

**The Role of 3-Dimensional State Goal Orientation
in the Process of Goal Establishment and Task Performance**

Benjamin Tyson Breland, IV

Dissertation submitted to the Faculty of
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Psychology

John J. Donovan, Ph.D. (Chair)

Roseanne J. Foti, Ph.D.

Neil M. A. Hauenstein, Ph.D.

Jack W. Finney, Ph.D.

Kevin D. Carlson, Ph.D.

May 4, 2004

Blacksburg, Virginia

Keywords: State Goal Orientation, Goals, Self-Efficacy, Mental Focus, Ability, Performance,
Self-Regulation, Work Motivation

**The Role of 3-Dimensional State Goal Orientation
in the Process of Goal Establishment and Task Performance**

by

Benjamin Tyson Breland, IV

Committee Chairperson: John J. Donovan

Psychology

(ABSTRACT)

The present research expanded upon the work of Breland and Donovan (in press) and examined the role of three-dimensional state goal orientation in an integrative model of goal setting and task performance. In addition, mental focus (Lee, Sheldon, & Turban, 2003) was also incorporated into the model. Results indicated that each of the three-dimensions of state goal orientation uniquely affected one's level of self-efficacy. More specifically, state learning goal orientation and state performance-approach goal orientation both enhanced an individual's level of self-efficacy, while state performance-avoidance goal orientation reduced their level of self-efficacy. In turn state goal orientation indirectly impacted mental focus, goals, and performance through its influence on self-efficacy. Implications of these findings as well as suggestions for future research on the personality construct of state goal orientation are discussed.

ACKNOWLEDGEMENTS

First, I would like to thank my advisor and committee chair, Dr. John J. Donovan, for his support and guidance throughout the years here at Virginia Tech. John Donovan has not only been there for me from an academic standpoint, but he has become a lifelong friend. His time and effort throughout the past year made this process an enjoyable and rewarding learning experience. By challenging me to think independently and to seek knowledge on my own, he allowed me to develop not only as a researcher, but also as an individual. I would also like to thank the other members of my committee, Dr. Roseanne J. Foti, Dr. Neil M. A. Hauenstein, Dr. Jack W. Finney, and Dr. Kevin D. Carlson for their contributions, their insightful suggestions greatly enhanced my research.

I would also like to thank my research assistants, Elizabeth Jarvis, Erin Froome, and Rob Grauzlis, for their help with running the computer task used by the participants in the study. The long hours and packed schedule were extremely appreciated. Their dedication to the study greatly aided in the timely completion of this research.

In addition, I would like to thank my family for their encouragement and understanding during this venture. I would like to thank my parents Diane and Norman Wand for giving me this opportunity. Their love and support, along with the occasional bragging, were invaluable. I would also like to thank my brothers, for setting their expectations for me so high that I had no other option but to complete this degree. I am also grateful for the unconditional love provided by my grandparents, Claudia and Ben Breland, Jr. and Frances H. Lamb. Finally, I would like to thank my father, Ben Breland, III, his encouragement throughout my childhood and academic career gave me the confidence to pursue my dreams and the ability to reach my goals. His memory will live on in all that I do.

TABLE OF CONTENTS

| | |
|--|-------------|
| ACKNOWLEDGEMENTS | iii |
| Chapter | Page |
| INTRODUCTION | 1 |
| Theoretical Model..... | 4 |
| GOAL ORIENTATION | 4 |
| Dispositional Goal Orientation | 4 |
| Dimensionality of goal orientation | 6 |
| Learning goal orientation..... | 8 |
| Performance-avoidance goal orientation | 9 |
| Performance-approach goal orientation | 10 |
| Goal orientation in current research..... | 11 |
| Learning goal orientation..... | 11 |
| Performance goal orientation..... | 12 |
| State goal orientation | 15 |
| Self-efficacy | 19 |
| Mental Focus..... | 24 |
| Goals | 26 |
| Performance | 27 |
| Cognitive Ability | 29 |
| Goal-Performance Discrepancies..... | 31 |
| METHODS | 32 |
| Participants..... | 32 |
| Procedure | 32 |
| Task..... | 33 |
| Measures | 34 |
| State goal orientation | 34 |
| Self-efficacy | 35 |
| Mental focus..... | 36 |
| Goals | 36 |
| Cognitive ability..... | 37 |
| Attention ability | 37 |
| Performance | 37 |
| Goal-Performance Discrepancies..... | 37 |
| Data Analysis | 38 |
| RESULTS | 38 |
| Descriptive Statistics..... | 38 |
| Original Model Analysis..... | 40 |
| Modification Indices of the Original Model | 43 |
| Exploratory Analyses..... | 45 |
| Goal-Performance Discrepancies..... | 45 |

| | |
|--|---------|
| Modification Indices for GPD Model | 46 |
| Choice | 47 |
| Prediction of performance..... | 48 |
| Incremental contribution of state goal orientation | 48 |
| DISCUSSION | 51 |
| Original Model..... | 51 |
| State Goal Orientation – Self-efficacy..... | 51 |
| State Goal Orientation – Mental focus..... | 56 |
| Self-Efficacy & Goals..... | 57 |
| Mental Focus - Performance..... | 58 |
| Cognitive Ability | 59 |
| Revised Original Model..... | 60 |
| Integrative Model Comparison | 61 |
| Exploratory Analyses..... | 63 |
| GPD Model | 63 |
| Choice | 64 |
| Additional Support for State Goal Orientation | 66 |
| Study Limitations..... | 66 |
| Implications..... | 68 |
| Conclusion | 71 |
| REFERENCES | 72 |
| APPENDICES | 101 |
| A. State Goal Orientation..... | 101 |
| B. General Task Self-Efficacy Measure | 102 |
| C. Goal and Strength/Magnitude Self-Efficacy Measure | 103 |
| D. Mental Focus..... | 104 |
| E. Attention..... | 105 |
| VITA | 106 |

LIST OF TABLES

| <u>Table</u> | | <u>Page</u> |
|--------------|---|-------------|
| 1 | Means, Standard Deviations, and Intercorrelations Among Trial 1 Variables | 87 |
| 2 | Means, Standard Deviations, and Intercorrelations Among Trial 2 Variables | 88 |
| 3 | Means, Standard Deviations, and Intercorrelations Among Trial 3 Variables | 89 |

| | | |
|----|---|----|
| 4 | Original Model Fit for Trial 1, 2, and 3 | 90 |
| 5 | Revised Original Model Fit for Trial 1, 2, and 3 | 90 |
| 6 | GPD Model Fit for Trial 2 and 3 | 91 |
| 7 | Revised GPD Model Fit for Trial 2 and 3..... | 91 |
| 8 | Stability of Measures across Trials | 92 |
| 9 | Influence of Ability, Mental Focus, Goals, and Self-Efficacy | 93 |
| | on Performance | |
| 10 | Influence of State Goal Orientation on Self-Efficacy..... | 94 |
| 11 | Influence of State Learning Goal Orientation on Self-Efficacy | 95 |
| 12 | Influence of State Performance-Approach Goal Orientation..... | 96 |
| | on Self-Efficacy | |
| 13 | Influence of State Performance-Avoidance Goal Orientation | 97 |
| 14 | Influence of State Goal Orientation on Self-Efficacy over and above | 98 |
| | Past Self-Efficacy and Past Performance | |

LIST OF FIGURES

| <u>Figure</u> | | <u>Page</u> |
|---------------|--|-------------|
| 1 | Theoretical Model..... | 4 |
| 2 | Original Model with Path Coefficients for Trials 1, 2, and 3 | 99 |
| 3 | Revised Original Model with Path Coefficients for Trials 1, 2, and 3 | 100 |

INTRODUCTION

The construct of goal orientation (Dweck & Leggett, 1988) has received a considerable amount of research attention within the field of work motivation during the past decade (e.g., Button, Mathieu, & Zajac, 1996; Chen, Gully, Whiteman, & Kilcullen, 2000; Phillips & Gully, 1997; Schmidt & Ford, 2003; VandeWalle, Brown, Cron, & Slocum, 1999). It has been considered a component in the goal establishment and task performance process (Chen et al., 2000; Elliot & Church, 1997; Phillips & Gully, 1997; Kanfer, 1992). In general, goal orientation refers to the goals that are implicitly pursued by individuals while attempting to attain or achieve a certain level of performance.

Research has demonstrated the relationship between goal orientation and the affective, cognitive, and behavioral reactions of individuals in achievement settings such as the classroom and athletics (e.g., Duda & Nicholls, 1992; Dweck & Leggett, 1988). More recent research has shown the important implications of goal orientation in training and employee contexts (e.g., Bell & Kozlowski, 2002; Brown, 2001; Fisher & Ford, 1998; Heimbeck, Frese, Sonnentag, & Keith, 2003; Kozlowski et al., 2001; Towler & Dipboye, 2001; VandeWalle et al., 1999; VandeWalle & Cummings, 1997). Specifically, goal orientation has been found to impact several key motivational processes, including the amount of effort individuals exert during pursuit of a performance goal (e.g., Fisher & Ford, 1998; VandeWalle et al., 1999), feedback seeking behavior (e.g., VandeWalle & Cummings, 1997), metacognitive activity (e.g., Schmidt & Ford, 2003), climate perceptions (e.g., Gonzalez-Roma, Peiro, & Tordera, 2002; Potosky & Ramakrishna, 2002), and the amount of goal revision individuals engage in when faced with goal failure (e.g., Donovan & Williams, 1999; Donovan & Swander, 2001). Perhaps most importantly, recent research has also suggested that an individual's goal orientation influences

the process of goal establishment and performance through its impact on self-efficacy (e.g., Beaubien & Payne, 1999; Mangos & Steele-Johnson, 2001; Phillips & Gully, 1997; Potosky & Ramakrishna, 2002; Steele-Johnson, Beauregard, Hoover, & Schmidt, 2000; VandeWalle, Cron, & Slocum, 2001).

Taken as a whole, this research literature appears to indicate that goal orientation may play a vital role in numerous processes related to the self-regulation of performance. However, it is important to realize that much of this research has conceptualized goal orientation as a dispositional trait variable that is relatively invariant over time and across performance contexts (e.g., Bell & Kozlowski, 2002; Button et al., 1996; Schmidt & Ford, 2003; VandeWalle, 1997). In contrast to this assumption, a growing body of work (e.g., Elliot & Church, 1997; Mangos & Steele-Johnson, 2001; Schmidt & Ford, 2003; VandeWalle, et al., 2001) has suggested that although individuals may possess dispositional goal orientations that provide a ‘default’ orientation across various settings, it is also likely that individuals may develop different state goal orientations in response to the characteristics of the performance environment they encounter. In addition, many researchers use situational manipulations of goal orientation in their studies, therefore, implicitly assuming that goal orientation fluctuates across situations (e.g., Gist & Stevens, 1998; Kozlowski, Gully, Brown, Salas, Smith, & Nason, 2001; Kraiger, Ford, & Salas, 1993; Martocchio, 1994; Stevens & Gist, 1997).

In a recent study by Breland and Donovan (in press), the role of state goal orientation was examined in the goal-establishment and task performance process. Consistent with the propositions of Kanfer (1990; 1992) and recent research by Chen et al. (2000), the results from this study indicated that dispositional goal orientation did not exert a direct influence on task self-efficacy as previously proposed but rather exerted an indirect influence on self-efficacy

through its impact on state goal orientation (i.e., Dispositional goal orientation → State goal orientation → Self-efficacy → Performance goals). Although each dimension of dispositional goal orientation was positively related to its associated state goal orientation dimension, an examination of the correlations among these variables indicated that individuals' state goal orientations were not simply a direct reproduction of their dispositional goal orientation (average $r = .30$ for performance goal orientation, $.38$ for learning goal orientation). This finding is consistent with current perspectives on dispositional goal orientation that argue that these orientations (learning goal orientation and performance goal orientation) provide a "default" orientation for individuals that are likely to be modified or overridden by elements of a specific environment (e.g., Button et al., 1996; Kozlowski et al., 2001).

Consistent with the above-mentioned research, the present study seeks to expand our knowledge of goal orientation with a reexamination of state-manifestations of the construct. More specifically, the present study proposes to expand upon previous research on goal orientation in two ways. First, when testing their model of the goal-establishment process, Breland and Donovan (in press) employed a two-dimensional model of state goal orientation. However, recent research on the goal orientation construct has begun to conceptualize goal orientation as a three-dimensional construct (e.g., Brett & Vandewalle, 1999; Dobbins, Bell, & Kozlowski, 2002; Lee, Sheldon, & Turban, 2003; Schmidt & Ford, 2003; Vandewalle et al., 2001). Therefore, it is important to explore these relationships from this three-dimensional perspective (i.e., state learning goal orientation, state performance-approach goal orientation, and state performance-avoidance goal orientation). Second, the present study incorporates the construct of mental focus into the model as a more proximal regulator of state goal orientation on performance (Elliot & Harackiewicz, 1996; Elliot & McGregor, 1999; Lee et al., 2003). The

present study will allow for a more comprehensive view of state manifestations of goal orientation and the proximal regulators involved in the processes of goal establishment and task performance.

Theoretical Model

The theoretical model proposed in this research is presented in Figure 1. In order to elaborate upon the relationships proposed above, the components of this model and their interrelationships will now be discussed.

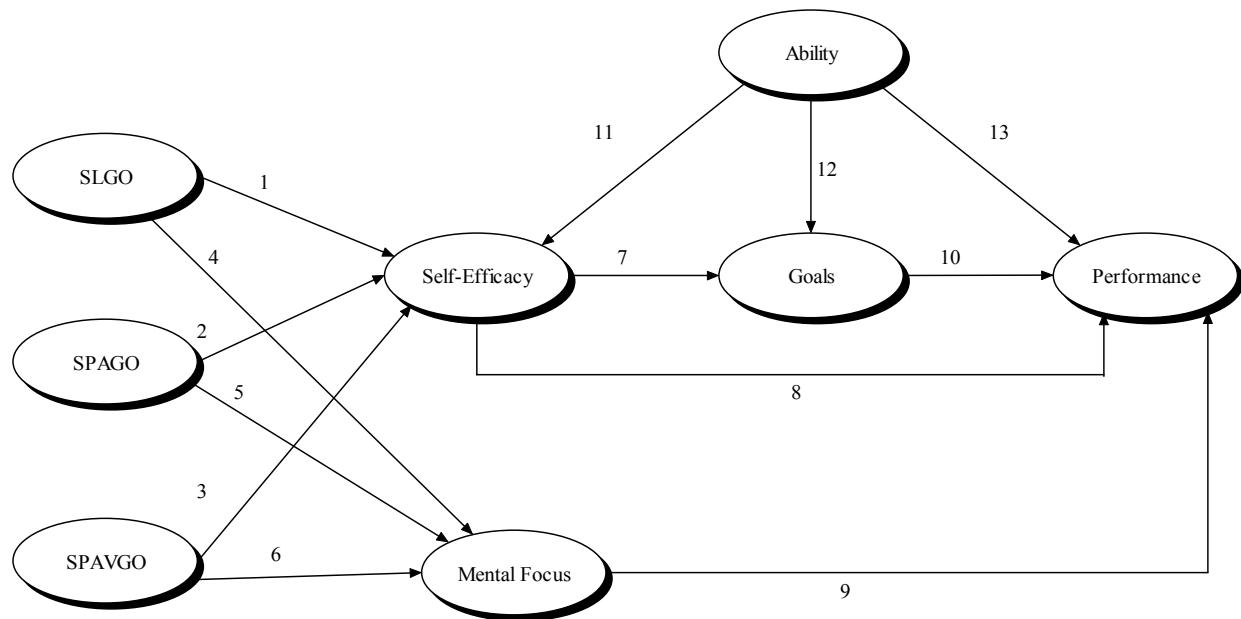


Figure 1. Proposed theoretical model: SLGO = State Learning Goal Orientation, SPAGO = State Performance Approach Goal Orientation, and SPAVGO = State Performance Avoidance Goal Orientation.

Goal Orientation

Dispositional Goal Orientation

Early work by Dweck and colleagues with children in achievement settings (e.g. Diener & Dweck, 1978; 1980; Dweck, 1975; Dweck & Reppucci, 1973) led to the identification of two behavioral response patterns that emerged when children were faced with challenging tasks. The

first of these behavioral patterns, characterized by maladaptive responses, was termed a “helpless” pattern. Children adopting a helpless behavior pattern tended to avoid challenging tasks and decreased their level of performance when confronted with a difficult situation.

The second behavioral pattern, characterized by adaptive responses, was termed a “mastery-oriented” pattern. In contrast to a helpless pattern, mastery-oriented children sought out challenging tasks and showed an increase in effort when faced with failure (Diener & Dweck, 1978). In an attempt to understand the basis for these different behavioral patterns, these researchers (e.g., Dweck & Elliott, 1983) looked into the goals these children were pursuing in achievement contexts. From this research, they classified these individuals into two distinct categories based upon the types of goals they were striving towards: (a) performance goal oriented individuals, whose primary objectives were to avoid task failure and to gain favorable judgments from others concerning their competence, and (b) learning goal oriented individuals, who were primarily concerned with increasing their competence level for a given task, overcoming task difficulties, and mastering challenging activities. According to these researchers, these different goals were responsible for the different behavioral patterns observed in the children in achievement settings; performance-oriented goals foster a maladaptive, helpless response pattern in challenging situations, while learning oriented goals lead to a more adaptive, mastery-oriented pattern. As noted by Dweck and Leggett (1988), “Individuals adopting different goals can be seen as approaching a situation with different concerns, asking different questions, and seeking different information” (p.260). As such, the pursuit of these distinct goal types is likely to influence the goals they set, their persistence toward that goal, their reaction to failure, the level of effort they exert, and their expectations of performance (Dweck, 1989; Fisher & Ford, 1998).

The tendency for these children to pursue one of these types of goals (performance oriented vs. learning oriented), and demonstrate the response pattern associated with such goals was subsequently labeled goal orientation (Dweck and Leggett, 1988). As originally conceptualized, Dweck and colleagues viewed goal orientation as a relatively stable dispositional variable that assumed one of two distinct forms that resided on opposite ends of a continuum; individuals either held a performance goal orientation or a learning goal orientation. Since the time of these early propositions, a number of additional studies have been conducted to examine the characteristics that are likely to be displayed by individuals with either a performance goal orientation or a learning goal orientation.

Dimensionality of goal orientation. Originally, Dweck and colleagues measured and conceptualized goal orientation as a unidimensional construct, with a learning goal orientation and a performance goal orientation residing on opposite ends of a single continuum (Diener & Dweck, 1978; 1980; Dweck & Leggett, 1988). That is, individuals could either hold a strong learning goal orientation, a strong performance goal orientation, or be neutral with regard to goal orientation. Despite her early conceptualizations, later research by Dweck concluded that learning goal orientation and performance goal orientation were independent (rather than opposite) dimensions based upon observations of individuals that displayed both orientations as well as individuals that displayed neither orientation (Heyman & Dweck, 1992).

With Dweck's reconceptualization of the dimensionality of the construct, Button et al. (1996) developed separate measures for learning goal orientation and performance goal orientation that operationalized them as independent dimensions of personality. They proposed that these two orientations are two entirely independent constructs that do not necessarily correlate with one another. Support was found for these two independent dimensions. In other

words, it is entirely possible that individuals may be high in both learning goal orientation and performance goal orientation, low in both orientations, etc. This two-dimensional perspective of goal orientation has been widely used in several studies in the work motivation literature (e.g., Colquitt & Simmering, 1998; Fisher & Ford, 1998; Ford, Smith, Weissbein, Gully, & Salas, 1998; Phillips & Gully, 1997).

Results from the above-mentioned studies have demonstrated that learning goal orientation is often associated with positive or beneficial effects on outcomes such as knowledge (e.g., Fisher and Ford, 1998), performance (e.g., Butler, 1992), and self-efficacy (e.g., Phillips & Gully, 1997). However, in contrast to the relatively consistent support that has been found for the role of learning goal orientation, the research findings on the role of performance goal orientation have been much less conclusive (Bouffard, Boisvert, Vezeau, & Larouche, 1995; Chen et al., 2000; Wolters, 1998). For example, while Phillips and Gully (1997) found that performance goal orientation was negatively related to the level of self-efficacy and performance goals set by individuals, additional research has found that performance goal orientation is either unrelated to self-efficacy and goal choice (e.g., Donovan & Williams, 1999) or positively related to goal choice (e.g., VandeWalle et al., 1999). In fact, a recent meta-analysis by Beaubien and Payne (1999) found that PGO demonstrated a highly inconsistent relationship with self-efficacy.

In response to the inconsistent findings surrounding the dimension of performance goal orientation, Elliot and colleagues proposed a three-dimensional conceptualization of goal orientation (Elliot, 1999; Elliot & Church, 1997; Elliot & Harackiewicz, 1996; VandeWalle, 1997), suggesting that these inconsistent results with respect to performance goal orientation may be due to the confounding of approach and avoidance aspects of motivation. In this trichotomous framework, the traditional performance goal orientation construct is separated into

approach and avoidance orientations, while learning goal orientation remains one dimension. A performance-approach goal orientation focuses on attaining normative competence, while a learning goal orientation focuses on attaining self- or task-referential competence. In contrast, a performance-avoidance goal orientation focuses on avoiding demonstrations of normative incompetence. Since a learning goal orientation and a performance-approach goal orientation involve striving to attain positive outcomes they are considered approach orientations. Although they are both approach orientation, they differ in how competence is defined (i.e., self or task vs. normative; Elliot, 1999). Performance-avoidance goal orientation, on the other hand, is construed as an avoidance orientation because it entails striving to avoid a negative possibility. This type of goal orientation defines competence in the same normative sense as a performance-approach orientation but differs in how competence is pursued. In comparison, performance-avoidance goal orientation differs from a learning goal orientation in both how competence is defined (normative vs. self or task referenced) and pursued (avoiding incompetence vs. attaining competence). This three-dimensional conceptualization of goal orientation has been employed in a series of current studies in the area of work motivation (e.g., Brett & VandeWalle, 1999; Dobbins et al., 2002; Lee et al., 2003; Schmidt & Ford, 2003; VandeWalle et al., 2001). A more complete examination of the three-dimensional framework and how it fits into the goal establishment and task performance process is presented below.

Learning goal orientation. Individuals demonstrating a learning goal orientation are not concerned with validating their competence but rather at improving their understanding of the task at hand (Dweck, 1986; Dweck & Leggett, 1988; Elliot & Dweck, 1988; Farr et. al, 1993). By viewing challenging situations as an opportunity to learn, a learning goal oriented individual displays cognitions, affect, and behaviors that are more adaptive for goal attainment. According

to Dweck (1989), individuals displaying a learning goal orientation are more likely to seek challenging situations, regardless of their perceived level of ability or expectations of success. Even when faced with failure, learning goal oriented individuals view the situation as a learning opportunity for personal growth (Dweck, 1989). In this context, failure is seen as useful feedback, indicating that the current strategy is insufficient for the particular task and that more effort and ingenuity is needed for mastery (Elliot & Dweck, 1988). In contrast to performance goal orientation, high effort in a learning goal framework does not engender cognitive or affective distress. Instead, effort is seen as a means to increasing one's ability to master a particular task, which leads to increased persistence towards their performance goal (Dweck, 1989). This is consistent with work by Elliot and colleagues which suggest that learning goals are grounded in achievement motivation and high competence expectancies (Elliot & Church, 1997).

Performance- avoidance goal orientation. According to Dweck and colleagues, individuals with a performance goal orientation view challenging situations as a chance for an ability judgment instead of a learning opportunity (Dweck, 1986; Dweck & Leggett, 1988; Elliot & Dweck, 1988). This focus on competence judgments is thought to create a vulnerability to a helpless pattern of cognitions, affect, and behavior (Dweck & Leggett, 1988). It is this side of performance goal orientation that VandeWalle (1997) refers to as the performance-avoidance goal orientation. Individuals displaying this orientation have a tendency to avoid challenging situations, such as learning situations which might be accompanied by errors and perceptions of incompetence on the part of others (Dweck, 1989). Button et al. (1996) suggested that a performance goal orientation might be associated with defensive behavior if participation in an activity could risk demonstration of low skill level and the risk of negative evaluation from

others. According to Elliot and Church (1997), a performance-avoidance goal orientation is rooted in fear of failure and low competence expectancies. As such, this form of self-regulation is likely to elicit threat appraisals, evaluative anxiety, and an extreme attention to failure-relevant information (Elliot, 1994; Higgins, 1995; Wegner, 1994). In contrast to learning and performance-approach goal orientations, a performance-avoidance goal orientation is a negative form of self-regulation in that it prompts efforts to escape potential failure consequences and is often associated with considerable anxiety which may serve as a distraction to individuals concentrating on a task (Elliot & McGregor, 1999).

Performance- approach goal orientation. As mentioned previously, performance goal orientation has traditionally been defined as individuals seeking to gain favorable judgments or avoiding negative judgments of their competence via their current level of task performance (Dweck, 1986; Dweck & Leggett, 1988; Elliot & Dweck, 1989; Farr et. al, 1993). According to VandeWalle (1997), the first part of this definition relates to the approach dimension of performance goal orientation. Theoretical and empirical research suggests that individuals displaying a performance orientation are likely to demonstrate their ability by attempting to look better than others while performing a task (Farr et al., 1993; Butler, 1993), which would be representative of the performance-approach dimension proposed by VandeWalle (1997) and Elliot and Church (1997). Elliot and colleagues proposed that this distinction between the approach and avoidance performance goal orientations is extremely important when looking at self-regulation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). In contrast to focusing on attaining positive outcomes, a self-regulation focus on avoiding negative outcomes is more likely to produce cognitive sensitivity to negative stimuli, anxiety about negative possibilities, and

undue consumption of cognitive resources in an attempt to avoid negative outcomes (Elliot & Sheldon, 1997).

Like learning goal orientations, a performance-approach orientation is grounded in achievement motivation and high competence expectancy. However, it is also affected by one's fear of failure since individuals are concerned with demonstrating their competence (Elliot & Church, 1997). With a performance-approach orientation being grounded in achievement motivation and fear of failure, the relationships between this construct and other motivational and performance-related outcomes seems to be more complex than those proposed with a learning or avoidance orientation. Although a performance-approach goal orientation, like learning goal orientation, involves striving to achieve, it is intensely concerned with the evaluations of and comparison with others. These extrinsic considerations, as opposed to self-determined evaluations, may facilitate performance in many achievement settings but minimize the likelihood that the process will be viewed as a learning opportunity. As such, these individuals may abandon their pursuit of achievement in a particular situation if they are faced with potential failure.

Goal Orientation in Current Research

As mentioned previously, goal orientation has been an area of extreme interest in both the motivation and training research literatures. Over the past decade, research has examined the role of learning and performance goal orientations with a wide array of motivational and performance outcomes. As theorized, each of these goal orientations has been linked to different affective, cognitive, and behavioral reactions.

Learning goal orientation. Research has generally revealed a positive association between learning goal orientation and elements of the self-regulation process. A learning goal

orientation has been linked to increased task engagement, effort, persistence, deep processing of information, and intrinsic motivation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 1999; Middleton & Midgley, 1997). In addition to these variables, high levels of learning goal orientation have been found to buffer individuals from the negative effects of failure, thereby helping to increase or maintain self-efficacy (Bell & Kozlowski, 2002; Button et al., 1996; Ford et al., 1998; Kozlowski et al., 2001; Phillips & Gully, 1997). Phillips and Gully (1997) found that learning goal orientation had a positive relationship with self-efficacy, which in turn had positive effects on both self-set goals and exam performance. Similarly, VandeWalle et al. (2001) found that learning goal orientation impacted exam performance through its positive, direct effect on self-efficacy. In a computer-simulated training task, Kozlowski et al. (2001) found that learning goal orientation had a positive, direct effect on one's level of self-efficacy and subsequent training performance. Schmidt and Ford (2003) also found that learning goal orientation was positively related to metacognitive activity, self-efficacy, and performance on a webpage design training task. Positive relationships have also been found between learning goal orientation and one's grade point average (Button et al., 1996) and sales performance (VandeWalle et al., 1999). As a whole, a learning goal orientation appears to positively influence motivational processes involved in self-regulation and task performance.

Performance goal orientation. In contrast to the relatively consistent findings regarding learning goal orientation, research on performance goal orientation has resulted in mixed and contradictory findings. For example, while Phillips and Gully (1997) found that performance goal orientation was negatively related to the level of self-efficacy and performance goals set by individuals, additional research has found that performance goal orientation is either unrelated to self-efficacy and goal choice (e.g., Donovan & Williams, 1999) or positively related to self-

efficacy or goal choice (e.g., Breland & Donovan, in press; Kozlowski et al., 2001; VandeWalle et al., 1999). In respect to other outcomes, performance goal orientation has often revealed a series of non-significant relationships. For example, Button et al. (1996) found that performance goal orientation was unrelated to self-esteem and students' grade point average. Similarly, VandeWalle et al. (1999) found that performance orientation was unrelated to sales performance. In research examining the influence of goal orientation in a training context, Bell, Mullins, Toney, and Kozlowski (1999) and Kozlowski et al. (2001) found that performance goal orientation was unrelated to both knowledge and performance. In addition, a meta-analysis by Beaubien and Payne (1999) found that PGO demonstrated a highly inconsistent relationship with self-efficacy. It is however important to note that the above-mentioned research has framed performance goal orientation as one dimension (rather than examining the approach and avoid aspects of this dimension separately), and for the most part utilized Button et al.'s (1996) measure performance goal orientation.

As stated earlier, in partial response to the inconsistencies surrounding performance goal orientation in the work motivation literature, many researchers have started developing and employing three-dimensional conceptualizations of the construct (e.g., Elliot, 1999; Elliot & Church, 1997; Horvath et al., 2001; Midgely, Kaplan, Middleton, Maehr, Urdan, L. Anderman, E. Anderman, & Roeser, 1998; VandeWalle, 1997), with performance goal orientation measured by both an approach and avoidance dimension. However, despite these efforts to clarify the role of performance goal orientation by measuring it from both a performance-approach and performance-avoidance perspective, research has shown that ambiguities continue to persist.

In reference to a performance-avoidance goal orientation, research tends to find that this orientation is deleterious to motivational and performance outcomes (Elliot & Church, 1997).

For example, performance-avoidance goal orientations have been linked to decreased task engagement, threat-related affect, distraction, disorganization, shallow processing of information, anxiety, and reduced intrinsic motivation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 1999; Middleton & Midgley, 1997). In addition, VandeWalle et al. (2001) found that a performance-avoidance orientation was negatively related to one's level of self-efficacy, goal level, and exam score. Similarly, in a more recent study, Lee et al. (2003) found that a performance-avoidance goal orientation was negatively related to mental focus, goal level, and performance. In the same fashion, while examining the impact of goal orientation on training outcomes, Schmidt and Ford (2003) reported negative relationships between performance-avoidance goal orientation and self-efficacy, declarative knowledge, metacognitive activity, and skill-based performance. These findings as a whole are consistent with the theorizing and research findings of Elliot and colleagues, which have suggested that this orientation is associated with a fear of failure and low competence expectancies (Elliot & Church, 1997), which would likely engender negative outcomes and low task performance.

Research exploring the role of performance-approach goal orientation in the process of self-regulation has not been as straightforward. Performance-approach goal orientation has been linked to both positive processes and outcomes such as high levels of aspiration, effort, persistence, high performance, intrinsic motivation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 1999; Middleton & Midgley, 1997) and negative processes and outcomes such as test anxiety, shallow processing of information, and unwillingness to seek help with schoolwork (Elliot, McGregor, & Gable, 1999; Middleton & Midgley, 1997). In response to these inconsistencies surrounding the dimension, VandeWalle et al. (2001) actually proposed null relationships between a performance-approach goal orientation

and effort, self-efficacy, and goal level. Although no relationship was found for self-efficacy and goals, a positive relationship did emerge between a performance-approach goal orientation and effort. In addition, Lee et al. (2003) found a positive relationship with mental focus while studying and goal level on upcoming exams. However, Schmidt & Ford (2003) reported no significant relationships between performance-approach goal orientation and training outcomes (e.g., self-efficacy, declarative knowledge, skill-based performance).

Given the research to date, the emergence of the three-factor goal orientation framework appears to have enhanced the clarity and theoretical precision of our knowledge in this area. However, this precision resides primarily among learning and performance-avoidance orientations. Results pertaining to a performance-approach orientation remain ambiguous and less well understood than its counterparts. Despite the lack of consistency in the literature regarding performance-approach goal orientation, this dimension needs to be explored in various tasks and situations in order to specify the conditions in which it will have a positive, negative, or neutral effect.

State Goal Orientation

Although the research to date can be seen as providing support for the notion that goal orientation operates through more proximal regulators (e.g., task self-efficacy) to impact goal establishment and performance, a closer examination of this research provides some evidence that these general, dispositional constructs are somewhat lacking as predictors of more specific behavioral/motivational variables. For example, Phillips and Gully (1997) found only relatively weak correlations between dispositional goal orientation and self-efficacy as well as goal choice, with correlations ranging from -.15 to .19. Similarly, research conducted since Phillips and Gully has repeatedly found weak correlations between dispositional learning and performance goal

orientation and various motivational variables (e.g., Bell & Kozlowski, 2002; Chen et al., 2000; Schmidt & Ford, 2003; VandeWalle et al., 1999). These findings indicate that our current levels of prediction of performance goals and self-efficacy utilizing these dispositional measures are rather unimpressive and suggest that the relationship between goal orientation and these variables may in fact not be direct, as currently proposed. Rather, the existence of weak correlations between dispositional goal orientation suggests that there may be additional mediating variables or linkages present in this relationship that have not yet been specified (Cook & Campbell, 1979).

As noted previously, Kanfer and colleagues (Kanfer, 1990; 1992; Kanfer & Heggestad, 1997) argue that distal constructs do not directly affect motivation and performance. Instead, these models of motivation propose that distal, trait-like constructs have an indirect influence on motivational processes and performance through more proximal, state-like constructs. Within the context of goal orientation, this indicates that dispositional goal orientation would only influence motivation and task performance indirectly through its impact on other more state-like variables. In agreement with this proposition, much of the current research on goal orientation has argued that goal orientation impacts various motivational processes such as goal establishment through its impact on task-specific self-efficacy (Dispositional goal orientation → Self-efficacy → Performance goals; Kozlowski et al., 2001; Phillips & Gully, 1997). Although this theoretical approach is entirely consistent with the propositions of Kanfer's (1990, 1992) model of personality and motivation, it does not acknowledge the previously discussed role of state-like manifestations of goal orientation as an additional linkage (i.e., mediator) in the relationship between dispositional goal orientation and goal establishment. In addition, current conceptualizations of goal orientation (e.g., Button et al., 1996; Farr et al., 1993; VandeWalle et

al., 2001) clearly acknowledge that although dispositional goal orientation may provide a “default” orientation for individuals, this dispositional goal orientation may be modified by elements of the situation to produce a distinct state goal orientation.

In support of this argument, research by Ames and Archer (1988) as well as Butler (1987, 1993) has demonstrated that an individual’s state goal orientation is responsive to and partially determined by characteristics of the performance environment. Similarly, research in the field of training and development has demonstrated that situational cues can be manipulated to induce a performance or learning goal orientation (e.g., Gist & Stevens, 1998; Kozlowski et al., 2001; Kraiger, Ford, & Salas, 1993; Martocchio, 1994; Stevens & Gist, 1997), and that these state goal orientations demonstrate significant and unique relationships with important motivational variables (e.g., self-efficacy) that are independent of dispositional goal orientation’s relationship with these same variables (Kozlowski et al., 2001).

Although previous research has tentatively explored the role of state goal orientation (Ames & Archer, 1988; Kozlowski et al., 2001), this research is somewhat limited in that it has focused upon the impact of experimentally induced state goal orientations in which individuals are given instructions or training that facilitates the adoption of either a strong state performance goal orientation or a strong state learning goal orientation. A recent study by Breland and Donovan (in press) expanded upon this research by examining the role of naturally occurring state goal orientations (i.e., those that are not artificially induced) in the process of goal establishment and task performance. The importance of this distinction becomes clear when one considers that the examination of artificially induced state goal orientation typically treats state goal orientation as a dichotomy (i.e., individuals are trained to be either performance oriented or learning oriented), which does not allow us to observe the independent influences of both state

learning goal orientation and state performance goal orientation on important motivational variables. This is an important limitation, given that current conceptualizations of goal orientation argue that these dimensions are independent and that individuals may possess high levels of each.

Results from Breland and Donovan (in press) indicated that dispositional goal orientation's effects on self-efficacy, goals, and performance were fully mediated by its corresponding state goal orientation. That is, dispositional goal orientation only affects these motivational processes through state goal orientation. Dispositional goal orientation was found to be a significant, positive predictor of the associated state goal orientation adopted by individuals in both a classroom and computer-simulated training setting (i.e., dispositional learning goal orientation significantly predicted state learning goal orientation, dispositional performance goal orientation predicted state performance goal orientation). In turn, state goal orientation impacted self-efficacy, goals, and performance. These findings are consistent with propositions made in the literature that dispositional goal orientations provide a “default” orientation for individuals that are likely to be modified or overridden by elements of a specific environment (e.g., Button et al., 1996; Kozlowski et al., 2001).

Having established the link between dispositional goal orientation and state manifestations of this construct in recent research (Breland & Donovan, in press), the present study focuses only on state goal orientation. The influence of state goal orientation on other proximal regulators of motivation involved in goal establishment and task performance will be the central focus of this study. This shift from dispositional goal orientation to state goal orientation, although supported by past research in the work motivation literature, is also consistent with the conceptualization of personality by Mischel (1973). More specifically,

Mischel and Shoda (1995) suggest that a stable structure of personality emerges in the course of development as a result of one's past experiences. This structure generates the distinctive stable patterns of behavior characteristic of the individual in particular situations (Mischel & Shoda, 1998). Therefore, given the situation, different aspects of an individual's personality are activated. For instance, in the workplace an individual may have an aggressive or assertive personality, but in a social setting they may be shy or withdrawn. In the context of goal orientation, an individual may be extremely learning goal orientated in the classroom and performance-approach goal oriented when participating in sports. In fact, in a novel situation, an individual may be learning goal oriented and then shift to a performance-approach goal orientation as they become more proficient at the task. Therefore, the present study's examination of state goal orientations, rather than dispositional goal orientation, seems justified, both empirically and theoretically.

As mentioned previously, dispositional constructs influence task performance indirectly through their influence on more proximal, state-like constructs (Kanfer, 1992; Kanfer & Heggestad, 1997). It is these proximal constructs that are the self-regulators of performance. The relationship of state goal orientation with these proximal regulators, and in turn, performance is the central focus of this study. Each of these constructs is discussed in more detail below.

Self-Efficacy

An important component in the goal establishment and task performance process is the construct of self-efficacy (Bandura, 1986, 1991; Chen et al., 2000; Ford et al., 1998; Mangos & Steele-Johnson, 2001; Phillips & Gully, 1997; Schmidt & Ford, 2003; Thomas & Mathieu, 1994; VandeWalle et al., 2001). Self-efficacy refers to "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances"

(Bandura, 1986; p. 391). As noted by Bandura (1986), self-efficacy is likely to be partially determined by one's past performance on a given or similar task. However, he differentiates self-efficacy from simple perceptions of past performance by noting that self-efficacy is also likely to be determined by a number of additional non-performance factors, including vicarious learning, physiological arousal, persuasion, and social modeling (Bandura, 1986). As evidence of this differentiation, a number of research studies have demonstrated that both self-efficacy and past performance make independent contributions to an individual's choice of goal level (e.g., Locke, Frederick, Lee, & Bobko, 1984; Phillips & Gully, 1997; Wood, Mento, & Locke, 1987).

As mentioned earlier, past research has demonstrated a relationship between goal orientation and one's level of self-efficacy (Chen et al., 2000; Ford et al., 1998; Kozlowski et al., 2001; Mangos & Steele-Johnson, 2001; Phillips & Gully, 1997; Schmidt & Ford, 2003; VandeWalle et al., 2001). More specifically, research has consistently demonstrated that dispositional learning goal orientation has a positive relationship with self-efficacy in both the classroom (Chen et al., 2000; Phillips & Gully, 1997; VandeWalle et al., 2001) and various training contexts (Ford et al., 1998; Kozlowski et al., 2001; Schmidt & Ford, 2003). For example, Phillips and Gully (1997) found that learning goal orientation's influence on performance goals was fully mediated by self-efficacy. Similarly, in a training context, Kozlowski et al. (2001) found that self-efficacy was positively related to learning goal orientation and fully mediated its relationship with training performance. These findings further stress the importance of self-efficacy in the goal establishment and task performance process.

In comparison, research examining the influence of dispositional performance-approach and dispositional performance-avoidance goal orientation on self-efficacy has been somewhat limited and a little less clear. Only two studies were found that explored the relationship between

self-efficacy and dispositional performance-approach and dispositional performance-avoidance goal orientation (i.e., Ford & Schmidt, 2003; VandeWalle et al., 2001). Both studies found performance-avoidance goal orientation to be negatively related to self-efficacy. That is, as one's level of performance-avoidance goal orientation increases, their belief in their ability to accomplish the task or meet their goal decreases. This negative relationship is consistent with the theory behind a performance-avoidance goal orientation. A performance-avoidance goal orientation is striving to avoid negative judgments, therefore, it is likely that these individuals would not place much confidence in their ability to perform a particular task, resulting in low levels of self-efficacy. In terms of performance-approach goal orientation, neither study found a relationship with self-efficacy. However, when looking at VandeWalle et al. (2001), the magnitude of the relationship ($r = .16$) is similar in magnitude to the correlations found in Phillips and Gully (1997). From a conceptual standpoint, performance-approach goal orientation is likely to have positive influence on an individual's self-efficacy. With this goal orientation, there is a desire to prove oneself, and in doing so, one must feel confident in their ability to perform the particular task. Although this is intuitive at a theoretical level, research exploring this relationship has been somewhat less conclusive. Based on the current literature, it appears that one can tentatively conclude that dispositional performance-avoidance goal orientation tends to decrease one's level of self-efficacy, while the effects of dispositional performance-approach goal orientation are unclear.

Although these studies provide some evidence regarding the relationship of the three dimensions of dispositional goal orientation with self-efficacy, it is important to realize that the magnitude of the correlations observed are generally weak, with most occurring at or below the .20 level. Although such correlations may reach practical significance when sample sizes are

sufficiently large, the magnitude of these correlations in a practical sense is somewhat disappointing. In addition, dispositional measures of performance-approach goal orientation have failed to demonstrate a relationship with self-efficacy, although the magnitude of this relationship is remarkably similar to those found in Phillips and Gully (1997). As noted previously, the weak nature of the observed relationships and the inconsistencies observed with respect to performance-approach goal orientation may be attributed to a failure to consider state manifestations of the goal orientation construct. That is, because this past research has attempted to establish a link between dispositional measures of goal orientation and self-efficacy without taking into account the fact that individuals may adopt state goal orientations in response to characteristics of the performance situation, these past studies have essentially been ignoring a part of the causal link between goal orientation and self-efficacy (i.e., dispositional goal orientation → state goal orientation → self-efficacy). As demonstrated by Breland and Donovan (in press), the inclusion of state goal orientation as a mediator between dispositional goal orientation and self-efficacy substantially improves the level of prediction obtained with respect to self-efficacy. Further evidence of the importance of considering state goal orientation can be seen in the fact that state goal orientation completely mediated the impact of dispositional goal orientation on self-efficacy in the Breland and Donovan (in press) study. That is, dispositional goal orientation influenced self-efficacy only through its impact on the state goal orientations adopted by individuals.

Taken as a whole, this evidence suggests that it appears to be more beneficial to examine state goal orientation (rather than dispositional goal orientation) as a predictor of self-efficacy in a performance context. Unfortunately, only one published study has examined the relationship between naturally occurring state goal orientations and self-efficacy (Breland & Donovan, in

press). With respect to state learning goal orientation, Breland and Donovan (in press) found that state learning goal orientation was positively related to self-efficacy both in a classroom setting (average $r = .31$) and in a complex, decision-making task ($r = .30$). Once again, it is worth noting that these correlations are substantially higher than those found using dispositional measures of learning goal orientation in the same setting (e.g., Phillips & Gully, 1997; $r = .14$). However, the results pertaining to performance goal orientation were not as clear. Results indicated that performance goal orientation was not significantly related to self-efficacy in a classroom setting (Study 1), although it is worth noting that the magnitude of the correlation between state performance goal orientation and self-efficacy was remarkably similar ($r = .16$) to the magnitude of correlations observed by Phillips and Gully (1997). As such, the lack of a relationship in the classroom setting may have been a function of the relatively small sample size employed in this setting ($N = 101$). In Study 2, which was conducted using a decision-making task, a positive relationship ($r = .40$) was observed between state performance goal orientation and self-efficacy. Taken together, these results suggest that we might expect a positive relationship between state performance goal orientation, although obviously no firm conclusions can or should be drawn on the basis of a single study. In addition, it is important to realize that this study utilized a two-dimensional conceptualization of state goal orientation in which performance goal orientation was not broken down into its more recent approach and avoidance dimensions. As such, the relationship between these dimensions of state performance goal orientation and self-efficacy remains unclear. The present study hopes to shed light on this area by assessing state manifestations of performance-avoidance and performance-approach goal orientations.

Consistent with Breland and Donovan (in press), the present study proposes that state learning goal orientation will be positively related to self-efficacy (Path 1). In line with the findings

obtained using dispositional measures of performance-avoidance goal orientation (Schmidt & Ford, 2003; VandeWalle et al., 2001), it is proposed that state performance-avoidance goal orientation will be negatively related to self-efficacy (Path 3). Finally, although the empirical evidence is limited in regard to performance-approach goal orientation, the evidence that does exist suggests that it may be positively related to self-efficacy (Path 2) (VandeWalle et al., 2001). In addition, theoretical assumptions about the construct emphasize that it is positively related to processes involved in self-regulation (Elliot & Church, 1997), and, therefore, state performance-approach goal orientation is proposed to be positively related to self-efficacy.

Hypothesis 1a: State learning goal orientation will be positively related to self-efficacy.

Hypothesis 1b: State performance-approach goal orientation will be positively related to self-efficacy.

Hypothesis 1c: State performance-avoidance goal orientation will be negatively related to self-efficacy.

Mental Focus

Recent work by Lee et al. (2003) has indicated that mental focus may be another proximal regulator of the motivation/task performance process. Mental focus is defined as the degree to which someone is able to concentrate and become absorbed in an activity or task. Lee and colleagues found that goal orientation influenced mental focus, which in turn positively influenced task performance. More specifically, both a learning goal orientation and a performance-approach goal orientation were positively associated with mental focus. This is to be expected since learning and performance-approach goal orientations both involve striving for positive outcomes: increased skill (learning goal orientation) or displaying competence (performance-approach goal orientation; Elliot & Church, 1997). In placing one's attention on

positive outcomes, emotions of enthusiasm and optimism are stimulated which should produce interest and absorption in the task, which in turn should lead to higher levels of mental focus on the task. In contrast to this positive relationship, Lee et al. (2003) found performance-avoidance goal orientation to be negatively related to mental focus. As with learning and performance-approach goal orientation, this relationship is also consistent with previous research and theoretical assumptions (Elliot & Harackiewicz, 1996; Elliot & McGregor, 1999). Performance-avoidance goal orientation entails striving to avoid a negative outcome. Therefore, in a situation that poses a challenge, this form of goal orientation is likely to elicit anxiety as a result of fear of failure or normative judgments. This test or task anxiety is coupled with self-criticism or concern with the consequences of failure, which promotes worry and diverts attention from task demands and interferes with cognitive processes (Deffenbacher, 1980; Elliot & McGregor, 1999; Sarason, 1972; Wine, 1971). As a result, performance-avoidance goal orientation decreases task involvement and one's resources available to mentally focus on the task at hand (Elliot & Harackiewicz, 1996). In a recent study examining the impact of goal orientation on task absorption (a construct related to mental focus), learning and performance-approach oriented individuals reported higher levels of task absorption than performance-avoidance oriented individuals (Curry, Elliot, Sarrazin, Fonseca, & Rufo, 2002).

The present study would like to expand upon the work of Lee et al. (2003) and examine the impact of state goal orientation on mental focus. Furthermore, the addition of this component of the state goal orientation-task performance relationship is an extension to the previous model tested by Breland and Donovan (in press). Consistent with the above-mentioned findings, state learning and state performance-approach goal orientations are expected to be positively related to

mental focus (Paths 4 & 5), while state performance-avoidance goal orientation is anticipated to be negatively related to mental focus (Path 6).

Hypothesis 2a: State learning goal orientation will be positively related to mental focus.

Hypothesis 2b: State performance-approach goal orientation will be positively related to mental focus.

Hypothesis 2c: State performance-avoidance goal orientation will be negatively related to mental focus.

Goals

One of the more popular theories of work motivation and task performance over the past three decades is goal setting theory as proposed by Locke and Latham (1990). The central tenet of this theory is that goals are an immediate regulator of human action, guiding the direction, intensity, and persistence of task-related behavior. In providing this direction, intensity, and persistence, performance goals are proposed to enhance performance on a given task, especially for goals that are specific and difficult (Locke & Latham, 1990).

Evidence for the validity of this proposition concerning the impact of specific, difficult goals on performance (termed the “goal-difficulty effect”) comes from the findings of over 200 studies that have almost unanimously demonstrated that specific, difficult goals lead to higher levels of performance than easy, vague, or do-your-best goals (Locke and Latham, 1990). In fact, a review of the goal setting literature by Locke and Latham (1990) indicates that well over 90% of the studies conducted to that point had supported the goal difficulty effect for a variety of different task types. Further evidence of the positive impact of specific, difficult goals has been obtained from two large scale meta-analytic reviews of the goal setting literature (Wood et al., 1987; Tubbs 1986). Thus, based upon both the primary and meta-analytic research conducted in

this area, it appears that there is strong support for the propositions that specific, difficult goals have a positive impact on performance.

According to Bandura (1986, 1997), self-efficacy is likely to influence goal setting such that individual's high in self-efficacy will set more difficult or challenging task performance goals than individuals low in self-efficacy. A number of research studies have supported this assertion, demonstrating that self-efficacy makes a significant contribution to an individual's choice of goal level (e.g., Chen et al., 2000; Locke et al., 1984; Locke & Latham, 1990, 2002; Phillips & Gully, 1997; Woodford, Goodwin, & Premack, 1992). To illustrate, in their review of the goal setting literature, Locke and Latham (1990) report an average correlation of .34 between self-efficacy and personal goals. These findings were also supported in a more recent study by Breland and Donovan (in press), which found that self-efficacy had a positive influence on performance goals in both a classroom setting and simulated training environment. Based upon this large body of supporting research, we expected that self-efficacy will be positively related to performance goals (Path 7).

Hypothesis 3: Self-efficacy will be positively related to performance goals.

Performance

As mentioned earlier, one of the most replicated and consistent findings in the motivational literature is that more challenging goals lead to higher performance than vague, easy, or do-your-best goals (Kanfer, 1990; Locke & Latham, 1990; Tubbs, 1986; Wood et al., 1987). Whereas self-efficacy is one's judgment in their ability to reach a desired level of performance, goals are the actual level of performance one strives to obtain (Locke & Latham, 1990). Numerous qualitative and meta-analytic reviews have confirmed that more challenging goals are associated with higher levels of performance (e.g., Locke & Latham, 1990, 2002;

Tubbs, 1986; Wood et al., 1987). In addition, recent empirical studies have continued to support this positive relationship between performance goals and one's level of exam or task performance (e.g., Breland & Donovan, in press; Lee et al., 2003, Phillips & Gully, 1997). Based upon this voluminous body of research, the present study expects personal goals to be positively linked to task performance (Path 10).

Hypothesis 4: Performance goals will be positively related to task performance.

In addition to its impact on the establishment of performance goals, self-efficacy has also been generally shown to have an independent, positive influence on subsequent performance (e.g., Bell & Kozlowski, 2002; Chen et al., 2000; Locke & Latham, 1990; Phillips & Gully, 1997; Schmidt & Ford, 2003; Stajkovic & Luthans, 1998). For example, Stajkovic and Luthans (1998) report an average correlation of .38 between these two variables, while Locke and Latham (1990) report an average correlation of .42. Similar correlations between self-efficacy and performance have been reported more recently by Schmidt and Ford (2003) in a web-based training task and Breland and Donovan (in press) in a classroom setting. In line with this body of evidence, we expected task self-efficacy to be positively related to performance (Path 8).

Hypothesis 5: Self-efficacy will be positively related to task performance.

Mental focus has also been recently incorporated into the goal establishment and task performance process model (e.g., Lee et al., 2003). Research has indicated that when individuals are distracted due to off-task worry or anxiety, that these cognitive interferences can lead to performance decrements (Hembree, 1988; Kanfer & Ackerman, 1996; Sarason, Piere, & Sarason, 1996). Furthermore, the concept of action-state orientation (Kuhl, 1994), an individual difference variable influencing goal-striving, proposes that progress on a task may be impeded when a person becomes consumed with thoughts about past and potential failure experiences

(Diefendorff, Hall, Lord, & Strean, 2000). From a resource allocation perspective (Kanfer & Ackerman, 1996; Kanfer & Heggestad, 1997) this decrease in performance makes sense. If someone is worried about failing or absorbed in off-task thoughts in general, the cognitive resources normally needed to perform the task effectively are not available. Recent research by Lee et al. (2003) found that mental focus was positively related to performance on exams. Consistent with the above present theoretical evidence, it is proposed that mental focus will have a direct, positive influence on task performance (Path 9).

Hypothesis 6: Mental focus will be positively related to task performance.

Cognitive Ability

The existence of a relationship between cognitive ability and performance has been well established and demonstrated across a wide variety of tasks and settings (e.g., Hunter & Hunter, 1984; Schmidt, Hunter, & Outerbridge, 1986). These performance episodes have ranged from training tasks (e.g., Martocchio & Judge, 1997) to academic learning in the classroom (e.g., Phillips & Gully, 1997). In fact, Schmidt and Hunter (1993) argue that cognitive ability is the single best predictor of performance in a learning environment (e.g., in a training program). Two recent studies by Bell and Kozlowski (2002) and Schmidt and Ford (2003), which examined performance in a training context, reported correlations of .43 and .31 between cognitive ability and task performance. This relationship has also been found in the classroom with exam performance (Lee et al., 2003; Phillips & Gully, 1997). It is, however, important to note that Breland and Donovan (in press) found that cognitive ability did not impact performance directly but instead had an indirect effect through self-efficacy. Despite this anomaly, an ample amount of research supports cognitive ability as a predictor of performance. Based upon this, we

hypothesized that cognitive ability would be positively related to performance (Path 13) in the present research.

Hypothesis 7: Cognitive ability will be positively related to task performance

However, as noted by numerous researchers, the relationship between cognitive ability and task performance may be partially attributable to the positive relationship between cognitive ability and the motivational variables of self-efficacy and performance goals (e.g., Chen et al., 2000; Locke & Latham, 1990, 2002; Phillips & Gully, 1997; Thomas & Mathieu, 1994). One of the key propositions of Bandura's social cognitive theory (1986, 1997) is that an individual's self-efficacy judgments are likely to be based in part on their actual task-related capabilities. Individuals high in task-related ability are likely to be highly efficacious with respect to task performance due to their demonstrated competence in this setting. Thus, within settings where task performance is partially determined by cognitive ability (e.g., the classroom settings, logical decision-making tasks, etc.), one would expect that measure of cognitive ability would be positively related to self-efficacy judgments within these settings. Evidence of this relationship can be seen in the work of both Chen et al. (2000) and Philips and Gully (1997), who demonstrated that the impact of cognitive ability on task performance is partially mediated by task specific self-efficacy. Therefore, we expected cognitive ability to be positive related to self-efficacy (Path 11).

Hypothesis 8: Cognitive ability will be positively related to self-efficacy.

According to Locke and Latham (1990, 2002), one of the primary determinants of the difficulty of the goals individuals set for themselves is their ability level with respect to the task being performed. Individuals that are low in ability are unlikely to set very challenging goals for themselves due to the low probability of attaining such goals. Similarly, individuals that are high

in ability are unlikely to establish goals of trivial difficulty because of the limited amount of self-satisfaction that would be derived from reaching such goals. In support of these propositions, several studies have found that cognitive ability tends to be positively related to the level of performance goals individuals establish (e.g., Chen et al., 2000; Phillips & Gully, 1997; Thomas & Mathieu, 1994). As such, we hypothesized that cognitive ability would be positive related to the level of goals set by individuals (Path 12).

Hypothesis 9: Cognitive ability will be positively related to goals.

Goal-Performance Discrepancies

Most achievement theorists identify task-specific competence expectancies as important variables in achievement settings (Atkinson, 1957; Bandura, 1982; Butler, 1992). In fact, much of the theory surrounding goal orientation proposes that the adoption of a particular goal orientation is partially determined by an individual's expectancy of competence on a given task (Elliot, 1994). As such, in the present study it could be expected that factors that influence a person's perceived competence with respect to a task would influence the level of the various state goal orientations they exhibit for that task. One such indicator of competence is the person's performance relative to their performance goal. As noted by self-regulation theorists (e.g., Bandura, 1986), it is not actual performance that regulates behavior, but rather performance relative to one's goal that drives behavior. Both social cognitive theory (Bandura, 1986) and control theory (e.g., Campion & Lord, 1982) conceptualizations of motivated behavior argue that motivation is partially determined by the discrepancy one observes between their desired goal and their actual behavior or performance (i.e., their goal-performance discrepancy). In support of such assertions, numerous studies have shown that these goal-performance discrepancies (GPDs) are related to the exertion of effort (e.g., Bandura & Cervone, 1983), goal revision (e.g.,

Donovan & Williams, 2003), and task prioritization (e.g., Kernan & Lord, 1990). Given that such GPDs may be interpreted by individuals as an indication of their task competence, and the assertion made by Elliot and colleagues that these perceptions of competence may foster the adoption of certain types of state goal orientations, it could be expected that GPDs might predict the level of the various state goal orientations individuals adopt when performing a task. More specifically, it would be expected that individuals achieving their goals would be more likely to adopt a state learning goal orientation or state performance-approach goal orientation, while individuals that are not reaching their self-set goals may adopt a more state performance-avoidance goal orientation. Although a lack of empirical evidence prevents the formulation of well founded, specific hypotheses regarding the effects of GPDs on state goal orientation, exploratory analyses were conducted in the present study to provide information about the presence and nature of any such relationships.

Methods

Participants

Participants were 225 undergraduate student volunteers from a large Southeastern university. Participants were recruited from undergraduate psychology courses. Individuals participating in the study received course credit in return for their voluntary participation.

Procedure

Upon arriving, participants were informed that they would be participating in a study looking at how students perform on a computer-based puzzle task. Participants were run in groups of approximately 10-12 participants. Following an explanation of the experiment, individuals were asked to complete a 12-minute cognitive ability test, followed by a measure of attention ability. Once this test and measure were completed, the researcher introduced the

participants to the puzzle task they would be performing in the study. To familiarize the participants with this task, the researcher presented a series of written instructions to the participants and briefly discussed these instructions. Individuals were then given the opportunity to complete two practice puzzles. Upon completion of the second practice session, individuals were instructed to complete a series of questions assessing performance goals for the next puzzle, 2 measures of self-efficacy relating to this performance goal, and a measure of state goal orientation. Once these questionnaires were completed, individuals performed the first performance trial puzzle. After they completed this puzzle, individuals completed another series of questions assessing mental focus, performance goals for the next puzzle, 2 measures of self-efficacy relating to this performance goal, and a measure of state goal orientation. After completion of these questions, they completed another puzzle. Once again, after the completion of this second puzzle, they completed a series of questions assessing mental focus, performance goals for the next puzzle, 2 measures of self-efficacy relating to this performance goal, and a measure of state goal orientation. Finally, they completed the third and final puzzle. Once they completed this puzzle, they completed a measure of mental focus and a question of choice. Following completion of the puzzle task, they were debriefed by the researcher.

Task

The task that was used in the present study was a computer-based puzzle program. The puzzles consisted of images divided into a 5 X 5 grid. The images used in the present study consisted of box office movie posters. The 2 practice puzzles were similar to the 3 performance puzzles, however, they were found to be easier to solve in an earlier pilot study (i.e., participants were able to solve the puzzles quicker). Once a puzzle was activated, the image of the movie poster appeared on the screen and remained intact for 5 seconds, allowing the participant time to

study the image. After 5 seconds, the puzzle was then scrambled. Subjects utilized mouse clicks to manipulate the puzzle pieces in the grid with the goal of ultimately returning each piece to its original location within the grid. Puzzles pieces were moved by swapping one piece with another puzzle piece. In the lower left-hand corner of the puzzle interface was a clock displaying minutes and seconds which allowed participants to monitor the time that had elapsed while working on the puzzle. After all the pieces were placed back in their original location, the task notified the participant that the puzzle had been solved, and the elapsed time clock stopped.

Although some may question the relevance of this task for examining motivational process and making generalizations to organizational settings, this task was chosen for two reasons. First, past research using this task has found that participants find this task to be very interesting and engaging and that individuals display high levels of motivation and interest in performing this task. As noted by Donovan (2001), it is difficult for researchers to study motivational processes in situations where individuals have little interest in performing the experimental task they are presented with or have little motivation to try to perform well on these tasks. Second, this task requires learning on the part of participants in that they must develop and test strategies for solving these puzzles in order to perform effectively. As such, this environment is similar to the learning environments that are typically utilized in past goal orientation research (e.g., Kozlowski et al., 2000) and, therefore, may be well suited for allowing comparisons between the results of the present study and those obtained by past research.

Measures

State goal orientation. State goal orientation (SGO) was assessed using a fifteen-item measure developed by Elliot and Church (1997) to measure goal orientation specific to a classroom setting (See Appendix A). Previous work (e.g., Lee et al., 2003) has demonstrated the

construct validity of this scale as a measure of goal orientation in a learning environment (e.g. classroom setting), and therefore we felt this was an appropriate measure of state goal orientation. The measure was adapted to the needs of the current study. In adapting the measure, one item from each of the three subscales was dropped since the content of the question did not fit the task employed in the present study. As a result, there were five items for each of the three scales (i.e. learning, avoidance, and approach) as opposed to six items in the original measure. An example of a state learning goal orientation item includes "I would like to completely master this puzzle task." An example of a state performance-approach goal orientation item includes "I am motivated by the thought of outperforming my peers on this puzzle." An example of a state performance-avoidance goal orientation item includes "I worry about the possibility of taking too long to solve this puzzle." For each of the fifteen items, individuals were presented with a statement and asked to rate their agreement with each statement at the present time on a scale from 1 (Strongly disagree) to 7 (Strongly agree). Elliot and Church (1997) report reliabilities of .89 for learning goal orientation, .91 for performance-approach goal orientation, and .77 for performance-avoidance goal orientation. In the present study the reliabilities for state learning goal orientation ranged from .89 to .95, state performance-approach goal orientation, .96 to .97, and state performance-avoidance goal orientation .75 to .79.

Self-Efficacy. As recommended by recent researchers (Bandura, 1997; Phillips, personal communication, October, 1999), self-efficacy was assessed utilizing two distinct methods. First, general task self-efficacy was assessed using a 10-item Likert scale. The items used in this scale were adapted from Phillips and Gully (1997) and were written so as to follow Bandura's (1991) suggestion that self-efficacy scales must be domain specific and assess the multifaceted ways in which efficacy beliefs operate in that particular domain (see Appendix B). Items contained in

this scale include: “I feel confident in my ability to perform well on the upcoming puzzle” and “I don’t feel that I am as capable of performing as well on this puzzle as other students.”

Responses to this measure were made on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The reliabilities for this measure were .87 for Trial 1, .87 for Trial 2, and .88 for Trial 3.

As recommended by Lee and Bobko (1994), self-efficacy was also assessed utilizing a composite measure that measures both self-efficacy magnitude and strength (see Appendix C). Within this measure, participants were presented with 10 time levels, ranging from 30 seconds up to 5 minutes in increments of 30 seconds. They were then asked to indicate whether or not they could reach each performance level and their confidence in their ability to do so (on a scale ranging from 0% confident, to 100% confident). Using this approach, self-efficacy is computed by summing the individual’s confidence ratings for all performance levels they indicated ‘yes’ to.

Mental Focus. Six items from Lee et al. (2003) were used to assess the degree of concentration when performing the puzzle task. The items were originally used to gauge concentration while studying but were adapted to the needs of the current study (see Appendix D). An example of an item on the mental focus measure is “When performing this task, I feel distracted and find it hard to pay attention.” A 5-point Likert scale was used for responses, ranging from 1 (I didn’t do this at all) to 5 (I did this all the time). Lee et al. (2003) reported a reliability of .88 for these items. The present study found reliabilities of .86 for Trial 1, .93 for Trial 2, and .92 for Trial 3.

Goals. Individuals’ personal goals were measured prior to the first, second, and third puzzle trials (see Appendix C). Subjects were asked “Please think about your performance on the

upcoming puzzle. In the space below, please indicate how quickly (in minutes and seconds) you would like to solve the next puzzle. _____ Minutes and _____ Seconds

Cognitive Ability. Due to the cognitive demands of the task performed in this study (and the impact of such cognitive demands on performance), a measure of general cognitive ability was obtained through the use of the Wonderlic Personnel Test, Form A (WPT; Wonderlic, 1983). The WPT is a 12 minute, self-administered paper and pencil test that consists of 50 items. A number of authors (Dodrill, 1981; 1983; Dodrill & Warner, 1988; McKelvie, 1989) have demonstrated the favorable psychometric properties as well as the practical utility of this test.

Attention Ability. As an alternative measure of ability, attention ability was assessed with Derryberry and Reed's (2002) measure of attention (see Appendix E). The measure consisted of 20-items. For example "It's very hard for me to concentrate on a difficult task when there are noises around" and "After being interrupted or distracted, I can easily shift my attention back to what I was doing before." A 5-point Likert scale was used for responses, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The reliability for this scale was .87.

Performance. The time (in minutes and seconds) taken to complete each puzzle was used as the performance measure. Therefore, there were three performance trial measures, one for each puzzle. A lower time indicated better performance.

Goal-Performance Discrepancies. Goal-performance discrepancies (GPDs) were used as an indicator of goal achievement and past performance for trials 2 and 3. GPD was computed by subtracting ones performance on the previous trial (Trials 1 and 2) from their goal for that particular trial. For this particular study, a positive GPD indicated that they did not reach their desired goal (goal for trial was higher than their performance for that trial); while a negative GPD indicated that they exceeded their self-set goal for that trial.

Data Analysis

To evaluate the proposed theoretical model, LISREL 8 (Jöreskog & Sörbom, 1993) was used to calculate all parameter estimates based on the covariance matrices generated within each study. To accomplish this, a model was constructed in which each latent variable was represented by a single indicator, and all parameter estimates were corrected for measurement error utilizing the obtained reliability estimates and observed variances for all variables. More specifically, the path from each latent variable to its single indicator was fixed at a value of 1.0, while the error variance estimates were fixed to equal one minus the reliability estimates multiplied by the observed variance of each variable (Bollen, 1989; Hayduk, 1987).

To evaluate the model presented in Figure 1, five indices of overall model fit (chi square, GFI, AGFI, CFI, and standardized RMR) were examined. With respect to these indices, the presence of a non-significant chi-square, GFI, AGFI, and CFI values above .90, and SRMR values below .08 are generally thought to be indicative of acceptable model fit (Browne & Cudeck, 1993; Joreskog & Sorbom, 1993). In addition, individual path coefficients were examined for significance and direction.

Results

Descriptive Statistics. Tables 1-3 contain the means, standard deviations, and intercorrelations of all variables for Trials 1, 2, and 3. In looking at these correlations across trials, initial evidence is provided for the proposed hypotheses. Across all three trials self-efficacy was significantly correlated with state learning goal orientation (average $r = .47$), state performance-approach goal orientation (average $r = .45$), and state-performance avoidance goal orientation (average $r = -.33$). Mental focus was significantly related to state learning goal orientation (average $r = .39$) and state performance-approach goal orientation (average $r = .29$).

The relationship between mental focus and state performance-avoidance goal orientation was only significant for trial 2 ($r = -.16$), although Trials 1 and 3 were similar in magnitude. Goals were significantly related to both self-efficacy (average $r = -.53$) and mental focus (average $r = -.29$) across all three trials. The relationship between performance and self-efficacy (average $r = -.26$), mental focus (average $r = -.30$), and goals (average $r = .32$) were all significant at the .01 level. In addition, cognitive ability was significantly related to self-efficacy (average $r = .23$), goals (average $r = -.21$), and performance (average $r = -.28$) for all three trials.

The stability of the self-report measures was also examined (see Table 8). Each measures zero-order correlation was examined from Trial 1 to 2, Trial 1 to 3 and Trial 2 to 3. State learning goal orientation had correlations ranging from .88 to .96. State performance-approach goal orientation similarly had correlations from .89 to .95. The correlations across trials for state performance-avoidance goal orientation ranged from .86 to .94. Self-efficacy was found to range from .83 to .91. Finally, mental focus was found to have correlations of .82 for Trial 1 to 2, .73 for Trial 1 to 3 and .82 for Trial 2 to 3. As can be seen from these correlations the measures of state goal orientation and self-efficacy tended to stay somewhat stable. It is important to note that these self-reported measures were all completed within 45 minutes of each other. However, it is interesting that the correlations were not stronger given this limited time differential between measures. Although, this fluctuation could be the result of random error variance, it may be that these state measures are varying from trial to trial as a result of elements such as past performance, learning, or goal performance discrepancies. The measure of mental focus did not seem to be as stable across trials as the above mentioned measures. This could have been the result of individuals become more comfortable and familiar with the task. As the novelty of the task were off, mental focus may have become less important in solving the puzzles (e.g. Trial 1

to 3, $r = .73$).

Unfortunately, the second measure of self-efficacy (Appendix C), which assessed strength and magnitude, proved to be problematic in that individuals appeared to have difficulties responding to this scale in an appropriate manner. More specifically, individuals were found to be consistently assigning confidence values of “0” to time intervals they had easily surpassed on the previous puzzle trial. In addition, several individuals exhibited response patterns that were logically inconsistent (e.g., indicating that they were 0% confident that they could achieve a time of 3 minutes better, while indicating that they were 100% confident that they could achieve a time of 2 minutes or better). Due to these problematic response patterns, the strength and magnitude measure of self-efficacy was not used in any of the analyses. Instead, the ten-item Likert scale described previously was utilized as the sole measure of self-efficacy for all analyses conducted in the present study.

Since the task in the present study required a certain level of ability to pay attention, Derryberry and Reed’s (2002) measure of attention ability was included as a possible alternate measure of ability. However, when looking at the correlations between this construct and variables of interest (i.e., self-efficacy, goals, and performance) the relationships were small in magnitude and non-significant. These non-significant relationships were consistent across all three trials. Given the lack of initial support for these relationships, the attention measure was not incorporated in the model analyses. Instead, cognitive ability, as measured by the Wonderlic, was the sole measure of ability for all model analyses.

Original Model Analysis. To evaluate the model presented in Figure 1, we first examined five indices of overall model fit (chi square, GFI, AGFI, CFI, and standardized RMR) (See Table 4). With respect to these indices, the presence of a non-significant chi-square, GFI, AGFI, and

CFI values above .90, and SRMR values below .08 are generally thought to be indicative of acceptable model fit (Browne & Cudeck, 1993; Joreskog & Sorbom, 1993). An examination of these indices revealed that the model demonstrated reasonably good fit with the data for all three trials: Trial 1 ($\chi^2(9) = 23.78, p < .01$, GFI = .98, AGFI = .90, CFI = .96, SRMR = .039), Trial 2 ($\chi^2(9) = 36.32, p < .01$, GFI = .96, AGFI = .85, CFI = .93, SRMR = .040), and Trial 3 ($\chi^2(9) = 29.38, p < .01$, GFI = .97, AGFI = .87, CFI = .95, SRMR = .038) providing initial support for the proposed model. Although the chi-square for trials 1 through 3 were significant, it is important to note that this index is sensitive to trivial differences between the observed and implied covariance matrix in large samples and may consequently lead to the rejection of well fitting models (Hu & Bentler, 1995). In addition, it is worth noting that despite the overall high level of the various fit indices, the AGFI scores obtained for Trials 2 and 3 were less than optimal since they were below .90 for these trials.

Next, we examined the standardized path coefficients (presented in Figure 2) and their significance to evaluate the individual paths in this model. An examination of these path coefficients revealed that many of these coefficients were significant and in the expected direction for all three trials. First, the relationship between state goal orientation and self-efficacy was examined. As expected, state learning goal orientation had a significant, positive effect on self-efficacy (Path 1) for Trial 1 (.31), Trial 2 (.28), and Trial 3 (.38). A positive relationship was also found between state performance-approach goal orientation and self-efficacy (Path 2) for Trial 1 (.52), Trial 2 (.49), and Trial 3 (.39). State performance-avoidance goal orientation was found to have a negative relationship with self-efficacy (Path 3) for all three trials (Trial 1 -.48; Trial 2 -.53; Trial 3 -.54). These results provide support for the direct effect of state goal orientation on self-efficacy.

The impact of state goal orientation on mental focus was also inspected. As hypothesized, state learning goal orientation was positively related to mental focus (Path 4) for Trial 1 (.32), Trial 2 (.37), and Trial 3 (.32). The same was true for state performance-approach goal orientation, which was positively related to mental focus (Path 5): Trial 1 (.25), Trial 2 (.19), and Trial 3 (.24). In addition, the expected relationship was also found with state performance-avoidance goal orientation. The path coefficients from state performance-avoidance goal orientation to mental focus (Path 6) were negative in direction and significant for Trial 1 (-.25), Trial 2 (-.26), and Trial 3 (-.24).

In looking at the relationships of the remaining variables on goals and performance, most of the anticipated relationships were supported. It is important to remember that for goals and performance a negative relationship is indicative of an improvement in one's goals or performance since a faster time is an increase in performance. As expected, self-efficacy was significantly related to goals (Path 7) for Trial 1 (-.59), Trial 2 (-.59), and Trial 3 (-.55). However, contrary to our expectations, self-efficacy was not a significant predictor of performance (Path 8). It appears that self-efficacy's influence on performance is solely through its impact on performance goals. Mental focus, on the other hand, was significantly related to performance (Path 9) for Trial 1 (-.22), Trial 2 (-.18), and Trial 3 (-.32). Goals were positively related to performance (Path 10) for Trials 1 & 3 (.41 and .17, respectively), but not significant for Trial 2 (.15). Therefore, only partial support was found for this hypothesis. Cognitive ability, contrary to our prediction, was not significantly related to self-efficacy (Path 11) or goals (Path 12) for any of the three trials, after controlling for all other variables in the model. Finally, cognitive ability was significantly related to performance (Path 13) for Trial 1 (-.23) and Trial 3 (-.26), but this relationship was not significant for Trial 2 (-.13).

Modification Indices of the Original Model. The modification indices provided by LISREL were inspected to determine if there were any aspects of the model that were potentially misspecified (i.e., paths missing). Examination of these modification indices suggested that an additional path be added to the model estimating the relationship between self-efficacy and mental focus. Conceptually this relationship make sense, as an individual becomes more confident in their ability to perform the task, s/he becomes more involved and/or absorbed in what they are doing. According to Bandura (1991), an individual's level of self-efficacy affects the amount of effort they put forth in a given task and the level of cognitive processing they engage in, both of which would impact mental focus. Furthermore, he states individuals display enduring interest in activities they find themselves to be self-efficacious at and from which they derive satisfaction (Bandura & Schunk, 1981). Although one must be cautious in adding such paths based simply upon modification indices, we felt that the estimation of this path was warranted given what we know about self-efficacy.

Once again, indices of overall model fit were examined (See Table 5). In comparison to the original model, an examination of these indices revealed that the model demonstrated improved model fit for Trial 1 ($\Delta\chi^2[1] = 17.98, p < .01$), Trial 2 ($\Delta\chi^2[1] = 31.15, p < .01$), and Trial 3 ($\Delta\chi^2[1] = 22.34, p < .01$). The fit indices also improved for all three trials: Trial 1 ($\chi^2(8) = 5.80, p > .05$, GFI = .99, AGFI = .97, CFI = 1.00, SRMR = .017), Trial 2 ($\chi^2(8) = 5.17, p > .05$, GFI = .99, AGFI = .97, CFI = 1.00, SRMR = .018), and Trial 3 ($\chi^2(8) = 7.04, p > .05$, GFI = .99, AGFI = .96, CFI = 1.00, SRMR = .024). It is important to note, that each of these indices exceed the values indicative of acceptable fit (Browne & Cudeck, 1993; Joreskog & Sorbom, 1993).

Next, the standardized path coefficients (presented in Figure 3) and their significance were examined to evaluate the individual paths in this model. An examination of these path

coefficients revealed that many of these coefficients were significant and in the expected direction for all three trials. The relationships between state goal orientation and mental focus did decrease due to the newly added path between self-efficacy and mental focus. As expected, as one's level of SLGO increased their level of self-efficacy also increased. State learning goal orientation had a significant, direct positive effect on SE for Trial 1 (.30), Trial 2 (.27), and Trial 3 (.37). A direct positive relationship was also found between state performance-approach goal orientation and self-efficacy for Trial 1 (.51), Trial 2 (.49), and Trial 3 (.38). State performance-avoidance goal orientation was found to have a direct negative relationship with self-efficacy for all three trials (Trial 1 -.46; Trial 2 -.50; Trial 3 -.52).

The relationship between state goal orientation and mental focus was also examined. State learning goal orientation was a significant predictor of mental focus for trials 1 & 2 (.17 and .20, respectively), this relationship was not significant for Trial 3. Similarly, state performance-approach goal orientation and state performance-avoidance goal orientation were not significantly related to mental focus for any of the three trials. As expected, self-efficacy was directly related to mental focus for Trial 1 (.51), Trial 2 (.65), and Trial 3 (.57). The decrease in the magnitude and lack of statistical significance for the paths from state goal orientation to mental focus is likely due to the inclusion of the path from self-efficacy to mental focus mentioned previously. Looking at these results, it can be suggested that state goal orientations effects on mental focus are through its impact on self-efficacy.

Self-efficacy was also significantly related to goals for Trial 1 (-.59), Trial 2 (-.58), and Trial 3 (-.55). As mentioned previously, lower goals denote more challenging goals. Contrary to our expectations, self-efficacy was not a significant predictor of performance. It appears that self-efficacy's influence on performance is completely mediated by its impact on goals. As

expected, goals were positively related to performance, however, this was only true for Trials 1 & 3 (.41 and .17, respectively). This relationship for Trial 2 was not significant. Mental focus, on the other hand, was significantly related to performance for Trial 1 (-.24), Trial 2 (-.19), and Trial 3 (-.32). As one's mental focus increases, their level of performance also improves. Once again, cognitive ability was not significantly related to self-efficacy or goals for any of the three trials after controlling for all other variables in the model. Cognitive ability was significantly related to performance for Trial 1 (-.23) and Trial 3 (-.26), but this relationship was not significant for Trial 2.

Exploratory Analyses

Goal Performance Discrepancies. Taken as a whole, the path coefficients and indices of model fit provide support for much of the proposed theoretical model. However, in an attempt for fully understand the role of state goal orientation, the role of past performance and goals were taken into account. Competency expectancies are one of the known influences goal orientation (Elliot & Church, 1997). One's level of competency is usually derived from past performance on a particular task or related task. Therefore, goal performance discrepancies (GPDs) were used as an indicator of goal achievement and past performance for trials 2 and 3. GPD was computed by subtracting ones performance on the previous trial (Trials 1 and 2) from their goal for that particular trial. For this particular study, a positive GPD indicated that they did not reach their desired goal (goal for trial was higher than their performance for that trial), while a negative GPD indicated that they exceeded their self-set goal for that trial.

For comparative purposes, fit statistics for the models with GPD for trials 2 and 3 are presented in Table 2. In looking at the change in chi-square, it is clear that the original model fits the data substantially better than the model with GPD included (Trial 2 ($\Delta\chi^2[10] = 163.47, p <$

.01; Trial 3 ($\Delta\chi^2[10] = 119.08, p < .01$). This is also evident in the reduction in the fit indices for both Trial 2 ($\chi^2(19) = 199.79, p < .01$, GFI = .852, AGFI = .65, CFI = .66, SRMR = .120) and Trial 3 ($\chi^2(19) = 148.46, p < .01$, GFI = .88, AGFI = .71, CFI = .71, SRMR = .126). Based upon these results, it appears that the addition of paths from GPD to each of the state goal orientations were detrimental to overall model fit, as indicated by the drop in GFI, AGFI, CFI and the rise in SRMR. Each index conveys unacceptable model fit (Browne & Cudeck, 1993; Joreskog & Sorbom, 1993)

Modification Indices for GPD Model. The modification indices provided by LISREL were inspected to determine if there were any aspects of the model that were potentially misspecified (i.e., paths missing) in the original model including GPD. Examination of these modification indices suggested that an additional path be added to the model estimating the relationship between GPD and goals. Although adding paths based simply upon modification indices capitalizes on chance and can be of questionable value, the estimation of this path can easily be justified by research demonstrating that an important determinants of an individual's performance goal is the extent to which they achieved their previous goal (e.g., Campion & Lord, 1982; Donovan & Williams, 2003).

In looking at the fit indices for the revised GPD model there were slight improvements in fit, however, they still did not exceed those of the original model: Trial 2 ($\chi^2(18) = 122.52, p < .01$, GFI = .91, AGFI = .76, CFI = .82, SRMR = .097) and Trial 3 ($\chi^2(18) = 116.98, p < .01$, GFI = .90, AGFI = .75, CFI = .78, SRMR = .12). In addition, the obtained values for the AGFI, CFI, and SRMR indices are all indicative of unacceptable fit (Browne & Cudeck, 1993; Joreskog & Sorbom, 1993). Given the overall lack of fit exhibited with both the original and revised GPD models, it can be concluded that the addition of these paths to state goal orientation and goals

degrades the overall model fit. As such, we chose not to pursue this model or present the path coefficients generated by such models because such estimates are likely to be misleading and potentially inaccurate. However, in looking at the zero order correlations, these were significant and in the expected directions. Negative GPDs (indicating that individuals surpassed their goal) were correlated significantly with SLGO (Trial 2, $r = -.31$; Trial 3, $r = -.14$) and SPAGO (Trial 2, $r = -.26$; Trial 3, $r = -.16$). Positive GPDs (indicating that individuals did not reach their goal) were significantly correlated with SPAVGO (Trial 2, $r = .15$; Trial 3, $r = .18$)

Choice. Given the recent introduction of state goal orientation into the work motivation literature, there are several questions that remain unexamined. Recent research has found that state manifestations of goal orientation impact proximal regulators of motivation, and in turn performance outcomes. In an attempt to build our knowledge base of the construct, exploratory analyses were conducted examining the effects of state goal orientation on behavioral choice. More specifically, the present study attempted to determine if state goal orientation is predictive of the behavioral choices made by participants regarding whether they would like to continue performing the puzzle tasks or would rather switch to a new task. It might be expected that the combination of state goal orientation and past performance on the puzzle task would predict which individuals would continue on with the puzzle task (e.g., individual's with a strong performance approach orientation and high levels of past performance might be expected to continue on with the same task). Therefore, after subjects had completed the three performance trials, they were given the “choice” of continuing on to another puzzle or the option to try a new task. Overall, 130 individuals chose to continue on with the same task, while 95 individuals chose to try a new task. To examine whether this choice was related to state goal orientation, mean comparisons were conducted to determine whether there were significant differences on

the state goal orientation measures between those who chose to continue with the puzzle tasks, and those who chose to try a new task. The results of these comparisons indicated that individuals who chose to continue with the same tasks were higher in state performance avoid goal orientation than those who chose to try a new task ($t[224] = 3.44, p < .01, d = 0.46$). However, there were no significant differences between the two choice categories in terms of state learning goal orientation and state performance approach goal orientation (both $p > .20$). Additional analyses were conducted to determine if state goal orientation interacted with past performance (utilizing both Trial 3 performance and Trial 3 GPD as indicators of past performance) to predict the choice made by participants. The results of this analysis, however, indicated that this interaction was nonsignificant. Overall, these results suggest that behavior choice was primarily a function of factors other than state goal orientation and past performance.

Prediction of performance. Although the previously conducted analyses demonstrate that the proposed model appears to be a reasonably sound depiction of the task performance process, further analyses were conducted to determine the level of prediction of task performance obtained in this model. More specifically, regression analyses were conducted in which performance was regressed on ability, self-efficacy, mental focus, and goals (all variables with direct paths to performance in the model tested). Together, these variables accounted for a significant proportion of the variance in performance for Trial 1 ($R^2 = .27$, adjusted $R^2 = .25$), Trial 2 ($R^2 = .12$, adjusted $R^2 = .10$), and Trial 3 ($R^2 = .23$, adjusted $R^2 = .21$). From these analyses we can conclude that these variables are indeed contributing significantly to the prediction of performance.

Incremental contribution of state goal orientation. In order to strengthen our understanding of the state goal orientation construct, it is important to know the extent to which

these variables increment our prediction of self-efficacy over and above the effects of ability. To provide such information, additional analyses were conducted for each trial in which self-efficacy was regressed on cognitive ability at Step 1 of the regression equation, state learning goal orientation, state performance-approach goal orientation, and state performance-avoidance goal orientation entered at Step 2. The results of these analyses indicated that state goal orientation was a significant predictor of self-efficacy after controlling for ability (Trial 1: adjusted $R^2 = .42$, $\Delta R^2 = .37$, $p < .01$; Trial 2: adjusted $R^2 = .46$, $\Delta R^2 = .42$, $p < .01$; Trial 3: adjusted $R^2 = .47$, $\Delta R^2 = .48$, $p < .01$), accounting for 37 to 48 percent of the variance in self-efficacy across trials. These results provide further support for the unique influence of state goal orientation on one's level of self-efficacy.

To further examine the incremental contribution of state goal orientation on self-efficacy, analyses were conducted to ascertain the incremental contribution of each of the three state goal orientation dimensions in predicting self-efficacy, over and above ability and the remaining two dimensions. In order to examine this, ability was once again entered at Step 1 of the regression equation, while two of the state goal orientation dimensions were entered at Step 2, followed by the third in Step 3. This process was repeated three times in order to examine the unique contribution of each state goal orientation over it preceding two state goal orientations. Results revealed that each dimension of state goal orientation contributed uniquely to the variance captured in self-efficacy, above and beyond ability state performance-approach, and state performance-avoidance goal orientation dimensions. As expected, state learning goal orientation significantly predicted self-efficacy (Trial 1: $b = .247$, $\beta = .253$, $p < .01$, $\Delta R^2 = .05$, adjusted $R^2 = .40$; Trial 2: $b = .254$, $\beta = .266$, $p < .01$, $\Delta R^2 = .06$, adjusted $R^2 = .46$; Trial 3: $b = .368$, $\beta = .385$, $p < .01$, $\Delta R^2 = .11$, adjusted $R^2 = .49$). State performance-approach goal orientation predicted self-

efficacy above and beyond ability, state learning, and state performance-avoidance goal orientation (Trial 1: $b = .336$, $\beta = .407$, $p < .01$, $\Delta R^2 = .12$, adjusted $R^2 = .40$; Trial 2: $b = .342$, $\beta = .425$, $p < .01$, $\Delta R^2 = .14$, adjusted $R^2 = .46$; Trial 3: $b = .267$, $\beta = .319$, $p < .01$, $\Delta R^2 = .07$, adjusted $R^2 = .50$). Similarly, state performance-avoidance goal orientation contributed uniquely to the prediction of self-efficacy over and beyond ability, state learning and state performance-approach goal orientation (Trial 1: $b = -.375$, $\beta = -.373$, $p < .01$, $\Delta R^2 = .12$, adjusted $R^2 = .40$; Trial 2: $b = -.373$, $\beta = -.385$, $p < .01$, $\Delta R^2 = .14$, adjusted $R^2 = .46$; Trial 3: $b = -.393$, $\beta = -.396$, $p < .01$, $\Delta R^2 = .14$, adjusted $R^2 = .49$). Taken together, each dimension of state goal orientation significantly contributed to the prediction of self-efficacy, providing further support for a trichotomous conceptualization of state goal orientation.

Finally, a more restrictive test of the role of state goal orientation in predicting self-efficacy was conducted to determine whether state goal orientation is adding to the prediction of self-efficacy over and above more traditional antecedents of self-efficacy (i.e., past performance, past self-efficacy). To examine this possibility, regression analyses were conducted in which self-efficacy for Trials 2 and 3 was regressed on both self-efficacy and performance from the previous trial at Step 1, followed by the three state goal orientation dimensions at Step 2 of the regression equation. The results of these analyses indicated that past self-efficacy and past performance accounted for nearly 80 percent of the variance in self-efficacy ($R^2 = .78$, adjusted $R^2 = .77$ for Trial 2; $R^2 = .83$, adjusted $R^2 = .83$ for Trial 3), while the three state goal orientation dimensions as a whole made an incremental contribution to the prediction of self-efficacy for both Trial 2 (adjusted $R^2 = .78$, $\Delta R^2 = .01$, $p < .01$) and Trial 3 (adjusted $R^2 = .84$, $\Delta R^2 = .02$, $p < .01$). More specifically, for Trial 2, state performance-approach ($b = .082$, $\beta = .104$, $p < .01$) and state performance-avoidance ($b = -.077$, $\beta = -.082$, $p < .05$) goal orientations predicted self-

efficacy. In Trial 3, state learning ($b = .124$, $\beta = .127$, $p < .01$) and state performance-avoidance ($b = -.090$, $\beta = -.094$, $p < .01$) goal orientations significantly predicted self-efficacy. Coupled together, these results add support to the importance of the incorporation of state goal orientation into models of goal setting and task performance, however, it appears that not all three dimensions of state goal orientation are needed to predict self-efficacy when more traditional antecedents of self-efficacy are present.

Discussion

The purpose of the present study was to explore the role of three-dimensional state goal orientation in the processes related to goal establishment and task performance. This study directly expanded upon the previous research of Breland and Donovan (in press) by providing: (1) a more detailed look into the role of state goal orientation by employing a three-dimensional measure of the construct, (2) an examination of the role of mental focus, a proximal regulator of performance, and (3) an examination of the potential relationship between past performance and the adoption of state goal orientations.

Original Model

State Goal Orientation - Self-Efficacy. The results of this study generally supported the notion that state goal orientation plays a role in the process of goal establishment and task performance. State goal orientation was significantly related to an individual's level of task self-efficacy across all three trials. Furthermore, the strength of the relationships between state goal orientation and self-efficacy did increase in comparison to past research utilizing dispositional measures of goal orientation. With respect to state learning goal orientation, the findings supported the proposed relationship between state learning goal orientation and self-efficacy for all three trials; Individuals with a strong state learning goal orientation tended to exhibit higher

levels of task self-efficacy than individuals with a weak state learning goal orientation. These results are consistent with Breland and Donovan (in press), who also found a significant relationship between state learning goal orientation and self-efficacy in both a classroom ($r = .31$) and computer simulated task setting ($r = .25$). In addition, these results were also similar to research demonstrating a positive relationship between dispositional learning goal orientation and self-efficacy (e.g., Phillips & Gully, 1997). However, it is worth noting that the zero order correlations obtained in the present study between state learning goal orientation and self-efficacy (average $r = .47$) were substantially larger than the correlations observed by Phillips and Gully (1997) between dispositional learning goal orientation and self-efficacy ($r = .14$). Thus, as with Breland and Donovan (in press), these findings once again suggest that the prediction of self-efficacy may be substantially enhanced through the use of a state measure of goal orientation as compared to dispositional measures of goal orientation.

The findings regarding state performance-approach goal orientation's relationship with self-efficacy in the present study were as expected. A positive relationship between state performance-approach goal orientation and self-efficacy was observed for all three trials. Like state learning goal orientation, as one's level of state performance-approach goal orientation increased so did his or her level of self-efficacy. These individuals are focusing on attaining positive outcomes (i.e., improving their puzzle times) and outperforming others. Therefore, this desire to attain positive outcomes and exceed the performance of others was beneficial in the present study. In looking at past studies which examined this relationship using dispositional measures of performance-approach goal orientation, it was generally assumed that this relationship was weak and non-significant. For example Schmidt and Ford (2003) found a correlation of .08, while VandeWalle et al. (2001) found a correlation of .16. In the present

study, the utilization of a state measure of performance-approach goal orientation increased this relationship dramatically (average $r = .45$). Once again, it appears that assessing these constructs through state measures considerably increases their ability to predict self-efficacy. It is important to note that the task in the present study was somewhat repetitive in nature and fairly simple, both characteristics that could have enhanced the strength of the relationship between state performance-approach goal orientation and self-efficacy. In past studies involving performance-approach goal orientation, the tasks employed appear to be more challenging and difficult. For example Schmidt and Ford (2003) used a web-page design task, while VandeWalle et al. (2001) assessed performance on exams in a challenging business course. It is also worth noting that the state performance-approach goal orientation is a variable that is comprised of elements of both need for achievement and fear of failure (Elliot & Church, 1997). In the present study, there were not any significant detrimental consequences for failing to perform well or to failing to reach one's goal. This characteristic of the task may have essentially eliminated the fear of failure aspect of the situation, thereby reducing state performance-approach goal orientation to its need for achievement component. In contrast, past research has typically utilized tasks with significant negative consequences for low performance, such as performance on class exams (VandeWalle et al., 2001). As such, one must take this into consideration when making conclusions based upon the present results.

As expected, state performance-avoidance goal orientation was found to have a negative relationship with self-efficacy across all three trials. These results are congruent with past research which has found dispositional performance-avoidance goal orientation to be negatively related to self-efficacy (Ford & Schmidt, 2003; VandeWalle et al., 2001). As noted previously, a performance-avoidance goal orientation involves striving to avoid negative judgments, and

therefore it seems likely that these individuals would not place much confidence in their ability to perform a particular task, resulting in low levels of self-efficacy. The average correlation of -.33 for this relationship was slightly higher than those found with dispositional performance-avoidance goal orientation and self-efficacy in Ford and Schmidt (2003; $r = -.24$) and VandeWalle et al. (2001; $r = -.31$), although this improvement was much smaller in magnitude than that exhibited by both the state learning orientation and state performance-approach orientation measures.

The present study helps enhance our understanding of the relationship between performance goal orientation and self-efficacy in two distinct ways. First, a two-dimensional conceptualization of performance goal orientation was utilized in the present study. As mentioned earlier, in a meta-analytic review of the goal orientation literature Beaubien and Payne (1999) found highly inconsistent findings regarding the relationship between performance goal orientation and self-efficacy ($r = .07, p > .05$). Most of the studies reviewed in this meta-analysis used Button et al.'s (1996) one-dimensional measure of performance goal orientation, which is problematic when one considers that this scale contains both items assessing performance avoidance goal orientation (e.g., "I'm happiest at work when I perform tasks on which I know that I won't make any errors."), and performance-approach goal orientation (e.g., "The opinions others have about how well I can do certain things are important to me."). As a result, these inconsistent findings could be an artifact of combining the two independent dimensions of performance goal orientation into one scale. Since the majority of the items on this measure appear to be assessing the performance avoidance aspect of goal orientation, the abundant use of this scale could have lead to the negative connotations often associated with performance goal orientation. Interestingly, when looking at the results from Breland and

Donovan (in press), a significant, positive relationship between state performance goal orientation and self-efficacy was found in Study 2. In taking a closer look at the one-dimensional state performance goal orientation measure used in Breland and Donovan (in press) (i.e., Boyle & Klimoski, 1995), the items are clearly assessing the state performance-approach side of the construct (e.g., "I want to do better than others on the next trial."). Taken together with the results of the present study, these findings indicate the importance of distinguishing among the two dimensions of performance goal orientation.

Secondly, the present study was able to enhance the prediction of self-efficacy through the use of state manifestations of performance-approach goal orientation and performance-avoidance goal orientation. In the case of state performance-approach, this was one of the first studies to display consistent relationships with this construct and self-efficacy. In previous research, dispositional performance-approach goal orientation was found to be unrelated (Ford & Schmidt, 2003) or proposed to have a null relationship with self-efficacy (VandeWalle, 2001). With respect to performance-avoidance goal orientation, although the increase in prediction obtained by this measure over dispositional measures was more modest, it did represent incremental improvement in the prediction of self-efficacy. As a whole, these state manifestations of performance goal orientation appear to offer considerable improvements over current dispositional measures in predicting motivational variables such as self-efficacy.

Overall, these results support the importance of a three-dimensional, state manifestation of the goal orientation construct in the goal establishment process. Although previous research has tentatively established this link (Ames & Archer, 1988; Kozlowski et al., 2001), the present study, like Breland & Donovan (in press), examined the role of naturally occurring state goal orientations in the process of goal establishment. The examination of a trichotomous goal

orientation framework allowed for a more detailed look at the role of state performance goal orientation. In doing so, the present study was able to pinpoint the negative and positive effects of state performance goal orientation on self-efficacy. In addition, as depicted in the exploratory regression analyses, each state goal orientation significantly enhanced the prediction of self-efficacy over and above ability and its preceding state goal orientation dimensions. These results provide evidence for the unique contribution of each state goal orientation in predicting self-efficacy. Furthermore, two of the three dimensions of state goal orientation were found to capture unique variance in self-efficacy when controlling for ability, past self-efficacy, and past performance. Together, these analyses provide support for the incorporation of state goal orientation into future models of self-regulation.

State Goal Orientation - Mental Focus. As expected state learning goal orientation had a positive direct effect on an individual's ability to concentrate and become absorbed in the task. Individual's displaying a learning goal orientation desire to increase their level of competence or skill mastery. In doing so, they are focusing on a positive outcome, which engages them in the task at hand. This positive relationship was present across all three trials. As one's level of state learning goal orientation increased, their mental focus towards the task also improved. Interestingly, these findings (average $r = .39$), were considerably larger (in magnitude) to those found in Lee et al. (2003; $r = .23$), suggesting once again that the use of state goal orientation measures could enhance the level of prediction observed with relevant outcome variables.

As hypothesized, and consistent with Lee et al. (2003), state performance-approach goal orientation was positively related to mental focus. As with a state learning goal orientation, individuals displaying a state performance-approach goal orientation are trying to attain positive outcomes. In striving to achieve these outcomes, their concentration the on the task is likely to

increase resulting in higher levels of mental focus. As with state learning goal orientation, the magnitude of the relationship between state performance-approach goal orientation and mental focus increased (average $r = .29$) in comparison to the correlations presented in Lee et al. (2003; $r = .14$).

State performance-avoidance goal orientation was negatively related to mental focus (average $r = -.14$). Since high levels of state performance-avoidance goal orientation are often associated with increased anxiety and worry, which diverts attention from the task (Deffenbacher, 1980; Elliot & McGregor, 1999), it makes sense that one's level of mental focus would decrease. In contrast to the other findings involving state goal orientation, the magnitude of the relationship between state performance-avoidance goal orientation and mental focus falls below that of previous research by Lee et al. (2003; $r = -.29$). Therefore, there wasn't any improvement in the magnitude of relationship with mental focus when using a state measure of performance-avoidance goal orientation.

Self-Efficacy & Goals. With respect to the remainder of the hypothesized model, self-efficacy was found to positively influence performance goals for all performance episodes, and goals were positively associated with performance. However, the relationship between performance goals and subsequent performance was not significant for Trial 2. It is interesting to note that the zero-order correlations between goal and performance considerably decrease after Trial 1 (Trial 1, $r = .44$; Trial 2, $r = .25$; Trial 3, $r = .27$). This would suggest that goals became less important as individuals gained experience with the task. Furthermore, it does appear that after the practice trials, performance became capped or limited (Trial 1; $m = 91.54$ sec; Trial 2; $m = 94.57$ sec; Trial 3; $m = 94.70$ sec) across the remaining three trials. Given the similarities in times for these three trials, performance appears to become stable after Trial 1.

Also contrary to expectations, self-efficacy was not significantly related to performance after controlling for goals and ability. Instead, self-efficacy indirectly impacted performance through its influence on performance goals. Once again, the lack of this relationship could have been due to individuals reaching their performance potential after completing the two practice trials. However, similar results were found in Breland and Donovan (in press) when using a computer-simulated radar task. It is important to note that present study used the exact Likert measure of self-efficacy employed in Breland and Donovan (in press). In looking at the self-efficacy likert scale, which was adapted from Phillips and Gully (1997), it assesses more general perceptions of competence, rather than referencing specific performance levels seen in self-efficacy strength and magnitude scales. The lack in specificity could be a possible explanation for the absence of a relationship with performance goals, which are specific in nature. Therefore, despite Phillips and Gully's successful utilization of this self-efficacy likert measure in a classroom setting, it is possible that this measure may be less appropriate for measuring self-efficacy in other contexts. That is, these general perceptions of self-efficacy may be adequate in assessing an individual's self-efficacy in a familiar situation (e.g., classroom), but inappropriate in contexts or on tasks that are novel to the individual (e.g., puzzle solving task). Future research should attempt to employ more specific measures of self-efficacy like the Guttman style strength and magnitude scales advocated by Lee and Bobko (1994). Although the present study included this type of self-efficacy measure, problems with the data made it impossible to include these results in the analyses. The incorporation of these measures would allow for a more detailed and comprehensive view of self-efficacy's impact on performance.

Mental Focus-Performance. Unlike self-efficacy, mental focus was directly related to performance across all three trials. While solving the puzzles, the more absorbed and mentally

involved students were, the more likely they were to improve their performance. For this particular task, mental focus was an important component of performance. Individuals were given only 5 seconds to memorize the puzzle and the original location of its pieces, making concentration essential. These results are also similar to those found in Lee et al. (2003) in a classroom setting, where student's mental focus was positively related to exam performance. Together these studies suggest that mental focus may represent a significant proximal predictor of task performance on tasks requiring significant or substantial levels of concentration. It is important to note that the present study only tested a path from mental focus to performance. Mental focus could have impacted performance through goals. As an individual becomes more mentally engaged in a task, they may set more challenging goals for themselves. Although this path was not explored given the substantial fit of the present model, the construct of mental focus needs to be more fully explored before we can make firm conclusions regarding its impact on performance.

Cognitive Ability. Interestingly, cognitive ability was not significantly related to self-efficacy or goals for any of three trials after controlling for all other variables in the model, although it was related to performance for trials 1 and 3. However, it is worth noting that the zero-order correlations between cognitive ability and self-efficacy and goals were actually statistically significant (ability-self-efficacy average $r = .23$; ability-goals average $r = .21$), albeit weak in magnitude. As such, the lack of significance of the path coefficients could have been the result of the state goal orientations capturing a sizable portion of the variance in self-efficacy (42% for trial 1, 46% for trial 2, 48% for trial 3), and self-efficacy capturing a meaningful amount of the variance in goals (28% for trial 1, 29% for trial 2, 26% for trial 3).

In addition, the nonsignificant relationships observed between cognitive ability and these

variables may be partially attributable to the nature of the participants in this study. Students attending this university are necessarily range restricted in terms of their cognitive ability, simply because indicators of cognitive ability (i.e., SAT scores) are utilized by the university in making acceptance decisions. To illustrate, Sackett and Ostgaard (1994) sampled 80 occupations ($N = 182,248$) and reported an average Wonderlic score of 21.69 ($SD = 8.07$), while participants in the present study obtained an average Wonderlic score of 26.72 ($SD = 4.70$). This difference is rather large in magnitude ($d = 0.79$), suggesting that the participants scores in this study were substantially higher than those of the average worker. As such, the lack of relationships between goals and self-efficacy could also be attributed to this range restriction present in the student sample.

Revised Original Model

In looking at the original model, the modification indices provided by LISREL indicated that a path should be added from self-efficacy to mental focus. Since mental focus has only recently been incorporated into the goal establishment/task performance literature, the addition of this path was explored. Research involving self-efficacy would suggest that higher levels of self-efficacy would likely increase an individual's task involvement or absorption. According to Bandura (1991), an individual's level of self-efficacy affects the amount of effort they put forth in a given task and the level of cognitive processing they engage in, both of which should impact mental focus. Furthermore, he states individuals display enduring interest in activities they find themselves to be self-efficacious at and from which they derive satisfaction (Bandura & Schunk, 1981). Based on the modification indices and this theoretical justification, a path from self-efficacy to mental focus was added to the original model.

As a result of this additional path (which demonstrated a positive relationship between

self-efficacy and mental focus), the models fit improved considerably from that of the original model. Regarding the other paths in this revised model, they were nearly identical to those presented in the original model. However, with the inclusion of this self-efficacy-mental focus relationship, the path coefficients from state goal orientation to mental focus were greatly reduced. State learning goal orientation was still a significant predictor of mental focus for Trials 1 and 2, however, the magnitude of these coefficients dropped substantially. The paths from state performance-approach and state performance-avoidance goal orientation to mental focus became non-significant for all three trials. The attenuation of the path coefficients from state goal orientation to mental focus could suggest that state goal orientation has an indirect, rather than a direct, effect on mental focus through its impact on self-efficacy. This could also be a plausible explanation for the weaker than expected relationship between state performance-avoidance goal orientation and mental focus present in the original model. The mediating affects of self-efficacy on the state performance-avoidance goal orientation relationship with mental focus were absent from the original model. Conceptually this makes sense, individuals would not make the decision to become engaged or disengage from a task until they have made their efficacy judgments. If an individual is performing poorly on a given task, they are probably less likely to put forth any additional effort. As mentioned earlier, individuals are more likely to become interested or absorbed in tasks that they are good at (Bandura, 1991). However, once again, it is important to point out this is one of only two studies exploring the construct of mental focus; additional studies need to be conducted before we can reach firm conclusions regarding its role in the process of goal setting and task performance.

Integrative Model Comparison

Kanfer (1990) called for more integrative models of self-regulation and task performance

in the work motivation literature. Since this request, there have been a series of proposed models which have attempted to integrate cognitive, motivational, and dispositional variables (i.e., goal orientation) into a model of task performance (e.g., Breland & Donovan, in press; Chen et al., 2000; Kozlowski et al., 2001; Lee et al., 2003; Phillips & Gully, 1997; VandeWalle et al., 2001).

Phillips and Gully (1997) were one of first to propose and construct an integrated model of individual differences (e.g., dispositional learning and performance goal orientation), self-efficacy, goal-setting, and task performance. From this model, we gathered an initial understanding of the goal orientation construct, observing that self-efficacy mediated the effects of goal orientation on performance goals. Building upon this model, Chen et al. (2000) proposed a model examining relationships among trait-like individual differences, state-like individual differences, and performance. They found that the dispositional variable of general self-efficacy had an indirect impact on goals and performance through its state manifestation, specific self-efficacy. Similarly, dispositional learning goal orientation was found to impact goals and exam performance through self-efficacy. Moving from the classroom setting, Kozlowski et al. (2001) demonstrated similar findings with their model in the context of a training environment. In this particular study, we were able to see the influence of dispositional learning goal orientation on self-efficacy and in turn adaptive performance (i.e., training generalization). Although these findings were informative, it is important to realize that goal orientation was artificially induced instead of being measured as a naturally occurring variable. VandeWalle et al. (2001) proposed a mediated model of goal orientation (similar to Phillips and Gully, 1997) which demonstrated that the effects of a three dimensional conceptualization (as opposed to the two dimensional model utilized in previous research) of goal orientation were partially mediated by self-efficacy. Continuing this trend, Lee et al. (2003) also incorporated a three-dimensional conceptualization

of goal orientation in their model of motivation and performance, while adding the variables of mental focus and task enjoyment into their study. However, Lee et al. (2003) were the first to ignore the component of self-efficacy in their model. Finally, in this string of integrative models, Breland and Donovan (in press) explored the role of state goal orientation in their model of goal establishment and task performance. As mentioned previously, this was the first attempt to incorporate state manifestations of goal orientation into these integrative models of motivation and performance.

The present study expanded on these integrative models by examining the role of three-dimensional state goal orientation in the process of goal establishment, mental focus, and task performance. These expansions to, and incorporations of, past research help broaden our knowledge of goal orientation and the process of self-regulation alike. The present study not only allowed for a more detailed examination of the dimensions underlying the general performance goal orientation, but also applied state manifestations of these variables which enhanced the level of prediction exhibited by these dimensions of goal orientation. Furthermore, the incorporation of mental focus into the model enabled a closer and more detailed examination of this construct as it relates to goal orientation, self-efficacy, and task performance. Although there are clearly numerous questions that remain unanswered with respect to the role of state goal orientation in a model of motivation and performance, the present study provides valuable initial information concerning state goal orientation and the proximal regulators of motivation in the goal establishment and task performance process.

Exploratory Analyses

GPD Model. Most achievement theorists identify task-specific competence expectancies as important variables in achievement settings (Atkinson, 1957; Bandura, 1982; Butler, 1992).

Elliot (1994) suggests that these competence expectancies are best portrayed as antecedents to goal orientation. In an attempt to examine this relationship, GPD was incorporated into the original model for trials 2 and 3 as a potential antecedent of the state goal orientation adopted by individuals. Although the zero order correlations indicated that GPD was significantly related to state goal orientation, the fit of the model deteriorated substantially.

An examination of the modification indices for this model suggested that a path from GPD to goals be added to increase model fit. Although this path was in fact significant and theoretically justified, the model's fit was still well below that of the more parsimonious, original model. Given that GPD was significantly related to both state goal orientation and goals, it appears that GPD does belong in the model. Participants' success at performing a given task should impact the state goal orientation they exhibit, at least according to current researchers such as Elliot (1994). If an individual is aware that s/he is a poor performer on a particular task and consistently falling short of his/her goals, it is likely that s/he would pursue a more state performance-avoidance goal orientation for this task. However, given the ill fit of a model which incorporated GPDs, the exact role of this construct needs further exploration before we can draw confident conclusions regarding its place in an integrative model of motivation and performance.

Choice

The particular state goal orientation an individual adopts was shown in the present research to affect (directly or indirectly) self-efficacy, mental focus, goals, and performance. Given that state goal orientation impacts these proximal regulators of motivation and performance outcomes, it was expected that it would influence the choices one would make. In order to examine this relationship, an element of choice was incorporated into the present study. At the completion of the study, participants were given the option to continue with the puzzle-

solving task, or to try a new task. Although the overall results for these analyses were somewhat disappointing, the results revealed that individuals high on state performance-avoidance goal orientation were more likely to choose to continue with the puzzle solving task instead of attempting a new task. This may have resulted from them feeling comfortable with the present task or a fear of trying something new, both of which are consistent with current conceptualization of this construct. A performance-avoidance goal orientation is rooted in fear of failure and low competence expectancies (Elliot & Church, 1988). Therefore, it is likely that they would keep improving at the current task (i.e., puzzle solving task), but avoid the potential risk associated with trying (and potentially failing at) something new.

Although these generally disappointing results may suggest that state goal orientation does not impact behavioral choice, this contradicts many of the assertions of theorists and researchers in the goal orientation domain (e.g., Dweck, 1989). Instead, these results may simply indicate that the manipulation of choice in the present study was not sufficient to detect differences among individuals with different state goal orientations. Given that individuals in the present study were only told that they could continue with the puzzle task or attempt a new type of task, and given no additional information on this new task, it could be that individuals were unable to make an accurate or comfortable assessment of their ability or interest for the newly offered task. As such, their choice may have been influenced by variables other than state goal orientation. Perhaps if they had been given more substantial or detailed information regarding this new task, we may have observed a relationship between state goal orientation and choice. For instance, state learning goal oriented individuals would have probably pursued a task that they found interesting. Similarly, state performance-approach oriented individuals may have attempted a task that would offer them the opportunity to successfully display their competence.

Given the highly exploratory nature of the analyses conducted in this study, as well as the limitations of the choice manipulation, future research should examine this relationship in situations involving more detailed and well specified behavioral choices.

Additional Support for State Goal Orientation. Given the results of the regression analyses, it is apparent that state goal orientation contributes significantly to models of self-regulation. More specifically, each dimension of state goal orientation uniquely captured variance in self-efficacy. This adds to the above mentioned support provided by the structural equation modeling analyses. It is important to note that state goal orientation contributed to the prediction of self-efficacy after controlling for past self-efficacy and past performance on the preceding trial. Therefore, state goal orientation is a distinct and important construct that desires further exploration in the goal setting and work motivation literature.

Study Limitations

The primary limitation of this study is the use of college students as participants rather than actual employees in organizational settings. However, it is important to note that the task utilized in this study requires learning on the part of participants; they must develop and test strategies for solving the puzzle task in order to perform effectively. As such, these are characteristics of real jobs in which individuals are performing fast-paced, novel tasks. In addition, participants displayed high levels of interest and motivation towards the task. Therefore, one could argue that the task utilized in this study may actually be an improvement in the representation of the typical workplace than tasks utilized in past research (e.g., classroom performance). Nonetheless, one should be careful in generalizing the results obtained in this study to the work environment.

Secondly, there is the possibility of common method variance since state goal orientation,

self-efficacy, mental focus, and goals were all assessed with self-report measures at the same time. As such, an individual's responses on a preceding measure could have influenced their responses on other measures that followed. More specifically, as a result of common method variance, these relationships could have been artificially induced due to the variables being assessed at the same point in time with self-report measures. It is important to note, however, that attention ability was also measured by self-report, yet this construct was not related to any of the variables of interest in this study. Thus, although the results from the present study should be generalized with caution, common method variance may not be as big of problem as expected.

Another limitation in present study was that the puzzle task was somewhat limited. The strategy requirements for each puzzle did not change from trial to trial. Once an individual developed a particular strategy for solving the puzzles, they could repeatedly use this strategy for the remaining trials. This limitation was further exaggerated due to the consistency in difficulty of each of the three puzzles presented in the experiment. Coupled together, these factors may have allowed the participants to reach the top of their learning curve by the end of the first performance trial. As a result, performance became stable, lacking variability, early on in the task. Experimental replications of these findings in various settings are needed before stronger causal inferences can be drawn.

Finally, recent work by Grant and Dweck (2003) has suggested that the impact of goal orientation is largely determined by the manner if which it is operationalized. More specifically, they propose that performance-approach goal orientation are comprised of 3 types of goal items, outcome goal items (e.g., goals focused on obtaining positive outcomes), ability goal items (e.g., goals that are linked to validating an aspect of self), and normative goals (e.g., goals that are focused on a comparison to others). According to Grant and Dweck (2003), the positive and

negative effects of performance-approach goal orientation are typically the result of how the construct is operationalized. They report that the negative effects of performance-approach goal orientation are present when these items are non-normative ability goal items, while normative goal items lead to the positive associations displayed in the literature. In the current study, an adapted measure of Elliot and Church's (1997) in which performance-approach goal orientation items were strictly normative in nature. Therefore, the positive results surrounding state performance-approach goal orientation could have been the result of how this dimension was operationalized. In the present study only the normative aspect of performance-approach goal orientation was explored and therefore it is important to realize that other effects may be observed when operationalizing performance-approach orientations in a different manner.

Implications

The results of this research have clear applied and theoretical implications for the field of work motivation. From a theoretical perspective, one clear implication is that future research focusing on the role of goal orientation in motivational processes such as goal establishment and goal revision should utilize state operationalizations of this construct. Based upon the present research, it appears that state goal orientation has the ability to not only enhance our prediction of important performance related variables, but also to explain the relatively weak findings observed in past research examining the link between dispositional goal orientation and these variables. Without the shift to state measures of goal orientation, the construct has little potential in the realm of work motivation. The magnitude of the relationship presented in past research utilizing dispositional measures provide little to no evidence of the potential of benefits of this construct.

In addition, future research should continue to employ three-dimensional measures of state goal orientation. As the present study illustrated, by segmenting performance goal orientation into two separate constructs, we are better able to capture the unique relationships of state performance-approach goal orientation and state performance-avoidance goal orientation with proximal regulators of motivation (e.g., self-efficacy, mental focus). The trichotomous measures of state goal orientation need to be explored in tasks that not only vary in complexity, but also tasks that have true consequences for the subjects. These factors could affect the relationships exhibited in the current study.

Researchers should also attempt to examine the relationship that exists between an individual's mental focus and regulators of motivation and performance. Although the present research found a moderate degree of correspondence between these variables, this relationship may fluctuate as a function of environmental and contextual factors as well as the nature of the task being performed. Mental focus is a proximal regulator that could pose high impact on a variety of tasks and behaviors. The integration of mental focus into models of self-regulation allows for a more complete picture and understanding of these processes. As mentioned previously, mental focus may influence goals in conjunction with performance, or goals could serve as a mediator of this relationship. Future research should seek to more clearly define the role of mental focus in the various aspects of self-regulation.

The present study also attempted to incorporate GPDs into an integrative model of goal establishment and task performance. Although this model did not fit the data well, it is worth noting that GPDs were significantly correlated with the various state goal orientations, suggesting that there may in fact be a relationship present. As such, the relationship between GPDs and state goal orientation (as well as other proximal regulators of motivation) should be

explored in future research so as to obtain a more complete picture of the goal establishment and task performance process. The understanding of the impact of these discrepancies on state goal orientation and/or other regulators would provide a wealth of knowledge to the work motivation literature by indicating whether these variables change as a function of achieving or not achieving one's goals. This evidence would be informative, given that we know relatively little about the antecedents of state goal orientations and their malleability at this time.

Finally, from an applied perspective, the results of this research indicate that, contrary to the general perception that performance goal orientation (and an environment that emphasize performance goal orientation elements) is harmful for motivation and performance, elements of a performance goal orientation may actually enhance performance. More specifically, it is a state performance-avoidance goal orientation that is detrimental to these processes and outcomes, not performance goal orientation in general. In fact, a strong state performance-approach goal orientation (or environment) appears to enhance self-efficacy, goal establishment, and subsequent performance under certain circumstances. This suggests that, depending on the nature of the job, organizational attempts to optimize worker behavior and motivation may be enhanced by incorporating elements associated with a state performance-approach goal orientation. As noted by Button et al. (1996) and Farr et al. (1993), there may be several positive benefits of strong performance goal orientation since these individuals tend to: (a) pay close attention to deadlines, (b) demonstrate a concern with meeting the standards of supervisors, and (c) focus on achieving task competence relatively quickly. As such, it becomes apparent that the "optimal environment" may emphasize not only state learning oriented elements, but state performance-approach oriented elements, while de-emphasizing performance-avoidance oriented elements.

Conclusion

In conclusion, the results of the present research provide support for the importance of state measures of the goal orientation construct in the processes involved in the self-regulation of behavior. Given these results, along with the growing number of studies that have supported the role of dispositional goal orientation in self-regulatory processes, future research should focus on an examination of the predictive validity that may be obtained by using state goal orientation measures in place of measures of dispositional goal orientation. In addition, the continuation of a trichotomous conceptualization of state goal orientation seems necessary in the work motivation literature and research. The present studies illustrates but a few of the benefits of this three-dimensional perspective.

References

- Ames, C. & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80*, 260-267.
- Ashton, M. C., Jackson, D. N., Paunonen, S. V., Helmes, E., & Rothstein, M. G. (1995). The criterion validity of broad factor scales versus specific trait scales. *Journal of Research in Personality, 29*, 432-442.
- Atkinson, J. W. (1957). Motivational determinants of risk taking behavior. *Psychological Review, 64*, 359-372.
- Austin, J. T., & Klein, H. J. (1996). Work motivation and goal striving. In K.R. Murphy (Ed.), *Individual differences and behavior in organizations* (pp. 209-257). San Francisco: Jossey-Bass.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50*, 248-287.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45*, 1017-1028.
- Barrick, M. R., Mount, M.K., & Strauss, J. P. (1993). Conscientiousness and performance of sales representatives: Test of the mediating effects of goal setting. *Journal of Applied Psychology, 78*, 715-722.
- Bar-Eli, M., Tenenbaum, G., Pie, J. S., Kudar, K., Weinberg, R., & Barak, Y. (1997). Aerobic

- performance under different goal orientations and different goal conditions. *Journal of Sport Behavior, 20*, 3-15.
- Beaubien, J. M., & Payne, S. C. (1999, April). *Individual goal orientation as a predictor of job and academic performance: A meta-analytic review and integration*. Paper presented at the 14th annual conference of the Society for Industrial and Organizational Psychology, Atlanta, GA.
- Bell, B. S., Mullins, M. E., Toney, R. J., & Kozlowski, S. W. J. (1999, April). *Goal orientation: Elaborating the effects of state and trait conceptualizations*. Paper presented at the conference of the Society for Industrial and Organizational Psychology, Atlanta, GA.
- Bell, B. S., & Kozlowski, S. W. J. (2002). Goal orientation and ability: Interactive effects on self-efficacy, performance, and knowledge. *Journal of Applied Psychology, 87*, 497-505.
- Bollen, K. A. (1989). *Structural equation modeling with latent variables*. New York: Wiley.
- Bouffard T., Boisvert, J., Vezeau C., & Larouche C. (1995). The impact of goal orientation on self-regulation and performance among college students. *British Journal of Educational Psychology, 65*, 317-329.
- Boyle, K. A., & Klimoski, R. J. (1995, May). *Toward an understanding of goal orientation in a training context*. Paper presented at the 10th Annual Meeting of the Society for Industrial and Organizational Psychology, Orlando, Fl.
- Breland, B. T. (2001). Learning and performance goal orientations' impact on the goal setting process: Is there an interaction effect? Unpublished master's thesis, Virginia Polytechnic Institute and State University.
- Breland, B. T., & Donovan, J. J. (in press). The role of state goal orientation in the goal establishment process. Manuscript in press at *Human Performance*.

- Brett, J. F., & VandeWalle, D. (1999). Goal orientation and goal content as predictors of performance in a training program. *Journal of Applied Psychology, 84* (6), 863 – 873.
- Brown, K. (2001). Using computers to deliver training: Which employees learn and why? *Personnel Psychology, 54*, 271–296.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J.S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- Butler, R. (1987). Task-involving and ego-involving properties of evaluation: Effects of different feedback conditions on motivational perceptions, interest, and performance. *Journal of Educational Psychology, 79*, 474-482.
- Butler, R. (1993). Effects of task- and ego-achievement goals on information seeking during task engagement. *Journal of Personality and Social Psychology, 65*, 18-31.
- Button, S. B., Mathieu, J. E., & Zajac, D. M. (1996). Goal orientation in organizational research: A conceptual and empirical foundation. *Organizational Behavior and Human Decision Processes, 67*, 26-48.
- Campion, M. A., & Lord, R. G. (1982). A control systems conceptualization of the goal setting and changing process. *Organizational Behavior and Human Performance, 30*, 265-287.
- Chen, G., Gully, S. M., Whiteman, J., & Kilcullen, R. N. (2000). Examination of relationships among trait-like individual differences, state-like individual differences, and learning performance. *Journal of Applied Psychology, 85*, 835-847.
- Colquitt, J. A., & Simmering, M. J. (1998). Conscientiousness, goal orientation, and motivation to learn during the learning process: A longitudinal study. *Journal of Applied Psychology, 83*, 654-665.

- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Houghton-Mifflin.
- Diefendorff, J. M., Hall, R. J., Lord, R. G., & Strean, M. L. (2000). Action state orientation: Construct validity of a revised measure and its relationship to work-related variables. *Journal of Applied Psychology, 85*, 250-263.
- Diener, C. I., & Dweck, C.S. (1978). An analysis of learned helplessness: Continuous changes in performance, strategy, and achievement cognitions following failure. *Journal of Personality and Social Psychology, 36*, 451-462.
- Diener, C. I., & Dweck, C. S. (1980). An analysis of learned helplessness: II. The processing of success. *Journal of Personality and Social Psychology, 39*, 940-952.
- Dobbins, H. W., Bell, B. S., & Kozlowski, S. W. J. (2002, April). *A comparison of the Button and VandeWalle goal orientation measures*. Paper presented at the annual meeting of the Society of the Industrial and Organizational Psychology, Toronto, Canada.
- Dodrill, C. B. (1981). An economical method for the evaluation of general intelligence in adults. *Journal of Consulting and Clinical Psychology, 49*, 668-673.
- Dodrill, C. B. (1983). Long-term reliability of the Wonderlic Personnel Test. *Journal of Consulting and Clinical Psychology, 51*, 316-317.
- Dodrill, C. B., & Warner, M. H. (1988). Further studies of the Wonderlic Personnel Test. *Journal of Consulting and Clinical Psychology, 56*, 145-147.
- Donovan, J. J. (2001). Work motivation. In Anderson, N., Ones, D.S., Sinangil, H. K., and Viswesvaran, C. (Eds.), *Handbook of Industrial, Work, and Organizational Psychology* (Vol. 2; pp. 53-76). Sage Publications, London.

- Donovan, J. J., & Swander, C. J. (April, 2001). *The impact of self-efficacy, goal commitment, and conscientiousness on goal revision*. Paper presented at the 16th Annual Conference of the Society for Industrial and Organizational Psychology, San Diego, CA
- Donovan, J. J. & Williams, K. J. (April, 1999). *Contextual, dispositional, and cognitive influences on goal revision*. Paper presented at the 1999 Annual Conference of the Society for Industrial and Organizational Psychology, Atlanta, GA.
- Donovan, J. J., & Williams, K. J. (2003). Missing the mark: Effects of time and causal attributions on goal revision in response to goal-performance discrepancies. *Journal of Applied Psychology*, 88, 379-390.
- Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology*, 84(3), 290-299.
- Dweck, C. S. (1975). The role of expectations and attributions in the alleviation of learned helplessness. *Journal of Personality and Social Psychology*, 31, 674-685.
- Dweck, C. S. (1986) Motivational processes affecting learning. *American Psychologist*, 41, 1040-1048.
- Dweck, C. S. (1989). Motivation. In A. Lesgold & R. Glaser (Eds.), *Foundations for a psychology of education*. Hillsdale, N.J.: Erlbaum.
- Dweck, C. S., & Elliott, C. S. (1983). Achievement motivation. In E. M. Hetherington (Ed.), *Socialization, personality, and social development* (pp. 643-691). New York: Wiley.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256-273.
- Dweck, C. S., & Ruppucci, N. D. (1973). Learned helplessness and reinforcement responsibility in children. *Journal of Personality and Social Psychology*, 25, 109-116.

- Earley, P. C., Connolly, T., & Ekegren, G. (1989). Goals, strategy, and task performance: Some limits on the efficacy of goal setting. *Journal of Applied Psychology*, 74, 24-33.
- Elliot, A. (1994). *Approach and avoidance achievement goals: An intrinsic motivation analyses*. Unpublished doctoral dissertation, University of Wisconsin, Madison, WI.
- Elliot, A. (1997). Integrating the “classic” and “contemporary” approaches to achievement motivation: A hierarchical model of approach and avoidance achievement motivation. In M. Maehr & P. Pintrich (Eds.), Advances in motivation and achievement (Vol. 10, pp. 143-179). Greenwich, CT: JAI.
- Elliot, A. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist*, 34, 169-189.
- Elliot, E. S., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, 72, 218-232.
- Elliott, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology*, 70, 461-475.
- Elliot, A. J., McGregor, H. A., & Gable, S. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology*, 91, 549-563.
- Elliot, A. J., & Sheldon, K. M. (1997). . Avodiance achievement motivation: A personal goals analysis. *Journal of Personality and Social Psychology*, 73, 171-185.
- Farr, J. L., Hoffman, D. A., & Ringenbach, K. L. (1993). Goal orientation and action control theory: Implications for industrial and organizational psychology. In C. L. Cooper & I. T. Robertson (Eds.), *International Review of Applied Psychology* (Vol. 8), pp. 193-232.

- Fisher, S. L., Delbridge, K. D., & DeShon, R. P. (1997, April). *Here today, gone tomorrow? Stability in the measurement of goal orientation*. Paper presented at the 12th Annual Conference of the Society for Industrial and Organizational Psychology, St. Louis, MO.
- Fisher, S. L., & Ford, K. J. (1998). Differential effects of learner effort and goal orientation on two learning outcomes. *Personnel Psychology*, 51, 397-420.
- Ford, J. K., Smith, E. M., Weissbein, D. A., Gully, S. M., & Salas, E. (1998). Relationships of goal orientation, metacognitive activity, and practice strategies with learning outcomes and transfer, *Journal of Applied Psychology*, 83(2), 218-233.
- Gellatly, I. R. (1996). Conscientiousness and task performance: Test of cognitive process model. *Journal of Applied Psychology*, 81, 474-482.
- Gist, M. E., & Stevens, C. K. (1998). Effects of practice conditions and supplemental training method on cognitive learning and interpersonal skill generalization. *Organizational Behavior and Human Decision Processes*, 75, 142-169.
- Gonzalez-Roma, V., Peiro, J. M., & Tordera, N. (2002). An examination of the antecedents and moderator influences of climate strength. *Journal of Applied Psychology*, 87, 465-473.
- Greene, B. A., & Miller, R. B. (1996). Influences on achievement: Goals, perceived ability, and cognitive engagement. *Contemporary Educational Psychology*, 21, 181-192.
- Gully, S. M., Payne, S. C., Koles, K. L. K., & Whiteman, J. K. (2002). The impact of error training and individual differences on training outcomes: An attribute-treatment interaction perspective. *Journal of Applied Psychology*, 87, 143-155.
- Hayduk, L. A. (1987). *Structural equation modeling with LISREL: Essentials and advances*. Baltimore: Johns Hopkins University Press.
- Heckhausen, H. (1991). *Motivation and action*. New York: Springer-Verlag.

- Heimbeck D., Frese, M., Sonnentag, S., & Keith, N. (2003). Integrating errors into the training process: The function of error management instructions and the role of goal orientation. *Personnel Psychology, 56*, 333-361.
- Hembree, R. (1988). Correlates, causes, effects, and treatment of test anxiety. *Review of Educational Research, 58*, 47-77.
- Heyman, G. D., & Dweck, C. S. (1992). Achievement goals and intrinsic motivation: Their relation and their role in adaptive motivation. *Motivation and Emotion, 16*, 231-247.
- Higgins, E. T. (1995). Ideals, oughts, and regulatory focus: Relating affect and motivation to distinct pains and pleasures. In P. Gollwitzer & J. Bargh (Eds.), *The psychology of action: Linking cognition and motivation for behavior* (pp. 91-117). New York: Guilford Press.
- Hollenbeck, J. R., & Brief, A. P. (1987). The effects of individual differences and goal origin on goal setting and performance. *Organizational Behavior and Human Decision Processes, 40*, 392-414.
- Hollenbeck, J. R., Williams, C., & Klein, H. (1989). An empirical examination of antecedents of commitment to difficult goals. *Journal of Applied Psychology, 74*, 18-23.
- Horvath, M., Scheu, C. R., & DeShon, R. P. (2001, April). *Goal orientation: Intergrating theory and measurement*. Paper presented at the 16th annual conference of the Society for Industrial and Organizational Psychology, San Diego, CA.
- Hoyle, R. H., & Panter, A. T. (1995). Writing about structural equation models. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 76-999). Thousand Oaks, CA: Sage.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis:

- Conventional criteria vs. new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Hunter, J. E., & Hunter, R. F. (1984). Validity and utility of alternative predictors of job performance. *Psychological Bulletin*, 96, 72-98.
- Hurtz, G. M., & Donovan, J. J. (2000). Personality and Job Performance: The big five revisited. *Journal of Applied Psychology*, 85, 869-879.
- Jackson, D. N. (1974). *Personality Research Form manual* (2nd ed.) Port Huron, MI: Research Psychologists Press.
- Jagacinski, C. M., & Duda, J. L. (2001). A comparative analysis of contemporary achievement goal orientation measures. *Educational and Psychological Measurement*, 61, 1013-1039.
- James, L. R., Mulaik, S. A., & Brett, J. M. (1982). *Causal analysis: Assumptions, models, and data*. California: Sage Publications.
- Jöreskog, K. G., & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Hillsdale, NJ: Lawrence-Erlbaum.
- Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: A meta-analytic review. *Journal of Applied Psychology*, 87, 797-807.
- Kanfer, R. (1990). Motivation theory and industrial and organizational psychology. In M.D. Dunnette & L.M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 1, pp 75-170). Palo Alto, CA: Consulting Psychologist Press.
- Kanfer, R. (1992). Work motivation: New directions in theory and research. In C.L. Cooper and I.T. Robinson (Eds.), *International review of industrial and organizational psychology* (Vol. 7, pp.1-53). London: Wiley.
- Kanfer, R., & Ackerman, P. L. (1996). A self-regulatory skills perspective to reducing cognitive interference. In I. G. Sarason, B. R. Sarason, & G. R. Pierce (Eds.), *Cognitive*

- interference: Theories methods, and findings* (pp. 153-171). Mahwah, NJ: Erlbaum.
- Kanfer, R., & Heggestad, E. D. (1997). Motivational traits and skills: A person-centered approach to work motivation. *Research in Organizational Behavior*, 19, 1-56.
- Kernan, M. C., & Lord, R. G. (1990). Effects of valence, expectancies, and goal-performance discrepancies in single and multiple goal environments. *Journal of Applied Psychology*, 75, 194-203.
- Kozlowski, S. W. J., Gully, S. M., Brown, K. G., Salas, E., Smith, E. M., & Nason, E.R. (2001). Effects of training goals and goal orientation traits on multidimensional training outcomes and performance adaptability. *Organizational Behavior and Human Decision Processes*, 85, 1-31.
- Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of cognitive, skill based, and affective theories of learning outcomes to new methods of training evaluation. *Journal of Applied Psychology*, 78, 311-328.
- Kuhl, J. (1992). A theory of self-regulation: Action versus state orientation, self-discrimination, and some applications. *Applied Psychology: An International Review*, 41, 97-129.
- Leary, M. R. (1983). A brief version of the fear of negative evaluation scale. *Personality and Social Psychological Bulletin*, 9, 371-375.
- Leary, M.R. (1991). Social anxiety, shyness, and related constructs (pp. 161 – 194). In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes: Vol. 1*.
- Lee, C. L., & Bobko, P. (1994). Self-efficacy beliefs: Comparison of five measures. *Journal of Applied Psychology*, 79, 364-369.
- Lee, F. K., Sheldon, K. M., & Turban, D. B. (2003). Personality and the goal-striving process:

- The influence of achievement goal patterns, goal level, and mental focus on performance and enjoyment. *Journal of Applied Psychology*, 88, 256-265.
- Le Pine, J. A., Colquitt, J. A., & Erez, A. (2000). Adaptability to changing task contexts: Effects of general cognitive ability, conscientiousness, and openness to experience. *Personnel Psychology*, 53, 563-593.
- Locke, E. A., Frederick, E., Buckner, E., & Bobko, P. (1984). Effect of previously assigned goals on self-set goals and performance. *Journal of Applied Psychology*, 69, 694-699.
- Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice Hall.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57, 705-717.
- MacCallum, R. C., Wegener, D. T., Uchino, B. N., & Fabrigar, L. R. (1993). The problem of equivalent models in applications of covariance structure models. *Psychological Bulletin*, 114, 185-199.
- Mangos, P. M., & Steele-Johnson, D. (2001). The role of subjective task complexity in goal orientation, self-efficacy, and performance relations. *Human Performance*, 41, 169-186.
- Martocchio, J. J. (1994). Effects of conceptions of ability on anxiety, self-efficacy, and learning in training. *Journal of Applied Psychology*, 79, 819-825.
- Martocchio, J. J., & Judge, T. A. (1997). Relationships between conscientiousness and learning in employee training: Mediating influences of self-deception and self-efficacy. *Journal of Applied Psychology*, 82, 764-773.
- Maurer, T. J., & Andrews, K.D. (2000). Traditional, Likert, and simplified measures of self-efficacy. *Educational and Psychological Measurement*, 60, 965-973.

- Maurer, T.J., & Pierce, H.R. (1998). A comparison of Likert scale and traditional measures of self-efficacy. *Journal of Applied Psychology, 83*, 324-329.
- McClelland, D. C. (1961). *The achieving society*. Princeton, NJ: Van Nostrand.
- McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1976). *The achievement motive*. New York: Irvington Publishers, Inc.
- McCrae, R. R., & Costa, P. T. (1990). *Personality in Adulthood*. The Guilford Press: New York.
- McCrae, R. R., & Costa, P. T. (1992). Discriminant validity of NEO-PIR facet scales. *Educational and Psychological Measurement, 52*, 229-237.
- McDonald, R. P., & Ho, M. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods, 7*, 64-82.
- Mckelvie, S. J. (1989). The Wonderlic Personnel Test: Reliability and Validity in an academic setting. *Psychological Reports, 65*, 161-162.
- McKinney, A. P. (2003). Goal orientation: A test of competing models. Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University.
- Middleton, M., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An underexplored aspect of goal theory. *Journal of Educational Psychology, 89*, 710-718.
- Midgley, C., Kaplan, A., Middleton, M., Maehr, M. L., Urdan, T., Anderman, L. H., Anderman, E., & Roeser, R. (1998). The development and validation of scales assessing students' achievement goal orientations. *Contemporary Educational Psychology, 23*, 113-131.
- Mischel, W. (1973). Toward a cognitive learning reconceptualization of personality. *Psychological Review, 80*, 252-283.

- Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review, 102*, 246-268.
- Mischel, W., & Shoda, Y. (1998). Reconciling processing dynamics and personality dispositions. *Annual Review of Psychology, 49*, 229-258.
- Murray, H. (1938). *Explorations in personality*. New York: Oxford University Press.
- Paunonen, S. V., & Ashton, M. C. (2001). Big five factors and facets and the prediction of behavior. *Journal of Personality and Social Psychology, 81*, 524-539.
- Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd Ed.) Florida: Harcourt-Brace.
- Phillips, J. M., & Gully, S. M. (1997). Role of goal orientation, ability, need for achievement, and locus of control in the self-efficacy and goal-setting process. *Journal of Applied Psychology, 82*, 792-802.
- Potosky, D., & Ramakrishna, H. V. (2002). The moderating role of updating climate perceptions in the relationship between goal orientation, self-efficacy, and job performance. *Human Performance, 15*, 275-297.
- Sarason, I. G. (1984). Stress, anxiety, and cognitive interference: Reactions to tests. *Journal of Personality and Social Psychology, 46*, 92-938.
- Sarason, I. G., Pierce, G. R., & Sarason, B. R. (Vol. Eds.). (1996). Domains of cognitive interference. In I. B. Weiner (Personality and Clinical Psychology Series Ed.), *Cognitive interference: Theories, methods, and findings* (pp. 139-152). Hillsdale, NJ: Erlbaum.
- Schmidt, A. M., & Ford, K. J. (2003). Learning within a learner control training environment: The interactive effects of goal orientation and metacognitive instruction on learning

- outcomes. *Personnel Psychology*, 56, 405-429.
- Schmidt, F. L., & Hunter, J. E. (1993). Tacit knowledge, practical intelligence, general mental ability, and job knowledge. *Current Directions in Psychological Science*, 2, 8-9.
- Schmidt, F. L., Hunter, J. E., & Outerbridge, A. N. (1986). Impact of job experience and ability on job knowledge, work sample performance, and supervisory ratings of job performance. *Journal of Applied Psychology*, 71, 432-439.
- Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work related performance: A meta-analysis. *Psychological Bulletin*, 124, 240-261.
- Steele-Johnson, D., Beauregard, R. S., Hoover, P. B., & Schmidt, A. M. (2000). Goal orientation and task demand effects on motivation, affect, and performance. *Journal of Applied Psychology*, 85, 724-738.
- Stevens, C. K., & Gist, M. E. (1997). Effects of self-efficacy and goal orientation training on negotiation skill maintenance. *Personnel Psychology*, 50, 955-978.
- Thomas, K. M., & Mathieu, J. E. (1994). Role of causal attributions in dynamic self-regulation and goal processes. *Journal of Applied Psychology*, 79, 812-818.
- Towler, A. J., & Dipboye, R. L. (2001). Effects of Trainer expressiveness, organization, and trainee goal orientation on training outcomes. *Journal of Applied Psychology*, 86, 664-673.
- Tubbs, M. E. (1986). Goal setting: A meta-analytic examination of the empirical evidence. *Journal of Applied Psychology*, 71, 474-483.
- Vancouver, J. B. Thompson, C. M., & Williams, A. A. (2001). The changing signs in the relationships among self-efficacy, personal goals, and performance. *Journal of Applied Psychology*, 86, 605-620.

- VandeWalle, D. (1997). Development and validation of a work domain goal orientation instrument. *Educational and Psychological Measurement, 57*(6), 995-1015.
- VandeWalle, D., Brown, S. P., Cron, W. L., & Slocum, J. W. (1999). The influence of goal orientation and self-regulation tactics on sales performance: A longitudinal field test. *Journal of Applied Psychology, 84*(2), 249-259.
- VandeWalle, D., Cron, W. L., & Slocum, J. W. (2001). The role of goal orientation following performance feedback. *Journal of Applied Psychology, 86*, 629-640.
- VandeWalle, D., & Cummings, L. L. (1997). A test of the influence of goal orientation on the feedback seeking process. *Journal of Applied Psychology, 82*, 390-400.
- Watson, D., & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33*, 448-457.
- Wegner, D. M. (1994). Ironic process of mental control. *Psychological Review, 101*, 34-52.
- Wine, J. (1971). Test anxiety and direction of attention. *Psychological Bulletin, 76*, 92-104.
- Wolters, C. A. (1998). Self-regulated learning and college students' regulation of motivation. *Journal of Educational Psychology, 90*, 224-235.
- Wonderlic, E. F., & Associates. (1983). *Wonderlic Personnel Test Manual*. Northfield, IL: Author.
- Wood, R. E., Mento, A. J., & Locke, E. A. (1987). Task complexity as a moderator of goal effects: A meta-analysis. *Journal of Applied Psychology, 72*, 416-425.
- Yukl, G. A. & Latham, G. P. (1978). Interrelationships among employee participation, individual differences, goal difficulty, goal acceptance, goal instrumentality, and performance. *Personnel Psychology, 31*, 305-323.

Table 1

Means, Standard Deviations, and Intercorrelations Among Trial 1 Variables

| Variable | <u>M</u> | <u>SD</u> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------|----------|-----------|--------|--------|--------|--------|--------|--------|--------|-----|-------|
| 1. SLGO | 26.46 | 5.70 | (.89) | | | | | | | | |
| 2. SPAGO | 22.94 | 6.82 | .42** | (.96) | | | | | | | |
| 3. SPAVGO | 20.70 | 5.65 | -.01 | .25** | (.75) | | | | | | |
| 4. Self-efficacy | 36.54 | 5.73 | .46** | .47** | -.26** | (.87) | | | | | |
| 5. Mental Focus | 25.87 | 3.36 | .36** | .28** | -.12 | .48** | (.86) | | | | |
| 6. Goal | 140.65 | 88.52 | -.38** | -.33** | .17** | -.53** | -.34** | -- | | | |
| 7. Performance | 91.54 | 43.46 | -.20** | -.12 | .11 | -.27** | -.30** | .44** | -- | | |
| 8. Ability | 26.72 | 4.70 | .22** | .16* | -.22** | .25** | .13* | -.21** | -.30** | -- | |
| 9. Attention | 58.04 | 10.58 | .22** | .10 | -.16* | .12 | .11 | -.06 | .04 | .12 | (.87) |

Note. N = 225. Values on the diagonal represent scale reliabilities. SLGO = state learning goal orientation. SPAGO = state performance-approach goal orientation. SPAVGO = state performance-avoidance goal orientation. Goal = goal set for Puzzle trial. Performance = time on Puzzle trial 1. Ability = Wonderlic. Attention = Derryberry & Reed attention measure. ** denotes a correlation that is significant at the .01 level. * denotes a correlation that is significant at the .05 level.

Table 2

Means, Standard Deviations, and Intercorrelations Among Trial 2 Variables

| Variable | <u>M</u> | <u>SD</u> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------------------|----------|-----------|--------|--------|--------|--------|--------|--------|--------|------|------|-------|
| 1. SLGO | 26.64 | 5.76 | (.93) | | | | | | | | | |
| 2. SPAGO | 22.70 | 7.16 | .43** | (.97) | | | | | | | | |
| 3. SPAVGO | 19.72 | 5.98 | -.03 | .15* | (.78) | | | | | | | |
| 4. Self-efficacy | 38.10 | 5.63 | .44** | .48** | -.36** | (.87) | | | | | | |
| 5. Mental Focus | 25.77 | 3.79 | .42** | .28** | -.16** | .55** | (.93) | | | | | |
| 6. Goal | 124.18 | 124.18 | -.32** | -.30** | .24** | -.54** | -.29** | -- | | | | |
| 7. Performance | 94.57 | 94.57 | -.22** | -.13 | .04 | -.25** | -.24** | .25** | -- | | | |
| 8. Ability | 26.72 | 26.72 | .16* | .16* | -.20** | .22** | .14* | -.22** | -.19** | -- | | |
| 9. GPD (Trial 1) | 49.11 | 49.11 | -.31** | -.26** | .15* | -.43** | -.21** | .67** | .12 | -.07 | -- | |
| 10. Attention | 58.04 | 58.04 | .19** | .09 | -.22** | .19** | .17* | -.03 | -.11 | .12 | -.09 | (.87) |

Note. N = 225. Values on the diagonal represent scale reliabilities. SLGO = state learning goal orientation. SPAGO = state performance-approach goal orientation. SPAVGO = state performance-avoidance goal orientation. Goal = goal set for Puzzle trial. Performance = time on Puzzle trial 1. Ability = Wonderlic. Attention = Derryberry & Reed attention measure. GPD = goal performance discrepancy for Trial 1. ** denotes a correlation that is significant at the .01 level. * denotes a correlation that is significant at the .05 level.

Table 3

Means, Standard Deviations, and Intercorrelations Among Trial 3 Variables

| Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|------------------|--------|-------|--------|--------|--------|--------|--------|--------|--------|-------|------|-----|-------|
| 1. SLGO | 26.58 | 6.05 | (.95) | | | | | | | | | | |
| 2. SPAGO | 22.69 | 7.30 | .47** | (.97) | | | | | | | | | |
| 3. SPAVGO | 19.18 | 6.13 | -.01 | .17* | (.79) | | | | | | | | |
| 4. Self-efficacy | 38.50 | 5.90 | .51** | .42** | -.38** | (.88) | | | | | | | |
| 5. Mental Focus | 25.56 | 3.80 | .40** | .31** | -.13 | .53** | (.92) | | | | | | |
| 6. Goal | 117.27 | 74.66 | -.31** | -.29** | .21** | -.51** | -.25** | -- | | | | | |
| 7. Performance | 94.70 | 46.62 | -.21** | -.27** | .07 | -.27** | -.36** | .27** | -- | | | | |
| 8. Ability | 26.72 | 4.70 | .17* | .16* | -.22** | .22** | .20** | -.19** | -.34** | -- | | | |
| 9. GPD (Trial 2) | 29.61 | 80.21 | -.14* | -.16* | .18** | -.25** | -.14* | .44** | .05 | -.07 | -- | | |
| 10. Choice | 1.42 | .50 | .08 | .01 | -.22** | .23** | .06 | -.10 | -.07 | .19** | -.04 | -- | |
| 11. Attention | 58.04 | 10.59 | .20** | .08 | -.19** | .18** | .16* | -.08 | -.07 | .12 | .04 | .11 | (.87) |

Note. N = 225. Values on the diagonal represent scale reliabilities. SLGO = state learning goal orientation. SPAGO = state performance-approach goal orientation. SPAVGO = state performance-avoidance goal orientation. Goal = goal set for Puzzle trial. Performance = time on Puzzle trial 1. Ability = Wonderlic. Attention = Derryberry & Reed attention measure. GPD = goal performance discrepancy for Trial 2. ** denotes a correlation that is significant at the .01 level. * denotes a correlation that is significant at the .05 level.

Table 4

Original Model Fit for Trial 1, 2, and 3

| | GFI | AGFI | CFI | SRMR | χ^2 | df |
|------------------|-----|------|-----|------|----------|----|
| Original model 1 | .98 | .90 | .96 | .039 | 23.78** | 9 |
| Original model 2 | .96 | .85 | .93 | .04 | 36.32** | 9 |
| Original model 3 | .97 | .87 | .95 | .038 | 29.38** | 9 |

Note. N = 225. Original model 1 = Original model for trial 1. Original model 2 = Original model for trial 2. Original model 3 = Original model for trial 3. ** indicates that the chi square statistic is significant at the .01 level.

Table 5

Revised Original Model Fit for Trial 1, 2, and 3

| | GFI | AGFI | CFI | SRMR | χ^2 | Df |
|--------------------------|-----|------|-----|------|----------|----|
| Revised Original model 1 | .99 | .97 | 1.0 | .017 | 5.80 | 8 |
| Revised Original model 2 | .99 | .97 | 1.0 | .018 | 5.17 | 8 |
| Revised Original model 3 | .99 | .96 | 1.0 | .024 | 7.04 | 8 |

Note. N = 225. Revised original model 1 = Original model for trial 1 with addition of a direct path from self-efficacy to mental focus. Revised original model 2 = Original model for trial 2, with addition of a direct path from self-efficacy to mental focus. Revised original model 3 = Original model for trial 3, with addition of a direct path from self-efficacy to mental focus.

Table 6

GPD Model Fit for Trial 2 and 3

| | GFI | AGFI | CFI | SRMR | χ^2 | df |
|-------------|-----|------|-----|------|----------|----|
| GPD model 2 | .85 | .65 | .66 | .120 | 199.79** | 19 |
| GPD model 3 | .88 | .71 | .71 | .13 | 148.46** | 19 |

Note. N = 225. GPD model 2 = Original model for trial 2 with the addition of a direct path from GPD to state goal orientation. GPD model 3 = Original model for trial 3 with the addition of a direct path from GPD to state goal orientation. ** indicates that the chi square statistic is significant at the .01 level.

Table 7

Revised GPD Model Fit for Trial 2 and 3

| | GFI | AGFI | CFI | SRMR | χ^2 | df |
|---------------------|-----|------|-----|------|----------|----|
| Revised GPD model 2 | .91 | .76 | .82 | .100 | 112.52** | 18 |
| Revised GPD model 3 | .90 | .75 | .78 | .116 | 116.98** | 18 |

Note. N = 225. Revised GPD model 2 = GPD model for trial 2 with the addition of a direct path from GPD to goals. Revised GPD model 3 = GPD model for trial 3 with the addition of a direct path from GPD to goals. ** indicates that the chi square statistic is significant at the .01 level.

Table 8

Stability of Measures across Trials

| | Trial 1 to 2 | Trial 1 to 3 | Trial 2 to 3 |
|---------------|--------------|--------------|--------------|
| SLGO | .88** | .88** | .96** |
| SPAGO | .94** | .89** | .95** |
| SPAVGO | .89** | .86** | .94** |
| Self-Efficacy | .88** | .83** | .91** |
| Mental Focus | .82** | .73** | .82** |

Note. N = 225. SLGO = State Learning Goal Orientation. SPAGO = State Performance Approach Goal Orientation. SPAVGO = State Performance Avoidance Goal Orientation. ** indicates that the correlation is significant at the .01 level.

Table 9:

Influence of Ability, Mental Focus, Goals, and Self-Efficacy on Performance

Performance Trial 1:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | -2.824 | -.304 | .09 | .09** | 22.69** |
| 2 | Goals | .179 | .363 | .25 | .17** | 17.43** |
| | Self-efficacy | .505 | .067 | | | |
| | Mental focus | -2.495 | -.188 | | | |

Influence of Ability, Mental Focus, Goals, and Self-Efficacy on Performance

Performance Trial 2:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | -2.174 | -.189 | .03 | .04** | 8.31** |
| 2 | Goals | .105 | .145 | .10 | .08** | 6.58** |
| | Self-efficacy | -.510 | -.053 | | | |
| | Mental focus | -2.386 | -.165 | | | |

Influence of Ability, Mental Focus, Goals, and Self-Efficacy on Performance

Performance Trial 3:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | -3.321 | -.334 | .11 | .11** | 27.57** |
| 2 | Goals | .097 | .156 | .21 | .12** | 10.81** |
| | Self-efficacy | .148 | .019 | | | |
| | Mental focus | -3.576 | -.289 | | | |

Note. $N = 225$. b = unstandardized regression coefficient. β = standardized regression coefficient. Adjusted R^2 = adjusted proportion of variance accounted for by all predictors in the regression equation. ΔR^2 = the incremental variance accounted for by the predictor variables entered at each step. F_{change} = F ratio assessing the significance of the incremental variance accounted for. ** denotes a statistic that is significant at the .01 level.

Table 10:

Influence of State Goal Orientation on Self-Efficacy

Self-Efficacy Trial 1:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .301 | .246 | .06 | .06** | 14.32** |
| 2 | SLGO | .273 | .271 | .42 | .37** | 46.79** |
| | SPAGO | .362 | .050 | | | |
| | SPAVGO | -.350 | -.344 | | | |

Influence of State Goal Orientation on Self-Efficacy

Self-Efficacy Trial 2:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .262 | .218 | .04 | .05** | 11.18** |
| 2 | SLGO | .245 | .251 | .46 | .42** | 57.68** |
| | SPAGO | .336 | .428 | | | |
| | SPAVGO | -.379 | -.403 | | | |

Influence of State Goal Orientation on Self-Efficacy

Self-Efficacy Trial 3:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .273 | .217 | .04 | .05** | 10.99** |
| 2 | SLGO | .348 | .357 | .47 | .44** | 61.70** |
| | SPAGO | .263 | .325 | | | |
| | SPAVGO | -.405 | -.420 | | | |

Note. $N = 225$. b = unstandardized regression coefficient. β = standardized regression coefficient. Adjusted R^2 = adjusted proportion of variance accounted for by all predictors in the regression equation. ΔR^2 = the incremental variance accounted for by the predictor variables entered at each step. F_{change} = F ratio assessing the significance of the incremental variance accounted for. ** denotes a statistic that is significant at the .01 level.

Table 11:

Influence of State Learning Goal Orientation on Self-Efficacy

Self-Efficacy Trial 1:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .307 | .246 | .06 | .06** | 15.49** |
| 2 | SPAGO | .433 | .524 | .35 | .30** | 55.96** |
| | SPAVGO | -.404 | -.402 | | | |
| 3 | SLGO | .247 | .253 | .40 | .05** | 19.55** |

Influence of State Learning Goal Orientation on Self-Efficacy

Self-Efficacy Trial 2:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .275 | .221 | .05 | .05** | 12.27** |
| 2 | SPAGO | .433 | .539 | .41 | .37** | 74.58** |
| | SPAVGO | -.396 | -.407 | | | |
| 3 | SLGO | .254 | .266 | .46 | .06** | 25.48** |

Influence of State Learning Goal Orientation on Self-Efficacy

Self-Efficacy Trial 3:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .294 | .223 | .05 | .05** | 12.59** |
| 2 | SPAGO | .421 | .504 | .38 | .33** | 64.34** |
| | SPAVGO | -.406 | -.409 | | | |
| | SLGO | .368 | .385 | .49 | .11** | 52.63** |

Note. $N = 225$. b = unstandardized regression coefficient. β = standardized regression coefficient. Adjusted R^2 = adjusted proportion of variance accounted for by all predictors in the regression equation. ΔR^2 = the incremental variance accounted for by the predictor variables entered at each step. F_{change} = F ratio assessing the significance of the incremental variance accounted for. ** denotes a statistic that is significant at the .01 level.

Table 12:

Influence of State Performance-Approach Goal Orientation on Self-Efficacy

Self-Efficacy Trial 1:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .307 | .246 | .06 | .06** | 15.49** |
| 2 | SLGO | .417 | .428 | .28 | .23** | 39.08** |
| | SPAVGO | -.258 | -.257 | | | |
| 3 | SPAGO | .336 | .407 | .40 | .12** | 46.95** |

Influence of State Performance-Approach Goal Orientation on Self-Efficacy

Self-Efficacy Trial 2:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .275 | .221 | .05 | .05** | 12.27** |
| 2 | SLGO | .422 | .441 | .32 | .28** | 50.63** |
| | SPAVGO | -.301 | -.301 | | | |
| 3 | SPAGO | .342 | .425 | .46 | .14** | 62.55** |

Influence of State Performance-Approach Goal Orientation on Self-Efficacy

Self-Efficacy Trial 3:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .294 | .223 | .05 | .05** | 12.59** |
| 2 | SLGO | .509 | .533 | .41 | .37** | 76.29** |
| | SPAVGO | -.343 | -.346 | | | |
| 3 | SPAGO | .267 | .319 | .49 | .07** | 34.90** |

Note. $N = 225$. b = unstandardized regression coefficient. β = standardized regression coefficient. Adjusted R^2 = adjusted proportion of variance accounted for by all predictors in the regression equation. ΔR^2 = the incremental variance accounted for by the predictor variables entered at each step. F_{change} = F ratio assessing the significance of the incremental variance accounted for. ** denotes a statistic that is significant at the .01 level.

Table 13:

Influence of State Performance-Avoidance Goal Orientation on Self-Efficacy

Self-Efficacy Trial 1:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .307 | .246 | .06 | .06** | 15.49** |
| 2 | SLGO | .293 | .301 | .28 | .23** | 39.58** |
| | SPAGO | .229 | .278 | | | |
| 3 | SPAVGO | -.375 | -.373 | .40 | .12** | 47.85** |

Influence of State Performance-Avoidance Goal Orientation on Self-Efficacy

Self-Efficacy Trial 2:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .275 | .221 | .05 | .05** | 12.27** |
| 2 | SLGO | .290 | .303 | .33 | .28** | 51.65** |
| | SPAGO | .277 | .345 | | | |
| 3 | SPAVGO | -.373 | -.385 | .46 | .14** | 60.75** |

Influence of State Performance-Avoidance Goal Orientation on Self-Efficacy

Self-Efficacy Trial 3:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F</i> _{change} |
|------|---------------------|----------|---------|-------------------------------|--------------|----------------------------|
| 1 | Ability | .294 | .223 | .05 | .05** | 12.59** |
| 2 | SLGO | .383 | .401 | .34 | .30** | 55.44** |
| | SPAGO | .202 | .241 | | | |
| 3 | SPAVGO | -.393 | -.396 | .49 | .14** | 67.40** |

Note. $N = 225$. b = unstandardized regression coefficient. β = standardized regression coefficient. Adjusted R^2 = adjusted proportion of variance accounted for by all predictors in the regression equation. ΔR^2 = the incremental variance accounted for by the predictor variables entered at each step. F_{change} = F ratio assessing the significance of the incremental variance accounted for. ** denotes a statistic that is significant at the .01 level.

Table 14:

Influence of State Goal Orientation on Self-Efficacy over and above Past Self-Efficacy and Past Performance

Self-Efficacy Trial 2:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F_{change}</i> |
|------|-----------------------|----------|---------|-------------------------------|--------------|---------------------------|
| 1 | Self-Efficacy Trial 1 | .853 | .867 | .77 | .78** | 388.37** |
| | Performance Trial 1 | -.006 | -.045 | | | |
| 2 | SLGO | .058 | .059 | .79 | .01** | 4.64** |
| | SPAGO | .082 | .104 | | | |
| | SPAVGO | -.077 | -.082 | | | |

Influence of State Goal Orientation on Self-Efficacy over and above Past Self-Efficacy and Past Performance

Self-Efficacy Trial 3:

| Step | Variable(s) entered | <i>b</i> | β | <i>adjustedR</i> ² | ΔR^2 | <i>F_{change}</i> |
|------|-----------------------|----------|---------|-------------------------------|--------------|---------------------------|
| 1 | Self-Efficacy Trial 2 | .928 | .886 | .83 | .83** | 544.13** |
| | Performance Trial 2 | -.009 | -.083 | | | |
| 2 | SLGO | .124 | .127 | .84 | .02** | 7.96** |
| | SPAGO | -.006 | -.007 | | | |
| | SPAVGO | -.090 | -.094 | | | |

Note. *N* = 225. *b* = unstandardized regression coefficient. β = standardized regression coefficient. Adjusted *R*² = adjusted proportion of variance accounted for by all predictors in the regression equation. ΔR^2 = the incremental variance accounted for by the predictor variables entered at each step. *F_{change}* = F ratio assessing the significance of the incremental variance accounted for. ** denotes a statistic that is significant at the .01 level.

Figure 2.

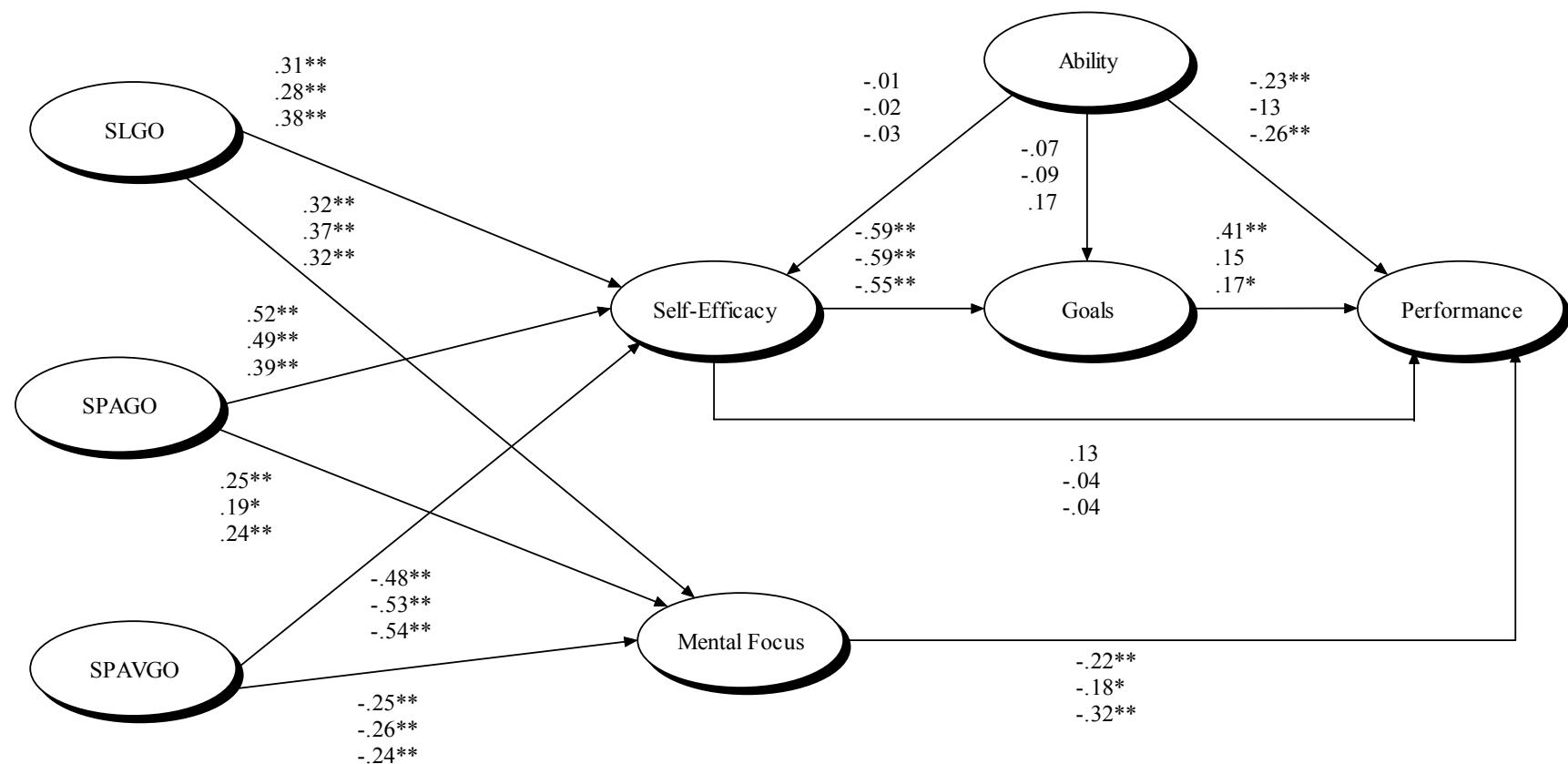
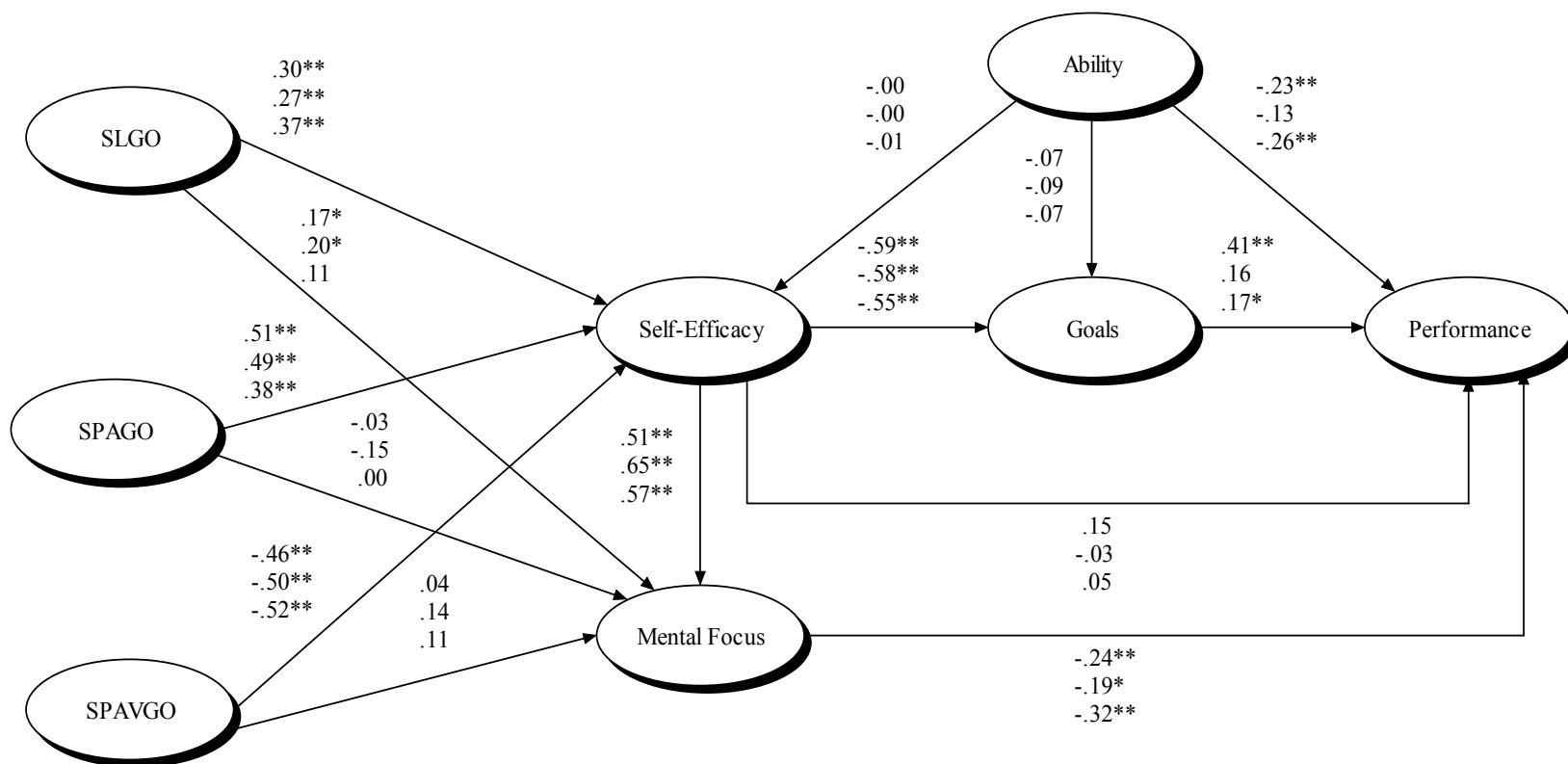


Figure 3.



Appendix A – State Goal Orientation (Elliot and Church, 1997)

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|-------------------|-------------------|----------|---------------------------|-------|----------------|----------------|
| Strongly Disagree | Slightly Disagree | Disagree | Neither Agree or Disagree | Agree | Slightly Agree | Strongly Agree |

State Learning Goal Orientation

1. I want to learn as much as possible about this puzzle task.
2. It is important for me to understand how to perform this puzzle task as thoroughly as possible.
3. I would like to completely master this puzzle task.
4. I prefer puzzles that arouse my curiosity, even if they are difficult to solve.
5. I prefer working on puzzles that really challenges me so I can learn new things.

State Performance-Approach Goal Orientation

6. It is important to me to do better than the other students on this puzzle.
7. My goal on this puzzle is to get a better time than most of the students.
8. I am motivated by the thought of outperforming my peers on this puzzle.
9. It is important to me to do well compared to others on this puzzle.
10. I want to do well on this puzzle to show my ability to others.

State Performance-Avoidance Goal Orientation

11. I worry about the possibility of taking too long to solve this puzzle.
12. My fear of performing poorly in this puzzle task is often what motivates me.
13. I just want to avoid doing poorly in this puzzle.
14. I'm afraid that if I ask the experimenter a "dumb" question, they might not think I'm very smart.
15. I wish this puzzle was not timed.

Appendix B - General Task Self-Efficacy Measure

Please think about your performance on the upcoming puzzle and indicate the extent to which you agree with the following statements.

| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|-------------------|-------------------|----------|---------------------------|-------|----------------|----------------|
| Strongly Disagree | Slightly Disagree | Disagree | Neither Agree or Disagree | Agree | Slightly Agree | Strongly Agree |

1. I feel confident in my ability to perform well on the upcoming puzzle.
2. I think that I can eventually solve this puzzle in a satisfactory time.
3. I am not confident that I will do as well on this puzzle as I would like.
4. I don't feel that I am capable of performing as well on this puzzle as other students.
5. I am a fast learner for these types of games, in comparison to other people.
6. I am not sure I can ever do well on these puzzles, no matter how much I practice.
7. I would have to practice for a long time to be able to do well on these puzzles.
8. I think that my performance will be adequate on this puzzle.
9. I am sure that I can learn the techniques required for the next puzzle in a short period of time.
10. On average, other individuals are probably not as capable of doing as well on these puzzles as I am.

Appendix C – Goal and Strength/Magnitude Self-Efficacy Measure

Please think about your performance on the upcoming puzzle. In the space below, please indicate how quickly (in minutes and seconds) you would like to solve the next puzzle.

GOAL: _____ Minutes and _____ Seconds

Please think about your performance on the upcoming trial and respond to each of the following items. Do you feel that you can solve the upcoming puzzle in:

Yes or No: 5 minutes?

Yes or No: 4 minutes and 30 seconds?

Yes or No: 4 minutes?

Yes or No: 3 minutes and 30 seconds?

Yes or No: 3 minutes?

Yes or No: 2 minutes and 30 seconds?

Yes or No: 2 minutes?

Yes or No: 1 minute and 30 seconds?

Yes or No: 1 minute?

Yes or No: 30 seconds?

Next, for each performance level, please indicate how confident you are (on a scale of 0-100%) that you can reach this level of performance on the upcoming puzzle.

_____ %: In 5 minutes.

_____ %: In 4 minutes and 30 seconds.

_____ %: In 4 minutes.

_____ %: In 3 minutes and 30 seconds.

_____ %: In 3 minutes.

_____ %: In 2 minutes and 30 seconds.

_____ %: In 2 minutes.

_____ %: In 1 minutes and 30 seconds.

_____ %: In 1 minute.

_____ %: In 30 seconds.

Appendix D – Mental Focus (Lee et al., 2003)

| ① | ② | ③ | ④ | ⑤ |
|-------------------------|------------------------|-----------------|------------------|-------------------------|
| I didn't do this at all | I hardly ever did this | I did this some | I did this a lot | I did this all the time |

When performing this task, I became easily absorbed in the puzzles.

When performing this task, I had good concentration.

When performing this task, I found my mind wandering to other things. (R)

When performing this task, I felt distracted and found it hard to pay attention. (R)

When performing this task, I had to work hard to keep my mind on-task. (R)

When performing this task, I had a difficult time focusing on the puzzles. (R)

Appendix E – Attention (Derryberry & Reed, 2002)

| ① | ② | ③ | ④ | ⑤ |
|-------------------|----------|---------------------------|-------|----------------|
| Strongly Disagree | Disagree | Neither Agree or Disagree | Agree | Strongly Agree |

1. It's very hard for me to concentrate on a difficult task when there are noises around.
2. When I need to concentrate and solve a problem, I have trouble focusing my attention.
3. When I am working hard on something, I still get distracted by events around me.
4. My concentration is good even if there is music in the room around me.
5. When concentrating, I can focus my attention so that I become unaware of what's going on in the room around me.
6. When I am reading or studying, I am easily distracted if there are people talking in the same room.
7. When trying to focus my attention on something, I have difficulty blocking out distracting thoughts.
8. I have a hard time concentrating when I'm excited about something.
9. When concentrating, I ignore feelings of hunger or thirst.
10. I can quickly switch from one task to another.
11. It takes me a while to get really involved in a new task.
12. It is difficult for me to coordinate my attention between the listening and writing required when taking notes during lectures.
13. I can become interested in a new topic very quickly when I need to.
14. It is easy for me to read or write while I'm also talking on the phone.
15. I have trouble carrying on two conversations at once.
16. I have a hard time coming up with new ideas quickly.
17. After being interrupted or distracted, I can easily shift my attention back to what I was doing before.
18. When a distracting thought come to mind, it is easy for me to shift my attention away from it.
19. It is easy for me to alternate between two different tasks.
20. It is hard for me to break from one way of thinking about something and look at it from another point of view.

BENJAMIN TYSON BRELAND, IV
 505 Sunridge Drive, Apt S
 Blacksburg, Virginia 24060
 (757) 871-0951
 bbreland@vt.edu

EDUCATION

- May 2004 **Ph.D. INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY**
 Virginia Tech, Blacksburg, Virginia
Dissertation: The Role of 3-Dimensional State Goal Orientation in the Process of Goal Establishment and Task Performance
Advisor: John J. Donovan
GPA: 3.8/4.0
- May 2001 **M.S. INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY**
 Virginia Tech, Blacksburg, Virginia
Thesis: Learning and Performance Goal Orientations' Influence on the Goal Setting Process: Is there an Interaction Effect?
Advisor: John J. Donovan
- Aug 1998 **B.S., PSYCHOLOGY, Magna Cum Laude, Phi Beta Kappa, Commonwealth Scholar**
 Virginia Tech, Blacksburg, Virginia

PROFESSIONAL EXPERIENCE

- Jul 2002 - Present *Assessment Coordinator*, Department of Mathematics, Virginia Tech, Blacksburg, Virginia
 Oversee educational assessment and evaluation research for department with 9,000+ person enrollments per semester. Conduct studies comparing efficacy of competing approaches to teaching Mathematics courses. Oversee administration of surveys to assess student reactions to math classes. Advise department chair on efforts to evaluate effectiveness of instructors.
- Nov 2002 – Present *Consultant*, HumRRO, Alexandria, Virginia
 Serve as an analyst for the National O*NET Consortium's National Center for O*NET development. Review relevant incumbent ratings for a particular occupation and make ability and skills ratings for that occupation.
- Jun 2001 - Aug 2001 *Summer Intern*, HumRRO, Alexandria, Virginia
 Developed and implemented a web-based survey for a large government agency in order to assess the attitudes and benefits of a current promotion program. Assisted in the administration of an assessment center for the Social Security Administration. Conducted workshops with subject matter experts to collect and evaluate critical incidents for a large government agency. Analyzed data and prepared feedback reports for company-wide climate survey.
- Jan 1999 - Jul 2002 *Instructor*, Department of Psychology, Virginia Tech, Blacksburg, Virginia
 Responsible for all facets of teaching a course in social psychology and two labs in motivational psychology, including lecture preparation, constructing exams, and grading assignments.
- Aug 2000 - Dec 2001 *Consulting Assistant*, Center for Organizational Research (COR),
 Department of Psychology, Virginia Tech, Blacksburg, Virginia
 Responsible for assisting with the development and execution of an exit interview program in order to determine causes of turnover for a large retail organization. Ran statistical simulations to determine the benefits of implementing a Paid Time Off Program for a large manufacturing organization.

Aug 1996 - May 1998 *Research Assistant*, Dr. E. Scott Geller, Virginia Tech, Blacksburg, Virginia
 Assisted with data collection, entry, and analysis for a grant from the National Institutes for Alcohol Abuse and Alcoholism and the National Institutes for Health. Evaluated community-based interventions to increase safety belt and designated driver use.

PUBLICATIONS

Breland, B.T., & Donovan, J. J. (in press). The role of state goal orientation in the goal establishment process.
 Manuscript in press at *Human Performance*.

Breland, B.T. (1999). The diverse role of emotions in human life. In Helena K. Chandler and Jack W. Finney (Eds.), *Exploring Introductory Psychology: A Reader and Workbook*. New York: McGraw Hill, Inc.

CONFERENCE PRESENTATIONS

Breland, B.T., & Donovan, J.J. (April, 2003). *The Impact of Goal Orientation and Conscientiousness on Goal Revision*. Poster presented at the 18th Annual Society for Industrial and Organizational Psychology, Inc., Orlando, Florida.

Breland, B.T., Hafsteinsson, L.G., & Donovan, J.J. (April, 2003). *An IRT Examination of VandeWalle's 3-Dimensional Goal Orientation Scale*. Poster presented at the 18th Annual Society for Industrial and Organizational Psychology, Inc., Orlando, Florida.

Hafsteinsson, L.G., Donovan, J.J., & **Breland, B.T.** (April, 2003). *An IRT Examination of Button et al.'s Goal Orientation Measure*. Poster presented at the 18th Annual Society for Industrial and Organizational Psychology, Inc., Orlando, Florida.

Breland, B.T., & Donovan, J.J. (April, 2002). *Situational Goal Orientation: Enhancing Our Understanding of the Goal-Setting Process*. Poster presented at the 17th Annual Society for Industrial and Organizational Psychology, Inc., Toronto, Canada.

Wiegand, D.M., Williams, J.H., Lee, D.F., & **Breland, B.T.** (May, 1998). *Increasing Safe Behaviors in an Industrial Setting: Global versus Specific Feedback*. Paper presented at the 24th Annual Convention of the Association for Behavior Analysis, Orlando, Florida.

Wiegand, D.M., Micheal, P.G., Cecil, C., **Breland, B.T.**, & Boyce, T.E. (October, 1997). *Intervening to Improve the Driving Behaviors of Pizza Delivery Drivers*. Poster presented at the 14th Annual Meeting of the Southeastern Association for Behavior Analysis, Chapel Hill, North Carolina.

Breland, B.T., & DePasquale, J.D. (May, 1997). *Behavior-based safety: Is industry getting the message?* Poster presented at the 17th Annual Convention of the Florida Association for Behavior Analysis, Sarasota, Florida.

Brother, J., **Breland, B.T.**, & Macdonald L. (April, 1997). *Can College Students' Intentions be Used to Predict Their Actual Alcohol Consumption?* Poster presented at the 1st Annual Meeting of The Virginia Collegiate Psychology Conference, Blacksburg, Virginia.

Breland, B.T., Rhudy, J., Chevailler, C.R., & Brinkman, J. (March, 1997). *The Airline Lifesaver: 12 years of Making a Difference*. Poster presented at the 43rd Annual Convention for the Southeastern Psychological Association, Atlanta, Georgia.

TECHNICAL REPORTS

Hannsgen, K. & **Breland, B.T.** (2003). Evaluation of Advanced Placement Student's Progression in Mathematics Courses.

Hannsgen, K. & **Breland, B.T.** (2003). Report on the Comparison between Traditional Classroom and Computer Simulated Teaching Methods for Mathematics Courses.

Hauenstein, N.M., & **Breland, B.T.** (2002). Report on the Implementation of a Paid Time Off Program for Hancock Steel Joist.

Schultz, S.R., Boyd, L.G., & **Breland, B.T.** (2001). Evaluation of SSA's Presidential Management Intern Program: Summary of Questionnaire Results.

Schultz, S.R., **Breland, B.T.**, Sterns, H.B., & Boyd, L.G. (2001). Evaluation of SSA's Presidential Management Intern Program: Summary of Interview and Focus Group Comments.

McBride, N.L., Hauenstein, N.M., Swartz, D.E., Bess, T.L., Lemmond, G., **Breland, B.T.**, Hollander, E., Robson, V.E., & O'Shea, P.G. (2001). Report on Exit Surveys of Distribution Employees of Advance Auto Parts.

Hauenstein, N.M., McBride, N.L., Swartz, D.E., Bess, T.L. Lemmond, G., **Breland, B.T.**, Hollander, E., Robson, V.E., & O'Shea, P.G. (2000). Report on Exit Surveys of Retail Employees of Advance Auto Parts.

RESEARCH IN PROGRESS

Breland, B. T., & Donovan, J. J. Interrelationships among goal orientation and established measures of personality.

Quintela, Y., **Breland, B.T.**, & Hafsteinsson, L. G. Changing effects of self-efficacy on task performance.

Hafsteinsson, L. G., Donovan, J. J., & **Breland, B. T.** Effects of task learning on goal orientation.

Hafsteinsson, L. G., Donovan, J. J., & **Breland, B. T.** An item-response theory analysis of current measures of dispositional goal orientation.

GRANTS

Research Presentation Travel Grant, 2003

Graduate Student Assembly, Virginia Tech

Award: \$300

Galper Graduate Fund in Psychology, 2003

Department of Psychology, Virginia Tech

Award: \$300

Research Presentation Travel Grant, 2002

Graduate Student Assembly, Virginia Tech

Award: \$300

HONORS

Phi Beta Kappa Society, inducted 1998

Golden Key National Honor Society, inducted 1996

Psi Chi – National Honor Society in Psychology, inducted 1996

Who's Who Among Students in American Universities and Colleges, 1997-1998

PROFESSIONAL AFFILIATIONS

Society for Industrial and Organizational Psychology (Student Member, 1998-present), American Psychological Association (Student Affiliate, 1997-present)

RELATED COURSES

Quantitative Topics (Factor Analysis)
Multiple Regression
Applied Structural Equation Modeling
Advanced Psychometric Theory
Psychological Measurement
Statistics in Research for Social Sciences I & II
Seminar in Tests and Measurements (Item Response Theory)
Seminar on Current Topics in I/O Psychology
Research Methods
Industrial Psychology I (Job Analysis, Selection, & Training)
Industrial Psychology II (Assessment and Performance Appraisal)
Organizational Psychology I (Work Motivation)
Organizational Psychology II (Leadership)
Organizational Behavior
Social Psychology
Personality Processes
Developmental Psychology

COMPUTER SKILLS

SPSS, SAS, LISREL, BILOG, MULTITLOG, DFITP4, EQUATE (application of Item Response Theory), Word, Excel, PowerPoint, Outlook