using psychophysical and psychomotor tasks, Garrett (1922) found evidence for an inverse relationship between speed and accuracy. Other authors, using different tasks have also confirmed this quantity-quality trade-off (Aronson & Gerard, 1966; Fitts, 1966; Fitts & Posner, 1967; Reed, 1973). Summarizing this line of research, Fitts and Posner (1967) propose:

Man has the ability to trade speed for accuracy. A typist may prepare a hurried rough draft in less time than it would take her to prepare a finished copy but it would contain more errors. A political speaker may impress his audience with the rapidity of his answers or he may take his time and prepare a more reasoned argument. In nearly every task, man can perform at varying levels of accuracy depending upon the rate at which he must act.

As found by Phillips and Farh (1990; 1991; 1992), a similar type of trade-off occurs in goal-setting. This phenomena is especially evident when an individual is
assigned only a single quantity goal. When quantity goals are assigned in isolation, the resulting effect on performance quality is detrimental. This inherent trade-off is consistent with observations made by quality expert Edwards Deming (1986), who is hailed for revitalizing Japan following World War II. According to Deming, quantity goals should not be used because of the resultant sacrificing of quality. Other practitioners, such as Peters and Waterman (1982), similarly warn about the pursuit of quantity output at the expense of quality. Goal-setting researchers have finally become more aware of this trade-off. As Locke and Latham (1990b, pp. 97-98) recently indicated, quality may have to be sacrificed to achieve increasingly difficult quantity goals. However, advice offered by goal-setting theorists for regulating this trade-off has been limited. To circumvent decrements in quality following the assignment of a quantitative goal, Locke and Latham (1990b) simply suggest "if quality is an important outcome, quality goals, in place of or in addition to quantity goals, should be set" (p.98, emphasis added). Similarly, Deming (1986) recommends that difficult quality goals be assigned in isolation. Yet such an assignment also results in a trade-off, as quantity seems to be sacrificed to attain quality goals (Phillips & Farh, 1992).
Seemingly the only apparent way to avoid the trade-off associated with assigning goals for a single performance dimension is to assign multiple goals simultaneously. But as Locke and Latham (1990b) recently remarked, extant research provides little direction about effective attributes of multiple goals. That is, if goals are assigned for more than a single performance dimension, what attributes should characterize the goals.

To date, there has been little research on affective, cognitive, or behavioral responses to multiple goal assignments (Austin & Bobko, 1985; Locke & Latham, 1990b). Traditionally, goal-setting research has predominantly focused on single-goal tasks, although in organizational settings individuals are often faced with multiple and even conflicting goals (Lord & Maher, 1990). When multiple, but equally important goals are set for performance dimensions which are interrelated aspects of a single task, little is known about individual reactions or resulting performance (Edmister & Locke, 1987).

Quality Feedback

As noted previously, it is typically time consuming and tedious to measure quality performance and provide timely knowledge of results to individuals. However, goal-setting theory posits that feedback, or knowledge of results, is an essential component of the technique. As Lee, Locke, and Latham (1989) indicate, "...neither goals
nor knowledge of results alone are sufficient to improve task performance. Rather both goals and knowledge of results must be present" (p. 305). That is, goal-setting theory posits that feedback is a moderator of the goal-performance relationship, such that goals can improve performance only when feedback is present. This relationship between goals, feedback, and performance can be understood through a control theory perspective (Taylor et al., 1984). Control theory posits that individuals will be motivated to the extent that there is a discrepancy between standards or goals and actual performance. When such a discrepancy exists, individuals will increase effort and develop task strategies aimed at reducing the discrepancy. However, for a discrepancy to be detected, feedback must be provided indicating progress toward the goal.

Interestingly, providing feedback may be more essential under quality rather than quantity conditions. Individuals can often gather feedback on quantity performance from the task environment (Locke & Latham, 1990b). The nature of many tasks is such that quantity feedback is often internally generated (Vance & Colella, 1990). For example, on many tasks individuals can assess quantity performance by simply counting the number of units produced. However, quality performance is more difficult to self-determine. Individuals may not know
what constitutes quality on a particular task. Even if the criteria are clear, a standard or referent for evaluation may be unavailable or the quality of a product may not be immediately determinable. Despite the central role played by feedback in goal-setting theory, literature investigating the effects of quality performance feedback has been notably absent.

Statement of Research Problem and Significance of the Study

Goal-setting has emerged as one of the predominant motivational paradigms in organizational literature (Pinder, 1984). Although hundreds of studies have investigated the theory, the overwhelming majority of this research has been very limited in that it has focused only on quantity goal-setting. Recent interest in and concern for performance quality has resulted in questioning the effectiveness of the goal-setting motivational technique. This is attributable to the fact that current knowledge about quality goal-setting is very limited, especially in comparison to the extant knowledge base on quantity goal-setting.

This proposed research will address unanswered questions regarding goal-setting under quality goal conditions. Specifically, the purpose of this proposed dissertation is to investigate boundary conditions
surrounding quality goal-setting. This will be done using an appropriate measure of quality performance developed by Phillips and Farh (1992) for the particular heuristic task utilized in this research. According to Locke and Latham (1990b, p. 34), the task used is the most frequently utilized experimental task in goal-setting research. They report that 34 goal-setting studies have either used this task or a slight variation. Specifically, the study will investigate how the attributes of goal difficulty and specificity affect quality performance following goal-setting. Secondly, this research will examine the influence of quality performance feedback on affective, cognitive, and behavioral reactions to goal-setting.

Overview of the Proposed Research

To address the research problem, a laboratory experiment was conducted to test substantive hypotheses derived from the goal-setting and feedback literatures. With the exception of subjects assigned to a control condition, all subjects were assigned both a quantity goal and a quality goal. Both quantity and quality goals varied in terms of goal difficulty (difficult versus easy). Additionally, two groups of subjects were assigned nonspecific quality goals. The experimental design is depicted in Figure 1-1.
### Quantity Goals

<table>
<thead>
<tr>
<th>Quality Goals</th>
<th>Difficult</th>
<th>Easy</th>
<th>NonSpecific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult</td>
<td>Cell 2 (n=30)</td>
<td>Cell 4 (n=30)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No FB</td>
<td>GD FB</td>
<td>Strat FB</td>
</tr>
<tr>
<td>Easy</td>
<td>Cell 3 (n=30)</td>
<td>Cell 5 (n=30)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No FB</td>
<td>GD FB</td>
<td>Strat FB</td>
</tr>
<tr>
<td>Nonspecific</td>
<td>Cell 6 (n=15)</td>
<td>Cell 7 (n=15)</td>
<td></td>
</tr>
</tbody>
</table>

Plus Control Conditions (Cell 1; n=15):
- Difficult, Specific Quantity Goal (10)
- No Quality Goal

**Figure 1.1: Experimental Design**
With the exception of the control and nonspecific goal subjects, all cells also include a feedback manipulation. There will be three levels of feedback - none, goal discrepant (outcome only), and strategic (outcome plus process). Subjects were also questioned regarding their cognitive and affective reactions to the goal manipulations.

Overview of Subsequent Chapters

Chapter Two will contain a review of relevant goal-setting and feedback literatures, culminating in the presentation of formal research hypothesis. Specifically, Chapter Two will first address the effects of goal difficulty and specificity on performance, performance variability, and affective reactions to goals. Next, this chapter will outline different types of feedback, and will discuss the processes through which feedback influences performance level, the "quantity-quality performance trade-off", and individual affective and cognitive reactions.

Chapter Three will present a detailed report of experimental methodology, including a discussion of experimental subjects, the experimental task, and procedures used to carry out the study. This chapter will also present procedures used to develop the quality scoring norm used in assessing subject's quality
performance. Interim-experimental and post-experimental questionnaire measures will also be outlined.

Chapter Four will present the results of analytical tests of the hypotheses, in both verbal and tabular form. Chapter Five will include an interpretation and discussion of the results, as well as implications and suggested future research directions.
Overview of Chapter

Chapter Two reviews relevant goal-setting and feedback literatures, culminating in formal hypotheses designed to investigate the research problems presented in Chapter One. Specifically, research on feedback will be discussed, with particular emphasis on different types feedback provided during the goal-setting process. Next, this chapter will examine research on effective goal attributes and will show that attributes characteristic of effective quantity goals may not be equally effective for quality goals. Finally, this chapter will address how goal attributes and feedback may regulate a phenomenon known as the "quantity-quality performance trade-off."

Quality Performance Feedback

Performance feedback has long been recognized as important for learning and maintaining desirable behaviors (Herold, Liden, & Leatherwood, 1987). Similarly, the central role of feedback in the goal-setting process has often been discussed by motivation researchers (cf. Locke et al., 1984; Locke & Latham, 1984; 1990b; Pinder, 1984). Despite the importance of feedback in attaining goals and improving performance, several areas of research remain in
need of investigation. One such area is the role of feedback under quality goal-setting conditions. According to Ilgen and Moore (1987), "for the most part, feedback effects on performance [following goal-setting] have been demonstrated for tasks in which the primary performance criterion was quantity. Yet most tasks encountered at work have both a quantity and a quality dimension" (p.401). This lack of attention to quality performance feedback has limited our knowledge about feedback effects following performance on tasks for which quality goals have been established.

Feedback, or knowledge of results, has been defined several ways by organizational behavior and communications researchers (cf. Gist & Bavetta, 1989). Ilgen, Fisher, and Taylor (1979) define feedback as a message conveyed to a recipient about that recipient. Others have offered a more specific definition. For example, Annett (1969) defines feedback as information provided to an individual specifically about his or her past behavior. Ashford and Cummings (1983) are even more explicit, defining feedback as information about how well an individual is meeting a goal. The latter definition is generally accepted by goal-setting researchers (Locke et al., 1981).

Despite the apparent simplicity of the feedback construct, there are qualitative differences in the types of feedback that can be transmitted to a recipient (Ilgen
et al., 1979). Feedback can contain differing types of information as well as differing amounts of information. Over a decade ago, Nadler (1979) warned about conceptualizing feedback in a narrow manner. Disregarding this warning, goal-setting research has typically limited attention to general outcome feedback. Specifically, goal-setting researchers have not fully investigated either: (a) the effect of different types of feedback on performance, or (b) the effects of feedback under goal conditions other than quantity.

There is increasing speculation that the feedback-performance relationship depends upon the content of feedback that is provided to a recipient (Gist & Bavetta, 1989; Hammond & Summers, 1972; Jacoby et al., 1984). That is, there are different types of feedback that can be communicated, and these different types may have different performance implications (Gist & Bavetta, 1989). Throughout this proposal, reference will be made to two types of feedback: (a) "goal-discrepant" feedback, and (b) "strategic" feedback. Goal discrepant feedback refers to information about the end result of an individual's behavior - such as whether or not a goal was met. Alternatively, strategic feedback refers to information about the process used to achieve desirable end results (Nadler, 1979). Within a goal-setting framework, strategic feedback refers to information about specific
behaviors, strategies, approaches, or activities involved in achieving a goal (Earley, 1988), as well as information about outcomes (goal-discrepant feedback).

Researchers outside the goal-setting domain have distinguished between these different types of feedback to a greater extent than motivational researchers. For example, Bogart (1980) defines strategic feedback as knowledge which can help an individual adjust to performance expectations on a task, and goal-discrepant feedback as knowledge about performance. Similarly, Herold and Greller (1977) refer to these different types of feedback as referent (strategic) feedback, which is information about behaviors needed to achieve a goal, and appraisal (goal discrepant) feedback, which is information about how well an individual is achieving that goal.

Goal-setting research, however, has focused almost exclusively on the effects of goal discrepant feedback in response to quantity performance. To date, there has been no empirical research directly examining the effects of goal discrepant and strategic feedback on quality performance following quality goal-setting.

Both motivational and communications literatures suggest feedback serves two primary functions: motivational and informational (Cusella, 1980; Locke & Latham, 1990b). Theoretically, feedback on goal progression increases performance because it encourages
individuals to work both harder (expend more effort) and smarter (engage in strategic task planning; Mitchell & Silver, 1990). Regarding the motivational function, feedback provides information about goal-performance discrepancy and increases the exertion of effort to reduce this discrepancy (Locke, 1967). Such a contention is supported by a control theoretical point of view (Taylor et al., 1984). If goals work like references in a closed-loop control system, their regulating influence on behavior can only be effective if performance is monitored and compared with standards through feedback (Schmidt, Kleinbeck, & Brockmann, 1984). With this comparison, differences between intended and actual performance can be detected, and correction can be initiated. Correction will result in desired responses so long as standards for evaluation are clearly communicated, accurate assessments are made, and goals are sufficiently difficult such that a discrepancy between desired and actual performance exists (Taylor, Fischer, & Ilgen, 1984). A common response to standard-performance discrepancies is an increase in effort, or energy expended in goal attainment (Matsui, Okada, & Inoshita, 1983). Increased effort resulting from the provision of feedback is hypothesized to increase quality performance. Thus, it is proposed:
Hypothesis 1: Individuals assigned difficult, specific quality goals and provided with feedback will exert more effort and will perform qualitatively better than individuals assigned a difficult, specific quality goal and not provided with feedback.

Numerous attempts have been made to characterize various sources of feedback. Annett (1969) proposes two general sources of knowledge of results - intrinsic and extrinsic. Intrinsic feedback is naturally available and uncontrollable by an agent. Extrinsic feedback consists of any information provided by a source other than an individual performer. Ilgen et al. (1979) offers an alternative taxonomy of feedback source. These authors postulate there are three feedback source categories: (a) other individuals observing a recipient's behavior, (b) the task environment, and (c) performers judging their own performance and serving as a feedback source (self-feedback). The latter two sources are internal, implicit, or intrinsic sources while the first source is external, explicit, or extrinsic (Harold & Parsons, 1985; Masuch, 1985). This distinction between intrinsic and extrinsic feedback is important, for as Cusella (1987) warns, different sources of feedback may be perceived and interpreted differentially. For example, internally generated feedback is found to more reliable, frequent,
and consistent than externally generated feedback (Herold, Liden, & Leatherwood, 1987; Greller & Herold, 1975; Hanser & Muchinsky, 1978). Most organizations, however, operate under the assumption that external feedback is most salient and effective (cf. Podsakoff & Farh, 1989). Little attention is paid to individuals generating their own feedback.

This issue seems especially consequential for goal-setting research, as it may help to explain an unusual phenomenon in the literature. Despite theoretical predictions, meta-analyses of goal-setting research fail to empirically show feedback has a strong effect on subsequent performance improvements (cf. Mento et al., 1987; Tubbs, 1986). Specifically, Tubbs (1986) reported a meta-analytic correlation between goals and performance of $r = .49$ under conditions of no feedback and only $r = .57$ when feedback was provided. Similarly, Mento et al. (1987) found an effect size of $r = .50$ under conditions of feedback and $r = .41$ when no feedback was provided. Differences in these magnitudes seem relatively modest considering the central role of feedback in goal-setting theory. One plausible explanation for these findings is the majority of studies included in these meta-analyses used tasks in which only quantity goals were set. Furthermore, the majority of these tasks were conducive to gathering of self-feedback on quantity performance. Thus
even when no explicit outcome feedback was provided, one cannot be sure that individuals did not collect self-feedback as they performed the task (Cusella, 1987; Vance & Colella, 1990). Locke and Latham (1990b) make a similar point when they warn that many tasks are designed such that an individual can easily collect implicit feedback on quantity performance.

As implied by this research, individuals understand what constitutes acceptable quantity and can often assess quantity performance on their own. However, quality performance feedback is more ambiguous and difficult to ascertain by an individual. Because of difficulty in gathering implicit quality feedback, explicit feedback may be more valued under quality goal conditions (Ilgen, Fisher, & Taylor, 1979). Ashford (1986) postulates individuals will value feedback most when there is a large degree of uncertainty about what constitutes acceptable performance, since such information allows individuals to structure situations and make choices about how to proceed. Since this is likely to be the case under quality goal-setting, it is proposed that:

**Hypothesis 2A:** Individuals will value quality feedback more than they will value quantity feedback.
Hypothesis 2B: Before receiving feedback, individuals will be more accurate in their prediction of quantity performance than they will be in their prediction of quality performance.

A second function of feedback is that it provides information, encouraging learning and knowledge acquisition, which in turn influences subsequent performance (Gist & Bavetta, 1989). Knowledge of performance can provide cues about ineffective behaviors and can help re-direct future behavior through the formation of task plans and development of task strategies (Hoffman, Earle, & Slovic, 1981). However, Pritchard, Montagno, and Moore (1978) argue that not all feedback can serve this informational function. This is because communication about performance must be detailed enough for an individual to assess how behavior can changed to be more productive (Taylor et al., 1984). Others concur, suggesting that planning and strategy development is more likely to take place when feedback is sufficiently informative to suggest distinct ways of behaving (Frost & Mahoney, 1979; Ilgen et al., 1979). Similarly, Steers and Porter (1974) warn that feedback only about outcomes, or goal-discrepant feedback, is of little value. They suggest that feedback should be specific and explicit enough to permit strategy development and planning. Because of the
distinct effects produced by different types of feedback, it is proposed:

**Hypothesis 3A:** Individuals assigned difficult, specific quality goals and provided with strategic feedback will perform qualitatively better than individuals assigned difficult, specific quality goals and provided with goal discrepant feedback only.

**Hypothesis 3B:** Individuals assigned difficult, specific quality goals and provided with strategic feedback will engage in more task planning/strategy development than individuals assigned difficult, specific quality goals and provided with goal discrepant feedback only.

**Effective Quality Goal Attributes: Goal Difficulty and Goal Specificity**

The core premise of goal-setting theory is goals regulate human action. That is, setting a goal directs attention and arouses persistent effort aimed at achieving that goal or objective. The theory suggests this process will occur despite the nature, or content, of the goal. As Locke and Latham (1990b) argue, "since the effect of the goal depends upon the content of the goal, there should be no limit to the types of measures used as
performance criteria [in goal-setting]" (p. 52). Furthermore, these authors speculate that effective goal attributes associated with quantity goals should apply to quality goals as well. Two of the most common goal attributes identified and discussed throughout the literature are goal specificity and goal difficulty.

Goal-setting theory posits that increasing goal specificity will reduce performance variability, such that more specific goals will result in more consistent levels of performance (Locke, Chah, Harrison, & Lustgarten, 1989). Locke and Latham (1990b) insist specificity does not influence performance level - only goal difficulty influences the level of performance. The only effect of specificity, divorced from difficulty, should be a reduction in inter-individual performance variability. However, identifying a goal attribute which restricts performance inconsistencies could be quite beneficial. Consistent performance may be just as important as the absolute level of performance - especially when considering quality. Many organizations have been adversely impacted because of their failure to maintain an invariable level of quality production (Collier, 1990). Despite the importance of this issue, very little attention has been paid to the attribute of goal specificity, especially in relation to quality goals. Based on theoretical predictions of the goal-setting
paradigm, indicating that increasing the specificity of a goal will reduce performance variability on the dimension for which a goal is set, it is proposed:

**Hypothesis 4A:** Individuals assigned difficult, specific quality goals will have lower quality performance variability than individuals assigned difficult, nonspecific quality goals.

**Hypothesis 4B:** Individuals assigned difficult, nonspecific quality goals will have lower performance variance than individuals not assigned a quality goal.

A second attribute associated with effective quantity goals is goal difficulty. Hundreds of studies confirm increasing the difficulty level of a quantity goal can increase quantity performance level. Research investigating the goal difficulty mechanism under quality goal conditions is absent, although Terborg and Miller (1978) warned difficult quality goals may elicit behavior different than difficult quantity goals because of the constraints imposed by goal difficulty.

Extant literature only seems to indicate the presence of a quality goal can improve quality performance - such
that when a quality goal is assigned, quality performance will be higher than when a quality goal is absent (Shalley, 1991). Previous research on quality goal-setting, as well as research in the creativity domain, supports the idea that quality goals assigned on a heuristic task prime individuals to be attuned to that construct. For example, research has found individuals will be more creative if they are told they are performing a creativity task (Manske & Davis, 1968; Speller & Schumacher, 1975). Similarly, Harrington (1975) found subjects who were told to be "creative" performed better on a divergent thinking task than subjects who were simply asked to perform the task. Shalley (1991) believes the results of these studies can be explained by the fact that the goal (i.e., mention of creativity task or instructions to be creative) primes attention and effort on creative behavior (Wyer & Srull, 1980). Extant quality goal-setting literature also supports this priming view, as the presence of quality goals (despite their level of difficulty) seems to improve quality performance (cf. Shalley, 1991). Based on this research, it is proposed:

Hypothesis 5: Individuals assigned a specific quality goal will perform qualitatively better than individuals not assigned a quality goal (before feedback).
However, there have been no empirical investigations of the effects of quality goal difficulty on quality performance. In fact, control theory would suggest until an individual receives feedback, quality goal difficulty may not have an effect on quality performance (Taylor et al., 1984). When quality goals are assigned, individuals have difficulty ascertaining progress toward the goal and understanding requirements for acceptable performance (Wood et al., 1987). Without knowledge of results about quality performance, individuals will typically not be able to detect a discrepancy between expected performance based on the goal and actual performance. Feedback, however, can serve to illuminate discrepancies between actual and desired quality performance, resulting in an increase in effort (Taylor et al., 1984). Feedback may also serve to encourage the development of effective task strategies aimed at meeting quality goals (Locke & Latham, 1990b). Supporting this control theory view, researchers have found when feedback was withheld, the relationship between goal difficulty and performance was attenuated (Becker, 1978; Strang, Lawrence, & Fowler, 1978). However, following the provision of feedback, the relationship between goal difficulty and performance was restored.

Research on task complexity also supports the idea that quality goal difficulty may not initially impact
performance. When quality goals are assigned on tasks, the nature of the task is transformed - it becomes more complex (Frost & Mahoney, 1979; Wood, 1986). As Terborg and Miller (1978) indicate, "quality goals may redefine the task in such a way as the task becomes more complex" (p.38). For example, if a quantity goal was assigned on a brainstorming task, an individual would merely have to list responses. However, if a quality requirement were imposed, the task would be transformed into listing responses that met certain criteria. This task transformation, stimulated by varying the nature of the goal, increases the complexity of the task (Bandura & Cervone, 1986; Huber, 1985). Task complexity depends upon task outputs expected and actions required to reach the goal. When quality goals are assigned independently of quantity goals, and strategy development is required for task completion, a task is considered complex within the goal-setting framework (Wood & Locke, 1990). On complex tasks, the relationship between level of goal difficulty and performance is weakened (Wood, Mento, & Locke, 1987). That is, increasing goal difficulty on complex tasks will not necessarily improve performance level (Earley, Connolly, & Ekegren, 1989; Locke & Latham, 1990b). This phenomena can be explained by control theory (Taylor et al., 1984). On complex tasks, individuals have difficulty ascertaining actual performance and goal-performance
discrepancies. However, Locke and Latham (1990b) recently suggested feedback may mitigate against the negative influence of complex tasks on the goal difficulty-performance relationship. Based on both control theory literature and research examining the relationship between goal difficulty on complex tasks and performance, it is proposed:

**Hypothesis 6A:** Individuals assigned difficult, specific quality goals will have similar levels of performance quality as compared to individuals assigned easy, specific quality goals (before feedback is provided).

**Hypothesis 6B:** Individuals assigned difficult, specific quantity goals will have higher levels of performance quantity as compared to individuals assigned easy, specific quantity goals (before feedback is provided).

**Hypothesis 6C:** Individuals assigned difficult, specific quality goals and provided with feedback will have higher levels of performance quality as compared to individuals assigned easy, specific quality goals and provided with feedback (after feedback is provided).
Goal Attributes, Feedback, and the Quantity-Quality Trade-Off

Motivation theorists assert one problem characterizing much of the extant goal-setting research is an overemphasis on single-goal tasks (Pinder, 1984). In fact, in most non-laboratory settings individuals are typically faced with multiple goals (Terborg & Miller, 1978). However, very little research has been conducted investigating individual reactions to multiple goal assignments. Some theorists suggest multiple goals strengthen the goal-performance relationship by leading to performance improvements on all dimensions for which goals are assigned (Forward & Zander, 1971; Locke et al., 1981). Supporters of this view theorize multiple and even conflicting goals stimulate the addition or employment of unused cognitive resources that facilitate attainment of goals simultaneously (cf. Humphreys & Revelle, 1984; Kahneman, 1973). Under the assumption that resources can be allocated purposefully to those aspects of the task relevant for performance, we similarly assume that "individuals develop and employ goal-adequate resource-allocation policies" (Schmidt et al., 1984, p.132). One method suggested for facilitating the development of these effective resource allocation policies is to manipulate goal attributes such that individuals can infer the importance of each goal based on their characteristics
(Wickens, 1980; Wickens & Gopher, 1977). For example, assignment of a specific, difficult goal implies this objective is more important than a nonspecific, "do your best" goal (Schmidt et al., 1984). However, the determination of individual resource allocation policies becomes more complex as multiple goals are assigned which are all characterized as difficult and specific. Erez (1990) suggests when multiple goals are perceived as equally difficult and specific, trade-off will occur as it does when single goals are assigned in isolation. That is, individuals will attempt to achieve one goal while sacrificing performance on the other dimensions for which goals are assigned.

Thus one method proposed for controlling the quantity-quality trade-off is to manipulate goal attributes such that individuals can infer the importance of goals without becoming overwhelmed. The question which must be addressed in this line of research is how multiple goals should be set to maximize performance on multiple dimensions while eliminating negative affective reactions, such as goal conflict. In fact, Locke and Latham (1990b) recently indicated investigation of this issue should be a top priority for goal-setting researchers. Another method proposed to regulate this trade-off is through providing feedback to individuals about progress toward the goal. Erez and Arad (1986) suggest the quantity-quality trade-
off may be regulated by providing information about performance. They found explicit instructions about how to perform a task reduced trade-off. Similarly, they suggested performance feedback may offset this trade-off.

Providing feedback serves an informational function useful for directing attention and mobilizing effort toward unmet goals, ultimately resulting in effective resource allocation strategies. However, such allocation strategies are typically necessary only when difficult goals are assigned. Definitionally, easy goals imply they will be met 90% of the time. In such cases, individuals assigned easy goals typically receive feedback indicating the established standard has been met. From a control theory perspective, such information is likely to convey the message that the individual should be satisfied with goal progress and few changes are expected in the effort put forth (Podsakoff & Farh, 1989; Taylor et al., 1984). As Bandura and Cervone (1986) point out, "if [individuals] are satisfied with approximating or surpassing the standard they do not invest increased effort in the pursuit" (p.109).

On the other hand, if individuals are assigned one easy and one difficult goal, feedback is likely to increase the quantity-quality performance trade-off. That is, feedback will likely contain both positive and negative aspects, indicating the goal was met on one
performance dimension (positive feedback indicating no actual-desired performance discrepancy exist) while the goal was not met on another (negative feedback indicating actual-desired performance discrepancy exists). In such cases, attention will be directed toward eliminating the performance discrepancy resulting in focus on one performance dimension to the exclusion of the other. Taylor et al. (1984) suggest difficult goals are more likely to produce a discrepancy signal and remedial responses than easy goals. That is, difficult goals are typically associated with more rapid detection and response to poor performance. But this is true only if an individuals has knowledge about results. Based on this line of reasoning, it is proposed:

Hypothesis 7: Individuals assigned an easy, specific quality goal and a difficult, specific quantity goal and provided with feedback will have higher performance quantity than individuals assigned an easy, specific quality goal and a difficult, specific quantity goal and not provided with feedback (after feedback is provided).

Another area of investigation receiving inadequate attention has been affective reactions arising from multiple goal assignments. Consideration of affective reactions to multiple goals is vital, as research
indicates constructs such as goal commitment and satisfaction are directly influenced by goal assignment and ultimately affect performance. Furthermore, multiple goals are likely to elicit reactions that are both stronger and different than reactions to single goals, especially if the goals are considered to be specific and difficult (cf. Drucker, 1974).

Goal commitment is an affective variable that has been given much consideration in recent goal-setting literature (cf. Hollenbeck & Klein, 1987). According to Locke et al. (1981), goal commitment refers to the determination to try for a goal. Commitment implies the exertion of effort over time and an unwillingness to abandon the goal. Goal commitment moderates the goal-performance relationship such that commitment to a goal is required for that goal to influence performance. Existing goal-setting literature suggests individuals assigned multiple goals may have lower goal commitment than individuals assigned a single goal for two reasons. First, individuals receiving multiple goal assignments are likely to experience goal conflict (Drucker, 1974). Goal conflict can be defined as perceived incompatibility between goals which exist within an individual (Reichers, 1986). Typically, there is less commitment to goals that involve a conflict than to single goals that present no conflict (Bandura, 1986; Locke & Latham, 1990b, p.145).
Second, multiple goals are also likely to be perceived as more difficult than single goals, since attention must be directed not at maximizing only one but at maximizing multiple performance dimensions. Previous goal-setting research has established a negative relationship between goal difficulty and goal commitment (Erez & Zidon, 1984; Locke, Frederick, Buckner, & Bobko, 1984).

Reductions in goal commitment are typically accompanied by reductions in performance satisfaction (cf. Locke & Latham, 1990b; Reichers, 1986). Performance satisfaction is the state of being pleased with one's work, and is based on comparison between performance standards and actual performance (Ilgen & Hamstra, 1972). When multiple goals are assigned, the message is conveyed to individuals that a certain level of performance is expected on each dimension. Such high expectations are not likely to be met, resulting in an actual-desired performance discrepancy which lowers satisfaction with performance. When unfavorable feedback is received indicating goal progress is substandard, satisfaction should decrease (Podsakoff & Farh, 1986). Self-dissatisfaction with performance operates as an influential affective variable when attainment falls short of a standard (Bandura & Cervone, 1986). Based on this research on affective reactions to goals, it is proposed:
Hypothesis 8: Individuals assigned difficult, specific quantity and difficult, specific quality goals are likely to experience greater goal conflict, perceive greater goal difficulty, be less goal committed, and less satisfied with performance than individuals assigned easy, specific quantity and easy, specific quality goals (after feedback).

A summary of the hypotheses is presented in Figure 2.1.
### Pre-Feedback

<table>
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<tr>
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<th>Dependent Variable</th>
</tr>
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<tbody>
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<tr>
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<td>Perceived Accuracy of Performance (Quality &gt; Quantity)</td>
</tr>
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<td>8</td>
<td>2G + 2S &gt; 5G + 5S</td>
<td>Goal Conflict; Goal Difficulty</td>
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N = No Feedback provided  
G = Goal Discrepant Feedback provided  
S = Strategic Feedback provided  

### Post-Feedback

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<td>8</td>
<td>2G + 2S &gt; 5G + 5S</td>
<td>Goal Conflict; Goal Difficulty</td>
</tr>
</tbody>
</table>

Figure 2.1: Summary of Hypotheses
CHAPTER THREE
Methodology

Overview of Chapter

Chapter Three outlines the experimental research, including identification of subjects, justification for the task, interpretation of the performance quality index, and explication of procedures used in the laboratory. Discussion of experimental procedures will include an explanation of the goal and feedback manipulations and how they were operationalized. Finally, experimental measures included in both the interim- and post-experimental questionnaires will be described.

Experimental Subjects

Students enrolled in management classes at a large southeastern university comprise the sample used in the experimental research. Subject participation was voluntary. However, instructors awarded the participants bonus points. Subjects were randomly assigned to one of fifteen treatment conditions.

To ensure the total sample size was large enough to avoid incorrect conclusions of no significant differences (Type II error; Cook & Campbell, 1979), power analysis was conducted to ascertain appropriate cell sizes. Cohen (1988) offers guidelines to estimate suitable sample
sizes. He suggests in order to determine the appropriate number of subjects needed, the following factors must be considered: (a) level of significance desired (Type I error), (b) amount of power desired, (c) anticipated effect size; and (d) numerator degrees of freedom (number of cells - 1). When using the conventional level of significance (a = .05), Cohen (1988) recommends that behavioral scientists use P = .80 as a power value. With this conventional level, Type I errors are considered to be 4 times as serious as Type II error (.20/.05). Because the laboratory is a strong situation with powerful manipulations, and because of the strong effects detected in similar studies (cf. Phillips & Farh, 1992), Cohen (1988) recommends using the conventional level of F = .40, representing a large effect size. With an expected effect size of F = .40, a significance level of a = .05, a power value of P = .80, and a numerator dF equal to 14 (15 cells - 1), the appropriate cell size is 9.5 subjects per cell.

**Experimental Task**

In selecting an appropriate task for this experiment, three criteria characteristic of creativity tasks were considered (Amabile, 1983): (a) the task must be one that leads to some product or clearly observable response appropriate for assessment of the statistical frequency; (b) the task should be open-ended to permit considerable
flexibility and novelty of response, and (c) performance on the task should not depend on special talents such as musical or artistic abilities.

A task was selected which met these criteria and is also the most commonly used experimental task in the goal-setting literature. The verbal fluency task (Austin & Bobko, 1985; Garland, 1982) proposed to be used in this study was originally developed by Locke (1966). Other authors have referred to this task as brainstorming or object-listing (e.g., Locke et al., 1981; Locke, Frederick, Lee, & Bobko, 1984). A large body of previous goal-setting research, dating back to Locke's (1964) dissertation, has been conducted using either this task or slight variations (e.g., Bavelas & Lee, 1978; Garland, 1982, 1983, 1984; Latham & Saari, 1979; Locke, 1964, 1966; Locke et al., 1984; Meyer & Gellatly, 1988; Podsakoff & Farh, 1989). Specifically, the task requires subjects to list as many objects as possible in one minute that can be described by a given adjective. Before the subjects attempt the task, they are presented with three rules to guide their performance (cf. Farh & Bedeian, 1990).

Rule 1. Do not repeat objects in the same category (e.g., "apples" and "cherries" are both examples of fruit. In this instance, either list the word "fruit" or one of the examples of fruit).
Rule 2. Nonsensical responses are unacceptable. You should not list "skyscraper" if the given adjective is "short."

Rule 3. You may use abstract nouns. For example, given the adjective "blue", you could list the word "mood."

Conceptualization and Operationalization of Quality

Traditionally, performance quality has been measured based only on rule compliance, or accuracy, as described in Chapter One. That is, if a response is in compliance with the task rules, it has been considered a "quality" response. However, this task lends itself to operationalizing quality another way. The creativity or novelty of responses could be considered (cf. Muckler, 1982). The quality index, subsequently referred to as the response creativity norm, was developed to measure the creativity of the objects or responses listed by the subjects. According to Jackson and Messick (1967), creativity is an essential property of response quality on a brainstorming task, as statistically infrequent or rare responses can be defined as creative (Romaniuk & Romaniuk, 1981). This operationalization is also consistent with Muckler (1982), who contends that his quality categorization is conducive to the numerical assessment
and measurement of quality. According to Muckler, novelty can be measured by an index of judgment points.

To construct this quality measure, a pilot study using 200 subjects was conducted. Subjects completed experimental protocol under "do best" goal instructions. That is, subjects were asked to list as many possible responses as they could in one minute. Using responses obtained during this pilot study, a scoring norm was developed as follows. First, all pilot subject responses were examined and similar responses were combined (e.g., "nail polish" and "fingernail polish"). Next, responses were compiled into a frequency distribution. The frequency score for each response was used as an indicator of the creativity of that response. Responses with lower frequency scores were those listed less frequently during the pilot study. Hence, these responses were deemed to be creative. Conversely, responses with high frequency scores were those listed more frequently by the pilot subjects and thus were considered less creative. A separate scoring norm was constructed for each adjective. Frequency scores ranged from 0 (indicating that a subject’s response had not been recorded by any of the pilot subjects) to 103 (indicating that 103 of the 200 pilot subjects listed this response or object).
To facilitate subject understanding of the scoring norm, the natural logarithm of the original frequency score was taken. These adjusted scores were then reversed, resulting in a maximum quality score per response of 4.31 for responses listed once and a minimum score of .67 for the response given by 103 of the 200 pilot subjects. Scores not listed on the norm were assigned 5 quality points. Subsequent analysis was conducted based on the reverse of the original frequency scores reported on the norm. The inter-rater reliability for this norm was $r = .95$.

Experimental Procedure

The protocol used in this experiment was modelled after Garland (1982). During the actual experiment, subjects were run through the experimental conditions individually. Tape recorded instructions guided subjects through the task and directed them to begin and finish working. Experimental procedures are summarized in Figure 3.1.
Figure 3.1: Experimental Procedure
The subjects initially completed one practice trial in which no goal was assigned. They were then randomly assigned to one of seven goal-setting conditions (see Figures 1.1 and 3.1). Following the practice trial, subjects were presented with their goals for the remainder of the experimental period. All subjects completed two trials of the experimental task. After the first two experimental trials, subjects in conditions who had been assigned specific goals on both performance dimensions (cells 2 through 5 in Figure 3.1) were further subdivided into three feedback manipulation groups (none, goal-discrepant, and strategic). Individuals who were to receive feedback were presented with this information. While the experimenter was calculating the feedback, subjects completed an interim-questionnaire. Similarly, subjects not given feedback completed an identical questionnaire. All subjects then completed the final two experimental trials and a post-questionnaire. The adjectives presented during the experiment will be "hot" (practice trial), "round" (pre-feedback), "strong" (pre-feedback), "soft" (post-feedback), and "shiny" (post-feedback).

Goal Manipulations

Difficult, specific quantity goals were defined by asking subjects to list 10 items per trial; easy, specific quantity goals were defined by asking subjects to list 4
items per trial. Difficult, specific quality goals were defined by asking subjects to attain an average of 4.5 quality points per response; easy, specific quality goals were defined by asking subjects to attain an average of 2.0 quality points per response. Pilot study analysis (See Appendix E) revealed these performance levels represent a 10% chance of achievement (difficult) and a 90% chance of achievement (easy), respectively. Nonspecific quality goals were operationalized by asking subjects to "list objects that are as creative as possible."

Because of the ambiguity associated with quantifying the specific quality goals, the goal manipulation included information on how quality performance would be calculated. The phrasing of this information was as follows:

On the next four trials, you will be assigned both a quantity and a quality performance goal. Your quantity performance will be evaluated as the number of responses you list that are in compliance with the rules of the task presented earlier. Your quality performance will be evaluated based on the creativity of your response. Specifically, the manner in which your quality score will be assessed is based on the following procedure. Prior to this experiment, the experimenters had 200 college
students complete the task you are now performing. We then complied all responses given by these 200 students into a quality scoring index. The more frequent a response was given by these individuals, the lower the quality score for that response. The maximum quality score for each word is 5 points. The minimum score is 0 points. To illustrate, in response to the adjective "hot", the word "sun" was often listed as a response. Therefore, the quality score for this response was .67 quality points. On the other hand, the word "explosion" was given much less frequently. Therefore, the quality score for this response was 4.31 quality points.

Remember, in performing this task, you should come up with responses that are as creative as possible. You should try to list objects that the average person would not ordinarily think of. That is, the objects you list should be unusual or unfamiliar. Your quality score will be based upon the creativity of your responses.

Your quantity goal for this session is to list (4/10) objects for each adjective.

Your quality goal for this session is to earn an average of (2.0/4.5) quality points per response.
Quantity and quality goals were assigned simultaneously for several reasons. First, as Terborg and Miller (1978) indicate, in most organizational settings performance is multidimensional and the measurement of any single outcome may insufficiently document the full effects of goal-setting. Secondly, Phillips and Farh (1992) report that single goal assignments can have detrimental effects for performance dimensions on which no goal is assigned. Third, multiple goals were assigned to permit comparison of perceived differences between quantity and quality feedback. Fourth, such goal assignments can further knowledge about goal-setting when multiple goals are assigned. Finally, multiple goal assignments were necessary to prevent subjects from purposely limiting quantity to achieve the quality goal.

Feedback Manipulation

The feedback construct contains three levels of manipulation: (a) no feedback, (b) goal-discrepant feedback, and (c) strategic feedback. Goal-discrepant feedback is defined as information only about performance outcomes. Specifically, subjects were informed only about total number of responses listed per trial and average quality score per trial. Strategic feedback also included information about performance outcomes (goal-discrepant feedback), in addition to specific information about
quality points each response received and information about why any responses had been disqualified. Outcome feedback (received by both goal-discrepant and strategic feedback subjects) was provided in written form on a worksheet which was attached to the subjects' protocol. Additionally, strategic feedback subjects had individual quality scores and disqualification notes recorded directly on their protocol. Based on Ilgen and Moore's (1987) suggestion, when feedback was provided, it was presented for both quantity and quality dimensions.

**Experimental Measures**

Experimental measures were collected in both the interim-experimental questionnaire (after the first two experimental trials) and the post-experimental questionnaire (after the last two experimental trials). Unless otherwise noted, each of these measures was anchored on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree).

**Effort** was measured by the scale developed by Earley et al. (1987). This four-item instrument, included in the post-experimental questionnaire, was designed to assess the extent to which individuals expended energy and effort while working on the task. Cronbach's measure of internal consistency (reliability) for this instrument was alpha = .89.
Planning/Strategy Development was tapped by four items adapted from Earley et al. (1987). The reliability for this measure included in the post-experimental questionnaire was alpha = .92. The scale contained items assessing subjects' procedures for performing the task and meeting goals.

Quality Feedback Value and Quantity Feedback Value were each four-item measures adapted from Ashford (1986). These measures were designed to tap subjects' perceptions of how informative, valuable, and helpful feedback was as provided by the experimenter. Reliabilities were alpha = .88 for the former measure and alpha = .86 for the latter. Both measures were included in the post-experimental questionnaire.

Quantity Estimate and Uncertainty and Quality Estimate and Uncertainty were measures which asked subjects to record perceptions of their actual quantity performance per trial and their actual quality performance per response. Each measure was one item, and was assessed on both the interim- and the post-experimental questionnaires. Additionally, subjects were asked to indicate how certain they were about their estimates on a scale ranging from 1 (extremely certain) to 7 (extremely uncertain).
**Goal Difficulty** was a three-item measure adapted from Phillips and Freedman (1988) and Earley and Kanfer (1985). This measure was designed to assess subjects' perceptions of how difficult the goals were. Reliability for this measure was alpha = .94 on the interim-experimental questionnaire and alpha = .92 on the post-experimental questionnaire.

**Goal Commitment** was assessed using four items adapted from the Hollenbeck, Klein, O'Leary, and Wright (1989) goal commitment measure. This instrument tapped subjects' desire to try for or work toward goal attainment. Reliability on the interim-experimental questionnaire was alpha = .85, and reliability on the post-experimental was alpha = .91.

**Goal Conflict** was a four-item measure designed to assess the degree to which individuals experienced cognitive conflict in determining which goal should be emphasized. These items were adapted from Phillips and Farh (1992), as well as from the Role Conflict Scale developed by Rizzo, House, and Lirtzman (1970). Reliability for this measure was alpha = .83 on the interim-questionnaire and alpha = .86 on the post-experimental questionnaire.

**Performance Satisfaction** was a two-item measure adapted from Phillips and Freedman (1985). These items were included to tap subject perceptions of how pleased
and satisfied they were with their performance. Reliability for the interim-experimental measure was alpha = .92. Reliability on the post-experimental measure was alpha = .93.
Overview of Chapter

Chapter Four consists of three major sections. The first section is concerned with the results of some preliminary data analysis. This section includes confirmation of the effectiveness of the experimental manipulations as well as a summary of the intercorrelations, means, and standard deviations for each of the study variables presented in Appendices A and B. The results of the 13 hypotheses tests are presented in the second section. Analyses revealed 10 of the 13 hypotheses were supported and 3 were not supported. Results for each hypothesis will be presented separately. The third and final section presents supplemental analyses examining the effects of goal attributes and feedback on performance using analysis of variance/covariance.

Preliminary Data Analysis

Manipulation Check

To assess the efficacy of the experimental manipulations, the interim-questionnaire contained measures pertaining to: (1) the difficulty of the quality goal (Quality Goal Emphasis), and (2) the specificity of the quality goal (Quality Goal Specificity). Additionally, the post-questionnaire inquired as to the specificity of
feedback (Feedback Specificity). Each of these measures are included in Appendix C with the experimental measures.

Quality goal emphasis was measured to assess to the effectiveness of the quality goal difficulty manipulation. This two-item measure (alpha = .85) anchored on a seven-point scale was designed to tap subjects' emphasis and concentration on the quality performance dimension (cf. Phillips & Farh, 1992; Shalley, 1990). It was expected that the difficult quality goal would result in greater emphasis on the quality performance dimension than would the easy quality goal. Results of planned comparisons analysis indicates subjects with difficult quality goals (Cells 2 and 4) emphasized quality goal attainment and performance (M = 5.73) significantly more than subjects assigned easy quality goals (Cells 3 and 5; M = 4.50, t(108) = 2.21, p < .05).

Quality goal specificity was assessed using a two-item measure adapted from Phillips and Freedman (1988) and Earley and Kanfer (1985). This instrument, anchored on a 7-point scale, measured how clear or explicit subjects perceived their assigned goals were. Reliability for this measures was alpha = .97. Results of planned comparisons analysis indicates subjects assigned specific quality goals (Cells 2, 3, 4, and 5) perceived their goal as being significantly more specific (M = 5.32) than subjects
assigned nonspecific quality goals (Cells 6 and 7; \( M = 3.11, t(136) = 8.2, p < .01 \)).

Feedback specificity, a two-item measure adapted from Earley et al. (1987), was included to serve as a check for the feedback type manipulation. This measure asked for subjects’ about the detail and explicitness of the provided feedback. Anchored on a 7-point scale, the reliability for this measure was alpha = .97.

Results of planned comparisons analysis indicates subjects provided with strategic feedback (Cells 2S, 3S, 4S, and 5S) perceived their feedback to be significantly more specific (\( M = 4.55 \)) than subjects provided only with goal-discrepant feedback (Cells 2G, 3G, 4G, and 5G; \( M = 3.13, t(108) = 2.76, p < .01 \)). Thus, from the above analyses it can be concluded that both the goal and the feedback manipulations were successful.

**Intercorrelations Among the Study Variables**

The intercorrelation matrix of all study variables is presented in Appendix A. The correlations between pre- and post-feedback quantity was significant (\( r = .63, p < .01 \)), as was the correlation between pre- and post-feedback quality (\( r = .20, p < .01 \)). However, the correlations between quantity and quality were not significant either before feedback (\( r = .00, n.s. \)) or after feedback (\( r = .07, n.s. \)). Interestingly, this finding is consistent with previous research showing when
both quantity and quality goals are assigned no trade-off occurs (Phillips & Farh, 1992). That is, in cases when either no goals are assigned or when a single goal is assigned there is often a negative correlation, or trade-off, between quantity and quality performance. In the present research the correlation between quantity and quality on the practice trial (when no goals were assigned) was $r = -.27 \ (p < .01)$. Instead of pursuing both performance dimensions, individuals concentrate on one to the exclusion of the other resulting in a negative relationship. However, when both quantity and quality goals are assigned, individuals appear to direct attention and put forth effort toward accomplishing both goals, mitigating against the negative correlation. Additionally, the nonsignificant correlation between quality and quantity on the expermental trials provides support for the independence of these performance dimensions. Finally, effort was significantly correlated with both post-feedback quantity ($r = .22, \ p < .01$) and planning ($r = .31, \ p < .01$). However, planning was not correlated with any of the performance measures.

Results of Hypotheses Tests

Analyses of the eight hypotheses developed in Chapter Two are presented in this section. Major analytical techniques included simple and multivariate planned
comparisons, and paired t-tests. Table 4.1 presents a summary of planned comparison coefficients used to test Hypotheses one and three through eight. Simple planned comparisons were conducted for all hypotheses involving pre-feedback performance measures. However, multivariate planned comparisons were conducted for hypotheses involving post-feedback performance measures so that pre-feedback performance could be controlled. Hypotheses 2A and 2B are excluded from Table 4.1, as they were tested using paired t-tests.

For ease of presentation, Table 4.2 is included for identification of cells referred to during discussion of the results. Finally, following presentation of findings for each of the hypotheses, Table 4.6 presents a summary of results.
Table 4.1: Planned Comparison Coefficients for Hypotheses Testing

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</tr>
<tr>
<td>Goal Conflict</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Goal Difficulty</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Goal Commitment</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Performance Satisfation</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 4.2: Mapping of Cell Identifications Used in Presentation and Discussion of Results

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Groups</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2G+2S+4G+4S &gt; 2N+4N</td>
<td>Effort, Post FB Quality</td>
</tr>
<tr>
<td>2A</td>
<td>2G+3G+4G+5G+2S+3S+4S+5S</td>
<td>Feedback Value (Quality &gt; Quantity)</td>
</tr>
<tr>
<td>2B</td>
<td>2+3+4+5</td>
<td>Perceived Accuracy of Performance</td>
</tr>
<tr>
<td>3A</td>
<td>2S+4S &gt; 2G+4G</td>
<td>Post FB Quality</td>
</tr>
<tr>
<td>3B</td>
<td>2S+4S &gt; 2G+4G</td>
<td>Planning/Strategy Development</td>
</tr>
<tr>
<td>4A</td>
<td>2+4 &lt; 6+7</td>
<td>Quality Performance Variance</td>
</tr>
<tr>
<td>4B</td>
<td>6 &lt; 1</td>
<td>Quality Performance Variance</td>
</tr>
<tr>
<td>5</td>
<td>2+3 &gt; 1</td>
<td>Pre FB Quality</td>
</tr>
<tr>
<td>6A</td>
<td>2+4 = 3+5</td>
<td>Pre FB Quality</td>
</tr>
<tr>
<td>6B</td>
<td>2+3 &gt; 4+5</td>
<td>Pre FB Quantity</td>
</tr>
<tr>
<td>6C</td>
<td>2G+2S+4G+4S &gt; 3G+3S+5G+5S</td>
<td>Post FB Quality</td>
</tr>
<tr>
<td>7</td>
<td>3G+3S &gt; 3N</td>
<td>Post FB Quality</td>
</tr>
<tr>
<td>8</td>
<td>2G+2S &gt; 5G+5S, 2G+2S &lt; 5G+5S</td>
<td>Goal Conflict; Goal Difficulty, Goal Commitment; Performance Satisfaction</td>
</tr>
</tbody>
</table>
Test of Hypothesis 1

Hypothesis 1 predicted individuals assigned difficult, specific quality goals and provided with feedback would exert more effort than individuals with the same goal assignments but not provided with feedback. Results of planned comparisons analysis indicate individuals with difficult, specific quality goals and provided with feedback (Cells 2G + 2S + 4G + 4S) exerted more effort ($M = 5.53$) than individuals with the same goals and not provided with feedback (Cells 2N + 4N; $M = 4.11$, $t(108) = 3.61$, $p < .01$).

Hypothesis 1 also predicted individuals assigned difficult, specific quality goals and provided with feedback would perform qualitatively better than individuals with the same goal assignments but not provided with feedback. Results indicate individuals with difficult, specific quality goals and provided with feedback (Cells 2G + 2S + 4G + 4S) performed qualitatively better ($M = 3.09$) than individuals with the same goals and not provided with feedback (Cells 2N + 4N; $M = 2.50$, $t(108) = 3.65$, $p < .01$). Thus, Hypothesis 1 was supported.

Test of Hypothesis 2A

Hypothesis 2A predicted individuals who received feedback would value quality feedback more than quantity feedback (Cells 2G + 2S + 3G + 3S + 4G + 4S + 5G + 5S).
Paired t-test results for Hypothesis 2A are presented in Table 4.3. Results indicate individuals did value quality feedback \((M = 4.97)\) significantly more than they valued quantity feedback \((M = 4.50, t(79) = 2.16, p \leq .01)\). Thus, Hypothesis 2A was supported.

Table 4.3: Paired t-test Results for Feedback Value

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Quality FB</th>
<th>Quantity FB</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>M</td>
<td>4.97</td>
<td>4.50</td>
</tr>
<tr>
<td>SD</td>
<td>1.43</td>
<td>1.58</td>
</tr>
<tr>
<td>Paired t</td>
<td></td>
<td>2.16*</td>
</tr>
</tbody>
</table>

* = \(p \leq .01\)

Test of Hypothesis 2B

Hypothesis 2B predicted subjects would be more accurate in their prediction of quantity performance than they would be in their prediction of quality performance. To examine Hypothesis 2B, three distinct analyses were conducted. First, correlations between actual and estimated performance on both the quantity and quality dimensions were compared. Second, a paired t-test was conducted on discrepancy scores measuring differences between actual and predicted performance on both the quantity and quality dimensions. Third, a paired t-test was conducted on estimate uncertainty scores.
Initial support for this hypothesis is provided by comparing the correlations between actual and estimated performance on both the quantity and quality dimensions (Cells 2 + 3 + 4 + 5). Results of a Fisher’s Z-test indicate the correlation between actual and predicted quantity performance ($r = .80$) was significantly greater than the correlation between actual and predicted quality performance ($r = -.05$, $Z = 11.36$, $p < .01$).

As an secondary test of Hypothesis 2B, discrepancy scores were computed to assess differences between predicted and actual performance. Both quantity and quality performance estimates were standardized, as were actual quantity and quality performance results. The standardized values were used to permit comparison between quantity and quality performance and performance estimates, as these two dimensions were measured on different scales.

To calculate discrepancies scores, standardized performance estimates were subtracted from standardized performance (cf. Bernardin & Pence, 1980). The resultant discrepancies were then compared using a paired t-test. Results of this analysis, presented in Table 4.4, indicate there was a greater discrepancy between actual and perceived quality performance ($M = 1.01$) than there was between actual and perceived quantity performance ($M = 0.41$, paired $t (119) = 5.7$, $p < .01$).
Table 4.4: Paired t-test Results of Predicted and Actual Performance Discrepancies

<table>
<thead>
<tr>
<th>Performance Discrepancy</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>Paired t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td>120</td>
<td>1.01</td>
<td>1.02</td>
<td>0.41</td>
<td>0.48</td>
<td>5.7*</td>
</tr>
</tbody>
</table>

* = p ≤ .01

Tertiary support was provided by asking subjects how certain they were about their performance estimates. Results of a paired t-test indicate individuals were significantly more uncertain of their quality estimates (M = 3.71) than they were of their quantity estimates (M = 2.62, paired t(119) = 8.63, p ≤ .01). Taken together, these results provide overwhelming support for Hypothesis 2B.

Test of Hypothesis 3A

Hypothesis 3A predicted individuals assigned difficult, specific quality goals and provided with strategic feedback would perform qualitatively better than individuals assigned the same goals and provided with goal-discrepant feedback. Results indicate individuals with difficult, specific quality goals and provided with strategic feedback (Cells 2S + 4S) did perform qualitatively better (M = 3.39) than individuals assigned the same goals and provided with goal-discrepant feedback.
(Cells 2G + 4G; \( M = 2.79, t(108) = 3.24, p \leq .01 \)). Thus, Hypothesis 3A was supported.

**Test of Hypothesis 3B**

Hypothesis 3B predicted individuals assigned difficult, specific quality goals and provided with strategic feedback would engage in more planning than individuals assigned the same goals and provided with goal-discrepant feedback. Results of planned comparisons indicate individuals with difficult, specific quality goals and provided with strategic feedback (Cells 2S + 4S) did not engage in significantly more planning (\( M = 4.40 \)) than individuals assigned the same goals and provided with goal-discrepant feedback (Cells 2G + 4G; \( M = 3.84, t(108) = 1.29, \text{n.s.} \)). Thus, Hypothesis 3B was not supported.

**Test of Hypothesis 4A**

Hypothesis 4A predicted individuals assigned specific quality goals (Cells 2 + 4) would have lower quality performance variability than individuals assigned nonspecific quality goals (Cells 6 + 7). To test for this non-homogeneity of cell variances, a conventional Bartlett's Test was used. Results indicate no significant differences in variance between the groups (\( sd = .59 \) for Cells 2 and 4; \( sd = .53 \) for Cells 6 and 7). Thus, Hypothesis 4A was not supported.
Test of Hypothesis 4B

Hypothesis 4B predicted individuals assigned a nonspecific quality goal (Cell 6) would have lower quality performance variance than individuals not assigned a quality goal (Cell 1). To test non-homogeneity of cell variances, a conventional Bartlett's Test was used. Results indicate no significant differences in variance between the groups (sd = .35 for Cell 6; sd = .54 for Cell 1). Thus, Hypothesis 4B was not supported.

Test of Hypothesis 5

Hypothesis 5 predicted before feedback, individuals assigned a specific quality goal would perform qualitatively better than individuals not assigned a quality goal. Planned comparison results indicate individuals assigned a specific quality goal (Cells 2 + 3) had significantly higher performance quality ($M = 3.06$) than individuals not assigned a quality goal (Cell 1; $M = 2.67$, $t(150) = 2.10$, $p < .05$). Thus, Hypothesis 5 was supported.

Test of Hypothesis 6A

Hypothesis 6A predicted before feedback, individuals assigned difficult, specific quality goals would not have significantly different performance quality as compared to individuals assigned easy, specific quality goals.
Results of planned comparisons indicate individuals assigned difficult, specific quality goals (Cells 2 + 4) did not have significantly different performance quality levels (M = 3.13) as compared to individuals assigned easy, specific quality goals (Cells 3 + 5; M = 2.98, t(150) = 1.55, n.s.) before feedback was provided. Thus, Hypothesis 6A was supported.

**Test of Hypothesis 6B**

Hypothesis 6B predicted before feedback, individuals assigned difficult, specific quantity goals would have significantly higher performance quantity than individuals assigned easy, specific quantity goals. Planned comparison results indicate individuals assigned a difficult, specific quantity goal (Cells 2 + 3) had significantly higher quantity performance (M = 7.88) than individuals assigned an easy, specific quantity goal (Cells 4 + 5; M = 3.98, t(150) = 7.10, p < .01). Thus, Hypothesis 6B was supported.

**Test of Hypothesis 6C**

Hypothesis 6C predicted individuals assigned difficult, specific quality goals and provided with feedback would have significantly higher levels of performance quality than individuals assigned easy, specific quality goals and provided with feedback.
Planned comparison results indicate individuals assigned difficult, specific quality goals and provided with feedback (Cells 2G + 2S + 4G + 4S) had significantly higher performance quality ($M = 3.09$) than individuals' assigned easy, specific quality goals and provided with feedback (Cells 3G + 3S + 5G + 5S; $M = 2.72$, $t(108) = 2.80$, $p < .01$). Thus, Hypothesis 6C was supported.

**Test of Hypothesis 7**

Hypothesis 7 predicted individuals assigned both an easy, specific quality goal and a difficult, specific quantity goal and provided with feedback would have higher performance quantity than individuals assigned the same goals and not provided with feedback. Results of planned comparisons indicate that individuals within this goal condition who received feedback (Cells 3G + 3S) had significantly higher quantity performance ($M = 9.85$) than individuals who did not receive feedback (Cell 3N; $M = 8.10$, $t(108) = 2.39$, $p < .01$). Thus, Hypothesis 7 was supported.

**Test of Hypothesis 8**

Hypothesis 8 predicted individuals assigned both difficult, specific quantity and quality goals will experience greater goal conflict, perceive greater goal difficulty, be less goal committed, and be less satisfied
with performance than individuals assigned both easy, specific quantity and quality goals. This hypothesis was tested using univariate planned comparisons, as the intercorrelations among these variables (ranging from \( r = -.07 \) to \( r = .27 \)) were not significant enough to warrant using multivariate analysis of variance. Results, contained in Table 4.5, indicate individuals assigned difficult goals (Cells 2G + 2S) experienced significantly more goal conflict than individuals assigned easy goals (Cells 5G + 5S; \( M_s = 4.85 \) versus 4.00, \( t(108) = 2.37, p \leq .05 \)). Similarly, individuals assigned difficult goals perceived greater goal difficulty than individuals assigned easy goals (\( M_s = 4.15 \) versus 3.52, \( t(108) = 2.05, p \leq .05 \)). Conversely, individuals assigned difficult goals were less goal committed than individuals assigned easy goals (\( M_s = 5.12 \) versus 5.76, \( t(108) = -2.11, p \leq .05 \)). Finally, individuals assigned difficult goals were less satisfied with their performance than individuals assigned easy goals (\( M_s = 4.30 \) versus 5.20, \( t(108) = -1.99, p \leq .05 \)). Thus, Hypothesis 8 was supported.
Table 4.5: Effects of Goal Attributes on Affective Reactions to Goal Assignments

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>2G , 2S (N = 20)</th>
<th>5G , 5S (N = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Goal Conflict</td>
<td>4.85</td>
<td>0.93</td>
</tr>
<tr>
<td>Goal Difficulty</td>
<td>4.15</td>
<td>1.00</td>
</tr>
<tr>
<td>Goal Commitment</td>
<td>5.12</td>
<td>1.16</td>
</tr>
<tr>
<td>Performance Satisfaction</td>
<td>4.30</td>
<td>1.45</td>
</tr>
</tbody>
</table>

* = p ≤ .05
** = p ≤ .01
Table 4.6: Summary of Hypotheses Tests Results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Summary of Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The provision of feedback will increase effort and will improve quality performance.</td>
</tr>
<tr>
<td>2A</td>
<td>Individuals value quality feedback more than they value quantity feedback.</td>
</tr>
<tr>
<td>2B</td>
<td>Individuals are more accurate in their prediction if quantity performance than they are in their prediction of quality performance.</td>
</tr>
<tr>
<td>3</td>
<td>The provision of strategic feedback results in better quality performance than the provision of only goal-discrepant feedback. However, strategic feedback does not encourage any more planning than goal-discrepant feedback.</td>
</tr>
<tr>
<td>4</td>
<td>Quality goal specificity does not reduce quality performance variability.</td>
</tr>
<tr>
<td>5</td>
<td>Providing a quality goal will improve quality performance, even before feedback is provided.</td>
</tr>
<tr>
<td>6</td>
<td>Before feedback, individuals with difficult quality goals will not perform any better qualitatively than individuals with easy quality goals. However, after feedback, quality goal difficulty does make a difference.</td>
</tr>
<tr>
<td>7</td>
<td>Feedback can help individuals accurately direct attention to areas of performance deficiency.</td>
</tr>
<tr>
<td>8</td>
<td>Multiple goals which are easy evoke more positive affective reactions than multiple goals which are difficult (after feedback).</td>
</tr>
</tbody>
</table>
Supplemental Data Analysis: Analysis of Variance Results for Pre- and Post-Feedback Quantity and Quality Performance Measures

In addition to testing the hypotheses using planned comparisons and paired t-tests, supplemental analyses were conducted to examine the effects of both goal attributes and feedback on performance. In order to present a summary of the effects of the manipulations on performance, analyses of variance and analyses of covariance were utilized. Four separate analyses will be discussed, corresponding to the pre- and post-feedback quantity and quality performance measures.

Pre-Feedback Performance

Analysis of covariance (ANCOVA) was conducted to examine the effects of both goal assignments and feedback on quantity and quality performance. To examine the effects of quantity and quality goal assignments on pre-feedback performance, 2 X 3 ANCOVAs were conducted. The results of these analyses are presented in Tables 4.7 (pre-feedback quantity performance) and 4.8 (pre-feedback quality performance). For these two analyses, there were two levels of quantity goals (difficult vs. easy), and three levels of quality goals (difficult vs. easy vs. nonspecific). The variables used as covariates were practice trial performances.
Pre-Feedback Quantity

Table 4.7 presents analysis of covariance results for pre-feedback quantity. The main effect due to quantity goals was significant ($F = 222.96, p < .01$), indicating individuals with a difficult quantity goal outperformed individuals with an easy quantity goal on the pre-feedback quantity measure. No other main effects or the interaction term was significant.

Pre-Feedback Quality

Table 4.8 presents analysis of covariance results for pre-feedback quality. The main effect for the quality goal was significant ($F = 4.67, p < .01$). Post-hoc analysis was then conducted to interpret this significant main effect. Follow-up analysis indicated individuals assigned a difficult quality goal significantly outperformed individuals assigned a nonspecific quality goal on the pre-feedback quality measure ($t = 3.18, p < .01$). Similarly, individuals assigned an easy quality goal significantly outperformed individuals assigned a nonspecific quality goal on the pre-feedback quality measure ($t = 2.06, p < .05$). However, there were no significant differences between individuals assigned a difficult quality goal and individuals assigned an easy quality goal on pre-feedback quality ($t = 1.51, n.s.$). In summary, these findings indicate individuals assigned a nonspecific quality goal performed qualitatively poorer
than individuals assigned a specific quality goal. However, there was no difference in the pre-feedback quality performance of difficult quality and easy quality goal subjects. Therefore, this significant main effect is attributable to the specificity attribute. Neither the quantity goal main effect nor the interaction were significant.

Additionally, one-way analysis of variance was used to examine the differences in pre-feedback quality performance between each of the feedback subconditions within major goal conditions (i.e., differences between individuals who were assigned the same goals but would eventually receive different forms of feedback). As expected, there were no significant differences between any of the subconditions within major goal conditions (Cell 2, F(2,29) = .77, n.s.; Cell 3, F(2,29) = .37, n.s.; Cell 4, F(2,29) = .26, n.s.; Cell 5, F(2,29) = 2.15, n.s.).

**Post-Feedback Performance**

To examine the effects of quantity and quality goal assignments, and feedback on post-feedback performance, 2 X 2 X 3 analyses were conducted. The results of these analyses are presented in Tables 4.9 (post-feedback quality performance) and 4.10 (post-feedback quantity performance). For these two analyses, there were two levels of quantity goals (difficult vs. easy), two levels
of quality goals (difficult vs. easy), and three levels of feedback (none vs. goal-discrepant vs. strategic).

**Post-Feedback Quality**

Table 4.9 presents 2x2x3 analysis of covariance results for the effects of quantity goals, quality goals, and feedback on post-feedback quality. The covariate controlled for in this analysis was pre-feedback quality performance. The main effect due to the quality goal was significant \( (F = 3.97, p < .05) \), indicating individuals with a difficult quality goal qualitatively outperformed individuals with an easy quality goal. The main effect due to feedback was also significant \( (F = 8.39, p < .01) \). Post-hoc analysis revealed subjects who received strategic feedback significantly outperformed both subjects who received goal-discrepant feedback \( (t(117) = 2.5, p < .01) \) and subjects who received no feedback \( (t(117) = 4.06, p < .01) \). Finally, the QL x FB interaction was significant \( (F = 3.16, p < .05) \).

Simple main effects analysis used to interpret this interaction revealed subjects assigned a difficult quality goal and provided with strategic feedback \( (M = 3.39) \) significantly outperformed subjects assigned an easy goal and provided with strategic feedback \( (M = 2.76; F(1,39) = 15.3, p < .01) \). However, there was no difference in post-feedback quality performance between subjects assigned a difficult quality goal and provided with goal-discrepant
feedback \((M = 2.79)\) and subjects assigned an easy goal and provided with goal-discrepant feedback \((M = 2.68; F(1,39) = .39, \text{n.s.})\). Nor was there a difference in post-feedback quality performance between subjects assigned a difficult quality goal and not provided with feedback \((M = 2.50)\) and subjects assigned an easy goal and not provided with \((M = 2.54; F(1,39) = .04, \text{n.s.})\). Therefore, the significant two-way interaction is attributable only to differences in performance between the easy and difficult quality goal subjects who received strategic feedback. Neither the main effect due to quantity nor any of the other interaction terms were significant.

**Post-Feedback Quantity**

Table 4.10 presents analysis of variance results for post-feedback quantity performance. Simple analysis of variance was used for this analysis because there was a significant main effect due to the quantity goal assignment on the pre-feedback trials. The main effect due to quantity goals was significant \((F = 187.00, p \leq .01)\), indicating subjects assigned a difficult quantity goal outperformed subjects assigned an easy quantity goal on the post-feedback quantity measure. No other main effects or interactions were significant.
Table 4.7: Means and Results of Analysis of Covariance of the Effects of Quantity and Quality Goal Difficulty and Goal Specificity on Pre-Feedback Quantity Performance

<table>
<thead>
<tr>
<th>Cell</th>
<th>Quality Goal</th>
<th>Quantity Goal</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Specific Difficult</td>
<td>Difficult</td>
<td>30</td>
<td>7.9</td>
<td>2.5</td>
</tr>
<tr>
<td>3</td>
<td>Specific Easy</td>
<td>Difficult</td>
<td>30</td>
<td>7.5</td>
<td>1.9</td>
</tr>
<tr>
<td>4</td>
<td>Specific Difficult</td>
<td>Easy</td>
<td>30</td>
<td>4.0</td>
<td>1.0</td>
</tr>
<tr>
<td>5</td>
<td>Specific Easy</td>
<td>Easy</td>
<td>30</td>
<td>4.0</td>
<td>0.6</td>
</tr>
<tr>
<td>6</td>
<td>Nonspecific Difficult</td>
<td>Difficult</td>
<td>15</td>
<td>6.8</td>
<td>1.1</td>
</tr>
<tr>
<td>7</td>
<td>Nonspecific Difficult</td>
<td>Easy</td>
<td>15</td>
<td>3.7</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Analysis of Covariance

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate (Practice Trial Quantity)</td>
<td>1</td>
<td>114.67</td>
<td>59.10**</td>
</tr>
<tr>
<td>Main Effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality Goal (QL)</td>
<td>2</td>
<td>2.18</td>
<td>1.12</td>
</tr>
<tr>
<td>Quantity Goal (QN)</td>
<td>1</td>
<td>432.61</td>
<td>222.96**</td>
</tr>
<tr>
<td>2-way Interactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN x QL</td>
<td>2</td>
<td>5.75</td>
<td>2.97</td>
</tr>
<tr>
<td>Error</td>
<td>149</td>
<td>1.94</td>
<td></td>
</tr>
</tbody>
</table>

* = p ≤ .05
** = p ≤ .01
Table 4.8: Means and Results of Analysis of Covariance of the Effects of Quantity and Quality Goal Difficulty and Goal Specificity on Pre-Feedback Quality Performance

Means for Each Cell in the Experimental Design

<table>
<thead>
<tr>
<th>Cell</th>
<th>Quality Goal</th>
<th>Quantity Goal</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Specific</td>
<td>Difficult</td>
<td>30</td>
<td>3.21</td>
<td>0.5</td>
</tr>
<tr>
<td>3</td>
<td>Specific</td>
<td>Difficult</td>
<td>30</td>
<td>2.93</td>
<td>1.3</td>
</tr>
<tr>
<td>4</td>
<td>Specific</td>
<td>Easy</td>
<td>30</td>
<td>3.06</td>
<td>0.7</td>
</tr>
<tr>
<td>5</td>
<td>Specific</td>
<td>Easy</td>
<td>30</td>
<td>2.90</td>
<td>0.7</td>
</tr>
<tr>
<td>6</td>
<td>Nonspecific</td>
<td>Difficult</td>
<td>15</td>
<td>2.75</td>
<td>0.4</td>
</tr>
<tr>
<td>7</td>
<td>Nonspecific</td>
<td>Easy</td>
<td>15</td>
<td>2.38</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Analysis of Covariance

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate (Practice Trial Quality)</td>
<td>1</td>
<td>2.01</td>
<td>3.18</td>
</tr>
<tr>
<td>Main Effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality Goal (QL)</td>
<td>2</td>
<td>2.96</td>
<td>4.72**</td>
</tr>
<tr>
<td>Quantity Goal (QN)</td>
<td>1</td>
<td>.61</td>
<td>.96</td>
</tr>
<tr>
<td>2-way Interactions QN x QL</td>
<td>2</td>
<td>.28</td>
<td>.45</td>
</tr>
<tr>
<td>Error</td>
<td>149</td>
<td>.63</td>
<td></td>
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</tbody>
</table>

* = p ≤ .05
** = p ≤ .01
Table 4.9: Means and Results of Analysis of Covariance of the Effects of Quantity and Quality Goal Difficulty and Goal Specificity and Feedback on Post-Feedback Quality Performance

Means for Each Cell in the Experimental Design

<table>
<thead>
<tr>
<th>Cell</th>
<th>Quality Goal</th>
<th>Quantity Goal</th>
<th>Feedback</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2N</td>
<td>Difficult</td>
<td>Difficult</td>
<td>None</td>
<td>10</td>
<td>2.6</td>
<td>.39</td>
</tr>
<tr>
<td>2G</td>
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<td>Difficult</td>
<td>Goal Discrepant</td>
<td>10</td>
<td>2.9</td>
<td>.41</td>
</tr>
<tr>
<td>2S</td>
<td>Difficult</td>
<td>Difficult</td>
<td>Strategic</td>
<td>10</td>
<td>3.3</td>
<td>.51</td>
</tr>
<tr>
<td>3N</td>
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<td>Difficult</td>
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<td>10</td>
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<td>.96</td>
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<tr>
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<td>Easy</td>
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<td>Goal Discrepant</td>
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<td>2.8</td>
<td>.25</td>
</tr>
<tr>
<td>3S</td>
<td>Easy</td>
<td>Difficult</td>
<td>Strategic</td>
<td>10</td>
<td>3.0</td>
<td>.52</td>
</tr>
<tr>
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<td>Easy</td>
<td>None</td>
<td>10</td>
<td>2.4</td>
<td>.58</td>
</tr>
<tr>
<td>4G</td>
<td>Difficult</td>
<td>Easy</td>
<td>Goal Discrepant</td>
<td>10</td>
<td>2.7</td>
<td>.74</td>
</tr>
<tr>
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<td>Easy</td>
<td>Strategic</td>
<td>10</td>
<td>3.5</td>
<td>.37</td>
</tr>
<tr>
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<td>Easy</td>
<td>None</td>
<td>10</td>
<td>2.6</td>
<td>.73</td>
</tr>
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<td>Easy</td>
<td>Goal Discrepant</td>
<td>10</td>
<td>2.6</td>
<td>.59</td>
</tr>
<tr>
<td>5S</td>
<td>Easy</td>
<td>Easy</td>
<td>Strategic</td>
<td>10</td>
<td>2.5</td>
<td>.61</td>
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Analysis of Covariance

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate (Pre-Feedback Quality)</td>
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<td>5.75*</td>
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<tr>
<td>Main Effects</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Quantity Goal (QN)</td>
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<td>.49</td>
<td>1.45</td>
</tr>
<tr>
<td>Quality Goal (QL)</td>
<td>1</td>
<td>1.35</td>
<td>3.97**</td>
</tr>
<tr>
<td>Feedback (FB)</td>
<td>2</td>
<td>2.85</td>
<td>8.39**</td>
</tr>
<tr>
<td>2-way Interactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN x QL</td>
<td>1</td>
<td>.12</td>
<td>.36</td>
</tr>
<tr>
<td>QN x FB</td>
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<td>.05</td>
<td>.14</td>
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<td>QL x FB</td>
<td>2</td>
<td>1.07</td>
<td>3.16*</td>
</tr>
<tr>
<td>3-way Interactions</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>QN x QL x FB</td>
<td>2</td>
<td>.54</td>
<td>1.63</td>
</tr>
<tr>
<td>Error</td>
<td>107</td>
<td>.34</td>
<td></td>
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</tbody>
</table>

* = p ≤ .05  
** = p ≤ .01
Table 4.10: Means and Results of Analysis of Variance of the Effects of Quantity and Quality Goal Difficulty and Goal Specificity and Feedback on Post-Feedback Quantity Performance

Means for Each Cell in the Experimental Design

<table>
<thead>
<tr>
<th>Cell</th>
<th>Quality Goal</th>
<th>Quantity Goal</th>
<th>Feedback</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2N</td>
<td>Difficult</td>
<td>Difficult</td>
<td>None</td>
<td>10</td>
<td>10.0</td>
<td>1.9</td>
</tr>
<tr>
<td>2G</td>
<td>Difficult</td>
<td>Difficult</td>
<td>Goal Discrepant</td>
<td>10</td>
<td>8.3</td>
<td>2.1</td>
</tr>
<tr>
<td>2S</td>
<td>Difficult</td>
<td>Difficult</td>
<td>Strategic</td>
<td>10</td>
<td>9.6</td>
<td>2.6</td>
</tr>
<tr>
<td>3N</td>
<td>Easy</td>
<td>Difficult</td>
<td>None</td>
<td>10</td>
<td>8.1</td>
<td>1.5</td>
</tr>
<tr>
<td>3G</td>
<td>Easy</td>
<td>Difficult</td>
<td>Goal Discrepant</td>
<td>10</td>
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<td>1.1</td>
</tr>
<tr>
<td>3S</td>
<td>Easy</td>
<td>Difficult</td>
<td>Strategic</td>
<td>10</td>
<td>9.1</td>
<td>2.4</td>
</tr>
<tr>
<td>4N</td>
<td>Difficult</td>
<td>Easy</td>
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<td>10</td>
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<td>0.9</td>
</tr>
<tr>
<td>4G</td>
<td>Difficult</td>
<td>Easy</td>
<td>Goal Discrepant</td>
<td>10</td>
<td>4.6</td>
<td>0.8</td>
</tr>
<tr>
<td>4S</td>
<td>Difficult</td>
<td>Easy</td>
<td>Strategic</td>
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<td>0.8</td>
</tr>
<tr>
<td>5N</td>
<td>Easy</td>
<td>Easy</td>
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<td>1.4</td>
</tr>
<tr>
<td>5G</td>
<td>Easy</td>
<td>Easy</td>
<td>Goal Discrepant</td>
<td>10</td>
<td>4.3</td>
<td>0.3</td>
</tr>
<tr>
<td>5S</td>
<td>Easy</td>
<td>Easy</td>
<td>Strategic</td>
<td>10</td>
<td>4.4</td>
<td>0.7</td>
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</table>

Analysis of Variance

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Quantity Goal (QN)</td>
<td>1</td>
<td>669.74</td>
<td>187.00**</td>
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<td>Quality Goal (QL)</td>
<td>1</td>
<td>0.25</td>
<td>0.05</td>
</tr>
<tr>
<td>Feedback (FB)</td>
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<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>2-way Interactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN x QL</td>
<td>1</td>
<td>0.32</td>
<td>0.07</td>
</tr>
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<td>QN x FB</td>
<td>2</td>
<td>1.32</td>
<td>0.35</td>
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<td>QL x FB</td>
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<td>6.55</td>
<td>1.81</td>
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<td>3-way Interactions</td>
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<td>QN x QL x FB</td>
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<td>18.60</td>
<td>1.47</td>
</tr>
<tr>
<td>Error</td>
<td>108</td>
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</tbody>
</table>

* = p ≤ .05
** = p ≤ .01
CHAPTER FIVE
Discussion, Implications, and Future Directions

Preface to Discussion of the Results

The robustness of the goal-setting technique has been demonstrated repeatedly over the last two decades. In fact, the majority of extant goal-setting literature unequivocally supports the usefulness of the paradigm in improving quantity performance. Currently, however, research needs to move beyond confirming the basic quantity goal-setting mechanisms toward investigating boundary conditions of the technique (Austin & Bobko, 1985). Boundary conditions are areas of theoretical significance which have been insufficiently investigated, empirically or conceptually. Such conditions limit the explanatory power of goal-setting theory (cf. Kaplan, 1964), and encourage possible misuse or misapplication of the technique (Garvin, 1984).

The intent of this research was to investigate perhaps the most significant boundary condition still surrounding the goal setting paradigm - that is, can goal-setting be used to enhance quality? In examining this issue, two mechanisms shown to be vital to the success of the quantity goal-setting paradigm were investigated. These two mechanisms were (1) the goal attributes of difficulty and specificity, and (2) feedback.
As a result of this study, goal-setting theorists and practitioners may better understand the technique under quality goal conditions.

Discussion of Results

By simultaneously considering the results of the hypotheses tests, three vital implications of this study can be identified. These implications are: (1) Difficult quality goals alone are ineffective for improving quality; (2) If quality goals are assigned, it is essential to provide extrinsic quality feedback; and (3) Quality goal specificity will improve quality performance but will not reduce quality performance variability. Each of these implications will be discussed separately, both in terms of theoretical and practical outcomes.

The Ineffectiveness of Goal Difficulty as a Quality Goal Attribute

Results of the present study indicate before feedback was provided, individuals with difficult quality goals did not qualitatively outperform individuals with easy quality goals. Such a finding is disconcerting, as it runs counter to both: (a) goal-setting theory predictions of a strong, positive relationship between goal difficulty and performance and, (b) hundreds of extant studies show quantity goal difficulty will positively affect quantity
performance level, even in the absence of external feedback. In fact, present results similarly support the typical goal difficulty-performance relationship under quantity goal conditions, as even before feedback was provided individuals with difficult quantity goals quantitatively outperformed individuals with easy quantity goals. However, the goal difficulty attribute appears to operate differentially under quality goal conditions. In essence, when quality goals are assigned, the typical goal difficulty-performance relationship found under quantity goal conditions is attenuated.

This finding is consistent with a growing body of literature that posits the goal difficulty-performance relationship may not be as robust as goal-setting theory predicts. Specifically, previous research indicates that on complex tasks, the normal relationship between goal difficulty and performance is diminished (Wood et al., 1987). Consistent with findings of extant literature, in the present study the assignment of quality goals may have increased the complexity of the task, weakening the relationship (cf. Frost & Mahoney, 1978; Terborg & Miller, 1978; Wood, 1986). Task complexity depends upon expected outputs and actions required to reach the goal (Bandura & Cervone, 1986). When quality goals are assigned, the nature of the task is subsequently transformed, as individuals are expected to engage in cognitive processes
more elaborate than the those required simply to attain a quantity goal (Huber, 1985). Thus, given this task transformation, increasing the difficulty of a quality goal may not necessarily improve performance (Earley et al., 1989).

This phenomenon can be understood within the framework of control theory (Taylor et al., 1984). Control theory predicts individuals will not be motivated to perform well unless they have knowledge about goal-performance discrepancies. Under complex task situations, such knowledge is often unavailable. In fact, in this study there was essentially no relationship between individuals' actual quality performance and estimated quality performance ($r = -0.05$, n.s.), despite the provision of information regarding the determination and calculation of quality performance scores. Thus, it appears in the absence of feedback, the quality goal difficulty attribute is unrelated to quality performance.

The Importance of Providing Quality Feedback

However, results indicate that after quality feedback was provided, individuals with difficult quality goals qualitatively outperformed individuals with easy quality goals. That is, after feedback was provided the typical goal difficulty-performance relationship was restored.
However, the importance of providing quality feedback can be seen not only through the improved quality performance of subjects assigned difficult quality goals, but also through the findings that: (a) quality feedback reduced subjects' uncertainty about quality goal attainment; (b) quality feedback increased the accuracy of subjects' perceptions about quality performance; and (c) quality feedback was more valued by subjects than was quantity feedback.

First, the effectiveness of feedback in alleviating uncertainty is demonstrated in that after feedback subjects in the feedback conditions (Cells 2G + 2S + 3G + 3S + 4G + 4S + 5G + 5S) became significantly more certain about their quality performance estimates (increase in certainty = .21) than individuals who did not receive feedback (2N + 3N + 5N; increase in certainty = .10, planned comparisons t(117) = 2.29, p < .05). Thus, one mechanism through which quality feedback contributes to improved quality performance is through clarification of the goals. Elimination of this uncertainty, therefore, seems paramount, as uncertainty not only interferes with performance, but also decreases performance satisfaction (r = -.40, p < .01) and goal commitment (r = -.22, p < .01).

Second, quality feedback increased the accuracy of subjects' perceptions about quality performance. Prior to
feedback, there was no relationship between quality performance estimates and quality performance ($r = -0.05$, n.s.). However, following the provision of feedback, the relationship between quality performance estimates and quality performance increased to $r = 0.21$, ($p < 0.01$).

Third, results indicate individuals value external quality feedback more than they value external quantity feedback. The higher value attached to quality feedback appears to be a result of individuals' uncertainty about both quality goal expectations and quality performance. Furthermore, quality feedback should be informative and helpful to the recipient, as a positive relationship existed between quality feedback value and task planning ($r = 0.37$, $p \leq 0.01$). Interestingly, there was a significantly stronger relationship between quality feedback value and planning than there was between quantity feedback value and planning ($r = 0.02$, n.s.). This finding implies quality feedback possesses greater informational value, and ultimately stronger motivational properties than does quantity feedback. Since information about quality performance is unavailable from the task environment, the importance of providing feedback under quality goal conditions becomes even more essential than under quantity conditions (Vance & Colella, 1990).

Furthermore, strategic quality feedback seems to exert
substantially more influence on motivation than does goal-discrepant quality feedback.

The Effects of Feedback on Task Planning

It was hypothesized that the provision of strategic feedback would result in more extensive planning and strategy development than the provision of goal discrepant feedback. However, this prediction was not supported. That is, individuals who received only goal-discrepant feedback engaged in as much planning as did individuals who received strategic feedback. Goal-setting theory identifies planning/strategy development as a mediator of the goal-performance relationship (Locke & Latham, 1991b). However, present results indicate the amount of planning engaged in was unrelated to post-feedback quality performance ($r = .03$, n.s.). This finding is consistent with emerging evidence indicating extensive planning and strategy development may not always prove beneficial (cf. Smith, Locke, & Barry, 1985). In fact, there is no evidence which relates the increased use of task plans to improved performance, especially if many strategies are available and it is difficult to determine which is optimal (Earley, 1986). This suggests that perhaps theoretical clarification of the goal-setting model is warranted. A more appropriate model might include functional strategy development as the mediating variable.
Since their quality performance was lower than the quality performance of individuals receiving strategic feedback and they did not plan any less, it appears plans developed by individuals receiving goal-discrepant feedback may have been ineffective. To investigate this issue, the correlations between specific strategies (identified in the pilot study) and post-feedback quality performance were examined. Four of the fifteen possible strategies were significantly correlated with quality performance in a positive direction. These strategies, which interestingly were the four most often cited by pilot subjects as being helpful, included: (a) word association, (b) visualizing the outdoors, (c) visualizing indoor facilities, and (d) visualizing personal possessions. When examining usage of these seemingly effective strategies in concert, planned comparisons analysis revealed subjects with difficult quality goals receiving strategic feedback (Cells 2S + 4S) utilized these plans significantly more than subjects receiving goal-discrepant feedback (Cells 2G + 2S, t(38) = 2.92, p < .01). Thus, improved performance seems to depend on the adequacy of the strategy employed, rather than the amount of time spent planning (cf. Earley, Connolly, & Ekegren, 1989).
The Influence of Quality Goal Specificity on Quality Performance

Contrary to prediction, present results indicate individuals assigned specific quality goals did not have lower quality performance variance than individuals assigned nonspecific quality goals. Interestingly however, before feedback individuals assigned difficult, specific quality goals qualitatively outperformed (M = 3.21) individuals assigned difficult, nonspecific quality goals (M = 2.75, t(43) = 3.35, p < .01). The findings that quality goal specificity does not reduce quality performance variability, but rather serves to improve quality performance level are, in fact, inconsistent with the predictions of goal-setting theory. Goal-setting theory postulates goal specificity will not influence performance level, but should decrease performance variability. The predicted influence of specificity on variability has been documented under quantity goal conditions (Locke, Chah, Harrison, & Lustgarten, 1987). But like goal difficulty, goal specificity appears to operate differentially under quality goal conditions.

The finding that goal specificity failed to reduce performance variability may be explained two ways. First, as previously discussed, quality goals seemed to lack meaning prior to feedback provision. Therefore, the ambiguity of the quality goal may have impeded its ability
to regulate behavior. Second, it may be the present sample size was too small to detect significant differences in variability between groups. Furthermore, the Bonferroni test of variance homogeneity is considered a conservative test, although it was the only test which allowed for unequal cell sizes (specific goals cell N = 60 versus nonspecific cell N = 30). The finding that specific quality goals improved quality performance is difficult to understand given existing theories. Therefore, future research should focus on further identifying the effects of quality goal specificity on performance.

In addition to examining inter-individual variability, it has also been suggested that goal specificity may reduce intra-individual variability. As Locke et al. (1989) noted, prior to their study there had been no attempts to assess the impact of goal specificity on intra-individual performance variability. However, they noted under nonspecific goal conditions, individuals could change their personal definition of the goal across repeated trials. Thus, specific goals may result in more consistent performance across time. Locke et al. (1989) tested for this effect under quantity goal conditions, but failed to show any evidence that quantity goal specificity could reduce intra-individual quantity performance variability. These authors only supported the prediction
that goal specificity would reduce inter-individual variability.

However, the present results indicate while quality goal specificity did not affect inter-individual performance variability, intra-individual variance was reduced by quality goal specificity. That is, individuals assigned difficult, specific quality goals (Cell 2, N = 30) exhibited less quality performance variance across performance trials than individuals assigned difficult, nonspecific quality goals (Cell 6, N = 15).

To examine this issue, within-individual variance was computed between pre-feedback Trials 1 and 2. Between group analysis of variance was then conducted on the computed differences in variance. Results indicate average differences in performance variance across trials for individuals assigned specific quality goals (Cell 2) was $M = .26$ (sd = .25). Average differences in performance variance across trials for individuals assigned nonspecific quality goals (Cell 6) was $M = .73$ (sd = .75). The difference between these values was significant ($t(43) = -3.12, p < .01$).

Thus the results of the present study do support Locke et al.'s (1989) prediction about intra-individual variability under quality goal conditions. A possible explanation might be that quantity goal specificity influences only inter-individual variance while quality
goal specificity only influence only intra-individual variability. Perhaps this occurs because the quality construct is so ambiguous when individuals settle on an interpretation, they consistently apply it (thus, intra-individual consistency). However, the ambiguity makes it more difficult for individuals to come up with similar interpretations (thus, little or no inter-individual consistency). Conversely, the quantity construct is less diffuse, and thus more easily interpretable between individuals in a similar manner (thus, inter-individual consistency). However, individuals may easily redefine the construct across repeated trials as they receive intrinsic information about quantity performance from the task environment (thus, little or no intra-individual consistency). This issue is deserving of further investigation because of the impact it may have on goal-setting theory.

Effects of Goal Attributes and Feedback on Performance and Affective Reactions Following Multiple Goal Assignments

Although not identified as a major contribution of the study, present results indicate goal attributes and feedback can be manipulated to direct attention under multiple goal assignments. One group of subjects were assigned a difficult quantity goal and an easy quality goal. Although nearly all subjects reached their easy
quality goal, only some were provided with feedback communicating this accomplishment. Those subjects who received feedback then diverted resources toward meeting the more difficult quantity goal. These subjects then had higher quantity performance on post-feedback trials than individuals with the same goal assignment but not provided with feedback about their quality performance.

One viable explanation for this finding is offered by the goal-adequate resource allocation theory (Wickens, 1980), which is ultimately grounded in control theory (Taylor et al., 1984). This theory suggests by varying goal attributes and the availability of performance feedback, individuals should be able to detect goal priorities and successfully pursue the goal deemed most important. This is accomplished as individuals divert energy away from meeting the seemingly less important goal toward meeting either the more important goal or the goal on which performance was poorest (cf. Schmidt, Kleinbeck, & Brockmann, 1984).

Recently, increased attention has been paid to affective outcomes following the assignment of goals (Hollenbeck & Klein, 1987). However, little is known about reactions arising from multiple goal assignments. Consideration of affective reactions to multiple goals is important, as multiple goals are likely to elicit stronger reactions than single goals. The present research
attempted to assess the effects of multiple goals with different attributes on these reactions. Results indicated significantly more positive reactions (less goal conflict, less perceived goal difficulty, more goal commitment, and more performance satisfaction) are elicited by multiple goals that are both easy as compared to multiple goals that are both difficult. In fact, multiple goals that are both easy do not seem to invoke any stronger negative reactions than single goals (cf. Phillips & Farh, 1991).

It also appears that like goal assignment, feedback may also influence affective goal reactions. Prior to feedback, individuals assigned difficult multiple goals experienced no more goal conflict ($M = 3.57$) than individuals assigned easy multiple goals ($M = 3.35$, planned comparison $t(108) = .46$, n.s.). Similarly, individuals assigned difficult multiple goals perceived no more goal difficulty ($M = 3.41$) than individuals assigned easy multiple goals ($M = 3.17$, planned comparison $t(108) = .64$, n.s.). Thus, results indicate feedback, albeit useful in improving performance, may serve to increase negative reactions.

Additional insight into the effects of both goal assignments and feedback on affective reaction is provided by examining reactions of individuals receiving feedback (2G + 2S and 5G + 5S) versus those who did not (2N and 5N)
within the same goal condition. Specifically, individuals assigned difficult multiple goals but not provided with feedback (2N) experienced less goal conflict, more goal commitment, and more performance satisfaction as compared to individuals assigned the same goals and provided with feedback (2G + 2S). Conversely, individuals assigned easy multiple goals and provided with feedback (5G + 5S) were more goal committed and more satisfied with performance than individuals who did not receive feedback. Thus, it appears the influence of negative feedback (typically received by difficult goals subjects) and positive feedback (typically received by easy goals subjects) operate differentially. Future research should be directed at segregating feedback into positive and negative forms and reexamining these issues, as it appears feedback influences affective reaction, but not in a consistent manner.

**Practical Implications**

On a practical level, the implication of these findings is that goal-setting - the most robust motivational technique available to managers to increase quantity output - may not be so easily adaptable to improving the quality of output. Currently, however, many organizations in the manufacturing, service, and federal sectors are becoming increasingly concerned with product
quality. In fact, it has been proclaimed that businesses are now moving into a new phase of management - that is, "fourth-generation management" (Port, 1991).

The "first-generation" consisted of management-by-doing, where craftsmen would produce their own product. The "second-generation" consisted of management-by-directing, where craftsmen would direct apprentices in their work. The "third-generation" consisted of management-by-results, where professional managers would focus only on meeting production schedules and output quotas. The "fourth-generation", however, represents a rejection of the previous one because of its focus on quantity at the expense of quality. Instead, the fourth-generation insists on "total quality management".

Proponents of this fourth-generation management contend goal-setting, a major tool used in the third-generation, is antiquated. In fact, quality experts such as W. Edwards Deming, insist managers' emphasis on goal-setting has resulted in the decline of American competitiveness. Most of the extant knowledge about quality management has arisen from the Total Quality Management (TQM) paradigm developed by W. Edwards Deming. This 91-year-old quality expert gained international prominence through his consultative work with Japanese manufacturing firms following World War II. He was so successful in his quality improvement endeavors that the
Japanese people attributed their industrial rebirth to his management philosophy (Dobyns, 1990). While Deming assisted Japan in improving quality after World War II, United States manufacturers concentrated on increasing production during this time (Duncan & Van Matre, 1990). The United States' pursuit of quantity rather than quality appears to have contributed to its decline in international competition.

Interestingly, a predominant theme of Deming's philosophy is that quantitative goal-setting should be eliminated (Duncan & Van Matre, 1990). However, goals serve as the backbone of traditional management practices. In contrast, Deming's approach directs that management should "forget production goals - in fact, forget management by objectives altogether" (Case, 1987, p.17). Deming feels that poor worker performance is due not to lack of employee motivation, but due to problems of management and of the traditional management system. He suggests that managers stifle quality output through quantitative goal-setting.

In discussing goal-setting theory, Locke and Latham (1991) recently suggested that if quality is of concern, quality goals should be assigned. Until the present research, however, the effectiveness of the goal-setting paradigm under quality goal conditions has not been adequately assessed. And results of the present research
suggest one of the important attributes of quantity goals - goal difficulty - has no significant relationship with quality performance. Instead, quality goal difficulty appears to be meaningless in the absence of quality feedback.

Although Deming's program does not advocate quality goal-setting, it appears that the technique, in conjunction with the provision of quality feedback, is consistent with his philosophy. Deming contends understanding of expectations and planning is essential if workers are to improve quality. According to Deming, practices such as assigning "zero-defects" goals make no sense, as there is no understanding whether the method provided meets the goal. However, the utilization of difficult quality goals such as "zero-defects" could be effective if workers were provided with feedback about their quality performance. In fact, Drucker (1991) recently coined the term "Disneyland Factor" to identify such a technique. He insists "zero-defects", a form of quality goal-setting, can be quite meaningful and effective if feedback is provided to encourage strategy development.

This technique was especially helpful in practice during the building and initial operation of Disneyland in Tokyo. Developers of the theme park insisted upon a zero-defects goals. So, a system was established at this
facility prescribing employees to precisely record incidents of customer complaints and operational problems. Strategies were then developed on how to deal with these issues. The information was then compiled into manuals and this detailed feedback was distributed to employees (Neff, 1991).

Drucker (1991) contends zero-defects management with feedback is somewhat of a return to Frederic Taylor's Scientific Management. Only the operators themselves, rather than the industrial engineer take the initiative in studying the task, the work, and the tools. And instead of the stopwatch and camera, feedback is provided in a more sophisticated manner to encourage performance improvement. Thus, at least preliminary operational evidence exists supporting the Locke and Latham's (1990b) suggestion that the goal-setting paradigm might be modified to be conducive to quality goal-setting.

However, the mechanism suggested by goal-setting theory to control performance variability is ineffective under quality goal conditions. This is especially troublesome, as one component of quality is the absence of variability (Port, 1991) or conformance to requirements (Augenblick, 1990). Taguchi and Quelch (1983) insist consistency is critical because of the quality loss function. That is, any deviation from specifications, no
matter how small result in decreased quality, and will ultimately diminish the competitiveness of any firm.

Instead, the practical answer suggested to controlling variability appears to be the continual monitoring of quality performance and the provision of feedback. However, successful monitoring of quality assumes quality performance measurements can be quantified (Garvin, 1983). This necessity for quantification has historically been problematic, and has in fact been a factor dissuading researchers from investigating quality goal-setting (cf. Austin & Bobko, 1985). The problem lies in the fact that quality is task-dependent, in that what constitutes quality on one task may not on another (Garvin, 1984). Thus, quality measurement becomes complex. Quality measurement problems have, in fact, stifled the advancement of the development of a quality paradigm (see Saraph, Benson, and Schroeder, 1989 for such an attempt). To further complicate matters, some tasks are more conducive to quality measurement and assessment than others. In some instances, quality assessment may be dependent upon quality behaviors engaged in and measured through performance appraisal systems such as behavioral observation scales (cf. Juran, 1986). In other cases, quality may be dependent upon customer satisfaction (cf. Deming, 1986). However, despite the technique chosen, an operational definition for quality must be developed
before quality variability can be adequately measured and controlled (Gitlow & Hertz, 1983).

Limitations of the Research

Some cautionary notes regarding the nature of the research are deserving of discussion. In particular, potential limitations including (a) the laboratory setting of the research, (b) the task, and (c) the time frame of the research.

Laboratory Setting

The present research was conducted in an experimental laboratory setting using a student population. However, Latham and Lee (1986) have shown laboratory goal-setting studies are applicable in the field, as patterns of results that emerge between laboratory results and field results are comparable. There is similar reason to believe the present results would be generalizable within organizational contexts, as quality is often enhanced through innovation and creativity requiring the skills utilized by subjects in this study.

Additionally, the purpose of this research was to examine if the theoretical underpinnings of quantity goal-setting were appropriate for quality goal-setting. As Berkowitz and Donnerstein (1982) and Mook (1983) point out, external generalizability is not the goal of all research. Instead, the purpose of some research is to
stimulate and investigate theory, which is most appropriately done within the controlled confines of a laboratory setting. The present study has, in fact, contributed to the theoretical refinement of goal-setting theory by highlighting important differences between traditional quantity goal-setting and quality goal-setting.

**Task**

Given the laboratory nature of the project, a heuristic task was used and scored by a measure of quality applicable only to this exercise. However, it is still recognized that quality is task specific (Garvin, 1984), and that measures of quality on one task may not be appropriate for others. Thus, future research should attempt to construct measures of quality for alternative tasks.

Additionally, it may be useful to replicate the findings using different types of tasks. According to Wood's (1986) classification of task complexity, the present task was considered complex because of the quality goal assignment. However, on simpler convergent tasks when expectations are clearer, it may be that goal-discrepant feedback is just as effective as strategic feedback. In essence, it may be that different degrees of feedback are more effective than others depending upon
task requirements. This issue is deserving of further research.

Time Frame

Subjects participating in the experiment were required to perform the task for relatively few trials and for a relatively short time period. As individuals repeatedly perform a task over time, they will progress up the learning curve and some of the results may be less applicable. For example, it is possible that as individuals master a task through repeated executions, strategic feedback may become unnecessary and redundant. Once learning has occurred and effective task plans have been developed, strategic feedback may not provide novel information to the recipient (Gist & Bavetta, 1987). Rather, such information may just be distracting and effort expended on processing the detailed feedback may divert energy away from task completion. Ilgen and Moore (1987), in fact, suggest once individuals become familiar with a task, they should be allowed to self-select the amount and type of information needed to meet goals. Again, future research is warranted investigating the effects of both goal-discrepant and strategic feedback over time.
Conclusion

In conclusion, goal-setting researchers have often made robust conclusions about the generalizability of the finding that difficult, specific goals increase performance. There are situations in which specific, difficult goals do not. These boundary conditions need to be identified and clarified. This research has taken a step in that direction. However, in the process of this investigation, several additional questions have been raised that future research should attempt to address. Only in answering these and other related questions will goal-setting research truly overcome the boundary conditions currently associated with this motivational technique.
REFERENCES


Amabile, T.M. (1990). The social psychology of creativity. Theories of Creativity.


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APPENDIX A

INTERCORRELATION MATRIX OF ALL STUDY VARIABLES
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1 = Pre-Feedback Quantity; 2 = Post-Feedback Quantity; 3 = Pre-Feedback Quality; 4 = Post-Feedback Quality; 5 = Effort; 6 = Planning; 7 = Quantity Feedback Value; 8 = Quality Feedback Value; 9 = Quantity Estimate; 10 = Quality Estimate; 11 = Uncertainty of Quantity Estimate; 12 = Uncertainty of Quality Estimate; 13 = Goal Difficulty; 14 = Goal Commitment; 15 = Goal Conflict; 16 = Performance Satisfaction; 17 = Time taken to Review Feedback; 18 = Practice Trial Quality; 19 = Practice Trial Quantity

$r > .15, p < .05$
r > .21, $p < .01$

Note: Most of the correlations presented are based on the total sample size of $N = 165$. However, correlations with variables (7) and (8) were based on a sample size of $N = 80$, which included only subjects who received feedback. Similarly, correlations with variables (9) through (12) were based on a sample size of $N = 120$, which included only subjects who had a specific quality goal.
APPENDIX B

MEANS AND STANDARD DEVIATIONS FOR ALL STUDY VARIABLES BY GOAL CONDITION
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<th>Total (N=165)</th>
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<th>7 (N=15)</th>
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<td>Time (FB Review)</td>
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Note: Pre-Feedback and Post-Feedback are terms used to identify the first two trials as compared to the last two trials. In Cells 1, 6, 7, 2N, 3N, 4N, and 5N there was no feedback presented to the subjects. However, the terminology was used to permit comparison with subjects in cells who did receive feedback.
## Goal Conditions

| Goal Conditions | 2  
|-----------------| (N=30) | 3  
|                 | (N=30) | 4  
|                 | (N=30) | 5  
|                 | (N=30) |
|                 | 10/4.5 | 10/2.0 |
|                 | 4/4.5  | 4/2.0  |
| Pre FB Quantity | 8.9(1.9) | 6.9(1.6) | 7.9(1.5) | 6.3(1.3) | 8.8(1.8) | 7.4(1.6) | 3.7(0.5) | 3.8(0.9) | 4.5(1.2) | 3.7(0.3) | 4.2(0.4) | 4.2(0.9) |
| Post FB Quantity| 10.0(1.9) | 8.3(2.1) | 9.6(1.6) | 8.1(1.5) | 10.6(1.1) | 9.1(2.4) | 4.3(0.9) | 4.6(0.8) | 4.6(0.8) | 5.2(1.4) | 4.3(0.5) | 4.4(0.7) |
| Pre FB Quality  | 3.2(0.5) | 3.1(0.4) | 3.3(0.6) | 2.8(0.7) | 2.8(1.0) | 3.2(1.8) | 3.0(0.7) | 2.8(0.9) | 3.4(0.3) | 2.9(0.6) | 2.7(0.6) | 3.1(0.9) |
| Post FB Quality | 2.6(0.4) | 2.9(0.4) | 3.3(0.5) | 2.5(1.0) | 2.8(0.3) | 3.0(0.5) | 2.4(0.6) | 2.7(0.7) | 3.5(0.4) | 2.6(0.7) | 2.6(0.6) | 2.5(0.6) |
| Effort          | 4.9(1.5) | 5.8(0.9) | 5.4(1.4) | 4.8(1.2) | 5.5(1.5) | 5.2(1.2) | 3.4(1.7) | 5.3(1.2) | 5.7(1.5) | 3.9(2.0) | 4.8(1.2) | 4.7(1.6) |
| Planning        | 3.9(1.6) | 4.2(1.2) | 4.4(1.2) | 4.6(1.3) | 4.1(1.4) | 4.6(1.5) | 3.8(1.3) | 4.6(1.5) | 4.5(1.6) | 4.6(1.3) | 4.3(1.1) | 4.8(1.3) |
| Qnty FB Value   | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) | 0.0(1.0) |
| Qnty Estimate   | 8.7(1.8) | 6.7(1.5) | 10.7(2.5) | 6.0(1.1) | 8.8(0.8) | 7.5(1.9) | 3.9(0.6) | 3.8(0.9) | 4.4(1.1) | 3.7(0.3) | 3.5(1.9) | 4.2(0.9) |
| Qlty Estimate   | 2.5(1.2) | 2.7(1.3) | 3.0(1.3) | 2.5(1.4) | 2.9(1.1) | 2.9(1.0) | 3.1(1.5) | 2.7(1.1) | 2.7(1.2) | 2.6(1.1) | 1.8(0.8) | 2.0(0.9) |
| Uncertainty Qnty| 2.5(1.2) | 2.7(1.3) | 3.0(1.3) | 2.5(1.4) | 2.9(1.1) | 2.9(1.0) | 3.1(1.5) | 2.7(1.1) | 2.7(1.2) | 2.6(1.1) | 1.8(0.8) | 2.0(0.9) |
| Uncertainty Qlty| 3.2(1.1) | 4.5(1.3) | 4.0(1.5) | 3.3(0.8) | 3.6(1.1) | 3.7(0.6) | 4.8(1.7) | 3.7(1.0) | 3.8(1.2) | 3.1(1.0) | 3.4(1.0) | 3.7(0.8) |
| Goal Difficulty | 4.3(1.0) | 4.3(0.7) | 4.0(1.3) | 3.7(1.1) | 4.3(1.3) | 4.4(1.1) | 4.3(1.4) | 3.7(0.8) | 3.7(1.7) | 3.5(1.7) | 3.5(1.1) | 3.5(0.8) |
| Goal Commitment | 5.6(0.7) | 4.9(1.3) | 5.3(1.0) | 5.4(1.0) | 5.6(0.6) | 5.7(0.7) | 5.3(1.2) | 5.7(0.6) | 5.6(0.8) | 5.3(1.1) | 5.7(0.8) | 5.8(0.6) |
| Goal Conflict   | 4.6(1.1) | 4.6(0.7) | 5.2(1.1) | 4.4(1.0) | 4.6(1.3) | 4.5(1.5) | 4.9(1.4) | 5.0(0.8) | 4.7(1.3) | 3.9(1.1) | 3.9(0.8) | 4.2(1.6) |
| Performance Sat.| 5.0(1.3) | 4.1(1.3) | 4.5(1.7) | 5.1(1.1) | 4.7(1.6) | 5.7(0.7) | 3.5(2.0) | 3.8(1.9) | 4.3(1.3) | 4.7(1.7) | 5.5(0.8) | 4.9(1.3) |
| Time (FB Review)| 34.0(13) | 65.0(18) | - 48.0(23) | 71.0(25) | - 40.0(12) | 77.0(29) | - 45.0(16) | 70.0(33) | - 45.0(16) | 70.0(33) | - 45.0(16) | 70.0(33) |
APPENDIX C

EXPERIMENTAL QUESTIONNAIRE ITEMS
Effort

I was more motivated to perform well in Trials 3 and 4 (Session 3) as compared to Trials 1 and 2 (Session 2).

I definitely expended more effort on Trials 3 and 4 as compared to Trials 1 and 2.

I found myself working much harder on Trials 3 and 4 as compared to Trials 1 and 2.

I put more energy into the task in Trials 3 and 4 as compared to Trials 1 and 2.

Planning

During the intermission, I came up with new ideas about how to improve my performance on the task.

During the intermission, I spent time planning about how I could better reach my goal.

During the intermission, I developed new strategies about how to perform the task so my performance would be better during the last session.

During the intermission, I realized it was important to have some sort of plan, procedure, or strategy to help me reach my goals.

Quality Feedback Value

The quality feedback I received was quite helpful for improving my quality performance in Session 3 (Trials 3 and 4).

The quality feedback I received was valuable to me in reaching my quality goal.

The quality feedback I received gave me insight about how I could improve my quality performance.

The quality feedback was helpful to me for reaching my quality goal in Session 3 (Trials 3 and 4).
Quantity Feedback Value

The quantity feedback I received was quite helpful for improving my quantity performance in Session 3 (Trials 3 and 4).

The quantity feedback I received was valuable to me in reaching my quantity goal.

The quantity feedback I received gave me insight about how I could improve my quantity performance.

The quantity feedback was helpful to me for reaching my quantity goal in Session 3 (Trials 3 and 4).

Quantity Estimate and Uncertainty

I listed _____ objects in Trial X.

How certain are you about your estimate of quantity performance in Trial X?

_____ Extremely Certain
_____ Certain
_____ Somewhat Certain
_____ Neither Certain nor Uncertain
_____ Somewhat Uncertain
_____ Uncertain
_____ Extremely Uncertain

Quality Estimate and Uncertainty

I earned an average of _____ quality points per response in Trial X.

How certain are you about your estimate of quality performance in Trial X?

_____ Extremely Certain
_____ Certain
_____ Somewhat Certain
_____ Neither Certain nor Uncertain
_____ Somewhat Uncertain
_____ Uncertain
_____ Extremely Uncertain
Goal Difficulty

The goals assigned to me on this task were difficult.
The goals assigned to me on this task were simple.
The goals assigned to me on this task were hard to reach.

Goal Commitment

After I began to work on the task, it didn't matter if I reached the assigned goals or not.
I constantly tried to reach the assigned goal.
I was strongly committed to pursuing the assigned goal.
As I performed the task, accomplishment of the goals became personally important to me.

Goal Conflict

While performing the task, I experienced a great deal of conflict in determining which goal to focus on.
While performing the task, I felt the goals assigned to me produced much conflict.
While performing the task, it was difficult for me to determine whether I should concentrate most on meeting my quantity goal or my quality goal.
While performing the task, I often found myself having to ignore one goal to achieve the other.

Performance Satisfaction

Overall, I am satisfied with my performance on this task.
Overall, I am pleased with my performance on this task.

Quality Goal Emphasis

It was very important to me to list objects that were unusual or unfamiliar - that is, objects of high quality.
I tried to list objects that were unusual or unfamiliar. That is, I tried to list objects that were high quality and that others performing this task would not think of.

Quality Goal Specificity

The quality goal assigned to me was extremely explicit.
The quality goal assigned to me was quite specific.

Feedback Specificity

The feedback provided to me by the experimenter was quite explicit.
The feedback provided to me by the experimenter was quite detailed.
APPENDIX D

EXPERIMENTAL PROTOCOL
Informed Consent Document

To: Participants in the study of problem solving behavior

From: Paula L. Phillips

Procedure: This study is one in a series of studies on problem solving behavior. You will be asked to perform a creativity task for a period of time after which you will be asked to answer some questions. The entire process will take about 45 minutes. If you decide that you no longer wish to continue with the project after you have begun, simply advise the director and leave.

Signature: Your signature is required to indicate that you have read and fully understood this form, and, at this point you agree to continue with this project. Your signature does not require you to complete the project, for, as noted above, you have the right to discontinue the study at any time.

I have read the above and, at this point, agree to continue.

________________________________________
Signature                                         Date
Pledge Form

I hereby agree that I will not release any information about this study to my classmates or friends. I understand that it is extremely important in this study that all future participants are subject to the same conditions that I was. I acknowledge that I was given the opportunity to decline to sign this form and that I freely agreed to do so.

Name____________________________________

Date____________________________________
Name ______________________________________

Instructions for Session I

There are three sessions in this experiment. In the first session, I would like you to perform one item or trial from an object-listing task. This item is an adjective, and your task will be to list objects described by that adjective. For example, if the adjective is "red", you could list "fruit", "clothes", "houses", "cars", "blood", etc. Below are 3 rules which should guide your performance.

1. Do not repeat objects in the same category. (e.g., "apples", "strawberries", "cherries", "plums", etc. are all examples of fruit. In this instance either list "fruit" or one of the examples of fruit.)

2. Nonsensical responses are unacceptable. You should not list "skyscraper" if the given adjective is "short".

3. You may use abstract words. For example, given the adjective "blue", you could list "mood".

The word on the next page is for practice. When I give you the signal, turn the page and list objects that can be described by that adjective. You will be given one minute. I will tell you when the minute is up. When I tell you to stop, please stop writing immediately and do not turn the page until you are instructed to do so.
Practice Trial
List objects that can be described by the word HOT

List your objects below

Do not write in this area. For experimenter use only.
Instructions for Session II

In the next two sessions of the experiment, I would like you to perform the object-listing task again for an additional four trials. On each trial you will be given a different adjective. The rules for performing the task in Session II are the same as those for the practice trial.

Again, you will have one minute for each trial. When I tell you to stop, please stop writing immediately and await instructions to continue on to the next trial.

Your goal for the following two trials is to list 4/10 responses per trial that are as creative as possible. That is, the words you list should be words that are unusual or unfamiliar - in other words, you should try to list responses that others performing this task would not think of.

Your **quantity** goal is to list 4/10 objects per trial.
Your **quality** goal is to list objects that are as creative (unusual or unfamiliar) as possible.
Trial 1

ROUND

List 4/10 objects per trial that are as creative as possible (unusual or unfamiliar)

List your objects below

Do not write in this area

For experimenter use only
Trial 2

STRONG

List 4/10 objects per trial that are as creative as possible (unusual or unfamiliar)

<table>
<thead>
<tr>
<th>List your objects below</th>
<th>Do not write in this area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For experimenter use only</td>
</tr>
</tbody>
</table>
Trial 3

SOFT

List 4/10 objects per trial that are as creative as possible (unusual or unfamiliar)

<table>
<thead>
<tr>
<th>List your objects below</th>
<th>Do not write in this area for experimenter use only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Trial 4

**SHINY**

List 4/10 objects per trial that are as creative as possible (unusual or unfamiliar)

<table>
<thead>
<tr>
<th>List your objects below</th>
<th>Do not write in this area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For experimenter use only</td>
</tr>
</tbody>
</table>
Instructions for Session II

In the next two sessions of the experiment, I would like you to perform the object-listing task again for an additional four trials. On each trial you will be given a different adjective. The rules for performing the task in Session II are the same as those for the practice trial.

On the next two trials, you will be assigned both a quantity and a quality performance goal.

Your quantity performance will be evaluated as the number of responses you list that are in compliance with the rules of the task presented earlier.

Your quality performance will be evaluated based on the creativity of your response.

Specifically, the manner in which your quality score will be assessed is based on the following procedure. Prior to this experiment, the experimenters had 200 college students complete the task you are now performing. We then compiled all responses given by these 200 students into a quality scoring index. The more frequent a response was given by these individuals, the lower the quality score for that response. The maximum quality score for each word is 5 points. The minimum score is 0 points. To illustrate, in response to the adjective "hot", the word "sun" was often listed as a response. Therefore, the quality score for this response was .67 quality points. On the other hand, the word "explosion" was given much less frequently. Therefore, the quality score for this response was 4.31 quality points.

Remember, in performing this task, you should come up with responses that are as creative as possible. You should try to list objects that the average person would not ordinarily think of. That is, the objects you list should be unusual or unfamiliar. Your quality score will be based upon the creativity of your responses.

Again, you will have one minute for each trial. When I tell you to stop, please stop writing immediately and await instructions to continue on to the next trial.

----

Your quantity goal for this session is to list 4/10 objects for each adjective.

Your quality goal for this session is to earn an average of 2.0/4.5 quality points per response.
Trial 1

Quantity goal: 4/10 objects
Quality Goal: An average of 2.0/4.5 quality points per response

List your objects below

Do not write in this area
For experimenter use only
Trial 2

Quantity goal: 4/10 objects
Quality Goal: An average of 2.0/4.5 quality points per response

SOFT

List your objects below

Do not write in this area
For experimenter use only
Trial 3

Quantity goal: 4/10 objects
Quality Goal: An average of 2.0/4.5 quality points per response

**STRENGTH**

List your objects below

Do not write in this area

For experimenter use only
Trial 4

Quantity goal: 4/10 objects
Quality Goal: An average of 2.0/4.5 quality points per response

SHINY

List your objects below

Do not write in this area
For experimenter use only
Instructions for Session II

In the next two sessions of the experiment, I would like you to perform the object-listing task again for an additional four trials. On each trial you will be given a different adjective. The rules for performing the task in Session II are the same as those for the practice trial.

Again, you will have one minute for each trial. When I tell you to stop, please stop writing immediately and await instructions to continue on to the next trial.

Your quantity goal is to list 10 objects per trial.
**Trial 1**

**ROUND**

List 10 objects per trial

List your objects below

Do not write in this area

For experimenter use only
**Trial 2**

**SOFT**

List 10 objects per trial

<table>
<thead>
<tr>
<th>List your objects below</th>
<th>Do not write in this area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For experimenter use only</td>
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<tr>
<td>List your objects below</td>
<td>Do not write in this area</td>
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<tr>
<td>-------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Trial 4**

**SHINY**

List 10 objects per trial

<table>
<thead>
<tr>
<th>List your objects below</th>
<th>Do not write in this area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For experimenter use only</td>
</tr>
</tbody>
</table>


Condition Sheet

Condition:

10 and 2.0 (No Feedback)
10 and 2.0 (Goal-Discrepant Feedback)
10 and 2.0 (Strategic Feedback)
10 and 4.5 (No Feedback)
10 and 4.5 (Goal-Discrepant Feedback)
10 and 4.5 (Strategic Feedback)
4 and 2.0 (No Feedback)
4 and 2.0 (Goal-Discrepant Feedback)
4 and 2.0 (Strategic Feedback)
4 and 4.5 (No Feedback)
4 and 4.5 (Goal-Discrepant Feedback)
4 and 4.5 (Strategic Feedback)
4 and Nonspecific Quality
10 and Nonspecific Quality
10 and No Quality

Number __________________ Name ______________________________________
Date _____________________ Time _____________  Male/ _______Female

Adjectives: Quantity Disqualified Quality

<table>
<thead>
<tr>
<th>HOT</th>
<th>Quantity</th>
<th>Disqualified</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROUND</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOFT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STRONG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHINY</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Time taken to review feedback (in minutes) ________min ________ sec

Experimenter Notes:
Performance Feedback Summary

**QUANTITY PERFORMANCE**

Number of responses listed in Trial 1 (Round) _________
minus: Number of responses disqualified _________
Total number of responses listed in Trial 1 _________

Number of responses listed in Trial 2 (Soft) _________
minus: Number of responses disqualified _________
Total number of responses listed in Trial 2 _________

Average Quantity for Trials 1 and 2 (___+____)/2 = _______

Therefore, for quantity performance, you met / did not meet
your goal of listing _____ objects per trial.

**QUALITY PERFORMANCE**

Average quality points per response in Trial 1 (Round) ______
Average quality points per response in Trial 2 (Soft) ______

Average Quality Points per Response for Trials 1 and 2
(____+____)/2 = _______

Therefore, for quality performance, you met / did not meet
your goal of earning an average of _____ quality points per response.
Pilot Study

To assess the appropriateness of the proposed research, a pilot study was conducted specifically to:
(1) Determine the time needed to provide feedback to subjects in an appropriate manner.
(2) Assess subjects' understanding and utilization of feedback provided to them.
(3) Inquire about strategies used in performing the experimental task.
(4) Assess understanding of the experimental protocol, task instructions, and goal manipulations.
(5) Develop and test an appropriate questionnaire to be used during the experimental research.

Pilot Study Procedures

Fifty-four subjects participated in the pilot research under procedures similar to those presented above. An exception to this previously outlined procedure was the number and type of experimental manipulations. In the pilot research, there were four goal conditions: (a) difficult, specific quantity goal with strategic feedback (N = 14); (b) difficult, specific quality goal with strategic feedback (N = 14); (c) difficult, specific quantity and quality goals with strategic feedback (N = 14); and (d) difficult, specific quantity and quality
goals without feedback (N = 12). In addition to having subjects perform the experimental task, following each session the experimenter met with subjects in groups of three to discuss the questions presented in Table 3.

**Results of the Pilot Study**

Findings from the pilot study are addressed in three subsequent subsections. First, the effects of goal-setting and feedback on quantity and quality performance are considered. Second, there is a discussion of the effects of goal-setting and feedback on self-reported measures collected on the interim- and post-experimental questionnaires. Finally subjects' perceptions of the experiment as reported in the post-experimental interview are summarized.

**Goals, Feedback, and Performance**

Table 1 presents analysis of covariance results showing the effects of goal-setting and feedback on quantity and quality performance. Practice Trial performance results were controlled for as a measure of task ability. As expected, however, there were no significant differences in either quantity or quality performance across groups on the practice trial.
Table 1: Effects of Goal-Setting and Feedback on Quantity and Quality Performance

<table>
<thead>
<tr>
<th>Goal-Setting Conditions</th>
<th>Quantity</th>
<th>Quality</th>
<th>Q&amp;Q Feedback</th>
<th>Q&amp;Q No Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only</td>
<td>Only</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Performance Measures: $M \pm SD$

**PRE-FEEDBACK**

- Quantity: $6.2 \pm 1.0$, $6.7 \pm 1.9$, $7.3 \pm 1.9$, $6.1 \pm 1.3$
- Quality: $21.6 \pm 6.0$, $24.4 \pm 8.8$, $24.9 \pm 11.4$, $24.1 \pm 15.5$

**POST-FEEDBACK**

- Quantity: $7.5 \pm 1.8$, $6.9 \pm 1.8$, $7.8 \pm 1.7$, $6.8 \pm 1.9$
- Quality*: $27.7 \pm 11.0$, $34.5 \pm 5.6$, $36.4 \pm 4.5$, $30.4 \pm 10.2$

* $F(3,53) = 2.90$, $p \leq .05$

 Significant differences in performance variance

- Pre-feedback quality: Bartlett-Box $F = 3.563$, $p \leq .01$
- Pre-feedback quantity: Bartlett-Box $F = 2.257$, $p \leq .10$
- Post-feedback quality: Bartlett-Box $F = 3.972$, $p \leq .01$
As this table indicates, subjects assigned a quality goal, either in isolation or jointly with a quantity goal, performed qualitatively better than individuals assigned only a quantity goal on pre-feedback trials. Following feedback, individuals assigned a quantity only goal performed qualitatively inferior to subjects assigned a quality goal. In fact, quality goal only subjects and quantity and quality/feedback subjects performed significantly better ($F = 2.90, p < .05$) than quantity goal subjects on post feedback quality. All four groups improved quality performance following feedback, but the increase was especially marked for the quality only and the quantity & quality/feedback subjects. From these results it can be concluded that the assignment of quality goals did influence quality performance, but feedback dramatically improved performance quality when it was provided to subjects with quality goals.

The results were less decisive for performance quantity. Prior to feedback there were no significant differences among the four experimental groups for performance quantity. Following feedback, the group with the best quantity performance was the quantity goal subjects. The quantity goal subjects also showed the greatest increase in quantity performance following feedback. Thus it appears that both the quantity goal and quantity feedback had weaker effects than the quality
manipulations. This may be attributable to two factors: (a) quantity only subjects were presented with information on how quality performance would be evaluated, priming these subjects to concentrate on quality; and (b) quantity only subjects reported in post-experimental interviews that pursuing quality was more challenging and intrinsically satisfying than attempting to achieve quantity goal.

Other findings deserving of discussion are the significant differences in performance variance. On prefeedback trials, subjects assigned both quantity and quality goals had significantly higher variance in performance quality than subjects assigned only quantity goals. Following feedback, however, there was a significant decrease in quality performance variability for quantity and quality/feedback subjects. In fact, both quantity only and quantity and quality/no feedback subjects had significantly higher quality performance variability than subjects in the other two conditions. Thus it appears that feedback served to significantly reduce quality performance variability for subjects assigned a quality goal.

Self-Reported Measures: Analysis and Findings

Since one of the specific purposes of this pilot study was to assess the reliability and validity of potential instruments, there are some measures contained
in the pilot study questionnaires which were not utilized in the experimental study. This is because they were either unreliable or because there was a superior alternative measure. Each of the measures included in both the interim-experimental questionnaire (administered after subject's completed the first two experimental trials while the researcher was evaluating subject performance), and the post-experimental questionnaire (administered after the final two performance trials) was anchored on a 7-point scale from 1 = strongly agree to 7 = strongly disagree. Table 2 shows the effects of the goal manipulations on these measures.
Table 2: Effects of Goal-Setting and Feedback on Self-Report Measures

<table>
<thead>
<tr>
<th>Goal-Setting Conditions</th>
<th>Quantity Only</th>
<th>Quality Only</th>
<th>Q&amp;Q Feedback</th>
<th>No Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Report Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity Goal Presence*</td>
<td>6.2</td>
<td>3.8</td>
<td>6.3</td>
<td>5.6</td>
</tr>
<tr>
<td>Quality Goal Presence*</td>
<td>5.1</td>
<td>6.2</td>
<td>5.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Goal Difficulty</td>
<td>4.2</td>
<td>4.2</td>
<td>4.4</td>
<td>4.4</td>
</tr>
<tr>
<td>Goal Satisfaction</td>
<td>5.2</td>
<td>4.6</td>
<td>4.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Quantity Goal Spec.</td>
<td>5.0</td>
<td>---</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Quality Goal Spec.</td>
<td>---</td>
<td>5.5</td>
<td>5.0</td>
<td>5.4</td>
</tr>
<tr>
<td>Feedback Specificity</td>
<td>4.0</td>
<td>4.7</td>
<td>4.3</td>
<td>---</td>
</tr>
<tr>
<td>Task Planning</td>
<td>4.4</td>
<td>4.3</td>
<td>4.3</td>
<td>4.0</td>
</tr>
<tr>
<td>Perceived FB Accuracy</td>
<td>5.4</td>
<td>4.9</td>
<td>4.3</td>
<td>---</td>
</tr>
<tr>
<td>Quantity Emphasis (I)*</td>
<td>5.0</td>
<td>2.9</td>
<td>4.4</td>
<td>4.8</td>
</tr>
<tr>
<td>Quality Emphasis (I)*</td>
<td>4.7</td>
<td>6.0</td>
<td>5.1</td>
<td>5.6</td>
</tr>
<tr>
<td>Quantity Emphasis (P)*</td>
<td>5.4</td>
<td>2.9</td>
<td>5.2</td>
<td>5.4</td>
</tr>
<tr>
<td>Quality Emphasis (P)</td>
<td>4.6</td>
<td>6.3</td>
<td>5.4</td>
<td>5.4</td>
</tr>
<tr>
<td>Goal Commitment (I)</td>
<td>5.0</td>
<td>4.7</td>
<td>4.4</td>
<td>4.7</td>
</tr>
<tr>
<td>Goal Commitment (P)</td>
<td>5.2</td>
<td>4.9</td>
<td>5.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Quantity Perf. Sat. (I)</td>
<td>3.3</td>
<td>2.9</td>
<td>2.5</td>
<td>2.9</td>
</tr>
<tr>
<td>Quality Perf. Sat. (I)</td>
<td>3.9</td>
<td>3.9</td>
<td>3.7</td>
<td>4.4</td>
</tr>
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* p < .05
I = Interim-experimental questionnaire
P = Post-experimental questionnaire
Subject’s Perceptions of Experimental Procedures Discussed in Post-Experimental Interviews

As the pilot subjects completed the experimental task, they were asked to meet with the experimenter in groups of three to discuss their perceptions of the experiment. Comments made during these interviews are summarized in Table 3.
Table 3: Summary of Findings from Post-Experimental Interviews

Was the feedback helpful, and if so, how was it helpful? (Questions 3 and 4)

- Quality feedback was more helpful than quantity feedback.
- Feedback helped to relax subjects, for even if the goal was not met, at least they knew they were on track.
- After feedback, subjects with both quantity and quality goals realized they had been engaging in a trade-off.
- Subjects who did not receive feedback focused on quantity, because they could better ascertain how well they were doing in relation to the goal.
- Subjects who thought the task itself was difficult tended to ignore the feedback.

Did you perform any differently after receiving feedback, or did you develop any new task strategies in response to the feedback? (Questions 5 and 9)

- Feedback often shifted subjects' focus, usually to concentrate more on quality.
- Subject's who received feedback reported that in the second session of the experiment (post-feedback) they worked both harder and differently.
- After feedback, subject's seemed more dissatisfied with failure to meet quality goal as compared to failure to meet quantity goal.

Were the task instructions, goal assignments, and questionnaires understandable and appropriate? (Questions 6, 7, and 8)

- The overwhelming majority of the subject's had no problems in understanding what was expected of them and how their performance would be evaluated. Similarly, the questionnaires seemed to present no problem.
- The only exception to these reports was that subject's with a quantity only goal admitted they were promote to focus on quality as well due to the discussion of quality performance evaluations presented in the instructions for Session II.
What processes or techniques did you use in coming up with task responses? (Questions 1 and 2)

Several unique strategies were reported by the subject's, including the following:
- Word association - that is, subject's would say the adjective and record the paired or associated word that came to mind.
- Visualizing the outdoors or things found in nature.
- Visualizing indoor environments, such as one's house or room.
- Thinking of cliches, sayings, or phrases which include the adjective, such as "shiny penny."
- Brainstorming - that is, no specific strategy was used.
- Visualizing possessions or things owned by the subjects.
- Recording one object, then linking it with other related objects in different categories, such as "steering wheel" and "hub caps."
- Thinking of objects you would present to the blind such that when they felt the object, they would understand what the adjective meant, such as giving a piece of "fur" to a blind person so they would understand what "soft" was.
- Thinking of songs that include the adjectives.
- Visualizing transportation vehicles, such as automobiles, trains, planes, and boats.
- Thinking of food and cooking (utensils, appliances)
- Visualizing clothing and accessories.
- Thinking about abstract, rather than concrete objects, such as emotions, character, and moods.
- Discarding the first several objects that popped into one's mind, realizing that others would probably have had very similar thoughts and reactions.
- Thinking of sports and equipment used in engaging in these activities.

Other comments about the experiment. (Question 10)

- Subject's reported that they would first try to meet their quantity goal and then shift their focus to quality, even though they realized this was a dysfunctional strategy. Subject's reported that they at least wanted to achieve one goal, and that while the quantity goal was not easier than the quality goal, they knew where they stood on quantity.
- Many subject's reported that it was more interesting, challenging, and intrinsically satisfying to try and focus on quality. Even subject's who had a quantity only goal reported that their personality was such that they only wanted to list items that were potentially of high quality, even though they were fully aware of their quantity goal.
Subjects indicated that feedback provided was both understandable and helpful. Subjects not receiving feedback reported desiring knowledge of results. Interestingly, subjects not provided with feedback indicated they focused primarily on quantity, since they could determine goal progress on this performance dimension themselves. Most subjects preferred quality feedback to quantity feedback, indicating the former was more helpful. Feedback was reported to both increase effort and encourage the development of task strategies. However, following feedback, attention was focused to the performance dimension deemed to be most deficient in comparison to the goal. Most often, subjects reported a shift in emphasis to quality performance. In fact, subjects seemed more dissatisfied with poor performance quality than with poor performance quantity. In summary, results of the post-experimental interviews: (a) supported previous expectations about the effects of goal-setting and feedback on performance; (b) coincided with empirical analyses presented in Tables 1 and 2; (c) suggested additional issues which should be addressed in the proposed experimental research; and (d) affirmed the appropriateness of the experimental manipulations and procedures.
Paula L. Phillips is a degree candidate in the Department of Management, Louisiana State University. She holds a BBA from Loyola University of the South and an MBA degree from Millsaps College. Her primary areas of interest are organizational behavior and human resource management. She is currently conducting research on goal-setting and workplace commitments.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Paula Lynne Phillips

Major Field: Management

Title of Dissertation: Quality Enhancement Through Goal-Setting: Examining the Effects of Goal Attributes and Feedback on Performance

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

4/3/1992