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INTERPERSONAL COMPETITIVENESS AS A MOTIVATIONAL CONSTRUCT: AN APPLICATION TO GOAL SETTING

By

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ABSTRACT

INTERPERSONAL COMPETITIVENESS AS A MOTIVATIONAL CONSTRUCT: AN APPLICATION TO GOAL SETTING

By

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Attempting to understand work motivation has historically occupied a central role in the field of industrial and organizational (I/O) psychology. The current study sought to extend the work motivation literature by examining the impact of individual differences with respect to the construct of competitiveness. Relevant literature from a variety of psychological areas was reviewed. Hypotheses were proposed based on previous research and current theory. Results indicated that an individual's competitive orientation had some significant effects on subsequent task performance accuracy on a complex decision task. Additional evidence suggested that, despite the claims of Locke and Latham (1990) regarding the similarity of goal difficulty and situational competitiveness, these two situational factors were differentially related to both individual perceptions and task performance. Support was also found for several other hypotheses, however the proposed model did not receive complete empirical support. Conclusions, limitations, and future research implications are presented and discussed.

For Alexander

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INTRODUCTION

Industrial and organizational (I/O) psychologists have traditionally considered motivation to be one of the key determinants of individual performance within conventional work settings (Pinder, 1984). As a result, a plethora of research related to work motivation has been conducted in the past 50 or 60 years (Kanfer, 1990). Both theoretical and empirical approaches have been used to examine topics such as goal setting (Locke & Latham, 1990), incentives and reward systems (Guzzo, 1979), intrinsic rewards (Deci & Ryan, 1980), expectancies (Vroom, 1964), and traits, needs, and drives (Kanfer, 1990). These diverse topics have been studied from both individual and group levels of analysis and in a variety of settings including laboratory investigations, field experiments, and naturalistic observations (Kanfer, 1990). However, irrespective of the specific topic or approach of a particular study, the ultimate question of interest has been, "What are the forces, both internal and external, that result in an individual initiating work-related behavior, as well as determine the form, direction, intensity, and duration of the behavior (Pinder, 1984)?"

The broad scope of the previous question and the relatively narrow views of most individual motivation theories illustrates the fractionist approach that has characterized the study of work motivation. Stated another way, despite the collective breadth and depth of research on work motivation, individual theories have typically

taken a rather limited view of the problem. In spite of this narrow focus and the well documented limitations of various theories of motivation, researchers have continued to promote their efforts as the theory of work motivation (Kanfer, 1990). This myopic perspective of work motivation is further suggested by the limited integration among key theories and/or constructs despite the vast amount of conceptualization and empirical research within the many subareas of motivation over the past 50 or more years (Kanfer, 1990).

An integration of concepts within the area of work motivation is needed to produce a meaningful and useful "meta-theory" of motivation (Kanfer, 1990). In fact, several authors have begun to develop such models (Kanfer, 1990; Landy & Becker, 1987). The general feature shared by these approaches has been a combination of constructs from many different subareas in the work motivation literature (e.g., goals, self-efficacy, expectancies). This integration has led to the development of an expansive, hierarchically-organized architecture for considering the broader construct of work motivation. The primary goal of such integrative models has been to provide a framework for understanding work motivation at the level implied by Pinder's (1984) question.

While models such as those proposed by Kanfer (1990) and Landy & Becker (1987) have provided an integration of key constructs within the area of work motivation, another useful method for constructing more integrative theories of work motivation may be to combine key constructs across research areas of psychology (Kanfer, 1990). The utility of this type of integration has been demonstrated in a

variety of areas within I/O psychology. For example, many of the constructs (e.g., search patterns, framing effects, and decisions in uncertain environments) and methods (e.g., multiple-cue probability learning and process tracing) commonly associated with individual decision making research in applied settings (Stevenson, Busemeyer, & Naylor, 1990) had their origins in research related to cognitive psychology (Abelson & Levi, 1985; Stevenson, Busemeyer, & Naylor, 1990). Had I/O researchers not incorporated ideas and results from this other literature, the base of knowledge regarding decision making within organizational contexts would not be at it's current state (Stevenson, Busemeyer, & Naylor, 1990). In summary, integration of variables and constructs that are common not only within the work motivation literature, but also considered by other areas of psychology as critical in understanding motivation may provide a richer view of work motivation.

The current paper describes an attempt toward building such an integrative framework. Specifically, research related to the cross-disciplinary motivational topic of competition is reviewed and integrated within the well developed theoretical framework of goal setting. The importance of integrating a variety of perspectives of competition is demonstrated through a discussion of key research results from sport psychology (Gill & Deeter, 1988), educational psychology (Ames, 1984), developmental psychology (Monsaas & Engelhard, 1990), and I/O psychology (Locke & Latham, 1990).

The integration of competition within a goal setting framework is based on the fact that I/O psychologists have considered goal setting to be a key component of any

integrative framework for explaining work motivation because of the broad empirical support for goal effects (Locke, Shaw, Saari, & Latham, 1981). However, a number of observed boundary conditions and constraints have suggested the limitations of the effectiveness of goal setting in particular situations (Locke & Latham, 1990). Additionally, current research (Locke & Latham, 1990) in the area of goal setting has investigated the potential moderating effects of a variety of phenomena (e.g., incentives, task complexity, and goal commitment). One moderator that has received insufficient attention to date has been competition (Locke & Latham, 1990). The demonstrated importance of competition in other domains clearly indicates that this neglected variable must be addressed if goal setting theory is to serve as the framework for a multi-disciplinary approach to work motivation (Locke & Latham, 1990).

Competition

The construct of competition has been examined from a number of perspectives. It has been treated as an organizational-level variable (Carlton & Perloff, 1990; Steers, 1991), a group-level variable (Schermerhorn, 1986), a situational variable (Locke & Latham, 1990), and an individual difference variable (Monsaas & Engelhard, 1990). Because competition has been studied from such different perspectives, the extensive literature on this topic reaches beyond the scope of the current paper. However, a brief review of some of the principal definitions of competition provides a theoretical framework for the current study.

Some of the research that has examined competition has considered the

construct from a macrosocial perspective. For example, researchers in the area of organizational science (Carlton & Perloff, 1990) have often defined competition from an economic/market-oriented perspective. In such conceptualizations, competition exists at the organizational level of analysis and is manifested in such topics as competitive strategies, supply-demand curves, and short-run/long-run equilibrium (Carlton & Perloff, 1990). In addition to the organizational level of analysis, competition has also been examined at the group level. The focus of this research has been on examining the inter-group competition within larger organizations. Specifically, since groups within an organization often rely on common resources, each group's desire to succeed creates competition over these scarce supplies (Schermerhorn, 1986). Although both the organizational and group views of competition may provide important perspectives for understanding competition, these macrosocial perspectives cannot fully explain the behaviors of individuals.

At the individual level of analysis, competition research has been divided along two major viewpoints. The first, illustrated by Johnson, Johnson, & Skon (1979), suggests that competition arises primarily from situational characteristics (i.e., some situations are more or less competitive than others). In contrast, an alternate view exemplified by Monsaas & Engelhard (1990) is that competitiveness is primarily the result of individual differences (i.e., some people are more or less competitive than others). One of the important distinctions within this literature is between competition, a behavior, and competitiveness, a situation or person characteristic. Research related to these perspectives is discussed in the following sections.

Competitiveness as a Situation or Person Variable

A study by Johnson, Maruyama, Johnson, Nelson, and Skon (1981) illustrates the view of competitiveness as a situational variable. Johnson et al. (1981) defined a competitive situation as "one in which the goals of separate participants are so linked that there is a negative correlation among their goal attainments." Two critical features of this definition are: (1) competition is caused by an environmental characteristic and (2) a competitive situation necessarily places a "win-lose" emphasis on individuals within the situation. The latter aspect of the Johnson et al. (1981) definition places an important restriction on this perspective of competitiveness. That is, only situations which result in a perfect negative relationship between the goal attainments of individual participants should be considered competitive.

The relatively narrow focus of the previous definition has been modified to take into account the variety of other competitive situations that may exist. An example of a more inclusive definition of competitiveness was presented by Tjosvold (1993). This view suggested that a competitive situation was "one in which the attainment of one individual's goals makes another individual's goal attainment less likely." While Tjosvold (1993) agreed that competition is the result of situational characteristics, he recognized that competition can arise not only in "win-lose" situations, but also in situations where there is a probabilistic negative relationship among individual outcomes.

Other researchers (cf. Ames, 1984 and King & Sorrentino, 1983) that have studied competition and its effects at the individual level have adopted similar

definitions to those of Johnson et al. (1981) and Tjosvold (1993). Irrespective of the definition employed by researchers within this perspective, all have made the same critical, common assumption: competition results entirely from characteristics of the situation (Johnson, Johnson, & Skon, 1979). While this perspective has generated interesting and important results related to the impact of competitive environments on individual behavior, it has failed to consider the competitive orientation that individuals may bring to the situation.

A similar body of research has examined the effect of individual differences in competitive behavior. Monsaas and Engelhard (1990) offered a definition of individual competitiveness that illustrates this particular viewpoint. Specifically, these authors suggested that individual competitiveness may be defined as the desire to win or be better than others engaged in the same, or similar, activity.

Two critical features of this conceptualization have had implications for considering competitiveness as an individual difference variable. First, that individuals differ with respect to their competitive orientation, or competitiveness, has led researchers in this area to search for main effects for individuals, irrespective of situational contexts. Second, Monsaas and Engelhard's definition reflects the same idea as Tjosvold's (1993) suggestion that competition need not be solely a "win-lose" orientation. While this "win-lose" focus has been used to describe some types of competitiveness, it has also been suggested that individuals may strive to simply "be better" than a referent other (Monsaas & Engelhard, 1990).

A related perspective of competition comes from the research on negotiation and

conflict. In a review of this literature, Thomas (1992) defined conflict as "the process that begins when one party perceives that the other has negatively affected, or is about to negatively affect, something that he/she cares about (p. 653)." A key factor of this definition that serves to delineate conflict from competition is the emphasis on the direct interdependence of outcomes. While Thomas (1976; 1992) acknowledged that outcomes other than "win-lose" (e.g., win-win) are possible, he suggested the critical characteristic of a conflict situation is that individuals have direct effects on the outcomes of others. By contrast, competitive situations have generally been defined by the lack of direct intervention by participants on others' outcomes (e.g., Weinberg, Gould, & Jackson, 1979). As an illustration of this difference, consider the following example. Football games are more appropriately termed conflict situations because teams directly attempt to impede the goal attainment of each other. Alternatively, golf is considered competitive because of the lack of direct competitor intervention.

A more detailed description of the research that has examined competitiveness as both a situational and an individual difference variable in competition is presented later. At this point it is important to address another key consideration in the definition of competitiveness: the comparison referent used by individuals in competitive situations. A brief description of the distinction between frames of reference will provide an additional means for considering competition research.

Within- versus Between-Person Referents in Competitive Behavior

Irrespective of whether competition is attributed to situational or personal characteristics, a fundamental idea has been that individuals compete against some referent (cf. Deci & Ryan, 1980). The within-person referent has been defined as an internal standard of performance by which individuals compare their current performance levels (Csikszentmihalyi, 1975, 1978). Some critics of this view have suggested that when within-person referents are the primary standards by which individuals compare their performance level, competition is isomorphic to intrinsic motivation (e.g., Deci & Ryan, 1980). In fact, some authors (Deci & Ryan, 1980) have further suggested that such a view should more precisely be termed a "mastery" situation, rather than a competitive one. However, no matter what the specific terminology that has been used, past research (e.g., Csikszentmihalyi, 1975, 1978) has demonstrated that individuals engage in such comparisons and that these comparisons can impact task performance as well as other key individual outcome variables (e.g., self-efficacy and task satisfaction).

Alternatively, the between-person view has suggested that individuals compare their performance to that of others engaged in the same, or similar, activities. As Deci and Ryan (1980) observed, it is this type of situation that has most often been defined as competitive within much of the motivation literature. More specifically, since typical competitive situations involve two or more parties (i.e., participants) attempting to outperform one another, the most common performance standard (i.e., referent) has been another participant's performance level. Similar to the within-person perspective,

the general conclusion from the literature on between-person comparisons has been that such situations affect not only individual performance, but also a variety of other individual outcome variables (e.g., aggression, frustration, and satisfaction) (Deci & Ryan, 1980).

Dimensionality of Competition Research

The previous discussion has illustrated that competition research has been broadly categorized along two independent dimensions. The first dimension has attributed competition to either a situational or personal characteristic, while the second dimension has been defined in terms of the referent used (i.e., either within- or between-person comparisons). These dimensions can be thought of in terms of a 2 x 2 matrix (see Figure 1) that can be used to broadly classify research related to competition and provide a framework for considering the perspective of competition adopted in the current study.

Cells 1 and 2 of the matrix represent instances of competition research when the referent, or comparator, has been a within-person standard. As previously described, research that has been conducted with respect to this dimension has typically been concerned with issues related to intrinsic motivation (see Csikszentmihalyi, 1975, 1978 and Deci & Ryan, 1980). An everyday example of the type of behavior included in these cells can be seen in the performance of golfers. Many golfers have standards of performance that are internally generated. They evaluate their performance for a particular round of golf relative to how well they have played in the recent past, not

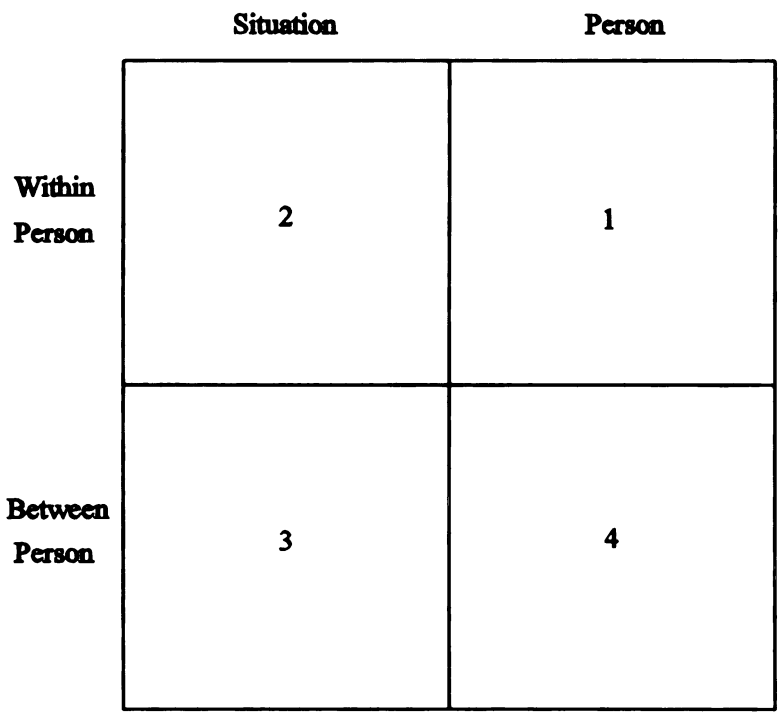

Figure 1. A Conceptual Matrix of Competition Research

necessarily with respect to the scores of other golfers. The distinction between whether this comparison process arises from situational cues (i.e., cell 2) or characteristics of the individual (i.e., cell 1) is an important consideration for researchers operating within this portion of the matrix. However, because the current research is concerned primarily with between-person comparisons, the distinction and issues illustrated above are considered outside the scope of this study.

Previous research on competition in both I/O (e.g., Locke & Latham, 1990) and educational psychology (e.g., Ames, 1984, Johnson et al., 1981, King & Sorrentino, 1983) has often occurred within cell 3 of the matrix. Specifically, this cell represents research that has taken the perspective that competition arises primarily from the situation and involves a comparison between self-performance and the performance of some relevant other(s). Further, this view has implicitly suggested a main effect for the situation. Alternatively, this view has neglected to consider the potential influence of competitiveness as an individual difference factor. Consequently, these perspectives often have examined how various learning or work environments foster either cooperative or competitive behaviors. As a result, an extensive literature has developed that addresses the effects of various environmental cues on both individual perceptions of competitive situations and the subsequent effects of these perceptions on individual performance. The results of these studies have provided important information in determining what effect situational competitiveness exerts on individuals. Nonetheless, these studies have suffered from a rather myopic perspective by suggesting only situational factors to be an important determinant of competition.

The final cell in the proposed matrix (cell 4) represents research that has suggested a between-person comparison process and that competition arises from an individual difference characteristic (e.g., Martens & Gill, 1976). This perspective asserts the importance of an individual difference variable often called competitiveness (e.g., Martens & Gill, 1976) or competitive orientation (e.g., Vealey, 1986). Research adopting this perspective has often been conducted in the area of sport psychology. In contrast to cell (3), research from this perspective has typically been framed in terms of how different types of individuals (i.e., competitive or noncompetitive) respond and perform in a variety of situations. Again, quite an extensive literature has accumulated with respect to how competitiveness impacts individual performance. However, this view of competition also has suffered from the same limitation as research proposing only a situation main effect: a myopic perspective that has neglected to consider the potential interaction between the person and situation.

Summary

From this broad review of the competition literature, at least two conclusions can be drawn. First, competitiveness plays an important role in many performance contexts. Researchers such as Johnson et al. (1981) and Monsaas & Engelhard (1990) have provided evidence for the importance of considering the impact of competitiveness arising from both situations and individuals, respectively. Second, although research has demonstrated the independent role of competitiveness as a function of situations or individuals, there has been little research that has focused on their possible joint effects.

Because the behavior of individuals can be considered to be a function of both personal traits and situational characteristics (Hogan, 1991), research that neglects this potential interaction provides potentially incomplete information.

This point is especially important in light of the assertion that competition is more realistically represented by an interactionist framework that includes characteristics of the situation and the individual in defining the level of competitiveness in a particular context (e.g., Krane, Williams, & Feltz, 1992). Researchers adopting this "interactionist" perspective have suggested the most important issue to be, "What is the nature of this interaction?" There have been two primary responses to this question. One has suggested that the relationship is one of reciprocal causation. Specifically, the situation exerts influence over individuals' perceptions of competitive cues, while at the same time individuals' competitiveness colors the cues (Krane, Williams, & Feltz, 1992). A second view has been that situations have cues that define them as more or less competitive and that the competition inherent in a situation has an effect on individuals' performance. Moreover, the relationship between situation and performance is moderated by individual differences (e.g., competitive orientation). Because little evidence has been gathered in support of either position, recent investigators have noted the need for future research to test them (Krane, Williams, & Feltz, 1992).

Thus, given previous research on competitiveness, the current study seeks to examine the hypothesis that competitiveness is a characteristic of both situations and persons and that performance in specific situations will be affected by both factors.

This view extends current conceptualizations of competition within the I/O literature by suggesting that competitiveness involves important individual differences as well as situational cues. In addition, by adopting an interactionist perspective, the current approach examines the nature of the combination of person and situation characteristics.

Review of Competitiveness Literature

With the previous synopsis of competition research and current definition of competition in mind, a review of the literature that has focused on competition both in terms of individual differences and situational variables is presented. Theoretical issues, methodologies, and key results from this literature are reviewed and integrated to provide a framework for the research questions asked in the current study.

Individual Differences in Competitive Behavior

As an individual difference variable, competitiveness has been examined by researchers from at least two perspectives. One perspective has been interested in construct development and refinement (Butt, 1979; Corcoran, 1989; Gill & Deeter, 1988; Gill, Kelley, Martin, & Caruso, 1991; Martens & Gill, 1976), while the other focus has examined how various conceptualizations and operationalizations of competitiveness are related to important individual outcome variables (Matheson & Mathes, 1991; Weinberg, 1985). Results of research related to each of these emphases are presented.

There have been a number of conceptualizations and operationalizations of competitiveness as an individual difference variable (Butt, 1974). Indeed, some of the initial research in this area focused not on competitiveness per se, but on a closely related individual difference variable: competitive anxiety. This research is important in illustrating the fundamental idea that individuals have certain predispositions to respond differently. For example, Martens and Gill (1976) reported an investigation involving the Sport Competition Anxiety Test (SCAT). This study examined the influence of "competitive A-trait" on a number of individual outcome variables within competitive sport situations. Martens and Gill (1976) defined competitive A-trait as a relatively stable personality disposition that reflects a person's tendency to perceive competitive situations as threatening or nonthreatening. Martens (1977) described the development of the SCAT as an alternative to more global measures of general trait anxiety (i.e., A-trait). Because situation-specific measures of trait anxiety have demonstrated greater predictive power in the situations for which they were developed (e.g., Martens, 1977), the SCAT was developed as a tool to be used as a predictor in competitive sport situation.

The Martens and Gill (1976) study was designed to provide support for the SCAT measure as well as to examine the impact of success or failure on measures of competitive A-trait. Results of this study provided some construct validity evidence for the SCAT. In addition, results suggested that the relationship between levels of competitive A-trait and failure was negative. Specifically, the more games an individual won, the lower the level of A-trait anxiety (Martens & Gill, 1976).

Additional support for the validity of the SCAT has been offered by Martens (1977) and Corcoran (1989). These studies presented results that demonstrated both convergent and discriminant validity evidence for the SCAT as a measure of competitive anxiety.

In contrast to this measure of competitive anxiety, Butt (1979) conceptualized a construct called "competitiveness", which was operationalized in a set of scales designed to measure a variety of sport-related motivations. Among the measures that were described in this research was a scale proposed to assess the degree to which an individual desires to defeat others in a contest. Butt (1979) hypothesized that competitors perceive a contest as an opportunity for self-assertion and dominance over others. Highly competitive individuals would be more concerned with status and position when completing a task than would those lower in competitiveness. Further, highly competitive individuals would be expected to be resentful and frustrated if task performance was thwarted (Butt, 1979). Results from this study indicated that competitive behavior appeared to be "the social expression of the psychological states of aggression and conflict (Butt, 1979)." Additionally, individuals who scored high on the competitive scale also described themselves as more insecure and lacking in self-confidence than those who scored lower on the scale (Butt, 1979).

Another attempt at measuring individual competitiveness was the Sport Orientation Questionnaire (SOQ) developed by Gill and Deeter (1988). Specifically, the SOQ was designed to measure competitive orientation in sport situations. SOQ development reflected the idea that competitive orientation was a multidimensional

construct. Three separate, but related, factors were defined as critical in determining a person's degree of competitiveness (Gill & Deeter, 1988). Although the items originally were written with the Spence & Helmreich (1983) notion of achievement orientation in mind, the final version of the scale was based upon empirical item analyses and factor analyses. The first dimension, competitiveness, was related to the desire to strive for success in competitive situations. Win orientation was the second dimension and was defined as the degree to which an individual had a focus on winning and avoiding losing. The final dimension was defined in terms of an individual's focus on personal goals and was termed goal orientation. Reported studies that have used this measure have reported evidence for both convergent and discriminant validity (see Gill & Deeter, 1988; Gill, Dzewaltowski, & Deeter, 1988).

Another widely used measure of competitive orientation reported in the sport psychology literature has been the Competitive Orientation Inventory (COI) developed by Vealey (1986). Although designed to measure the same construct as the SOQ (i.e., individual competitiveness in sport situations), the COI has been a substantially different instrument with respect to both construct conceptualization and operationalization. Unlike the SOQ, the items on the COI were developed and retained based solely on rational content analyses. In addition to the differences in scale construction, the COI was based primarily on the task-ego orientation distinction proposed by Nicholls (1984). Nicholls (1984) defined an ego orientation as one in which an individual seeks to demonstrate ability by improving task mastery rather than demonstrating ability relative to others. On the other hand, a task orientation is one in

which the individual seeks to demonstrate ability by performing well relative to others. In addition, Nicholls (1984) suggested that different situations may elicit different orientations within the same individual: an interactionist perspective which will be addressed later. An additional difference between the COI and SOQ was that only two dimensions of competitive orientation were proposed in the COI: (1) the orientation toward performing well, and (2) the orientation toward winning (Gill et al., 1991).

Another distinguishing feature of the COI is the manner in which individuals are scored. Responses to the COI are framed as choices that indicate the relative importance of the two dimensions (Gill et al., 1991). Specifically, the COI measure consists of a 4 x 4 matrix with four levels of outcome and four levels of performance. Respondents indicate for each of the cells how satisfying the particular combination is on a scale from 0 (very unsatisfying) to 10 (very satisfying). Individuals are scored on the COI by calculating the proportion of variance due to performance and the proportion due to outcome (Gill et al., 1991). Refinement of the COI scale along with further construct validity evidence has been reported by Vealey (1986, 1988).

Gill et al. (1991) conducted a methodological study that compared the extent to which the SOQ and COI measures tapped the same construct. Given the differences in conceptualization and operationalization of the two constructs, Gill et al. (1991) predicted that these two scales would not measure the same dimensions of competitive orientation. Results indicated some support for this hypothesis. Gill et al. (1991) found that the sport-specific achievement orientation, as measured by the SOQ, and performance versus outcome orientations, as measured by the COI, were relatively

independent dimensions.

Additional research examining individual competitiveness has examined the construct's possible causal antecedents. Much of this research has examined the role of genetic and environmental influences on an individual's competitiveness. As Monsaas and Engelhard (1990) noted, Mead (1937) demonstrated the critical role environmental settings play in developing an individual's social behavior. Mead (1937) contended that social groups such as families vary significantly in terms of the relative emphasis placed on cooperative, competitive, and individualistic behaviors and attitudes.

In a recent examination of the relationship between childhood home environments and competitiveness as adults, Monsaas and Engelhard (1990) highlighted several critical issues. They proposed that "because competitiveness is a social behavior, it may be learned in much the same way as other social behaviors." Drawing on a variety of sources (e.g., Bandura, 1977a; Deutsch, 1949; Johnson & Johnson, 1987; and Mead, 1937), Monsaas and Engelhard (1990) proposed that individuals who came from home environments where competitiveness was modeled, reinforced, and valued would display a greater degree of individual competitiveness than those from non-competitive home environments.

Monsaas and Engelhard (1990) gathered data to test this proposition by means of extensive individual interviews covering a variety of topics. Because the interviews were conducted for a larger purpose than this study alone, questions related to individual and home competitiveness were embedded as part of a longer questionnaire battery. A five-item scale of individual competitiveness included items addressing the

importance of winning or being the best, the motivation for wanting to win or be the best (e.g., to impress others), and competitive behaviors (e.g., did they compete with others regularly). An independent sample of judges then rated these items on a three-point scale from 1 (not competitive) to 3 (very competitive). Home environment competitiveness was assessed in a similar manner using a four-item scale. Interviews with parents and relevant others (e.g., peers and coaches) were also conducted following similar procedures in order to "corroborate ratings of competitiveness" provided by individuals. Simple correlational analyses indicated that, as hypothesized, individual competitiveness was significantly correlated with home environment competitiveness ($r = .68$). That is, approximately 46% of the variance in individual competitiveness could be accounted for by home environment competitiveness.

Notwithstanding the potential problem of method bias in the data reported by Monsaas and Engelhard (1990), several aspects of this study should be mentioned. First, the magnitude of the observed relationship suggests that the degree of competitiveness in developmentally early environments should be considered when attempting to understand the construct of individual competitiveness. Second, unlike other studies of competition (cf. Johnson & Johnson, 1987; Slavin, 1987), Monsaas and Engelhard (1990) evaluated competitiveness in a non-laboratory setting. Finally, a very unusual sample (i.e., individuals from specialized talent areas) was used in this study and therefore generalizability to other samples is unknown.

Additional research on the antecedents of competitiveness has examined the role of gender differences. Specifically, this research has considered the role of an

individual's expectancy for success in various situations. The primary view has been that these expectancies are related to gender and subsequently to performance. Early work in this area (e.g., Feather & Simon, 1973; Maccoby & Jacklin, 1974) reported that females generally exhibited less self-confidence than males in certain types of situations, particularly competitive ones. However, other research has suggested no gender differences in these situations (e.g., Corbin & Nix, 1979; House & Perney, 1974). In an attempt to resolve these conflicting results, Hall (1990) examined the effects of gender, skill level, and opponent gender on self-confidence on a competitive task. Results indicated that gender differences were erased when differences in initial performance level were controlled. Hall (1990) suggested that a potential reason for gender differences in early research may have been due to a failure to control for these initial performance differences. In short, Hall's (1990) conclusion was that skill level is a better predictor of expectancies than gender.

Taken together, the results of these studies demonstrate that while the construct of competitiveness has received attention, there continue to be disagreements regarding the appropriate conceptualization and operationalization of the construct. On one hand, these disagreements are troubling because they indicate that an extensive amount remains to be learned about competition and competitiveness. On the other hand, they do illustrate the potentially important role that individual competitiveness may play with respect to performance in a variety of situations. It is also important to consider that since most of this research has been conducted in the area of sport psychology, the results of these efforts may be limited in their generalizability to other contexts. That

is, certain aspects of sport situations such as well defined roles, strong emphasis on motor skills, and immediate feedback may not be common to other environments (e.g., traditional work settings). However, the importance of competitiveness as an individual difference variable in sport situations suggests that attention should be paid to the construct in other settings as well.

Competitiveness and Related Constructs

While the previous literature review has described what competitiveness is, it is also necessary to consider what it is not. The following sections address this issue by presenting a review of some related concepts. Specifically, achievement motivation, learning/outcome orientation, and self-efficacy are examined to identify definitional elements that distinguish each from competitiveness.

Achievement Motivation. Achievement motivation has traditionally been acknowledged as a "trait" theory of motivation (e.g., Kanfer, 1990). The fundamental assumption characterizing theories within this perspective (e.g., Alderfer's Existence-Relatedness-Growth Theory, 1969; Maslow's Need Hierarchy, 1943, intrinsic motivation, job characteristics theory, and organizational fairness/justice theories) is that behavior is determined primarily by individual difference factors, rather than environmental or situational characteristics. Additionally, theories adopting this view have typically suggested that these individual difference factors are innate and relatively unchangeable (Kanfer, 1990).

Within the achievement motivation literature, there have been a number of

perspectives. One of the most prominent of these perspectives is Atkinson's (1957) definition of achievement motivation as a broad framework for considering individual behavior. Alternatively, a second important perspective associated with McClelland (1965) has considered Need for Achievement (nAch) to be a simple personality factor.

Atkinson (1957) offered one of the original theories of achievement motivation. This theory assumed that the achievement motive was a unitary construct represented as a basic dispositional tendency to strive for excellence (Kanfer, 1990). Specifically, Atkinson (1957) suggested that an individual's tendency to approach a task was determined by (a) motives to achieve success, (b) motives to avoid failure, (c) perceived probability of task success, and (d) the incentive value of success. An important feature of Atkinson's (1957) theory is that the incentive value of success (d above) is proposed to be positively correlated with task difficulty. This leads to the specific prediction that individuals classified as "success-oriented" should perform best on tasks of intermediate difficulty, and persist longer at these tasks in the face of failure than persons classified as "failure-oriented" (Kanfer, 1990). Conversely, "failure-oriented" persons should prefer either easy or difficult task levels.

Reviews of research testing Atkinson's model have reported mixed support (see Campbell & Pritchard, 1976; Kanfer, 1990). Support for the predictions made by the original model has been found in tightly controlled situations, but less than robust support has been found in more unconstrained settings (Kanfer, 1990). As a result, achievement motivation as conceived by Atkinson has undergone various reformulations.

A number of theorists (Nicholls, 1984; Heckhausen, 1977; Kuhl, 1978, 1984) have offered modified views of achievement motivation. For example, Nicholls (1984) proposed a distinction between performance and learning motives contending that these motives involve different motivational processes and, in turn, should result in different outcomes (e.g., learning and task persistence) in various contexts (Kanfer, 1990). By contrast, Heckhausen and Kuhl (1985) have proposed an action-control framework based on the idea that individuals have either an action orientation (i.e., are task focused) or a state orientation (i.e., are focused on internal or emotional states) (Kuhl, 1984).

McClelland's (1965) more limited perspective on achievement motivation proposed that need for achievement (nAch) was an important personality factor, but did not consider the larger framework suggested by Atkinson (1957). Research testing McClelland's (1965) theory has demonstrated that individuals with high nAch would tend to: (1) prefer moderately challenging tasks, (2) have a strong need for performance feedback, (3) prefer situations in which they can take responsibility for performance, and (4) try new ways of doing things. O'Reilly, Chatman, and Caldwell (1991) further suggested that individuals high in nAch prefer outcome-oriented contexts. Finally, Miner (1980) has suggested that high nAch individuals prefer tasks and situations in which success is attained through their own efforts as opposed to chance or luck. Current research (e.g., Turban & Keon, 1993) has attempted to examine the boundary conditions of nAch as well as the interactive effects of situational characteristics and nAch on critical individual outcome variables.

Additional research related to nAch has incorporated it as part of the "Big Five" personality dimensions where it has most frequently been considered as part of the dimension labelled "Conscientiousness" or "Conscience" (Barrick & Mount, 1991). While there has been considerable disagreement regarding the components of this dimension (Barrick & Mount, 1991; Botwin & Buss, 1989; Digman, 1989; Hogan, 1991), there has been some evidence that nAch represents a stable, enduring, personality factor that includes traits such as dependable, hardworking, achievement-oriented, and persevering (Barrick & Mount, 1991).

The previous description of nAch indicates at least some similarity to competitive orientation. The critical feature differentiating these two constructs would appear to be that achievement motivation typically has been presented as a motivational construct applicable to any situation involving individual task performance (McClelland, 1965). By contrast, investigators have usually defined competitiveness as domain specific. Moreover, the term competitiveness has been reserved for situations in which one individual's performance is assessed relative to another "competing" individual (Gill et al., 1991). As a result, while achievement motivation has been applied to situations and contexts involving stable standards that can be internal or external, competitive orientation has generally been applied to contexts when performance has been compared to that of an external, potentially shifting, standard (Gill et al., 1991).

Learning versus Outcome Orientation. Research on the COI and SOQ has illustrated the importance of considering competitiveness as a multidimensional

construct. In this vein, one of the primary differentiations has been between learning and outcome orientations. A learning, or mastery, orientation has been defined as one in which individuals seek to increase their competence and to understand or master something new (Dweck, 1986). By contrast an outcome, or performance, orientation has been defined as one in which individuals seek to gain favorable judgments of their competence or avoid negative judgments of their competence (Dweck, 1986).

A number of researchers (e.g., Dweck, 1986; Elliott & Dweck, 1988; Glaser, 1982; Weiss, 1990) have identified the influence of type of orientation on a number of individual outcome factors. For example, Dweck (1986) found that orientation can interact with self-confidence to affect a number of behaviors. Dweck (1986) asserted that individuals with a performance orientation and high self-confidence in present ability levels will display a "mastery-oriented" behavior pattern characterized by seeking challenges and persisting in the face of obstacles. By contrast, individuals with a performance orientation and low confidence in their abilities will display a "helpless" behavior pattern characterized by challenge avoidance and low persistence. Dweck (1986) further suggested that individuals with a learning orientation will display a "mastery-oriented" behavior pattern, irrespective of self-confidence. Elliott and Dweck's (1988) subsequent test of these predictions provided support for these predictions.

In a related study, Butler (1990) examined the effects of performance versus mastery orientations on another individual outcome, children's self-assessment of ability. The influence of two conditions were examined in this study. A performance

condition, which Butler (1990) labelled "competitive," presented children with the goal of drawing a figure better than anyone else. Alternatively, the mastery condition set the goal of drawing a figure as close to a given standard as possible. These conditions were considered analogous to the outcome and learning conditions described in previous research (e.g., Elliott & Dweck, 1988; Martin & Gill, 1991).

Results indicated that younger children were more likely than older children to overestimate the quality of their drawings in the performance (i.e., competitive) condition. No effects were found in the mastery condition. Older children tended to be accurate in the assessment of their performance regardless of condition. The explanation offered for these results was that as children mature they adopt normative criteria when in competitive conditions. This adoption of normative goals and criteria allows older children to more realistically evaluate their performance in a variety of situations. Thus, the results of this study in conjunction with results reported by Elliott and Dweck (1988) have suggested that although type of orientation may affect some behavioral responses, it does not impact the ability of individuals to accurately evaluate their performance.

Ames (1984) similarly examined the impact of different goal structures on performance and self-assessment. Ames (1984) used the terms competitive and individual conditions to refer to outcome and learning orientations, respectively. Participants were told either to attempt to perform better than another participant (i.e., competitive) or try to achieve some externally set standard of performance (i.e., individual). Results indicated that children made more ability attributions in the

competitive than in the individual condition. Additionally, participants in the individual condition displayed mastery orientations in that they made more effort attributions. In explaining the data, Ames (1984) hypothesized that participants asked themselves, "Was I smart?" in the competitive condition and, "How can I do this task?" in the individualistic condition. Unfortunately, performance was a manipulated variable so that the comparison between competitive and individual conditions in terms of effects on performance could not be examined.

When the previous results are integrated with related research regarding competitiveness by Gill and Deeter (1988) and Vealey (1986), a clear conclusion can be drawn regarding the relationship between competitiveness and performance orientations. Specifically, the results of studies that have examined learning versus outcome orientations (e.g., Ames, 1984; Butler, 1990; Dweck, 1986; Elliott & Dweck, 1988) and competitiveness have suggested that in less competitive situations individuals having a mastery orientation tend to perform better than individuals with a competitive orientation. However, when the situation is more competitive, just the opposite has been observed.

Self-Efficacy. A final construct that has often been considered in discussions of competition-related individual difference variables is self-efficacy. This construct had its origins in social cognitive theory (Bandura, 1977b, 1986), which is predicated on the idea that behavior, cognitions, and the environment are dynamically related to each other in a model of reciprocal causation (Gist & Mitchell, 1992). Wood and Bandura (1989) defined self-efficacy as "beliefs in one's capabilities to mobilize the motivation,

cognitive resources, and courses of action needed to meet given situational demands." Gist and Mitchell (1992) defined self-efficacy as "a person's estimate of his or her capacity to orchestrate performance on a specific task." The critical features of these definitions have been that self-efficacy is: (1) an individual difference construct, (2) perceived by the individual, and (3) task, or situation specific.

Self-efficacy has received a great deal of research attention since it was presented by Bandura (1977a). The diversity of topics to which this construct has been related has been reviewed recently by Gist and Mitchell (1992). Although an extensive review of the literature related to self-efficacy is well beyond the scope of the current proposal, key theoretical ideas and relevant empirical results are presented in order to highlight the relationship between self-efficacy and competitiveness.

In the original formulation of self-efficacy, Bandura (1977a) suggested that an individual's previous task experiences form the foundation for making efficacy judgments. Specifically, four broad categories of experience were postulated as influencing an individual's perceptions of self-efficacy: personal attainments (enactive mastery), vicarious experience (modeling), verbal persuasion, and physiological arousal (anxiety) (Gist & Mitchell, 1992). Although these four types of experiences were suggested as critical in determining efficacy levels, it is the cognitive appraisal and integration of these experiences that ultimately determines self-efficacy (Bandura, 1982).

The importance of self-efficacy judgements has been demonstrated through the relationship between efficacy and task performance. Gist and Mitchell (1992)

presented a model of this relationship. From this model a number of evaluations related to individual judgments of self-efficacy are suggested. First, task requirements are assessed. This assessment process generates inferences about what is required to perform a given task at a variety of levels. This analysis is expected to be most explicit in situations where a task is novel. By contrast, extensive experience with a task will reduce reliance on this type of analysis and increase efforts to interpret the causes of previous performance (Gist & Mitchell, 1992).

This second type of assessment involves an attributional analysis resulting from an appraisal of the four categories of experience proposed by Bandura (1982). As Gist and Mitchell (1992) pointed out, the outcome of this analysis is initiated by the question, "Why did I perform at a particular level?" That individuals do, in fact, ask this question of themselves has been substantiated by Weiner (1985), who has suggested that answers to this question (i.e., the outcome of this attributional analysis) generally revolve around three major dimensions of performance: ability, motivation, and external factors. Thus, students evaluating their efficacy with respect to performance on an upcoming final examination would examine the causes of their performance on previous examinations in the class. Answering the performance attribution question by concluding, "I performed poorly because I did not have the knowledge required" indicates an ability attribution, while, "I performed poorly because I was not trying very hard," is an example of a motivational attribution. "I did poorly because I was unlucky" is an example of an external attribution.

A third assessment that is critical to an individual's self-efficacy judgment

concerns the availability of specific resources and/or constraints for task performance (Gist & Mitchell, 1992). This analysis includes a consideration of a variety of personal factors (e.g., anxiety, available effort), as well as situational factors (e.g., distractions, competing demands) that might impact performance (Gist & Mitchell, 1992).

The manner in which these three assessment outcomes are integrated to form a self-efficacy judgment is not well understood (Gist & Mitchell, 1992). Although progression through each phase is proposed to be relatively independent, there is theoretical support for the suggestion that it might be more of an iterative process (Bandura, 1988; Gist & Mitchell, 1992). Indeed, as Gist & Mitchell (1992) pointed out, the conceptualization of self-efficacy as task-specific implies the progression through each of these analyses is task-specific as well.

There is extensive research evidence on the effects of various experience factors on self-efficacy (Bandura, 1982; Gist, 1987; Gist & Mitchell, 1992; Kanfer, 1990; Russell & McAuley, 1986; Schunk, 1983). The most basic finding is that people who think they can perform well on a task actually do better than those who think they will fail (Bandura, 1977a). More important than this obvious conclusion are some of the other empirical results associated with this theory. First, self-efficacy differences are generally associated with actual differences in skill level. That is, those individuals who have objectively greater skill levels also tend to have higher self-efficacy than those with lower skill levels (Gist & Mitchell, 1992). Second, as previously described, a variety of individual differences related to both personal and situational factors affect self-efficacy judgments (Gist & Mitchell, 1992). For example, Kavanagh and Bower

(1985) examined the impact of positive and negative arousal on judgments of self-efficacy for a task. Results indicated higher self-efficacy scores for those in positive mood states versus those in negative mood states. Gist and Mitchell (1992) reported results from a study by Cervone (1985) that demonstrated when people were asked to focus on the difficult aspects of a task, self-efficacy was lowered. Alternatively, when asked to focus on the easier aspects of a task, individuals' self-efficacy scores increased.

Despite the recognition of competitiveness as an important situational characteristic, few studies have examined the impact of competitiveness on self-efficacy judgments. Weinberg (1985) reported a study that examined the effects of self-efficacy on cognitive strategies on the performance of a physically demanding, competitive task. Specifically, this study investigated Bandura's (1982) hypothesis that high arousal debilitates performance, thus decreasing people's expectations of success when they are beset by aversive physiological feedback. Weinberg also examined the effects of cognitive strategies (see Weinberg, 1985, or Weinberg, Smith, Jackson, & Gould, 1984 for a thorough description of cognitive strategies related to physical performance) on performance of a physical task. Finally, Weinberg (1985) examined the interaction of these two variables (i.e., cognitive strategies and self-efficacy). In all cases, Weinberg and colleagues used a competitive muscular-leg endurance task.

Results replicated the positive relationship between self-efficacy and task performance, with highly efficacious participants outperforming those with lower efficacy. However, no main effect for cognitive strategies or interaction between

efficacy and strategies was found. Weinberg's (1985) interpretation of these results was that efficacy was such a powerful agent in this situation that strategies could not exert any influence. He also reasoned that because the cognitive strategies used had been demonstrated to be effective in previous investigations, there must be additional strategies for enhancing performance that led to the reported effects.

These results can be further clarified when considered along with previous research (e.g., Weinberg, Gould, and Jackson, 1979). While primarily a simple test of Bandura's (1977b) self-efficacy theory in a competitive situation, the Weinberg et al. (1979) study also reported evidence related to the influence of strategies. Specifically, though higher self-efficacy individuals performed significantly better on an endurance task than did low self-efficacy individuals, it appeared that subjects with high self-efficacy engaged in the strategy of "positive self-talk" to a greater extent than those with low self-efficacy. An example of positive self-talk would be an individual saying to her- or himself, "I know I can do this," while performing the task. Although this effect was not significant, perhaps due to inadequate sample size, it does suggest that strategies may have a relationship with self-efficacy.

Lee (1982) presented a study which examined not only the relationship of self-efficacy to performance, but also the factors that may result in perceptions of efficacy. Using a sample of gymnasts, Lee (1982) operationalized self-efficacy as an individual's estimate of her score on each piece of apparatus. Although this operationalization of efficacy is not necessarily consistent with recent views of efficacy (e.g., Gist & Mitchell, 1992), interesting results were nonetheless obtained. Most notably, two of

the best predictors of performance were the gymnast's estimate (i.e., the efficacy measure) and task experience. Another interesting, albeit puzzling, result was that previous scores (i.e., past performance) did not significantly predict future performance. However, Lee (1982) acknowledged that this could have been due to small sample size in this particular setting. Additional explanations included the instability of peak physical performance and the extreme restriction of range in a sample of elite performers. However, these results conflict with data reported by Krane, Williams, & Feltz (1992), in which past performance was a significant predictor of future performance. Taken together, these studies suggest that efficacy and past performance are likely to be good predictors of future performance and should be examined in the same situation to determine which has greater predictive power.

Taylor (1989) posited two different types of self-efficacy as critical in competitive situations: personal (i.e., expectations based on an internally derived standard of performance) and competitive (i.e., expectations based on an externally derived standard of performance). Based on the idea that different situations can produce different cognitions (Ames, 1984), Taylor (1989) suggested that if an individual performs a task under noncompetitive situations, personal self-efficacy will be the more salient cognition. Alternatively, if an individual is under competitive conditions, competitive self-efficacy will become more salient. Taylor (1989) also suggested that this distinction is determined by the individual's point of reference (internal vs. external standard) and the impact of different types of feedback (performance vs. outcome). Competitive feedback (e.g., you are beating your

opponent) should have greater impact on performance of an individual focused on external standards of performance. In addition, personal self-efficacy should be a better predictor of performance in noncompetitive situations while competitive self-efficacy should be related to competitive performance. Taylor (1989) acknowledged that these two types of self-efficacy are not independent, but did suggest there should be little overlap. Results indicated the variance shared between the two efficacy measures was small (ranging from 5% to 17%). Additionally, personal, but not competitive, self-efficacy was predictive of subsequent performance and competitive outcome feedback affected competitive self-efficacy.

These results from studies examining the impact of self-efficacy in competitive situations have identified a number of still unresolved issues. Key among these are the results from the Weinberg (1984, 1985) studies that suggest additional questions need to be asked about the interaction of efficacy and strategies in both the physical and cognitive performance domains. Specifically, what is the relative influence of self-efficacy and various strategies of performance in competitive situations? and, how is efficacy affected by various situations and performance levels?

Influence of Competitive Situational Characteristics on Behavior

In addition to competitiveness as an individual difference variable, an extensive amount of research on competition-related behavior has examined the effects of situational characteristics. As with the review of competitiveness as an individual trait, this section presents a representative review of the common questions asked, key

variables studied, and typical results of this literature.

De Moja & De Moja (1986a) examined the effects of a particular competitive situation on the individual outcome variables of anxiety and performance. An adapted version of the State-Trait Anxiety Inventory was administered to a sample of motocross riders at two separate times before an important race. Results indicated that the expectation of participation in a high-level competition was associated with increased state anxiety in the 17 hours before the race started for higher A-trait riders, but not for those who scored lower on the A-trait measure. Additional research reported by these authors also indicated that the relationship between state anxiety and performance was negative (De Moja & De Moja, 1986b).

Matheson and Mathes (1991) examined the relationships among experience, difficulty of task, type of event, competitive anxiety, and self-confidence among a sample of high school female gymnasts. At the level of main effects, it was predicted that anxiety would become greater with the stakes of the competition; operationalized as a practice session, a dual meet, and a district championship competition. Anxiety was measured with the Competitive State Anxiety Inventory-2 (CSAI-2). Results were similar to those predicted, except that the dual meet resulted in greater anxiety than the district championship. The authors suggested that this may have been due to the fact that the dual meet occurred earlier in the season when gymnasts were more uncertain about their own and others' abilities. Results for the self-confidence measure were consistent with those for the anxiety scores; self-confidence was highest in the practice session and lowest at the dual meet. Thus, prior experience with both self and others'

performance was hypothesized to be a key factor in determining if a competitive situation engenders feelings of high self-confidence and anxiety.

Other results of this study indicated that overall experience, measured by years as a gymnast, and task difficulty, measured in terms of the difficulty of the routine performed, were unrelated to gymnasts' anxiety levels. These results conflict with those reported by Martens, Burton, Vealey, Bump, and Smith (1983) which demonstrated athletes with less experience had significantly higher anxiety levels. The Martens et al. (1983) results support conclusions from Martens (1969) suggesting more difficult tasks result in greater anxiety levels.

A limitation of the Matheson and Mathes (1991) study that may have resulted in the failure to produce findings consistent with those described above was the potential range restriction on both the experience and difficulty dimensions. The authors acknowledged that with such a young, homogeneous sample it was difficult to account for the effects of these variables on anxiety and self-confidence. Another shortcoming of this study, not identified by the authors, was that there was no measure of performance. While it proved interesting to gather information regarding the relationships among the variables in this study, the observed relationships have practical significance only to the extent that they have an impact on task performance or other salient individual outcomes.

Martin and Gill (1991) reported a study that examined the relationships among competitive orientation, measured with the COI (Vealey, 1986) and SOQ (Gill & Deeter, 1988); sport-confidence, measured with the Trait Sport-Confidence Inventory

(TSCI) and State Sport-Confidence Inventory (Vealey, 1986); self-efficacy, measured with a developed set of items based on Bandura (1977b); anxiety, measured with the CSAI-2 (Martens, Burton, Vealey, Bump, & Smith, 1990); and performance. Participants were high school middle- and long-distance runners competing in a mid-season dual track meet. Responses to these self-report measures, as well as the performance measures of finishing time and place, were used to examine the relationships among the constructs.

Because the terms "confidence" and "efficacy" are often used interchangeably, it is important to consider how Martin and Gill (1991) differentiated between the two. In this particular study, sport-confidence referred to how confident athletes usually feel in a sport achievement situation. Specifically, this study predicted that sport-confidence was related to an individual's competitive orientation. Competitive orientation, as described in the earlier discussion of the COI's development (Vealey, 1986), was defined in terms of an outcome or a performance orientation.

In contrast to confidence, self-efficacy has generally referred to how sure individual's are about their performance on a particular task in a particular situation (Bandura, 1977b). Martin and Gill (1991) operationalized efficacy by asking runners how they felt about achieving both a specific performance goal and achieving a specific outcome goal. By identifying efficacy as important to both types of competitive orientation in this particular study, the Martin and Gill (1991) operationalization was consistent with other investigators' conceptualizations of efficacy.

Martin and Gill (1991) proposed two primary hypotheses about the relationships

among the variables previously described. The first hypothesis was that performance orientation and trait sport-confidence would be positively related to self-efficacy and state sport-confidence and negatively related to state anxiety. Results provided some support for this prediction. Although state and trait sport-confidence and self-efficacy were related, performance orientation did not contribute to predicting state sport-confidence. The authors acknowledged that these results were inconsistent with previous literature regarding this relationship (e.g., Vealey, 1986). However, they suggested that range restriction of experience and homogeneity of performance orientation in their sample may have influenced the results.

The second hypothesis examined in this study was that state sport-confidence and self-efficacy would be positively associated with performance and that anxiety would be negatively related to performance (Martin & Gill, 1991). While results indicated that athletes who scored high in sport-confidence and high in self-efficacy expectations for outcomes performed better than those low on the sport-confidence and efficacy measures, a stepwise regression indicated that sport-confidence did not contribute a significant increment to the prediction of finishing time beyond that made by self-efficacy. As the authors noted, these results were consistent with previous research that has examined similar relationships (e.g., Okwumabua, 1986).

Krane, Williams, and Feltz (1992) described a study in which a model of the relevant variables in a competitive situation was developed and tested. Like Martin and Gill (1991), Krane et al. (1992) examined the relationships among anxiety, state confidence, performance expectations, and performance. However, their sample

consisted of female collegiate golfers who were older and had more variability in experience than Martin and Gill's (1991) runners. In this study, anxiety was measured using the SCAT (Martens, 1977) and state confidence was measured with the CSAI-2 (Martens et al., 1990). Performance expectations were measured by asking each participant to provide a goal score for each round of golf. Performance was measured by golfers' season-long average score, as well as by their scores for the first and second rounds of the tournament.

Krane et al. (1992) hypothesized two models with respect to the key study variables. The first model proposed that a variety of factors such as season-long average score, years of experience, competitive state anxiety, and pre-competitive anxiety would influence pre-first round self-confidence. Self-confidence, in turn, was hypothesized to be a predictor of first-round performance. Similar predictions were generated using first round performance as the antecedent to pre-second round confidence and second round performance. The alternate model proposed a similar relationship pattern as the first, except that performance expectations (i.e., performance goals) were substituted in place of self-confidence.

Tests of both models resulted in the failure of either to adequately account for the variability in performance. With respect to the first model, the only significant findings were that competitive trait anxiety and pre-competitive anxiety significantly predicted pre-first round confidence. Within the second model, average score was the only significant predictor of first round performance. In fact, the best predictor of performance in both models was previous performance.

At this point, it is important to note that all of the studies described in this section have been conducted within the domain of sport situations. Despite some strong results from this literature related to certain key variables in competitive situations, there may be significant limits to the generalizability of the conclusions. For example, the situations studied in sport psychology paradigms have been almost exclusively explicitly competitive situations. All participants are aware that they are taking part in the activity with the express purpose of demonstrating their ability versus one, or a number of, competitors. Not all, or even very many, interactions in work settings take place in such explicitly competitive environments. Thomas (1992), in a review of the literature of the related construct of conflict, offered a similar suggestion that different situations have particular cues that affect how explicitly competitive a situation is perceived.

Key questions when applying the previous results to typical work settings include: Can some work settings be defined/perceived as competitive?, If so, does this type of competition differ from the explicitly competitive situations studied in sport environments?, and, What is the impact of this competition in terms of personal and organizational outcomes? Implicit in the last question is the broader problem of how competition fits in with more widely accepted theories of work motivation (e.g., goal setting).

Competition and Goal Setting Research

One area of the work motivation literature that has recognized the importance of situational competitiveness is goal setting (Locke & Latham, 1990). In particular, several key studies (Chung & Vickery, 1976; Mitchell, Liden, & Rothman, 1985; Shalley, Oldham, & Porac, 1987; White, Mitchell, & Bell, 1977) have examined the impact of situational competitiveness, but definitions, operationalizations, and results have been inconsistent.

Chung and Vickery (1976) presented a study of the effectiveness of three different types of reinforcement conditions and knowledge of results (KR) on performance in a repetitive task situation. Competition in this experiment was operationalized through a KR manipulation in which normative information regarding performance standards was presented to individuals. As noted by Locke and Latham (1990), the situation in the Chung and Vickery (1976) study may be thought of as competitive because of participants' comparison of their performance with the typical performance of others. While the comparison of performance with external, pallid, interpersonal standards has been thought of in terms of competitiveness (cf. Deci & Ryan, 1980), the authors (Chung & Vickery, 1976) did not originally suggest that situational competitiveness was the mechanism by which KR and performance standards influenced performance. Although they discussed their results in terms of these conditions affecting intrinsic motivation, the suggestion that situational variables affect all individuals in the same manner is inconsistent with trait conceptions of competitiveness (e.g., Butt, 1979).

White, Mitchell, & Bell's (1977) definition of competition was similar to Chung and Vickery's (1976) except that they also recognized the importance of social facilitation. Based on the work of Zajonc (1965), White et al. (1977) predicted that individuals who were working in situations in which others were present would be more productive because of (1) evaluation apprehension and (2) expectations from social cues. In addition to task performance, job satisfaction was also used as a dependent variable in this experiment. Results were consistent with predictions regarding the effects of evaluation apprehension and social cues on performance. However, no effects were observed with respect to job satisfaction. As with Chung and Vickery's (1976) study, a potential limitation of this study in terms of addressing the impact of situational competitiveness on performance is the failure to consider the fact that individuals may differ in their competitive orientations.

Mitchell, Rothman and Liden (1985) reported a study that examined the influence of normative information and goal setting on task performance. In addition to using normative information as an operationalization of situational competitiveness, this study also employed "actual" performance by another participant. Some participants were asked to perform a task in which the performance of a previous participant was made salient (i.e., actual performance condition). The task the participants were asked to complete was placing lids onto ice cream containers. In the "normative performance" condition, individuals were provided feedback in terms of the average performance level achieved by individuals working on this task. In the "actual performance" condition, individuals were shown the performance (i.e., the covered

containers) of the person immediately preceding them in the experiment. In fact, the amount completed was manipulated by the experimenters and was equivalent for all participants in this condition.

Results indicated performance for participants in the actual performance condition was significantly greater than in the normative condition. While Mitchell et al. (1985) offered several potential reasons for their results, the most probable explanation is that their operationalization of situational competitiveness was more consistent with the notion of direct competition observed in many of the preceding studies. However, as with the other studies described in this section, competitiveness was defined only in terms of situational factors. No individual differences were addressed.

Shalley, Oldham, and Porac (1987) examined the impact of goals and external evaluation on intrinsic motivation. Situational competitiveness in this study was manipulated by participants being told that their performance would (competitive) or would not (non-competitive) be compared to others. While this study used a manipulation similar to those previously described, Shalley et al. (1987) believed that evaluation apprehension would affect not only performance, but also intrinsic motivation for the task. Results demonstrated no support for this hypothesis. The only effect for intrinsic motivation was with respect to how the goals were set (i.e., assigned versus participative).

According to Locke and Latham (1990), these studies lead to the following two conclusions. First, the results of these four studies provide evidence for the assertion

that goals and situational competitiveness are similar constructs and affect behavior in the same fashion. Specifically, these authors suggested that situation competitiveness and goals are "two sides of the same coin."

Second, Locke and Latham (1990) concluded that the influence of situational competitiveness on task performance reflects the importance of goal commitment as a mediator. In fact, Locke and Latham (1990) recommended that future goal setting research should be focused on the impact of competitiveness on goal commitment. While the latter suggestion seems a reasonable conclusion to draw from these studies, the implication that competitiveness, as a construct, is well understood within the goal setting framework is a bit premature considering the inconsistency of the previous conceptualizations. Further, while previous goal setting studies do have some interesting implications for research related to situational competitiveness, the effect of competitiveness as an individual difference variable in goal setting situations has remained unexplored.

An Integration and Development of a Conceptual Model

The previous literature review has illustrated the attempts of researchers to identify the ways in which competitiveness as an individual difference variable and as a situational characteristic affects performance. A critical question arising from this research is, "What are the joint effects of these variables - additive or interactive?" The aim of the present study is to examine these effects within a traditional work setting. Because many of the constructs and relationships included in previous

literature were tested by means of paradigms other than those commonly used in I/O research, it is necessary to operationalize these constructs in ways that are more consistent with work situations. In particular, goals are an important feature of work situations that warrant investigation. Moreover, the paradigm associated with goal setting research has been used by a number of investigators to study the effects of situational competitiveness (Locke & Latham, 1990). The review of goal setting literature has illustrated that this integration would also have key benefits for goal setting theory. Locke and Latham's (1990) assertion that goals and situational competitiveness represent "two sides of the same coin" is empirically tested within the current study by considering competitiveness of the situation and goals as two independent factors. The current study also allows for the assessment of the importance of individual competitiveness as a potential moderator of goal effects.

Figure 2 presents a synthesis of the previous literature on competitiveness and goals in the form of a conceptual model. A key construct of this heuristic model is competitive orientation. As previous literature (e.g., Butt, 1979) has suggested, individuals differ with respect to their competitiveness which, in turn, exerts an influence on a variety of outcomes. The current study examines the influence of competitive orientation within a complex, cognitively demanding task that is representative of many work situations. A second critical construct in this model is situational competitiveness. The inclusion of this variable is based on the results of previous literature that have shown effects for situational competitiveness on individual outcomes (e.g., Mitchell et al., 1985). The third critical antecedent component is goal

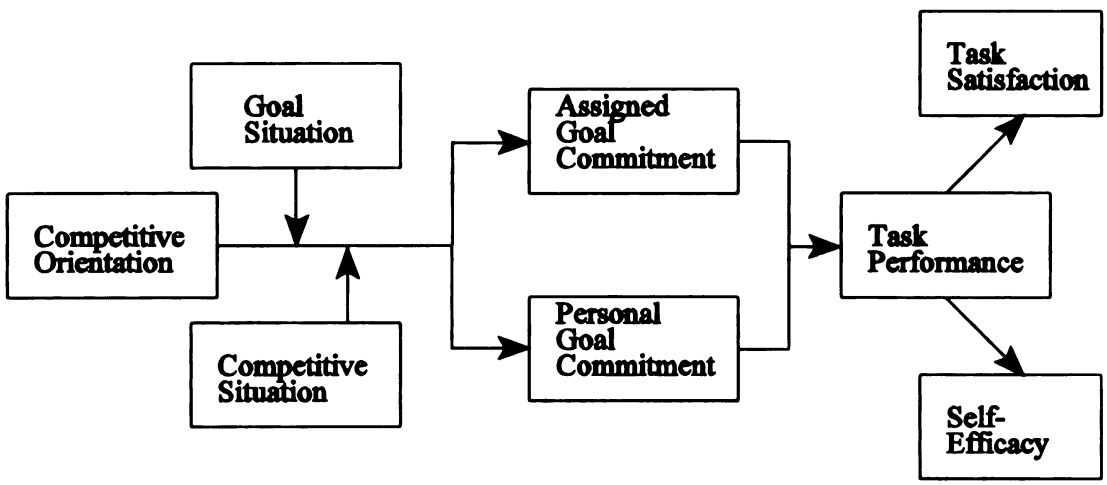

Figure 2. Conceptual Model of Relationships Among Key Study Variables

difficulty. Previous research (Locke et al., 1981) has consistently demonstrated the beneficial effects of specific, difficult goals on task performance. Thus, a unique feature of this model is that situational competitiveness and goals are defined as independent factors that can jointly influence the overall situational cues.

Moreover, the model also builds on the results of previous literature (e.g., Gill et al., 1991) by including task satisfaction and self-efficacy as important individual outcomes. The remaining variables in the model, assigned and personal goal commitment, are included as mediators. Specific predictions regarding these relationships are presented in a later section.

Operationalizing the constructs in the model required consideration of a number of issues. Specifically, despite the demonstrated construct validity of existing measures of individual competitiveness (e.g., SOQ, COI), there were several reasons for believing they could not be used without modification in the current study. First, although there are jobs which require primarily physical performance, many jobs in today's work environment are more strongly dominated by cognitive demands than the tasks typically examined with previous scales of competitiveness. The disparity between types of tasks appropriate for sports and I/O psychologists means that there could be a potential problem in using a measure based on primarily physical tasks to understand mental activities.

Another potential difficulty with transferring the sport psychology scales of competitive orientation to I/O settings is that the very nature of the competitive situations may be different. More specifically, the tasks typically used in the sport

psychology literature are explicit forms of competition (e.g., golf tournaments, basketball games, gymnastic meets). Explicit forms of competition are likely to be defined as competitive by an external source and would generally be agreed to be competitive by all individuals taking part as well. These situations are conceptually distinct from implicitly competitive situation. Implicitly competitive situations are characterized as being defined as competitive only by the participants. Thomas (1976; 1992) stated this difference in terms of the salience of competitive cues. An explicitly competitive situation is one in which there are critical outcomes at stake and a definite conflict of interest among outcomes. By contrast, implicitly competitive situations often contain little, or no direct conflict among participants' outcomes. This latter situation would likely be the type most often found in work settings. That is, two individuals working on similar tasks in a particular environment may or may not perceive themselves to be in competition. Whether or not other observers would define the situation as competitive, it is the perceptions of situational competitiveness of the individuals involved that are important.

Though competitiveness in work and sport may be different, there are areas of overlap between the two disciplines. It is on these similarities that a construct of competitive orientation relevant to work settings can be developed. Thus scales such as the SOQ and COI were carefully scrutinized to identify components relevant to cognitive tasks in organizational settings and modifications made as necessary. Because work situations are more likely to include the more implicit types of competitiveness described earlier, it is important for measures of competitiveness within this context to

assess the tendency for individuals to interpret an ambiguous situation as competitive. Specifically, items were developed that related to how individuals perceived situations that contained critical competitive characteristics.

The characteristics that define situations as competitive or non-competitive within a goal setting framework were similarly critical for the current study. The proposed model has suggested the potential independence of situation competitiveness and goals. As a result, each of these variables are considered in turn.

As previous research (Ames, 1984, Johnson et al., 1981, Tjosvold, 1993) has demonstrated, a number of cues may result in situations being perceived as competitive. One aspect that influences the competitiveness of a situation is an individual's comparison performance standard. Specifically, situations that define success in terms of achieving a higher level of performance than a relevant other are perceived as more competitive than situations that do not suggest such interpersonal comparisons (Tjosvold, 1993). Additionally, situations that provide feedback to individuals regarding performance are perceived to be more competitive than situations in which feedback is not available (Chung & Vickery, 1976). If individuals do not know the level at which they are performing a task, comparisons with other individuals is not possible (Chung & Vickery, 1976). Finally, feedback must be made public in order for situations to perceived as competitive (Zajonc, 1965). That is, individuals must be told not only how well they are performing, but the performance level of relevant others in the environment (Zajonc, 1965).

In addition to these critical competitive characteristics, goal setting researchers

have concluded that more difficult goals lead to greater perceived situational competitiveness (Locke and Latham, 1990). Consistent with previous research (cf. Locke et al., 1981), the current study adopted an operationalization of goals such that difficult goals reflected a performance level achieved by roughly 20% of a previous sample, while easy goals were set at a level of performance achieved by approximately 80% of a previous sample. Additionally, goals were included which provided participants with instructions that directed them to "do your best."

A final key characteristic of the conceptual model is the role of commitment. Goal setting research (Locke & Latham, 1990) has consistently demonstrated that the primary mechanism by which goals affect performance is through the commitment an individual feels toward the assigned goal. More specifically, it has been suggested that commitment moderates the relationship between goals and performance (Locke & Latham, 1990). While the proposed heuristic model in Figure 2 indicates commitment as a mediator, it is not inconsistent with previous goal setting research. The reason for the apparent discrepancy is that commitment is typically measured only with respect to assigned goals, while the current conceptualization suggests that commitment to personal goals may also be important. In situations where only assigned goal commitment is measured, it is logically correct to view it as a moderator. If there is no commitment to the assigned goal, then goal level will have no effect on performance. However, the current model suggests that while commitment to assigned goals may be low, if an individual is highly committed to another goal, performance can still be high. In sum, the model suggests that individuals make a decision to pursue, to some

degree, either the assigned goal or a personal goal. Once this choice is made, commitment to the chosen goal actually mediates the goal-performance relationship: the stronger the commitment, the greater the performance. Specific predictions regarding the role of commitment are presented in the following section.

Hypotheses

The relationships indicated in the conceptual model presented in Figure 2 summarize a number of specific hypotheses that were examined in this study. This section describes each hypothesis, as well as offers a brief rationale for the inclusion of each in the current study.

The first hypothesis is based on literature that has examined competitiveness as an individual difference variable (e.g., Butt, 1976). As previously reviewed research has indicated, the competitiveness of an individual has an effect on subsequent task performance. With this in mind the following hypothesis was generated:

H1: There will be a significant, positive relationship between individual competitiveness (i.e., competitive orientation) and task performance.

The next two hypotheses are related to the research that has suggested various situational characteristics affect the perceived competitiveness of particular contexts (Locke & Latham, 1990). Situations that emphasize interpersonal comparisons and provide public feedback regarding performance levels typically have been defined as more competitive than situations that do not provide public feedback (White et al., 1977). These researchers have further suggested that perceptions of situational competitiveness are directly related to task performance. With these considerations in

mind, the following predictions were made with respect to perceived situational competitiveness:

H2: Individuals performing a task in conditions where they are given instructions that emphasize interpersonal comparisons and provided public feedback regarding their performance will perceive the situation as more competitive than individuals who are not given instructions that emphasize interpersonal comparisons or provided with public feedback.

H3: Individuals performing a task in conditions where they are given instructions that emphasize interpersonal comparisons and provided public feedback regarding their performance will perform better than individuals who are not given instructions that emphasize interpersonal comparisons or provided with public feedback.

The fourth and fifth hypotheses are related to the expected effects of goal situations on perceived competitiveness and task performance. Previous theory (Locke and Latham, 1990) regarding the impact of goal level on perceived situational competitiveness (i.e., that goals and competition are two sides of the same coin) and task performance (i.e., that difficult goals lead to better performance than easy or do your best) provided the following predictions:

H4: Individuals with specific, difficult goals will perceive the situation to be more competitive than individuals with either easy or "do your best" goals.

H5: Individuals with specific, difficult goals will perform better than individuals with either easy or "do your best" goals.

In addition to the predicted main effects for each of the three key exogenous variables (competitive orientation, situational competitiveness, and goal conditions) in the current study, interactive effects are expected. Previous research has demonstrated that individuals with a competitive orientation perform better in situations that are

competitive. By contrast, in situations that are not competitive, individual differences in competitive orientation have not been related to performance differences. Within the context of the current study, situational cues refer to the extent to which instructions are provided that emphasize interpersonal comparisons and public feedback is provided. The general predictions regarding these effects were included in hypothesis 6, while predictions regarding the specific effects of the interaction were included in hypotheses 6a and 6b.

H6: Situation competitiveness will moderate the relationship between competitive orientation and task performance.

H6a: Non-competitive situations will result in no performance differences between non-competitive and competitive individuals.

H6b: Directly competitive situations (i.e., when instructions that emphasize interpersonal comparisons and public feedback are provided) will result in higher performance for individuals with a competitive orientation than for those with a non-competitive orientation.

Based on the assertion of Locke & Latham (1990) regarding the similarity of goals and situation competitiveness, the interactive effects of goals and competitive orientation were predicted to mirror those for situation competitiveness and competitive orientation with "do your best" and easy goals analogous to non-competitive situations and difficult goals similar to competitive situations. The general and specific predictions were as follows:

H7: Goal situation will moderate the relationship between competitive orientation and task performance.

H7a: Situations in which "do your best" goals are assigned will result in no performance differences between non-competitive and competitive individuals.

H7b: Difficult goal and easy goal situations will result in higher performance for individuals with a competitive orientation than for those with a non-competitive orientation.

H7c: In situations with difficult goals, the expected interaction with competitive orientation will be stronger than in situations when easy goals have been assigned.

Because of the lack of theoretical and/or empirical evidence regarding the three-way interaction between competitive orientation (CO), competitive situation (CS), and goal situation (GS), predictions regarding the proposed model were restricted to the 2-way interactions of CO x CS and CO x GS. The following set of hypotheses are related to the expected role of commitment to assigned performance standards. Based on previous research (Locke & Latham, 1990), it was expected that high task performance would result only when individuals were committed to their assigned performance objective. As a result, with respect to the CO x GS interaction, it was predicted that commitment to an assigned goal would be high when individuals were non-competitive. By contrast, it was expected that individuals who displayed a high level of competitiveness would tend to focus more on interpersonal standards of performance and therefore be less committed to the assigned goal. However, even though these individuals were predicted to be less committed to the assigned goal, they could still realize high performance due to their commitment to their personal, goal.

A similar prediction was made with respect to the CO x CS interaction. Individuals who were high on the competitiveness measure would be more committed when instructions were provided that emphasized performance standards based on interpersonal comparisons. By contrast, individuals who were non-competitive would

be less committed to the stated objectives in these situations, instead focusing on their own personal performance level, and wouldl subsequently demonstrate less commitment to the assigned performance standards. However, it was expected that these individuals could still realize high task performance through their commitment to their personal goals. Consistent with the previous discussion, the following specific predictions were offered:

H8a: In situations when objective performance goals are assigned to individuals, individuals who score low on the CO measure will display higher commitment to those goals than individuals who score high on the CO measure.

H8b: In situations when instructions that emphasize interpersonal comparisons are assigned, individuals who score high on the CO measure will display higher commitment to those goals than individuals who score low on the CO measure.

The implication of the preceding hypotheses and the proposed model is that commitment, broadly defined, is fundamentally predicted to be a mediator between the key interactions and task performance. However, the nature of commitment is of critical importance. Higher commitment is predicted to lead to increased performance. Further, when individuals display low commitment to an assigned goal, it is expected that they will alter the goal to be more consistent with their own expectations. Thus, in situations where objective goals are assigned and individuals are competitive, although the individuals will display low commitment to the assigned goal, it is expected that they will display high commitment to their own, personal goal. This is indicated by the inclusion of two paths from the interactions to task performance. Specifically:

H9a: In conditions in which CO is low and objective performance goals are provided and conditions in which CO is high and instructions are

provided that emphasize interpersonal comparisons, commitment to the assigned performance standard will mediate the effects on task performance.

H9b: In conditions in which CO is high and objective performance goals are provided and conditions in which CO is low and instructions are provided that emphasize interpersonal comparisons, commitment to personal performance standards will mediate the effects on task performance.

Two affective outcomes were hypothesized to result from the interaction between competitive orientation and the situational cues. Specifically, individuals' self-efficacy judgments after performing in these situations were expected to be significantly correlated with individual differences in pre-task self-efficacy, perceived situational competitiveness, goal level, and task performance. These effects were expected based on the fact that research examining the effect of competitive situations on self-efficacy has demonstrated that competition affects subsequent self-efficacy judgments through its effects on performance. Specifically, the following hypothesis was offered:

H10: Post-task self-efficacy will be positively related to individuals' task performance. Specifically, those who perform well on the task will report greater efficacy for the task than those who perform poorly.

Task satisfaction was also predicted as an outcome variable in the current study, based on research that has shown that individuals who perform well on a task typically report higher levels of task satisfaction (cf. Riggio, 1990). As a result, the following hypothesis was proposed:

H11: There will be a significant, positive correlation between task performance and task satisfaction.

The key variables and analytical tests of the previous set of hypotheses are summarized in Table 1.

Table 1

Summary of Study Hypotheses

H_0's	KEY VARIABLES	TEST
H1	Competitive Orientation Task Performance	Multiple Regression
H2	Competitive Situation Perceived Competitiveness	Multiple Regression
H3	Competitive Situation Task Performance	Multiple Regression
H4	Goal Situation Perceived Competitiveness	Multiple Regression
H5	Goal Situation Task Performance	Multiple Regression
H6	Competitive Situation Competitive Orientation Task Performance	Multiple Regression
H7	Goal Situation Competitive Orientation Task Performance	Multiple Regression
H8	Competitive Situation Goal Situation Competitive Orientation Goal Commitment	Hierarchical Multiple Regression
H9	Competitive Situation Goal Situation Competitive Orientation Goal Commitment Task Performance	Hierarchical Multiple Regression
H10	Task Performance Self-Efficacy	Multiple Regression
H11	Task Performance Task Satisfaction	Bivariate Regression

METHOD

Participants

A power analysis was conducted to determine the necessary sample size to detect a moderate effect with power of approximately .80. Results of this analysis suggested cell sizes of 25, which resulted in a total sample of 150. Participants were undergraduate psychology students at Michigan State University who took part in the experiment as part of a course requirement.

Design

The study was a 3 (goal condition) x 2 (competitive condition) factorial design. Three levels of goals (difficult, easy, and "do your best") were crossed with 2 levels of situation competitiveness (competitive and non-competitive) to which participants were randomly assigned. A more detailed description of the specific manipulations is presented in the Procedure section. The remaining variables in the study involved measured, as opposed to manipulated, factors.

Task

The task used in the current study was based on the multiple-cue probability learning (MCPL) paradigm. According to Abelson and Levi (1985) MCPL tasks require a decision maker to choose an alternative from a set of options that vary on a

number of attributes, or cues. In order to make the most accurate judgments the decision maker must understand the relationships (i.e., weights) between the cues and the criterion. The process by which the decision maker typically learns these relationships involves observing a cue profile, selecting an alternative, receiving feedback regarding the correct alternative, and repeating the process a number of times. Depending on the task characteristics, predictive accuracy (the correlation between the decision maker's judgments and the correct answers) can range from zero to one. With respect to learning the weights, feedback can either take an outcome form, in which feedback simply indicates the accuracy of an individual's response or a process form, in which feedback is provided in terms of how close an individual's weighting structure is to the weights as they exist in the environment (Balzer, Doherty, & O'Connor, 1989).

An MCPL task addressed several critical issues related to the current study. First, this type of task is largely cognitive and requires the same critical skills necessary for performance of many non-laboratory decision making tasks. Second, cues and cue values can be presented for tasks in which the decision makers lack experience (Quiñones, 1993). A novel task is important because it avoids any confounds of prior individual difference variables. Third, feedback can be manipulated so that performance of individuals can be made public. Fourth, MCPL tasks provide discrete stages at which individuals can easily compare performance with an external, or internal, standard, thereby affording them the opportunity to change strategies or modify standards of performance. Finally, research utilizing these types of tasks has typically demonstrated variability in individual performance through acquisition of

proper cue weighting strategies. As individuals become more or less engaged in the task, performance differences result.

A computer simulation of a Naval Air Defense scenario developed by Hollenbeck, Sego, Ilgen, and Major (1991) was chosen for this study. This task required individuals to command a United States Naval Carrier and to make decisions regarding the "threat level" of a series of targets presented on a microcomputer. Specifically, individuals were asked to choose from one of five defensive postures (Ignore, Monitor, Warn, Ready, Defend) depending on a target's standing on nine attributes (speed, altitude, size, angle, IFF, direction, corridor status, radar type, range). Each trial in this task required individuals to select one defensive posture for each target within a specified time limit. After each trial, individuals received feedback regarding the accuracy of their response and then were presented with the next target. Individuals were allowed to use as much, or as little, of the allotted time as necessary, so the number of targets viewed varied depending on how quickly individuals proceeded through the trials. As a result, both performance quality (i.e., accuracy of assessing targets) and performance quantity (i.e., number of targets assessed) was measured on the task.

Consistent with the MCPL paradigm, the level of threat associated with each target was determined by the values of each of the nine target attributes. The task structure included four interactions and one main effect. Interactions only indicated a threat when both attributes of the interaction had values considered threatening. If either attribute had a value that was non-threatening, the interaction was also non-

threatening. Thus, this task required individuals to know the pattern of interactions among the attributes, as well as the threat level for each attribute (Hollenbeck, Sego, Ilgen, & Major, 1991). Pages 5 and 6 of Appendix A provide the ranges of threat level for each of the nine attributes as well as the rules for interactions.

One of five potential outcomes resulted after an individual selected one of the decision alternatives. These outcomes, which were based on the accuracy of an individual's prediction of the correct response, ranged from "hit", indicating that the individual's decision was exactly correct, to "disaster", indicating that the individual's decision was off by four in terms of aggressiveness. Page 7 of Appendix A provides a complete description of all possible decision outcomes.

Each outcome had a point value associated with it. A "hit" was worth 2 points, a "near miss" 1 point, a "miss" 0 points, an "incident" -1 point, and a "disaster" -2 points. An individual's accuracy score was the number of points achieved across the completed trials.

Goal and Competitive Manipulations

The conditions under which individuals completed the task varied in terms of (1) the level of the assigned performance goal and (2) the level of situational competitiveness. With respect to the goal manipulation, individuals performed the task in one of three conditions: difficult, easy, or "do your best" goals. Difficult goals were set at a performance level achieved by roughly 20% of a previous sample of

individuals working independently on this task (Quiñones, 1993)[1]. Similarly, easy performance goals were set at a level achieved by roughly 80% of the Quiñones (1993) sample. "Do your best" instructions emphasized performing as well as possible with no explicit standards.

Situational competitiveness was manipulated by varying instructions emphasizing interpersonal comparisons and "publicness" of the provided feedback. In directly competitive situations, instructions emphasized that an individual should attempt to outperform a relevant other. In addition, individuals received feedback regarding their performance relative to their competitor and were told that their competitor received the same information. In contrast, individuals in noncompetitive conditions did not receive either instructions emphasizing interpersonal comparisons or public feedback. Specific instructions provided to the participants in the resulting six cells of this design are presented in the Procedure section.

Measures

The following measures were collected as part of this experiment. The measures are presented in the order in which they were collected. All participants completed all measures. Scale reliabilities are reported where appropriate.

Competitive Orientation. Competitive orientation was assessed using a measure developed explicitly for the current study. This measure identified an individual's competitive orientation as related to typical work situations. The 11-item scale

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[1] Characteristics of the Quiñones (1993) sample were N=217, $\underline{M}$ = 1.30, SD = .22.

contained modified items from the SOQ, the COI, and the scales reported by Butt (1979). Items measured performance versus outcome orientations, tendency to seek out competitive situations, preferences for competitive versus non-competitive situations, and previous experience with competitive situations. Responses were made on a 5-point Likert scale. Scores were coded such that high values represented a competitive orientation. The observed reliability for this scale was $\alpha = .83$. A copy of this scale can be found in Appendix B.

Pre-Task Knowledge. Knowledge of threat levels and rules for interactions among the nine attributes was measured using a 30-item, multiple-choice test. This measure (see Appendix C) was adapted from similar measures used by Hattrup (1992), Landis (1992), and Quiñones (1993) and was used to assess initial differences in skill level of study participants. Because the items in this test measure different aspects of the task and the fact that coefficient alpha is an index of unidimensionality, the current study adopted a split-half approach for assessing the reliability of this measure. The split-half reliability (odd-even) was $r = .70$.

Pre-Performance Self-Efficacy. Participants' expectations regarding performance levels on the task were assessed using a 10-item measure adapted from Hattrup (1992) and Quiñones (1993). Responses were made using a 5-point Likert scale. The observed reliability was $\alpha = .87$. This measure can be found in Appendix D.

Task Performance Inventory. This measure was administered at the beginning of task performance and at two 15 minute intervals thereafter. This inventory included

a measure of individuals' knowledge of conditions, personal goals, and commitment to assigned and personal goals. A one-item, manipulation check, measure (see Item #1 in Appendix E) was included to assess individuals' knowledge regarding the conditions in which they were performing and the goal level originally assigned by the experimenter. Also included in this questionnaire was a one-item measure (see Item #9 in Appendix E) designed to assess an individual's personal goal with respect to task performance. Additionally, participants responded to 7-item measures of commitment to both personal and assigned goals. This measure was a modified version of the goal commitment scale developed by Hollenbeck, Klein, O'Leary, & Wright (1989). Reliabilities for these scales ranged from $\alpha = .77$ to $\alpha = .85$. Reliabilities at each of the three time intervals are reported in the "Results" section.

Performance Quantity. The number of trials completed by each participant was recorded by the computer and used as a measure of performance quantity. There were 60 targets in the simulation set, allowing scores on this measure to range from 0 to 60.

Performance Accuracy. Performance quality was measured using the point system described earlier. For each target, an individual could score between -2 and +2. Performance quality was computed by taking an individual's score across completed trials and dividing by the number of trials completed, yielding a measure with a range from -2 to +2.

Perceptions of Situation Competitiveness. Participants' perceptions about the competitiveness of the situation was assessed using a 6-item measure (see Appendix F). Responses to this scale were made using a 5-point Likert format and reflected

participants' perceptions of "publicness" of feedback, awareness of others' performance, and overall perceptions of the competitiveness of the situation. The observed scale reliability was $\alpha = .79$.

Post-Performance Self-Efficacy. Participants' expectations regarding future performance levels was measured using a 10-item scale similar to the pre-performance self-efficacy measure. The scale reliability was $\alpha = .88$.

Post-Performance Attitudes. Reactions to the competitive aspects of the situation was addressed by means of a 9-item measure of satisfaction with the task and general attitudes toward the situation. Again, a 5-point Likert scale format was used. The scale reliability was $\alpha = .91$. A copy of this measure is presented in Appendix G.

Procedure

Each participant attended a single two hour experimental session. Upon arrival, participants were asked to read and sign a consent form that provided them with a brief description of the task they would be performing. A copy of the consent form is included in Appendix H.

After signing the consent form, individuals were given oral instructions for completing the Naval Air Defense Simulation. In addition, a handbook (see Appendix A) adapted from Landis (1992) and Quiñones (1993) containing an in-depth description of the situation, target attributes and values, decision options, and decision outcomes was provided for the participants to read and study. At this time, the experimenter also informed the participants that the purpose of the present investigation was to examine

task performance within different goal conditions. Participants were given 15 minutes to review the handbook. Questions regarding information contained in the handbook or about the experiment itself were answered at this time. The handbooks then were collected and individuals taken to a computer station and given 15 minutes to practice the actual task.

After this training, participants completed the Competitive Orientation measure, Pre-Task Knowledge test, and Pre-Performance Self-Efficacy measure. Responses were collected and individuals provided with information relevant to their assigned condition. Appendix I contains the specific protocols that were used in explaining the situation to the participants. After receiving these instructions, participants completed the Task Performance Inventory. They were then given 45 minutes to work on the task. At 15 minutes and 30 minutes into the task, participants' performance was assessed and feedback provided. In those conditions where appropriate, participants were informed of their competitor's performance levels. In order to present all participants with the same situation, competitor's feedback was bogus and reflected the mean of the Quiñones (1993) sample. At each of these times, participants also completed the Task Performance Inventory.

After the 45 minute period ended, participants' overall point performance was measured. They were then asked to complete the Post-Task Knowledge test, the Post-Performance Self-Efficacy measure, and the Post-Performance Attitudes measure. Participants were then debriefed, asked not to discuss the experiment with anyone, and allowed to leave.

Data Analysis Strategy

The analytic strategy for this experiment followed the logic of causal direction suggested by the model described in Figure 2 and described specifically in Table 1. However, before analyses of the primary hypotheses were conducted, the psychometric properties of the various measures was assessed. These included analyses of item-level statistics and reliability for each of the scales.

To assess the effects of competitive situation on both performance outcome measures (quality and quantity) and goal commitment, a multiple regression approach was used. Depending on the specific hypothesis being tested, the endogenous variables (performance and goal commitment) were regressed on the exogenous variables (competitive orientation, situation competitiveness, and goal situation). While no significant differences across conditions in terms of participants' self-efficacy or pre-task knowledge were found, these measures were used as covariates in the appropriate analyses. In all analyses, covariates were entered at the first step. Again, depending on the specific hypothesis being tested, main effects for one, or more, of the three exogenous variables were entered next followed by appropriate interaction terms.

RESULTS

Descriptive Data

Table 2 presents the means, standard deviations, and scale reliabilities for the experimental groups. In general, the scales showed sufficient reliabilities to proceed with the data analyses related to the primary hypotheses. In addition, the scales showed sufficient range and there appeared to be no floor or ceiling effects. The intercorrelations among the variables are reported in Table 3.

Because performance was assessed at three points in time, a multivariate analysis of variance (MANOVA) was conducted to assess performance differences across each of these periods. Analyses with performance accuracy as the dependent variable (DV) and time as a within-subjects factor demonstrated a significant overall effect for time, F (2,298) = 13.65, $p < .01$. Additional analyses of differences between pairs of time periods indicated significant differences between performance accuracy at Time 1 (M = 1.31, SD = .25) and Time 2 (M = 1.44, SD =.25), t(149) = -4.78, $p < .01$, as well as between Time 1 (M = 1.31, SD =.25) and Time 3 (M = 1.42, SD =.25), t(149) = -4.31, $p < .01$. However, the observed difference between Time 2 (M = 1.44, SD =.25) and Time 3 (M = 1.42, SD =.25) was not significant, t(149) = .39, $p > .05$. Figure 3 illustrates the effect of time on performance accuracy, suggesting that asymptotic levels were reached at Time 2.

Similar analyses were performed using performance quantity as the DV. Again,

Table 2

Means, Standard Deviations, and Reliabilities of Study Variables

VARIABLE	# ITEMS	MEAN	SD	RELIABILITY
Task Knowledge	30	16.13	3.72	.70[a]
Pre-Task Self-Efficacy	10	3.66	.63	.87
Competitive Orientation	11	3.02	.62	.83
Assigned GC[b] (T1)[c]	7	3.46	.58	.78
Personal GC[b] (T1)[c]	7	3.69	.55	.79
Assigned GC[b] (T2)[c]	7	3.59	.58	.79
Personal GC[b] (T2)[c]	7	3.71	.52	.77
Assigned GC[b] (T3)[c]	7	3.59	.65	.82
Personal GC[b] (T3)[c]	7	3.73	.61	.85
Post-Task Self-Efficacy	10	3.83	.59	.88
Perceived Competitiveness	6	2.46	.78	.79
Post-Task Attitudes	9	3.81	.64	.91
# of Targets (T1)[c]	---	9.37	2.14	---
Accuracy (T1)[c]	---	1.31	.25	---
# of Targets (T2)[c]	---	10.48	2.62	---
Accuracy (T2)[c]	---	1.43	.25	---
# of Targets (T3)[c]	---	10.97	2.77	---
Accuracy (T3)[c]	---	1.42	.25	---

Note. n = 150.

[a] Split-half reliability estimate (odd-even). All others are coefficient alpha. [b]GC = Goal Commitment. [c] T1 = Time 1, T2 = Time 2, T3 = Time 3.

Table 3

Intercorrelations Among Study Variables

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Goal Situation[a]																				
2. Comp. Sit.[b]	00																			
3. Task Knowledge	-17	17																		
4. Pre-Task SE	-20	01	26																	
5. Comp. Or.	-06	00	03	18																
6. Ass. GC (T1)[c]	-18	-18	12	24	31															
7. Per. GC (T1)[c]	-15	02	06	20	17	55														
8. Ass. GC (T2)[c]	-16	-14	04	16	27	76	60													
9. Per. GC (T2)[c]	-16	02	07	13	22	64	75	74												
10. Ass. GC (T3)[c]	-21	-09	10	15	28	74	54	81	71											
11. Per. GC (T3)[c]	-18	01	13	05	17	56	67	63	81	74										

NOTE: Decimals have been omitted from the table. Correlations with absolute values greater than .16 are significant at $p < .05$, and those greater than .21 are significant at $p < .01$. n = 150. [a] Coded 0=Do Your Best, 1=Easy, 2=Difficult.
[b] Coded 0=Non-competitive, 1=Competitive. [c] T1 = Time 1, T2 = Time 2, T3 = Time 3.

Table 3 (cont'd)

Intercorrelations Among Study Variables

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12. Post-Task SE	-18	08	32	68	28	23	19	22	22	28	25									
13. Perc. Comp.	00	64	06	01	17	-16	-08	-11	-01	-09	-05	-01								
14. Attitudes	-02	07	22	16	17	33	24	32	37	40	45	39	-02							
15. Targets (T1)[c]	-22	00	-01	23	06	03	00	05	02	10	-08	12	03	04						
16. Accuracy (T1)[c]	-05	-02	19	20	07	00	06	09	09	12	03	34	-15	15	-03					
17. Targets (T2)[c]	-14	10	01	19	07	03	-01	05	04	08	-02	13	11	09	81	-02				
18. Accuracy (T2)[c]	-20	10	25	26	23	12	09	00	11	13	12	38	06	20	18	21	23			
19. Targets (T3)[c]	-09	-10	-10	13	12	08	-05	10	10	08	-01	16	-03	15	56	01	70	15		
20. Accuracy (T3)[c]	-15	06	35	04	-03	13	11	03	08	10	17	25	-04	24	-08	19	-09	16	-11	

NOTE: Decimals have been omitted from the table. Correlations with absolute values greater than .16 are significant at $p < .05$, and those greater than .21 are significant at $p < .01$. n = 150. [a] Coded 0=Do Your Best, 1=Easy, 2=Difficult.
[b] Coded 0=Non-competitive, 1=Competitive. [c] T1 = Time 1, T2 = Time 2, T3 = Time 3.

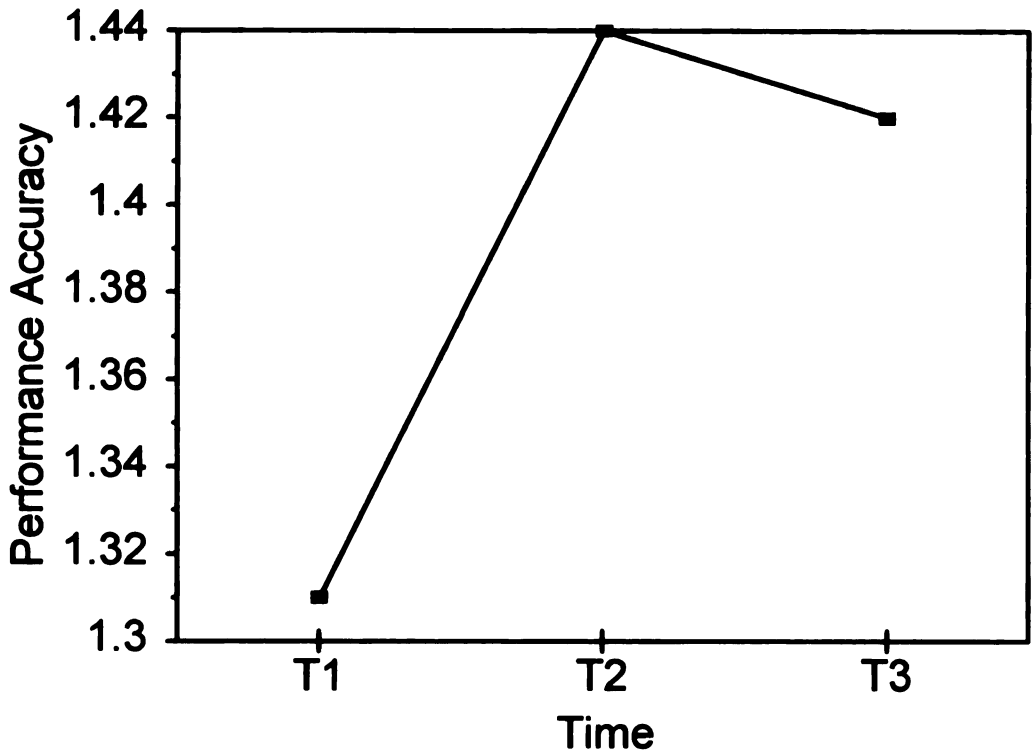

Figure 3. Performance Accuracy Scores at Three Time Periods.

a significant overall effect, F (2,298) = 48.72, $p < .01$, was found. Paired comparisons between time periods revealed significant differences among all three: Time 1 (M = 9.37) and Time 2 (M = 10.48), $t(149) = -8.76$, $p < .01$, Time 1 (M = 9.37) and Time 2 (M = 10.97), $t(149) = -8.28$, $p < .01$, and Time 2 (M = 10.48) and Time 3 (M = 10.97), $t(149) = -2.88$, $p < .01$. Figure 4 illustrates the pattern of means. These performance differences on both accuracy and quantity suggest that task performance in this study was multidimensional.

Additional evidence in support of the multidimensionality of task performance can be found in the pattern of relationships among the two measures of performance across the three time periods (see Table 3). If task performance were unidimensional, the intercorrelations among accuracy and quantity measures would be expected to be the same both within and across time periods. In fact, a strikingly different pattern of relationships was observed. Strong correlations were observed among performance quantity measures across the three periods (.81, .56, and .70) and modest, albeit significant, correlations were observed among the three accuracy measures (.21, .19, and .16). Moreover, the correlations observed between quantity and accuracy measures within and across time periods were, for the most part, non-significant (-.03, -.02, .18, .23, .01, .15, -.08, -.09, and -.11). These data provided further evidence for the multidimensionality of task performance.

Given these results, each applicable hypothesis was tested using both performance accuracy and quantity. In addition, because of the differences across all

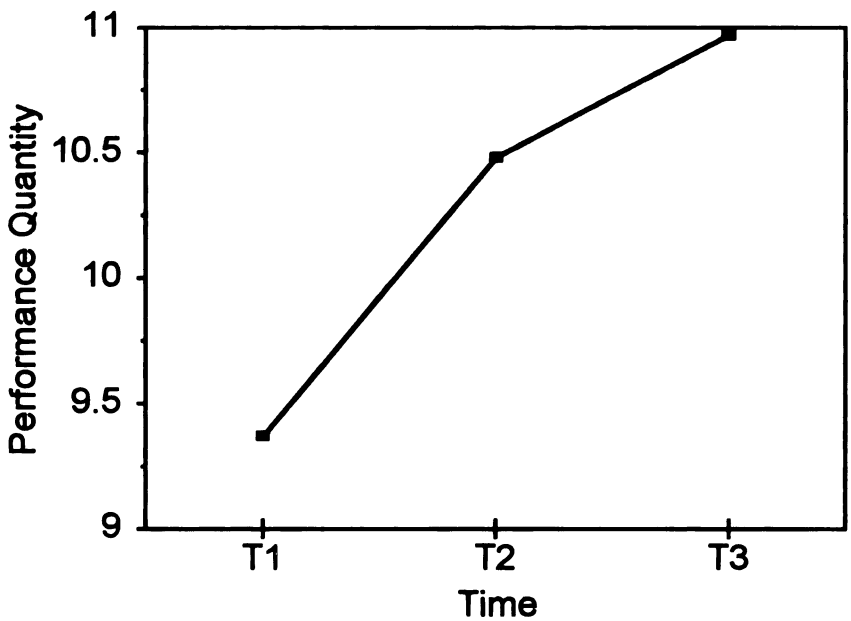

Figure 4. Performance Quantity at Three Time Periods.

three time periods with respect to these performance dimensions, all were retained for subsequent analyses.

Analyses of Primary Hypotheses

Hypothesis 1 predicted a significant, positive correlation between competitive orientation and task performance. The zero-order correlations contained in Table 3 show that competitive orientation was, with one exception, not significantly related to either performance quality or quantity. The one significant correlation occurred at time 2, $r(149) = .23$, $p < .01$. Although it was unlikely that the non-significant correlations would be affected, given the logic of the proposed relationships and the presence of a significant zero-order correlation, hierarchical regression analyses were then conducted using ability (i.e., Pre-Task Knowledge Test scores) as a covariate. Tables 4 and 5 present the results of these analyses for both measures of task performance. These tables again show that competitive orientation was only significantly associated with performance accuracy at Time 2.

These results provided some support for the first hypothesis in that no effects would be expected for performance quantity because instructions and goals emphasized accuracy comparisons. Further, the effect for competitive orientation on performance accuracy at Time 2 is consistent with the hypothesis because feedback regarding competitor performance was first presented before Time 2 performance. As a result, Time 2 was the first time individuals had an interpersonal standard of comparison against which to compete. However, the relationship between competitive orientation

Table 4

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Competitive Orientation and Ability

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.19*	.08	.03*	.03*
STEP 2:				
Competitive Orientation	.07	.08	.04*	.00

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.25**	.08	.06**	.06**
STEP 2:				
Competitive Orientation	.22**	.08	.11**	.05**

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.35**	.08	.12**	.12**
STEP 2:				
Competitive Orientation	-.04	.08	.12**	.00

n=150

* $p < .05$, ** $p < .01$

Table 5

Results of Hierarchial Regression Analyses with Performance Quantity Regressed on Competitive Orientation and Ability

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.01	.08	.00	.00
STEP 2:				
Competitive Orientation	.06	.08	.00	.00

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.01	.08	.00	.00
STEP 2:				
Competitive Orientation	.07	.08	.01	.01

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.10	.08	.01	.01
STEP 2:				
Competitive Orientation	.13	.08	.03	.02

n=150

* $p<.05$, ** $p<.01$

and performance quality at Time 3 was not supportive of Hypothesis 1. One potential explanation for the lack of significance at Time 3 may be related to the task itself. Given the probabilistic nature of the task and the fact that perfect performance is practically impossible, it is possible that a performance ceiling reached at Time 2 influenced individual performance at Time 3. The fact that mean performance increased from Time 1 to Time 2 suggests that individuals had not yet reached this ceiling. However, the similarity in means and variance of Time 2 and Time 3 performance, the negative relationship between accuracy at these times, and the lack of an observed relationship between competitive orientation at Time 3 suggests that competitive individuals in an attempt to increase their performance accuracy may have altered their performance strategies. Because they had likely reached the ceiling of performance, these new strategies did not lead to greater accuracy.

Hypothesis 2 predicted a significant, positive correlation between perceived competitiveness of the situation and the situational competitiveness manipulation. This hypothesis was offered to provide support for the idea that "publicness" of feedback is a strong cue to the competitiveness of a situation. Specifically, this prediction was based on the work of Zajonc (1965) and Mitchell, Liden, and Rothman (1985). The observed correlation between the two variables, $r(148) = .64$, $p < .01$ indicated support for the second hypothesis. In addition to replicating previous research, the significance of this relationship suggested that the manipulated conditions differed on the competitiveness dimension and allowed for the examination of additional related hypotheses.

Hypothesis 3 predicted a significant, positive correlation between situational competitiveness and task performance. Although no significant zero-order relationships were observed, analyses in which ability was covaried were conducted in order to specifically test the logic of the hypotheses. Tables 6 and 7 contain the results of these hierarchical regression analyses using both performance accuracy and quantity. As these tables show, there were no significant effects for situation competitiveness on either performance measure. As a result, no support was obtained for the third hypothesis.

The fourth hypothesis predicted a positive correlation between goal situation (i.e., difficulty) and perceived situational competitiveness. This prediction was based on the suggestion of Locke & Latham (1990) that goals and competition were "two sides of the same coin." If this hypothesis were true, the observed relationship between goal situation and perceived competitiveness should mirror that between competitive situation and perceived competitiveness (see Hypothesis 2 above). In fact, the observed correlation was non-significant, $r(148) = .00$, $p > .05$.

As a result, these data fail to provide evidence for the assertion made by Locke and Latham (1990). If these situational characteristics are the same, as Locke and Latham proposed, individual perceptions regarding them should also be similar. Since these factors were experimentally manipulated, the relationships between perceptions and each of the situational characteristics should be the same. As these results demonstrate, these relationships were not identical.

One possible reason for observing this non-significant relationship between

Table 6

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Situation Competitiveness and Ability

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.19*	.08	.03*	.03*
STEP 2:				
Situation Competitiveness	-.05	.08	.04	.00

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.25**	.08	.06**	.06**
STEP 2:				
Situation Competitiveness	.06	.08	.06**	.00

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.35**	.08	.12**	.12**
STEP 2:				
Situation Competitiveness	.00	.08	.12**	.00

n=150

* $p<.05$, ** $p<.01$

Table 7

Results of Hierarchial Regression Analyses with Performance Quantity Regressed on Situation Competitiveness and Ability

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.01	.08	.00	.00
STEP 2:				
Situation Competitiveness	.00	.08	.00	.00

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.01	.08	.00	.00
STEP 2:				
Situation Competitiveness	.10	.08	.01	.01

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.10	.08	.01	.01
STEP 2:				
Situation Competitiveness	-.08	.08	.02	.01

n=150

* $p < .05$, ** $p < .01$

goals and perceived situation competitiveness could be that the goal manipulation was not consistent with previous research. However, data found in Table 3 do not support this alternative explanation. As would be expected from the voluminous body of goal setting research (cf. Locke & Latham, 1990), the observed relationships between goal difficulty and commitment are significant and negative. That is, the more difficult that goals are, the less committed are individuals to them. As a result, this data provided additional evidence that goals and competitiveness are independent situational characteristics by demonstrating the adequacy of the goal level manipulation.

Hypothesis 5 predicted a significant, positive correlation between goal situation and task performance. Although some significant zero-order correlations were observed, because motivational effects were again the focus, analyses that included ability as a covariate were conducted. Tables 8 and 9 contain the results of the hierarchical regression analyses for performance accuracy and quantity, respectively. These tables show significant effects for goal difficulty with both performance accuracy at Time 2 and performance quantity at Time 1. However, the effects of goal difficulty in both instances were in the opposite direction as that predicted. In fact, the data suggest that performance was improved most under "do your best" instructions and least under difficult goal instructions. While these effects are contrary to those predicted, they are not necessarily inconsistent with existing goal setting literature (e.g., Earley, Connolly, & Ekegren, 1989). A more detailed discussion of these observed effects is presented later in the paper.

The sixth hypothesis predicted an interactive effect for competitive situation and

Table 8

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Goal Situation and Ability

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.19*	.08	.03*	.03*
STEP 2:				
Goal Situation	-.03	.08	.04	.00

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.25**	.08	.06**	.06**
STEP 2:				
Goal Situation	-.16*	.08	.09**	.03*

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.35**	.08	.12**	.12**
STEP 2:				
Goal Situation	-.10	.08	.13**	.01

n=150

* $p<.05$, ** $p<.01$

Table 9

Results of Hierarchial Regression Analyses with Performance Quantity Regressed on Goal Situation and Ability

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.01	.08	.00	.00
STEP 2:				
Goal Situation	-.23**	.08	.05*	.05**

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.01	.08	.00	.00
STEP 2:				
Goal Situation	-.15	.08	.02	.02

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.10	.08	.01	.01
STEP 2:				
Goal Situation	-.11	.08	.02	.01

n=150

* $p < .05$, ** $p < .01$

competitive orientation on task performance. Hierarchical regression analyses that tested this hypothesis are presented in Tables 10 and 11. No interactive effects were observed for competitive orientation and situation competitiveness on any of the performance accuracy or quantity measures. This result is unexpected considering the substantial amount of previous research demonstrating this effect. While the possibility exists that the competitive manipulation was not strong enough, given that there was a strong relationship between competitive situation and perceived competitiveness makes this possibility unlikely.

Another possibility is that the regression analytical technique is not powerful enough to detect the interaction (Alexander & DeShon, 1994). Alexander & DeShon (1994) demonstrated that when the assumption of homogeneity of error variance is violated, the resulting F test of the equality of slopes in the regression analysis is not robust. In the current case, the mean squared residuals were different across the competitive conditions within each time period (Time 1: .25 and .26, Time 2: .27 and .22, and Time 3: .23 and .27). As a result, an additional analysis was done to examine the relationship between competitive orientation and performance accuracy as a function of the situation competitiveness. Specifically, the correlations between competitive orientation and performance accuracy within each competitive condition were compared (Alexander & DeShon, 1994).

Even with this more powerful test, the interactive effects of competitive orientation and situation competitiveness were not observed. At Time 1, the Fisher-z correlations were $r = .03$ between competitive orientation and performance in non-

Table 10

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Situation Competitiveness and Competitive Orientation

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.19*	.08	.03*	.03*
STEP 2:				
Sit. Competitiveness[a] (C)	-.05	.08	.04	.01
Comp. Orientation (CO)	.07	.08		
STEP 3:				
C x CO	.19	.42	.04	.00

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.25**	.08	.06**	.06**
STEP 2:				
Sit. Competitiveness[a] (C)	.07	.08	.11**	.05*
Comp. Orientation (CO)	.22**	.08		
STEP 3:				
C x CO	-.41	.40	.12**	.01

n=150. [a] Coded: 0=Noncompetitive, 1=Competitive. * $p < .05$, ** $p < .01$

Table 10 (cont'd)

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Situation Competitiveness and Competitive Orientation

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.35	.08	.12**	.12**
STEP 2:				
Sit. Competitiveness[a] (C)	.00	.08	.12**	.00
Comp. Orientation (CO)	-.04	.08		
STEP 3:				
C x CO	.04	.40	.12**	.00

n=150. [a] Coded: 0=Noncompetitive, 1=Competitive. * $p < .05$, ** $p < .01$

Table 11

Results of Hierarchial Regression Analyses with Performance Quantity Regressed on Situation Competitiveness and Competitive Orientation

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.01	.08	.00	.00
STEP 2:				
Sit. Competitiveness[a] (C)	.00	.00	.00	.00
Comp. Orientation (CO)	.06	.08		
STEP 3:				
C x CO	-.34	.43	.01	.00

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.01	.08	.00	.00
STEP 2:				
Sit. Competitiveness[a] (C)	.10	.08	.01	.01
Comp. Orientation (CO)	.07	.08		
STEP 3:				
C x CO	-.18	.43	.02	.00

n=150. [a] Coded: 0=Noncompetitive, 1=Competitive. * $p < .05$, ** $p < .01$

Table 11 (cont'd)

Results of Hierarchial Regression Analyses with Performance Quantity Regressed on Situation Competitiveness and Competitive Orientation

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.10	.08	.01	.01
STEP 2:				
Sit. Competitiveness[a] (C)	-.08	.08	.03	.02
Comp. Orientation (CO)	.13	.08		
STEP 3:				
C x CO	-.15	.42	.03	.00

n=150. [a] Coded: 0=Noncompetitive, 1=Competitive. * $p<.05$, ** $p<.01$

competitive situations and $r = .11$ in competitive situations ($\chi^2_{(1)} = .23$, $p > .05$), at Time 2 the correlations were $r = .28$ and $r = .18$ ($\chi^2_{(1)} = .36$, $p > .05$), and at Time 3 the correlations were $r = -.03$ and $r = -.02$ ($\chi^2_{(1)} = .00$, $p > .05$). Additional potential reasons for the lack of significance associated with this interaction are presented later.

The seventh hypothesis predicted an interactive effect for goal situation and competitive orientation on task performance. Hierarchical regression analyses related to this hypothesis are presented in Tables 12 and 13. Results suggested no support for the predicted interactive effects. Again, since there was a possibility that the lack of significance in these analyses could have been due to the fact that regression technique is not powerful enough to detect the interaction (Alexander & DeShon, 1994), an additional analysis was done. Again, this analysis failed to find support for the predicted interaction. At Time 1, the Fisher-z correlations were $r = .07$ between competitive orientation and performance accuracy in "do your best" conditions, $r = .27$ in easy goal conditions, and $r = -.17$ in difficult goal conditions ($\chi^2_{(2)} = 4.56$, $p > .05$), and at Time 2 the correlations were $r = .11$, $r = .31$, and $r = .25$, respectively ($\chi^2_{(2)} = .99$, $p > .05$), while at Time 3 the correlations were $r = .10$, $r = -.17$, and $r = -.01$ ($\chi^2_{(2)} = 1.73$, $p > .05$).

Hypothesis 8 predicted that the three exogenous variables of goal situation, situation competitiveness, and competitive orientation would have interactive effects on the prediction of goal commitment. Implicit in this hypothesis, as well as the theoretical review leading up to it, was that in competitive situations individuals who were competitive would be more likely to accept their assigned goal than individuals

Table 12

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Goal Situation and Competitive Orientation

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.19	.08	.03	.03
STEP 2:				
Goal Situation[a] (G)	-.02	.08	.04	.01
Comp. Orientation (CO)	.07	.08		
STEP 3:				
G x CO	-.42	.41	.05	.01

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.25**	.08	.06*	.06*
STEP 2:				
Goal Situation[a] (G)	-.15	.08	.13*	.07*
Comp. Orientation (CO)	.21*	.08		
STEP 3:				
G x CO	.40	.39	.14*	.01

n=150. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. * $p<.05$, ** $p<.01$

Table 12 (cont'd)

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Goal Situation and Competitive Orientation

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.35**	.08	.12**	.12**
STEP 2:				
Goal Situation [a] (G)	-.10	.08	.13**	.01
Comp. Orientation (CO)	-.04	.08		
STEP 3:				
G x CO	-.18	.40	.14**	.00

n=150. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. * $p<.05$, ** $p<.01$

Table 13

Results of Hierarchial Regression Analyses with Performance Quantity Regressed on Goal Situation and Competitive Orientation

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.01	.08	.00	.00
STEP 2:				
Goal Situation[a] (G)	-.22*	.08	.05	.05
Comp. Orientation (CO)	.05	.08		
STEP 3:				
G x CO	.50	.41	.06	.01

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	.01	.08	.00	.00
STEP 2:				
Goal Situation[a] (G)	-.14	.08	.02	.02
Comp. Orientation (CO)	.06	.08		
STEP 3:				
G x CO	.62	.42	.04	.01

n=150. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. * $p<.05$, ** $p<.01$

Table 13 (cont'd)

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Goal Situation and Competitive Orientation

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Knowledge	-.10	.08	.01	.01
STEP 2:				
Goal Situation [a] (G)	-.10	.08	.03	.03
Comp. Orientation (CO)	.12	.08		
STEP 3:				
G x CO	.24	.42	.04	.00

n=150. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. * $p<.05$, ** $p<.01$

low in competitive orientation. Similarly, individuals who were in non-competitive situations and who were low in competitive orientation would be more likely to accept assigned goals than individuals who were high in competitive orientation. To test whether acceptance of goal differed as a function of competitive orientation and situation competitiveness, a logistic regression was run with acceptance (yes/no) as the categorical criterion, and competitive orientation, situation competitiveness, and their interaction as predictors. The entry of terms in the logistic regression followed the same logic as that used in the preceding hierarchical multiple regression analyses. That is, main effects were entered first followed by the interaction. This procedure in logistic regression results in the test of model fit for each of the two models: Model 1 including just the main effects and Model 2 including the main effects and interaction. Model fit is assessed using a $\Delta\chi^2$ index. Within each model, significance of individual variables is indicated by the Wald χ^2. Table 14 contains the results of this analysis.

As these results illustrate, a main effect for situational competitiveness was observed at all three time periods. Specifically, individuals in non-competitive situations reported greater goal acceptance. Goal acceptance for non-competitive versus competitive conditions within each time period was: T1 -- 48% to 16%, T2 -- 44% to 12%, and T3 -- 43% to 15%. On the other hand, no main effects were observed for competitive orientation. The predicted interactive effects of competitive situation and competitive orientation on goal acceptance received mixed support. As predicted, a significant interaction was observed at Time 1 (Wald $\chi^2_{(1)} = 5.61$, $p < .05$. Additionally, this interaction was in the predicted direction with the correlation

Table 14

Results of Logistic Regression Analyses with Assigned Goal Acceptance Regressed on Situation Competitiveness and Competitive Orientation

Time 1

VARIABLE	$\Delta\chi^2$	B	SE B	Wald
STEP 1:				
Situation Competitiveness [a] (C)	18.34**	-1.58	.39	16.33**
Comp. Orientation (CO)		-.09	.31	.09
STEP 2:				
C x CO	6.06**	1.61	.68	5.61*

n=149

Time 2

VARIABLE	$\Delta\chi^2$	B	SE B	Wald
STEP 1:				
Situation Competitiveness [a] (C)	21.30**	-1.77	.43	17.18**
Comp. Orientation (CO)		-.38	.33	1.33
STEP 2:				
C x CO	2.77	1.15	.71	2.68

n=150

Time 3

VARIABLE	$\Delta\chi^2$	B	SE B	Wald
STEP 1:				
Situation Competitiveness [a] (C)	15.04**	-1.47	.40	13.37**
Comp. Orientation (CO)		-.14	.31	.19
STEP 2:				
C x CO	1.75	.86	.66	1.70

n=150. [a] Coded: 0=Non-Competitive, 1=Competitive. * $p<.05$, ** $p<.01$

between competitive orientation and acceptance in the competitive condition of $r(74) = .20$, $p=.08$ and in the non-competitive condition $r(74) = -.19$, $p=.10$. Competitive individuals were more likely to accept their goals when the goals were framed in terms of interpersonal comparisons (i.e., outperform another person working on a similar task) than if they were framed in terms of intrapersonal comparisons (i.e., achieve a certain level of task performance). In contrast, noncompetitive individuals were more likely to accept goals stressing intrapersonal, rather than interpersonal, comparisons. In spite of these encouraging results, significant interactions were not observed at either Time 2 or Time 3. As a result, some support, although mixed, was gathered concerning the relationship among the exogenous variables and the critical intervening variable of goal acceptance allowing analyses of the relationships predicted in Hypothesis 8 to be conducted.

Support for the predicted interactive effects of goal situation, situation competitiveness, and competitive orientation on goal commitment was examined again using hierarchical multiple regression. Because acceptance of a goal previously has been demonstrated to be a critical precursor to commitment (Locke & Latham, 1990), the commitment measure used in the following analyses was related to assigned goals when individuals did not report a different personal goal and to personal goals when they differed from assigned goals. Results of these analyses are presented in Table 15.

At both Time 1 and Time 2, no significant 2- or 3-way interactions were observed (all p's $> .05$). In fact, the only significant effect at either of these times was for competitive orientation at Time 2 ($\beta = .20$, $p < .05$). This effect suggests that

Table 15

Results of Hierarchial Regression Analyses with Goal Commitment Regressed on Goal Situation, Situation Competitiveness, Competitive Orientation, and Respective Interaction Terms

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Goal Situation[a] (G)	-.14	.08	.04	.04
Situation Competitiveness[b] (C)	.01	.08		
Comp. Orientation (CO)	.15	.08		
STEP 2:				
C x G	.16	.15	.05	.01
STEP 3:				
G x CO	.46	.43	.06	.01
C x CO	-.31	.43		
STEP 4:				
C x G x CO	-.42	.79	.07	.00

n=149. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. [b] Coded: 0=Non-competitive, 1=Competitive. * $p<.05$, ** $p<.01$

Table 15 (cont'd)

Results of Hierarchial Regression Analyses with Goal Commitment Regressed on Goal Situation, Situation Competitiveness, Competitive Orientation, and Respective Interaction Terms

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Goal Situation[a] (G)	-.13	.08	.06*	.06*
Situation Competitiveness[b] (C)	.01	.08		
Comp. Orientation (CO)	.20*	.08		
STEP 2:				
C x G	.13	.15	.06	.00
STEP 3:				
G x CO	.20	.42	.07	.00
C x CO	.22	.43		
STEP 4:				
C x G x CO	-.49	.78	.07	.00

n=150. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. [b] Coded: 0=Non-competitive, 1=Competitive. * $p<.05$, ** $p<.01$

Table 15 (Cont'd)

Results of Hierarchial Regression Analyses with Goal Commitment Regressed on Goal Situation, Situation Competitiveness, Competitive Orientation, and Respective Interaction Terms

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Goal Situation[a] (G)	-.14	.08	.07*	.07*
Situation Competitiveness[b] (C)	.00	.08		
Comp. Orientation (CO)	.22**	.08		
STEP 2:				
C x G	.30*	.15	.10**	.03*
STEP 3:				
G x CO	-.20	.42	.10*	.01
C x CO	.30	.42		
STEP 4:				
C x G x CO	-.30	.76	.10*	.00

n=150. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. [b] Coded: 0=Non-competitive, 1=Competitive. * $p<.05$, ** $p<.01$

individuals who scored high on the competitive orientation measure tended to be more committed to their goals than those low on this measure. At Time 3, in addition to a main effect for competitive orientation ($\beta = .22$, $p < .01$), a significant interaction between situation competitiveness and goal situation was observed ($\beta = .30$, $p < .05$) (see Figure 5). Because the levels of commitment to assigned difficult goals in both competitive and non-competitive conditions was roughly equivalent, the significance of this interaction is derived mainly from the disordinal interaction between situation competitiveness and the "do your best" and easy goal levels of goal situation. Individuals in competitive situations reported higher goal commitment in the easy and difficult goal conditions. Alternatively, individuals in non-competitive situations reported higher commitment under the relatively ambiguous "do your best" goals. The effects related to commitment in the non-competitive conditions replicate what has typically been found in goal setting research (Locke & Latham, 1990). This is not surprising given that goal setting studies have typically used tasks and situations that were non-competitive (e.g., anagram tasks). These results provided additional support for the appropriateness of the manipulation of goal level in the current study.

Results related to commitment in the competitive situations are more difficult to reconcile with the existing goal setting literature. If goals and situation competitiveness have the same effect, then commitment in these situations should be the same. However, the disordinal interaction suggests that situation competitiveness has a different effect on commitment than does goal level. In competitive situations individuals expressed greater commitment to easy goals than to either "do your best" or

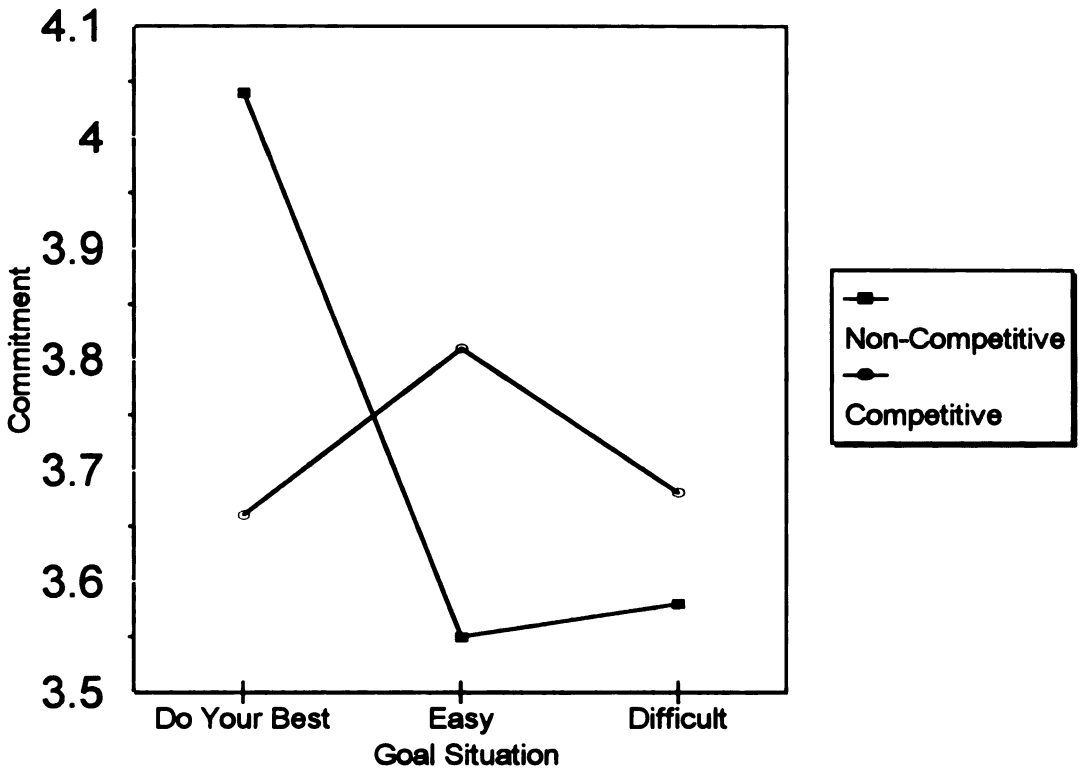

Figure 5. Interaction of Goal Situation and Competitive Situation on Goal Commitment

difficult goals. These differences, along with the fact that the goal manipulation produced results on goal commitment that were consistent with previous goal setting literature provide more evidence for the independence of goals and situation competitiveness. In addition, these results call into question the equivalence of "do your best" instructions across the competitive conditions. However, in light of the lack of significant interactions elsewhere in these analyses, strong conclusions regarding these effects must be tempered.

Hypothesis 9 predicted a mediating effect for goal commitment on the relationship between situation characteristics (i.e., goal situation and situation competitiveness) and competitive orientation on task performance. Because previous analyses demonstrated that the relationship between the proposed mediator (i.e., commitment) and task performance was not significant, the hypothesis of mediation was not tested (James & Brett, 1984).

Despite evidence that a significant portion of individuals did not accept their assigned goals, the intercorrelations between commitment measures (see Table 3) suggest that when individuals did pursue personal, rather than assigned, goals, these self-set goals were similar to those that were assigned. This evidence suggests the unidimensionality of the commitment measures. As a result of this lack of distinction between assigned and personal goals, the hypothesized role of commitment in the proposed model was not supported. However, since goal commitment has frequently been identified as a moderator in the difficulty-performance relationship, hierarchical analyses were conducted to test the viability of this effect. Results of these analyses for

performance accuracy are reported in Table 16. No effects were observed for this alternate hypothesis.

Hypothesis 10 predicted a significant relationship between task performance and self-efficacy. This relationship was examined through hierarchical regression techniques by first controlling for pre-task self-efficacy. Results of this analysis are presented in Table 17 for performance accuracy and Table 18 for performance quantity.

These results provide support for the prediction that performance accuracy has a positive effect on self-efficacy. Stated another way, the better one performs a task, the higher one's self-efficacy for task performance. While these results may be viewed as simply a replication of previous research on the construct of self-efficacy (Gist & Mitchell, 1992), it is of interest that these effects were only true for performance accuracy. Viewing more targets did not have a significant effect on self-efficacy. One of the dimensions suggested as important in self-efficacy judgments (i.e., experience with a task) was demonstrated to be insufficient to increase self-efficacy assessments. In order to significantly alter perceptions of efficacy, not only must individuals perform a task and receive feedback (i.e., gain task experience), but also they must perform the task accurately.

The final hypothesis predicted a significant, positive relationship between task performance and task satisfaction. From Table 3, the correlation between performance accuracy at Time 1 and task satisfaction was observed to be $r(149) = .15$, $p < .05$, at Time 2 $r(149) = .20$, $p < .05$, and at Time 3 $r(149) = .24$, $p < .01$. As predicted, performing well was associated with more favorable perceptions of the task. Indeed,

Table 16

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Goal Situation, Situation Competitiveness, Competitive Orientation, Goal Commitment, and Respective Interaction Terms

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Goal Situation[a] (G)	-.06	.08	.01	.01
Goal Commitment (GC)	.43	.08		
STEP 2:				
G x GC	.79	.57	.02	.01

n=149. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. [b] Coded: 0=Non-competitive, 1=Competitive. * $p<.05$, ** $p<.01$

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Goal Situation[a] (G)	-.19*	.08	.04*	.04*
Goal Commitment (GC)	.22	.08		
STEP 2:				
G x GC	-.02	.59	.04	.00

n=150. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. [b] Coded: 0=Non-competitive, 1=Competitive. * $p<.05$, ** $p<.01$

Table 16 (cont'd)

Results of Hierarchial Regression Analyses with Performance Accuracy Regressed on Goal Situation, Situation Competitiveness, Competitive Orientation, Goal Commitment, and Respective Interaction Terms

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Goal Situation[a] (G)	-.13	.08	.04*	.04*
Goal Commitment (GC)	.15	.08		
STEP 2:				
G x GC	.34	.51	.05	.00

n=150. [a] Coded: 0=Do Your Best, 1=Easy, 2=Difficult. [b] Coded: 0=Non-competitive, 1=Competitive. * $p<.05$, ** $p<.01$

Table 17

Results of Hierarchial Regression Analyses with Post-Task Self-Efficacy Regressed on Pre-Task Self-Efficacy and Performance Accuracy

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Self-Efficacy	.68**	.06	.46**	.46**
STEP 2:				
Task Performance	.12**	.06	.50**	.04**

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Self-Efficacy	.68**	.06	.46**	.46**
STEP 2:				
Task Performance	.22**	.06	.50**	.05**

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Self-Efficacy	.68**	.06	.46**	.46**
STEP 2:				
Task Performance	.23**	.06	.51**	.05**

n=149. * $p<.05$, ** $p<.01$

Table 18

Results of Hierarchial Regression Analyses with Post-Task Self-Efficacy Regressed on Pre-Task Self-Efficacy and Performance Quantity

Time 1

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Self-Efficacy	.68**	.06	.46**	.46**
STEP 2:				
Task Performance	-.04	.06	.46**	.00

Time 2

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Self-Efficacy	.68**	.06	.46**	.46**
STEP 2:				
Task Performance	.01	.06	.46**	.00

Time 3

VARIABLE	β	SE β	R^2	ΔR^2
STEP 1:				
Pre-Task Self-Efficacy	.68**	.06	.46**	.46**
STEP 2:				
Task Performance	.07	.06	.46**	.00

n=149. * $p<.05$, ** $p<.01$

this relationship got progressively stronger through the three time periods.

DISCUSSION

The current study examined the construct of competitive orientation within a traditional I/O paradigm. Specifically, predictions regarding the interaction between competitive orientation and situation competitiveness (Mitchell, Liden, and Rothman, 1985) and the independence of situation competitiveness and goals (Locke & Latham, 1990) were tested. To provide a framework for considering the observed results, this discussion is organized into three sections. The first presents a brief review of the results as they relate to specific study hypotheses, as well as describes some of the strengths of the current study. The second section focuses on the potential limitations to generalizability from the results, while the third considers future research directions and a summary of the potential implications, both theoretical and applied, for the construct of competitiveness.

Review of Results and Integration with Current Literature

In the Introduction section of this paper, a review and synthesis of previous research led to the development of a model of competitiveness (see Figure 2). Because the hypotheses offered and tested in the current study were based on the relationships indicated in this model, this section reviews the results of key analyses with respect to how they might be integrated with previous literature.

As previously stated, one of the primary aims of the current study was to provide evidence for the importance of individual competitiveness as a key construct

within contemporary work settings. Since much of the research related to the construct of competitive orientation has been done in the area of sport psychology, the conceptualization and measurement of the construct in the current study attempted to apply it within a work context. Because the construct has generally been defined as a relatively stable personality characteristic (e.g., Monsaas & Engelhard, 1990), the current conceptualization of competitiveness was similar to previous definitions. Due to this similarity, the measure used was comprised of questions that are quite similar to those that have typically been used in the sport psychology domain.

Results were supportive of some of the critical psychometric properties of the measure. Specifically, adequate variability was observed in responses to this measure and reliability was considered acceptable ($\alpha = .83$). As predicted, competitiveness was positively related to performance at Time 2 with more competitive individuals being more accurate in their assessments of target threat level than less competitive individuals. However, these effects were not observed for the other two time periods. The lack of an observed relationship at Time 1 can be attributed to the fact that interpersonal comparisons were not possible. On the other hand, the lack of a significant correlation at Time 3 is more difficult to interpret given the significant results observed at Time 2. Given the weak correlation between performance accuracy measures at Time 2 and 3, $r(148) = .16$, $p < .05$, the non-significant correlation between competitive orientation and Time 3 accuracy may be interpreted as an artifact arising from the multidimensional nature of task performance. A more complete discussion of the dimensionality issue is presented later in this section.

These mixed results are similar to previous literature that has examined this relationship in that some studies have demonstrated a positive relationship (e.g., Monsaas & Englehard, 1990) while others have found no relationship (e.g., Martin & Gill, 1991). One suggestion for why some studies find these effects and others do not is that there is no "main effect" for competitive orientation on performance, but rather an interaction between competitive orientation and situations that produces an impact on performance. Results from the current study with respect to this proposed interaction are discussed shortly.

Additional evidence for the usefulness of the current measure of competitiveness was found in the observed relationship between competitive orientation and ability. Previous research (Martin & Gill, 1991) has typically demonstrated no relationship between these two variables. Results of the current study similarly found no relationship. Suggesting that the lack of an observed relationship is significant is analogous to affirming the null hypothesis and cannot be used as the sole basis for addressing the issue of construct validity. However, given the statistical power of the current tests, a non-significant effect would only be expected in roughly 2 out of 10 replications. Not only is the non-significant correlation unlikely given the associated power, but it also provides some evidence of discriminant validity for the measure given the results of previous research. Thus, the current study provides some psychometric support for the current measure of competitive orientation from both reliability and discriminant validity perspectives. However, there are still many unanswered questions about the construct of competitiveness in terms of understanding

the underlying psychological mechanisms by which it develops or operates.

Based on the assertion of Locke & Latham (1990) that goals and competitiveness are "two sides of the same coin," the current study included independent manipulations of both of these situational factors. Indeed, a unique feature of the current study was the experimental design that allowed for an examination of these independent effects. Several interesting results emerged from the manipulations of both situational competitiveness and goal level.

The current conceptualization and operationalization of situation competitiveness was based on previous research (Mitchell, Liden, & Rothman, 1985, and Zajonc, 1965). In short, this research has suggested that the key characteristic that defines a situation as competitive versus noncompetitive is the presence of public performance feedback. In addition to the presentation of public feedback, instructions that were given to individuals either stressed interpersonal (competitive) or intrapersonal (noncompetitive) comparisons. To assess whether there was a difference between experimental situations, individuals were asked for their perceptions regarding situation competitiveness. Results suggested support for the role of public feedback and interpersonal comparison instructions in influencing individual perceptions of competitiveness with a significant correlation between perceptions and the manipulated situation factors ($r(148) = .64$, $p < .01$). Specifically, individuals in situations that included instructions that emphasized interpersonal comparisons and the presentation of "public" feedback rated those situations as more "competitive" than those in situations with instructions that emphasized intrapersonal comparisons and no "public" feedback.

Because the hypotheses regarding the role of situation competitiveness both as a main effect and also as a component of several interactions depended on demonstrating the relationship between situation characteristics and individual perceptions, the strength of the observed correlation suggested that the manipulation was effective in producing the desired perceptions and that the remaining hypotheses could be examined. While these results provide support for the role of both instructions and feedback, these situational cues were not manipulated independently (i.e., instructions emphasizing interpersonal comparisons with no public feedback and vice versa) and the relative importance of these factors cannot be determined.

In addition to affecting perceptions of the situation, competitiveness was also predicted to influence task performance. Specifically, based on previous research (Locke & Latham, 1990), the effect of situation competitiveness on performance accuracy was expected to mirror the often replicated goal effect (e.g., Locke, Shaw, Saari, & Latham, 1981). However, results suggested no significant relationship between situation competitiveness and performance accuracy at any of the three time periods. Thus, the implicit suggestion that goals and situation competitiveness would similarly affect task performance received no empirical support from this set of analyses.

In addition to the main effect for situation competitiveness, hypotheses related to this variable's interaction with competitive orientation were also tested. Specifically, it was predicted that individuals who were in competitive situations would perform better (i.e., be most accurate) if they scored high on the competitive orientation

measure, while those in noncompetitive situations would perform better if they scored low on the competitive orientation measure. Unexpectedly, the results were not supportive of this prediction. However, failure to find this effect is not unprecedented (e.g., Matheson & Mathes, 1991). With respect to the current study, a potential reason for failing to find support for the predicted interaction, as well as the main effect, is related to the strength of the experimental manipulation. That is, although there were significant perceptual differences across the two experimental conditions, it is possible that the "absolute" magnitude of competitiveness in the competitive condition may not have been strong enough to affect individual behaviors. As some research has suggested (e.g., Thomas, 1992), there may be a continuum of competitiveness on which situations may be placed. It is possible that the current manipulation, unlike those typically reported in the sport psychology literature, was simply not powerful enough (i.e., far enough along the continuum) to elicit the expected effects on task performance.

Goals were the other situational factor assessed in the current study. Based on extensive previous research (cf. Locke, Shaw, Saari, and Latham, 1981), the expected effect for goals was that more difficult goals would lead to better performance (i.e., greater accuracy) than easy or "do your best" goals. However, results demonstrated the opposite. Difficult goals were associated with lower performance, while easy and "do your best" goals resulted in greater performance accuracy. As already presented in the Results section, some goal setting studies have reported similar results (e.g., Earley et al., 1989). These "negative" goal effects have generally been observed in situations

involving complex tasks. One proposed explanation for this effect has been that when tasks are complex, setting specific, difficult goals leads to lower performance because the direct goal mechanisms of effort, persistence, and choice are not sufficient when task strategies must be learned (Locke & Latham, 1990). Kanfer and Ackerman (1989) provided additional evidence and explanation for these effects from a skill acquisition perspective. Because performance on complex tasks is dependent on allocating resources to the development of successful strategies, difficult performance goals divert the allocation of these resources and therefore result in poorer task performance (Kanfer & Ackerman, 1989). More specifically, this interference and resulting poor performance has been demonstrated during learning of the task (Kanfer & Ackerman, 1989). When the task and strategies are well-known, specific, difficult goals have been shown to lead to greater performance (Locke & Latham, 1990). With respect to the current results, since the task was similar in structure to those used by the previously described studies, it is not surprising that the negative goal effects were found. Although training was provided in the current context, it may simply have not been enough. The improvement in average performance accuracy between Time 1 and Time 2 provides additional evidence in support of this explanation.

Given the previous results with respect to the main effect for goals, little support was expected for the hypotheses related to the interaction of goals and competitive orientation. In fact, no significant interactive effects were observed when either accuracy or quantity was used as the performance measure.

However, despite the lack of significant effects on the primary outcome variable

(i.e., performance), results did provide a basis for testing the hypothesized similarity of goals and situation competitiveness. Based on the assertion of Locke & Latham (1990), these independently manipulated factors should have demonstrated similar relationships with other key study variables. In fact, their respective relationships with a key perceptual variable were not the same. The observed correlation between situation competitiveness and the measure of perceived situational competitiveness was $r(148) = .64$, $p < .05$, while the correlation between goal situation and the measure was $r(148) = .00$, n.s. Additionally, the relationships among commitment across conditions (see Table 3) further suggested that these situational characteristics had independent effects. Specifically, significant relationships were observed between goals and commitment to assigned and personal goals for all three time periods, while only assigned commitment at Time 1 and Time 2 was significantly related to situation competitiveness. In short, goals were significantly related to key goal perceptions and situation competitiveness was related to key competitiveness perceptions, but the various perceptions were unrelated. These data are taken as further evidence that situation competitiveness and goals are not the same. However, due to the lack of significant results with respect to the performance measures for either of these situational factors, it is unclear to what extent these perceptual differences impact individual processes and outcomes.

This study also examined the roles of acceptance and commitment to assigned instructions. Specifically, it was predicted that competitive individuals would be more likely to accept instructions that emphasized interpersonal comparisons than non-competitive individuals. Conversely, non-competitive individuals would be more likely

to accept instructions that emphasized intrapersonal comparisons than competitive individuals. While these predictions were supported at Time 1, they did not receive empirical support at either of the other time periods. Instead of the predicted interactive effects, only situation competitiveness was significantly related to acceptance. Thus, these results suggest that competitive situations (i.e., where individuals are given instructions emphasizing interpersonal comparisons and provided public feedback regarding their performance) will yield greater goal acceptance than non-competitive situations. However, the mixed results preclude drawing strong generalizations.

Predictions regarding the expected role of commitment were also tested in the current study. Because acceptance was defined as a necessary precursor to commitment, commitment to assigned or personal goals was hypothesized to mediate the relationships among goal situation, situation competitiveness, competitive orientation, and performance. Since there were no zero order relationships between commitment and performance, the hypothesis of mediation was not examined (James & Brett, 1984).

Although hypotheses were presented only in terms of performance accuracy, the structure of the experimental task allowed the gathering of performance quantity data as well. Given that most of the significant effects were observed in analyses including performance accuracy, there is some evidence to suggest that the structure of the task did result in people focusing on the accuracy dimension of task performance. An interesting research design would be to provide instructions which alternatively directed

individuals to focus on the quantitative aspects of their performance.

Self-efficacy was another variable predicted to be an important component in the conceptual model. Specifically, the current study examined its role as an endogenous variable. Results were generally supportive of the expected relationship between self-efficacy and performance. Specifically, individuals who performed more accurately reported greater post-task self-efficacy. Additionally, experience alone was not enough to increase self-efficacy evaluations, as evidenced by the non-significant relationship between the quantity measures of performance and post-task self-efficacy judgments. That is, individuals who reported efficacy for this task were those who had more positive task feedback. These results have a number of applied implications. For example, consider the implications of these results to employee training programs. Given the results of the current study, these programs should not simply expose individuals to new processes and procedures with repeated exposure, but also these exposures should provide individuals with positive task experiences as a way toward increasing feelings of self-efficacy. In fact, recent research has suggested that training programs should not only focus on teaching critical skills, but should also enhance trainees' self-efficacy for the task (Tannenbaum & Yukl, 1992).

An additional effect observed with respect to self-efficacy was the relationship between competitive orientation and pre-task self-efficacy. Specifically, a significant correlation, $r(148) = .18$, $p < .05$, was found. The fact that competitiveness and self-efficacy may be related has important implications. Consider that competitiveness was found to be related to performance accuracy, with more competitive individuals

performing better. Also, the relationship between performance accuracy and self-efficacy was significant. Because people with feelings of greater pre-task self-efficacy may be more likely to take on new tasks, the fact that they may be more competitive suggests that they will likely perform better which would then result in greater post-task self-efficacy. Additional research examining the underlying relationship between these two constructs would be likely to provide important information about the psychological mechanisms that may be responsible for an individual's competitive orientation.

A final variable that was examined in the current study, task satisfaction, also demonstrated significant effects with other key variables. Specifically, predictions that performing well on a task would be positively related to resulting satisfaction with the task were supported. These results provide some support for the assertion that the direction of causality between job satisfaction and performance to be opposite from early satisfaction research (Riggio, 1990). That is, people who are satisfied at work are those that perform well and not that satisfaction causes better performance. Of course, these data cannot completely refute the hypothesis that satisfaction causes performance because no additional performance measures were collected after individuals provided responses to the satisfaction scale. Additional research related to this relationship should be directed toward gathering this type of information.

To summarize, support for some of the predicted relationships in the current model was found. Interestingly, early relationships in the proposed model and later relationships tended to have been supported, while the intervening processes were not.

Specifically, manipulated factors had significant effects on proximal perceptual variables as well as some performance and individual outcome variables. However, the intervening processes may have been complicated by individual's learning processes and focus on the development of task performance strategies. This may suggest that the relatively simple models that have been offered to describe the underlying processes associated with competitive orientation, situation competitiveness, and goals (e.g., Monsaas and Englehard, 1990; Matheson and Mathes, 1991; and Locke and Latham, 1990) should be closely examined in order to understand the motivational mechanisms that operate within a complex work environment. It was suggested earlier that integrating theories and constructs across areas of psychology might lead to a greater understanding of motivation. The results of the current study have supported this suggestion by demonstrating the potential importance of competitiveness, both as an individual and a situational characteristic, within the area of work motivation. Specifically, the integration of ideas within the current study has suggested one aspect of goal setting theory that requires further examination.

Limitations to the Generalizability of Results

A number of problems with the current experiment may have resulted in the failure to support some of the key research hypotheses. Specifically, the impact of the complexity of the research design, the complexity of the task itself, the conceptualization and operationalization of the commitment variable, and the nature of the situation competitiveness manipulation on the observed results are discussed in the

current section.

One potential limitation of the current study may have been associated with the complexity of the study design. Consider the two primary issues addressed in the current study: (1) the independence of situation competitiveness and goals and (2) the role of competitive orientation within traditional work situations. The current study attempted to examine both of these issues within the same research design. As a result, individuals were exposed to situations which had instructions that emphasized both goal and competitive dimensions. In fact, results did provide important evidence related to the issue of situation competitiveness and goal independence. However, the interactive effects of either goals or situation competitiveness with competitive orientation were not observed. This may have been due to the presence of both factors in all situations. For example, consider the hypothesized relationships involving the goal level manipulation. Primarily, these predictions were derived from traditional goal setting research that has used relatively simple tasks (e.g., solving anagrams) in which the only situational variant was goal level. As more recent goal setting research has demonstrated (e.g., Locke & Latham, 1990), as experimental situations become more complex (i.e., multiple independent variables), the typical effects for goals are not always observed. Likewise, studies that have examined the impact of situation competitiveness on behavior (e.g., Martin & Gill, 1991) have not traditionally included other situational factors. With the previous considerations in mind, the failure to find evidence in support some of the predicted hypotheses may have been related to the differences in experimental design of this study from those that were used to gather

data on which the specific predictions were based.

Another potential limitation of the current study is related to the task itself. Specifically, the task may have been too complex to test the basic propositions of the current research. Both of the situational characteristics (situation competitiveness and goals) were proposed to influence individuals' basic motivation to perform a task. However, the variance in task performance in the current study may have been due to factors other than motivation. Evidence for this is the finding of "negative" (i.e., "do your best" goals resulting in better task performance than difficult goals) goal effects. Such results have typically been observed in experiments that have utilized complex decision tasks. As the previous discussion of these effects has suggested, a potential reason for observing these results is that when tasks are complex (i.e., require the development of strategies), goals may interfere with performance by detracting from an individual's available cognitive resources. In short, when individuals are in the process of learning a task, goals do not generally result in positive effects on performance. In the current study, although individuals were provided with training and given practice on the task, there was additional learning occurring during the experiment. As a result, the current task may have presented a more complex situation than the theory was able to describe.

A third potential problem related to the current study is the conceptualization and operationalization of commitment. Because commitment has been demonstrated to be an important intervening variable within the goal setting literature (Locke & Latham, 1990), the proposed model included it as a mediator. However, given that

instructions included not only a goal dimension, but also a competitive dimension, commitment was conceptualized and operationalized to reflect these dimensions. While the operationalization was consistent with the construct in the current study, an important question is "With goals and competition instructions mixed, is the construct of commitment the same as commitment as traditionally defined in the goal setting literature?" Within the context of the current study, a better understanding of this modified conceptualization and resulting operationalization of commitment are clearly needed. Additionally, these issues related to commitment may be important to consider in other goal setting studies as well. That is, when other situational factors are present, goal commitment may no longer be a relevant construct as it has been traditionally been defined. This issue further illustrates the fact that goal setting research has often taken a fairly myopic view of goals. It is likely that in most "real world" contexts, goals occur in situations that are rich and varied including other motivational forces such as rewards/punishments, expectancies, and competition. These other situational characteristics may change the nature of the goal-performance relationship. More research examining goals in more richly developed contexts is needed to further understand the effects and processes of goals.

One final problem to be addressed is the potential lack of "true" competition. While the manipulation of situation competitiveness was perceived by individuals, there is no way of knowing the absolute strength of this manipulation. Theoretically, there is likely a continuum on which situations can vary in terms of competitiveness. Within the relatively narrow scope of the current study (i.e., two situations), there is little way

of knowing where the manipulations were on this continuum. For example, another competitive situation may have been used in which individuals not only received public feedback, but could also directly observe the performance of each other. For reasons of control, the current study did not examine the effect of this type of situation on performance. However, if this latter situation is "more" competitive than the one used in the current study, difference results may have been observed. As already discussed, the issue of situation "strength" could have important implications for observing the predicted interactions of competitive orientation and situation competitiveness. Future research on the effects of situation competitiveness should examine the relative strength of various situations.

Future Research

A number of research questions that could be pursued by future researchers in this area have already been presented in various sections of this paper. The purpose of this final section is to describe the critical questions that must be addressed in terms of examining the role of competitiveness as an individual difference variable within organizational contexts.

The current study has illustrated the potential importance of competitive orientation as a construct within traditional work settings. However, many unanswered questions remain regarding this construct. First, although previous research has demonstrated the influence of competitive orientation on a variety of indices of performance, little work in the area of construct development has been done.

Specifically, little, or no, research evidence has been presented that speaks to the construct validity of competitive orientation or the number of measures that have been used to assess it. Additionally, there have been few systematic attempts that have examined the set of relationships between competitive orientation and other similar constructs (i.e., achievement motivation, self-efficacy, cooperative orientation). Future research should take a more basic focus of the competitive orientation construct and try to establish some evidence that would address these very fundamental construct-related concerns. A more detailed examination of the construct would provide a better understanding of the motivational role that competitive orientation plays within a variety of performance contexts.

Yet another set of research questions related to understanding the fundamental mechanisms underlying competitive orientation should focus on the proposed relationship with situation competitiveness. As previously discussed, situations likely vary in terms of their competitiveness. Until a thorough understanding of this "competitiveness continuum" is achieved, the nature of a proposed person/situation interaction will not be known. This interaction has important implications for researchers in the area of I/O within the areas of personnel selection and job redesign. For example, consider the importance of understanding the nature of situation competitiveness within the framework of job analysis. If sound measures of competitive orientation and situation competitiveness existed, this information could ultimately be used to aid in the selection of new employees.

In conclusion, although there have been questions about the role of competitiveness as both an individual difference and a situational factor, there continue to be many people and situations that are defined as competitive. The current study was an initial attempt toward understanding the nature of this relationship within a traditional organizational paradigm. While evidence regarding the independence of situation competitiveness and goals, there was little evidence with respect to the predicted person-situation interaction. As a whole, the integration of concepts across research areas has demonstrated some useful relationships and also suggested some interesting areas for future research. Because of the importance of the topic of motivation within the psychological literature, future attempts toward the integration of concepts would likely provide additional critical information. Thus, not only did this study provide useful answers to some important questions, but also it stimulated the development of new research questions that will continue to provide an integration of ideas and methods across psychological areas.

APPENDICES

APPENDIX A

APPENDIX A

NAVAL AIR DEFENSE SIMULATION

TRAINING MANUAL

INTRODUCTION

The year is 1996 and you are part of a U.S. naval carrier group's command and control team stationed in the Middle East. A regional conflict between two nations in this area has recently broken out, and your mission is to protect seagoing commercial traffic in the area from accidental or intentional attacks. As history indicates, this is a highly sensitive task. For example, in 1987, an Iraqi jet accidentally fired two Exocet missiles into the Frigate U.S.S. Stark, killing 37 American servicemen and crippling the vessel. One year later, the U.S.S. Cruiser Vincennes accidentally shot down an Iranian passenger plane killing 290 innocent civilians. Any repeat of mistakes of this kind will probably lead to a withdrawal of American forces from the area. Such a withdrawal would have disastrous economic and political ramifications that would spread well beyond this region.

THE TASK FORCE

A naval carrier battle group team is an awesome array of ships and support units. It has a concentric ring of missile firing warships which protect the aircraft carrier at its center. The aircraft carrier in return provides an overall umbrella of air protection for the entire task force. The carrier's 90 planes can unleash air strikes against targets at land, sea, and even under water. A carrier group can dominate up to 196,000 square miles of ocean. A standard carrier group consists of six ships; the Carrier itself, two Ticonderoga class Aegis Cruisers, two anti-air Destroyers, and a submarine.

A carrier group is also supported by AWACs reconnaissance planes and a land based Coastal Air Defense (CAD) unit. Although the Carrier itself is equipped with some air patrol capacities, the Cruisers, AWACs, and CAD units provide the bulk of air traffic patrol. Taken together, the air patrol groups on the Carrier, the Cruiser, the AWACs, and the CAD unit make up the command and control team.

MISSION

You role in this simulation is the Commanding Officer (CO) of a Carrier. Your mission is to monitor the air space surrounding the carrier group, making sure that neutral ships are not attacked. In performing this role, you must make certain that you do not allow loss of life resulting from accidental or intentional attacks on ships in the task force. At the same time, it is also of paramount importance that you do not inadvertently shoot down friendly military aircraft or any civilian aircraft. Many passenger flights move in and out of the region, and friendly military aircraft from nations not involved in the conflict also patrol the area. The navy can ill-afford any mistakes of either the Stark or Vincennes variety.

DECISIONS

Your task is to decide what response the carrier group should make toward incoming aircraft. Aircraft that are being tracked on radar are called targets. You base your decisions on data you collect by measuring characteristics of the air targets. These measures are obtained from sophisticated radar equipment. You must make a critical choice regarding each target. There are five potential responses, IGNORE, MONITOR, WARN, READY, DEFEND. These are described below:

IGNORE: This means that the carrier group should devote no further attention to the target and instead focus on other possible targets in the area. The group should never ignore a target that might possibly attack. This would most assuredly lead to loss of lives on the ship attacked.

MONITOR: This means that the carrier group should continuously track the target on radar. A carrier group can only monitor a few targets, thus monitoring diminishes the group's overall patrol capacity.

WARN: This means that the carrier group sends a message to the target identifying the group and alerting the target to steer clear. Warning targets that should be ignored detracts from the salience of legitimate warnings. Warning targets that intend to attack is also bad, since the warning makes it easier for the attacker to locate the ship.

READY: This means to steer the ship into a defensive posture and to set defensive weapons on automatic. A ship in a readied position is rarely vulnerable to attack. This stance should not be taken to non-threatening targets since weapons set to automatic often fire mistakenly at innocent targets that fly too close to the carrier group. A ship in this position cannot readily take offensive action toward the target.

DEFEND: This is "weapons away" and means to attack the target with Tomahawk cruise missiles. A defend decision cannot be aborted once initiated. Defend is an appropriate response only when you feel an attack is imminent.

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CHARACTERISTICS OF TARGETS

The incoming air targets can be measured on nine attributes. These are listed below along with the ranges of possible values on the attributes:

(1) **SPEED:** 150 to 800 miles per hour (mph)

(2) **ALTITUDE:** 5,000 to 35,000 feet

(3) **SIZE:** size of the target ranging from 10 meters to 65 meters

(4) **ANGLE:** -15 degrees (rapid descent) to +15 degrees (rapid ascent)

(5) **IFF:** stands for "Identification Friend or Foe". This is a radio signal that identifies whether an aircraft is civilian, para-military or military, and ranges from 0.2 Mhz (an airliner) to 1.8 Mhz (a fighter)

(6) **DIRECTION:** from +30 degrees (passing far to the east or west of the carrier) to 0 degrees (coming straight to the carrier)

(7) **CORRIDOR STATUS:** a corridor is a lane open to commercial air traffic. It is expressed in terms of miles from the center of the corridor, ranging from 0 miles (in the middle of it) to 30 miles (way out of it)

(8) **RADAR TYPE:** the kind of radar possessed by the aircraft ranging from Class 1 (weather radar only) to Class 9 (weapons radar)

(9) **RANGE:** distance of the aircraft from the Carrier ranging anywhere from 20 to 200 miles

DETERMINING THE LEVEL OF THREAT

In general, the degree to which an incoming target is threatening depends on its standing on the nine attributes. There are five simple rules to remember in determining the danger associated with any target:

(a) all else equal, in terms of IFF, military targets are more threatening than civilian targets (see attribute #5).

(b) SPEED and DIRECTION go together, so that fast targets coming straight in are most threatening (see #1 & #6 above). Speed alone and direction alone mean nothing. There is nothing to fear if fast targets are not headed toward the group. There is nothing to fear from objects headed directly for the group that are moving slowly.

(c) ANGLE and RANGE go together, so that descending targets that are close are especially threatening (see #4 & #9 above). Angle alone and range alone mean nothing. Descending targets that are far away, or close targets that are on the way up are not threatening.

(d) ALTITUDE and CORRIDOR STATUS go together, so that low flying targets that are way outside the corridor are especially threatening (see #2 & #7 above). Altitude alone and corridor status alone mean nothing. There is nothing to fear from high targets flying well outside the corridor or low flying targets in the middle of the corridor.

(e) SIZE and RADAR go together, so that small objects with weapons radar are especially threatening (see #3 & #8 above). There is nothing to fear from small targets with weather radar or from large targets with weapons radar.

RANGE OF ATTRIBUTES

The following chart will help you determine the level of threat associated with the different values on all nine attributes.

	DEGREE OF THREAT		
	Non Threatening	Somewhat Threatening	Very Threatening
Speed	100-275 mph	325-500 mph	600-800 mph
Altitude	35,000-27,000 ft	23,000-17,000 ft	13,000-5,000 ft
Size	65-43 m	37-23 m	17-10 m
Angle	+15 to +8 dgs	+3 to -3 dgs	-8 to -15 dgs
IFF	.2 to .6 Mhz	.9 to 1.1 Mhz	1.4 to 1.8 Mhz
Direction	30 to 22 dgs	18 to 12 dgs	8 to 0 dgs
Corridor Status	0 to 8 mi	12 to 18 mi	22 to 30 mi
Radar Type	Class 1 & 2	Class 5	Class 8 & 9
Range	200 to 110 mi	90 to 60 mi	40 to 1 mi

HOW RULES COMBINE TO DETERMINE JUDGMENTS

The five rules combine to determine the overall threat represented by the target. For example, if you detected (1) a military aircraft that is (2) flying in straight and fast, (3) was close and descending, (4) was flying low and way outside the corridor and (5) was small and had weapons radar; the ship is being attacked and should DEFEND.

If the you detected (1) a civilian aircraft, (2) passing slow at an angle, (3) was far away and ascending, (4) was flying high and in the middle of the corridor and (5) was large and had weather radar; this is a passenger plane that should be IGNORED.

Intermediate responses like MONITOR, WARN, or READY are to be used when the target is threatening according to some of the rules, but not all. For example, a military aircraft that is close and descending (see Rule c), small and with weapons radar (see Rule e), but is travelling slowly at an angle to the group (see Rule b), and is high and in the middle of the corridor (see Rule d) might need to be WARNED. It should not be IGNORED, but also should not be shot down.

PATROL SESSIONS

The "Sea Screen". A patrol session is the time that you are responsible for monitoring air traffic in your designated area. While you are monitoring traffic, you will be stationed at a computer monitor. When this screen has a Carrier icon on it, you are in the "Sea Screen" mode. This means that there is a target (i.e. a red dot) in your airspace that needs to be assessed. The target will begin to blink and beep at an increasing rate when there is less than 30 seconds to respond. If you fail to make any decision with respect to the target, this will be treated as if you decided to IGNORE it.

The "Feedback Screen". When a patrol session is over, you will receive an immediate report telling you how well you performed. It will inform you of your decision, the correct decision, and the outcome of the session. There are five possible outcomes from an encounter, HIT, NEAR MISS, MISS, INCIDENT, and DISASTER. Your effectiveness will be expressed in terms of points associated with each of these outcomes. The outcomes and their point values are:

HIT: A hit means that your decision was exactly correct. For example, the target should have been "warned" and that was exactly what you decided. A hit is worth 2 points to your overall score. The color bars at the top and bottom of the screen will be green when this occurs.

NEAR MISS: A near miss means that you were off by one place in terms of your aggressiveness level. For example, if your decision was a "warn" when it should have been "monitor" this would be a near miss (a little too aggressive). It would also be a near miss if your decision was "warn" when it should have been "ready" (a little too passive). A near miss is a pretty good outcome. A near miss is worth 1 point. The color bars at the top and bottom of the screen will be aquamarine when this occurs.

MISS: A miss means that your decision was off by two places. This is worth 0 points. The color bars will be purple when this occurs.

INCIDENT: An incident means that your decision was off by three places. An incident means that you just narrowly avoided disaster (e.g., being hit yourself or mistakenly shooting down a friendly target). This outcome results in a loss of 1 point. The color bars will be red when this occurs.

DISASTER: A disaster means that your decision was off by four places. This outcome results in a loss of 2 points. The color bars will be black in this case.

APPENDIX B

APPENDIX B

Competitive Orientation Measure

Using the scale below indicate your agreement with the following items. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither Agree nor Disagree*
4 = *Agree*
5 = *Strongly Agree*

___ 1. When taking part in games or sports contests, I feel determined to always come in first, or otherwise win.

___ 2. When I take a test for a class, I try to get the best grade in the class.

___ 3. Winning is not that important to me.

___ 4. If someone does better than me at something, I feel irritated.

___ 5. I don't care if I get the highest grade in a class.

___ 6. When I play a game, I try to do the best I can.

___ 7. It's important to win in order to impress other people.

___ 8. When I was growing up, I always competed against my siblings, or friends.

___ 9. I only enjoy tasks that result in a winner and loser.

___ 10. When I take part in a game I try to perform as well as I can and don't worry about winning or losing.

___ 11. Knowing how well others are performing a task affects my performance by making me try to do better than them.

APPENDIX C

APPENDIX C

TASK KNOWLEDGE TEST

PART 1: Select the correct answer for each of the questions below. Make sure to mark your answers ONLY on the computer form provided. **PLEASE DO NOT MAKE ANY MARKS ON THE TEST BOOK!!**

1. 650 miles per hour represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

2. 14 degrees of direction represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

3. 50 meters represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

4. Class 3 radar type represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

5. 1.5 Mhz represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

6. 0 degrees of angle represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

7. 175 miles for range represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

8. 15,000 foot altitude represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

9. 25 miles outside the corridor represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

10. 20 meters represents which of the following?

   a) A non-threatening target.
   b) A somewhat threatening target.
   c) A very threatening target.
   d) A target on the border between two threat levels.

11. Class 8 radar type represents which of the following?

    a) A non-threatening target.
    b) A somewhat threatening target.
    c) A very threatening target.
    d) A target on the border between two threat levels.

12. .5 Mhz represents which of the following?

    a) A non-threatening target.
    b) A somewhat threatening target.
    c) A very threatening target.
    d) A target on the border between two threat levels.

13. 300 miles per hour represents which of the following?

    a) A non-threatening target.
    b) A somewhat threatening target.
    c) A very threatening target.
    d) A target on the border between two threat levels.

14. 28 degrees of direction represents which of the following?

    a) A non-threatening target.
    b) A somewhat threatening target.
    c) A very threatening target.
    d) A target on the border between two threat levels.

15. -12 degrees of angle represents which of the following?

    a) A non-threatening target.
    b) A somewhat threatening target.
    c) A very threatening target.
    d) A target on the border between two threat levels.

16. 55 miles for range represents which of the following?

    a) A non-threatening target.
    b) A somewhat threatening target.
    c) A very threatening target.
    d) A target on the border between two threat levels.

17. 27,500 foot altitude represents which of the following?

    a) A non-threatening target.
    b) A somewhat threatening target.
    c) A very threatening target.
    d) A target on the border between two threat levels.

18. 5 miles outside the corridor represents which of the following?

    a) A non-threatening target.
    b) A somewhat threatening target.
    c) A very threatening target.
    d) A target on the border between two threat levels.

19. All else equal, which of the following is/are characteristic(s) of a threatening target?

    a) High flying targets.
    b) Military targets.
    c) Targets with weather radar
    d) 2 of the above are characteristics of a threatening target.
    e) 3 of the above are characteristics of a threatening target.

20. All else equal, which of the following is/are characteristic(s) of a threatening target?

    a) Targets that are high flying.
    b) Targets with weather radar.
    c) Targets that are fast and inside the traffic corridor.
    d) Targets that are descending and close.
    e) Targets that are large and descending.

21. All else equal, which of the following is/are characteristic(s) of a threatening target?

    a) Targets that are large.
    b) Targets with weather radar.
    c) Targets that are fast and coming straight in.
    d) Targets that are small and inside the traffic corridor.
    e) Targets that are ascending and close.

22. Which of the following combinations represents a more threatening target?

a) Weather radar and small targets.
b) High flying and inside the traffic corridor.
c) Fast and straight on targets.
d) Close and land radar targets.
e) Outside the traffic corridor and descending targets.

23. Which of the following combinations represents a more threatening target?

a) Slow and land radar targets.
b) High flying and fast targets.
c) Descending and inside the traffic corridor targets.
d) Small targets with weapons radar.
e) Close and ascending targets.

24. Which of the following combinations represents a more threatening target?

a) Slow and land radar targets.
b) High flying and fast targets.
c) Descending and inside the traffic corridor targets.
d) Inside the traffic corridor and low flying targets.
e) Close and descending targets.

25. Which of the following combinations represents a more threatening target?

a) Slow and land radar targets.
b) High flying and fast targets.
c) Descending and inside the traffic corridor targets.
d) Outside the traffic corridor and low flying targets.
e) Close and ascending targets.

PART 2: For the following targets, make the appropriate decision regarding the defensive posture which you should take. Mark your answers ONLY on the computer form provided. **PLEASE DO NOT MAKE ANY MARKS ON THE TEST BOOK!!**

26. **SPEED:** 172 mph
ALTITUDE: 10,248 ft
SIZE: 10 m
ANGLE: -14 dgs
IFF: 1.3 Mhz
DIRECTION: 4 dgs
RADAR: Class 2
RANGE: 31 miles
CORRIDOR STATUS: 29 miles

Your Decision:

a) IGNORE
b) MONITOR
c) WARN
d) READY
e) DEFEND

27. **SPEED:** 321 mph
ALTITUDE: 26,605 ft
SIZE: 41 m
ANGLE: +9 dgs
IFF: .7 Mhz
DIRECTION: 21 dgs
RADAR: Class 4
RANGE: 108 miles
CORRIDOR STATUS: 19 miles

Your Decision:

a) IGNORE
b) MONITOR
c) WARN
d) READY
e) DEFEND

28. **SPEED:** 291 mph
ALTITUDE: 14,321 ft
SIZE: 21 m
ANGLE: -6 dgs
IFF: .7 Mhz
DIRECTION: 9 dgs
RADAR: Class 6
RANGE: 101 miles
CORRIDOR STATUS: 21 miles

Your Decision:

a) IGNORE
b) MONITOR
c) WARN
d) READY
e) DEFEND

29. **SPEED:** 591 mph
ALTITUDE: 14,016 ft
SIZE: 19 m
ANGLE: -6 dgs
IFF: 1.3 Mhz
DIRECTION: 9 dgs
RADAR: Class 7
RANGE: 43 miles
CORRIDOR STATUS: 11 miles

Your Decision:

a) IGNORE
b) MONITOR
c) WARN
d) READY
e) DEFEND

30. **SPEED:** 172 mph
ALTITUDE: 10,248 ft
SIZE: 14 m
ANGLE: -14 dgs
IFF: 1.6 Mhz
DIRECTION: 4 dgs
RADAR: Class 2
RANGE: 31 miles
CORRIDOR STATUS: 23 miles

Your Decision:

a) IGNORE
b) MONITOR
c) WARN
d) READY
e) DEFEND

APPENDIX D

APPENDIX D

Self-Efficacy Scale

Using the scale below indicate your level of agreement with the following items. These items are intended to measure your confidence in performance the Naval Air Defense Simulation. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither Agree nor Disagree*
4 = *Agree*
5 = *Strongly Agree*

___ 1. I feel confident in my ability to perform the Naval Air Defense Simulation effectively.

___ 2. I think I can eventually reach a high level of performance on the Naval Air Defense Simulation.

___ 3. I am sure I can learn how to perform this task effectively in a relatively short period of time.

___ 4. I don't feel that I am as capable of performing the Naval Air Defense Simulation as other people.

___ 5. On average, other people are probably much more capable of performing this task as I am.

___ 6. I generally perform poorly on tasks like this.

___ 7. I am sure that I can reach a high level of performance on this task.

___ 8. It would take me a long time to learn how to perform this task effectively.

___ 9. I am not confident that I can perform this task successfully.

___ 10. I doubt that my performance will be very adequate on the Naval Air Defense Simulation.

APPENDIX E

APPENDIX E

Task Performance Inventory

Name: _____

ID#: _____

The following items are intended to measure various aspects of your task performance. Please respond honestly and completely to all of the following items.

1.	Which of the following represents the situation in which you are performing this experiment? (Please mark only one)
	To maintain a performance level of at least 0.22 greater than my competition.
	To maintain a performance level of no less than 0.22 lower than my competition.
	To try to outperform my competition.
	To maintain a performance level of at least 1.52.
	To maintain a performance level of at least 1.08.
	To perform as well as possible.

With the above goal in mind, please respond to the following set of items using the scale below.

5 = *Strongly Disagree*
4 = *Disagree*
3 = *Neither Agree nor Disagree*
2 = *Agree*
1 = *Strongly Agree*

___ 2. It's hard to take this goal seriously.

___ 3. It's unrealistic for me to expect to reach this goal.

___ 4. It is quite likely that this goal may need to be revised, depending on how things go.

___ 5. Quite frankly, I don't care if I achieve this goal or not.

___ 6. I am strongly committed to pursuing this goal.

___ 7. It wouldn't take much to make me abandon this goal.

___ 8. I think this goal is a good goal to shoot for.

9. Sometimes, even when an individual has been assigned a particular goal, he or she may choose to work toward a different goal. Please indicate what your personal goal is in this experiment. It may be the same or different from the one that you were assigned. Also, it may be a specific average score (i.e., 1.3 points) or it may be to simply beat the other person you are completing the task with.

My personal goal in this experiment is _____.

With the above personal goal in mind, please respond to the following set of items using the scale below.

5 = *Strongly Disagree*
4 = *Disagree*
3 = *Neither Agree nor Disagree*
2 = *Agree*
1 = *Strongly Agree*

___ 10. It's hard to take this goal seriously.

___ 11. It's unrealistic for me to expect to reach this goal.

___ 12. It is quite likely that this goal may need to be revised, depending on how things go.

___ 13. Quite frankly, I don't care if I achieve this goal or not.

___ 14. I am strongly committed to pursuing this goal.

___ 15. It wouldn't take much to make me abandon this goal.

___ 16. I think this goal is a good goal to shoot for.

17. Please divide **100 points** to indicate the relative importance to you of:

    a. completing a large number of targets _____

    b. being as accurate as possible on each target _____

18. Past experience with this task has indicated that individuals use different strategies in attempting to perform well. In the space below, please indicate the strategy that you will, or are currently, using.

APPENDIX F

APPENDIX F

Perceptions of Situation Competitiveness

Using the scale below indicate your agreement with the following items. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither Agree nor Disagree*
4 = *Agree*
5 = *Strongly Agree*

___ 1. It didn't matter to me how well I did on this task because no one else knew how well I was doing.

___ 2. I wasn't aware of how well others were performing on this task.

___ 3. This situation was structured so that it was highly competitive.

___ 4. Other participants were aware of how well I was performing on this task.

___ 5. I felt pressured to perform better than others on this task because they knew how well I was doing.

___ 6. It was clear that my performance was being directly compared to another's.

___ 7. I really had to work hard to do well on this task.

___ 8. My performance on this task depended on things not under my control.

___ 9. I was not sure what my goal in this study was.

___ 10. I was concerned about what other people would think about my performance on this task.

APPENDIX G

APPENDIX G

Post-Performance Attitudes

Using the scale below indicate your level of agreement with the following items. These items are intended to measure your attitudes about performing the Naval Air Defense Simulation. Do not answer how you think you are expected to answer. Answer in an honest fashion.

1 = *Strongly Disagree*
2 = *Disagree*
3 = *Neither Agree nor Disagree*
4 = *Agree*
5 = *Strongly Agree*

___ 1. I enjoyed participating in the Naval Air Defense Simulation.

___ 2. I liked the task.

___ 3. I didn't enjoy participating in this experiment.

___ 4. If I had the opportunity, I would participate in this experiment again.

___ 5. I wish that I hadn't signed up for this experiment.

___ 6. After having completed the experiment, I felt satisfied.

___ 7. I would continue working on this task for a longer period of time if asked by the experimenter.

___ 8. All in all, I thought this task was boring.

___ 9. I would recommend participating in this experiment to my friends just because I enjoyed it.

APPENDIX H

APPENDIX H

CONSENT FORM

NAVAL AIR DEFENSE SIMULATION

This study investigates the impact of various goal situations on performance on a computer task. This session will last approximately 2 hours. You will be asked to work on the Naval Air Defense Simulation and to complete a series of questionnaire items.

Your participation in this study is strictly voluntary and you may refuse to answer any questions that you may find inappropriate without penalty. In addition, you can discontinue the experiment if you feel it necessary to do so. However, in order to receive credit you must FINISH the entire experiment. Your individual results in this study will be STRICTLY CONFIDENTIAL. The experimenter will only report data in an aggregate form. This procedure will ensure that no responses will be identified to particular individuals. These aggregate results of the experiment will be available from the experimenter.

If you have any questions or concerns following your participation in this study you may contact Ron Landis at 353-9166.

I have read the consent form and choose to participate in this study:

NAME: _____

SIGNATURE: _____

DATE: _____

APPENDIX I

APPENDIX I

Protocols for Experimental Conditions

After individuals completed the various pre-task measures, they were told the characteristics of the situation in which they would be working. The protocols for each condition are presented below.

Direct Competition/Difficult Goal (DCDG):

The experimenter said, "Now that you have had an opportunity to perform this task, I would like you to spend 1 hour working independently on it. Your goal is to maintain an average score of at least 0.22 higher than your competition. I will come into the room every 15 minutes to ask you to complete a brief questionnaire and to provide you with feedback on your performance level relative to your competition and will do the same for your competition. It is critical that you complete this task independently. As a result, I am asking you to refrain from speaking to others as you complete the task. If you talk during the experiment, you will forfeit your extra credit. If there aren't any questions, you may begin."

Direct Competition/Easy Goal (DCEG):

The experimenter said, "Now that you have had an opportunity to perform this task, I would like you to spend 1 hour working independently on it. Your goal is to maintain an average score of no less than 0.22 lower than your competition. I will come into the room every 15 minutes to ask you to complete a brief questionnaire and to provide you with feedback on your performance level relative to your competition and will do the same for your competition. It is critical that you complete this task independently. As a result, I am asking you to refrain from speaking to others as you complete the task. If you talk during the experiment, you will forfeit your extra credit. If there aren't any questions, you may begin."

Direct Competition/"Do Your Best" Goal (DCDYB):

The experimenter said, "Now that you have had an opportunity to perform this task, I would like you to spend 1 hour working independently on it. Your goal is to outperform your competition. I will come into the room every 15 minutes to ask you to complete a brief questionnaire and to provide you with feedback on your performance level relative to your competition and will do the same for your competition. It is critical that you complete this task independently. As a result, I am asking you to refrain from speaking to others as you complete the task. If you talk during the experiment, you will forfeit your extra credit. If there aren't any questions, you may begin."

No Competition/Difficult Goal (NCDG):

The experimenter said, "Now that you have had an opportunity to perform this task, I would like you to spend 1 hour working independently on it. Your goal is to achieve an average performance level of 1.52. I will come into the room every 15 minutes to ask you to complete a brief questionnaire and to provide you with feedback on your performance level relative to the assigned goal. It is critical that you complete this task independently. As a result, I am asking you to refrain from speaking to others as you complete the task. If you talk during the experiment, you will forfeit your extra credit. If there aren't any questions, you may begin."

No Competition/Easy Goal (NCEG):

The experimenter said, "Now that you have had an opportunity to perform this task, I would like you to spend 1 hour working independently on it. Your goal is to achieve an average performance level of 1.08. I will come into the room every 15 minutes to ask you to complete a brief questionnaire and to provide you with feedback on your performance level relative to the assigned goal. It is critical that you complete this task independently. As a result, I am asking you to refrain from speaking to others as you complete the task. If you talk during the experiment, you will forfeit your extra credit. If there aren't any questions, you may begin."

No Competition/"Do Your Best" Goal (NCDYB):

The experimenter said, "Now that you have had an opportunity to perform this task, I would like you to spend 1 hour working independently on it. Your goal is to do your best on this task. I will come into the room every 15 minutes to ask you to complete a brief questionnaire and to provide you with feedback on your performance level. It is critical that you complete this task independently. As a result, I am asking you to refrain from speaking to others as you complete the task. If you talk during the experiment, you will forfeit your extra credit. If there aren't any questions, you may begin."

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