# Individual Differences in Trait Motivation: An Exploration of the Relative Influence of Motivational Traits and Goal Orientation on Goal Setting Processes

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# INDIVIDUAL DIFFERENCES IN TRAIT MOTIVATION: AN EXPLORATION OF THE RELATIVE INFLUENCE OF MOTIVATIONAL TRAITS AND GOAL ORIENTATION ON GOAL SETTING PROCESSES

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(ABSTRACT)

Very little empirical evidence exists linking the motivational traits portion of the motivational traits and skills framework to goal setting processes. The present study explored relationships between motivational traits, task-specific self-efficacy and self-set goal level during a computer-based task. Along with direct assessment of these relationships, we assessed whether task-specific self-efficacy mediates relationships between motivational traits and self-set goal level. In the current study, we also examined the ability of motivational traits to provide an increment in the prediction of motivational outcomes over currently accepted goal orientation constructs. Analyses suggest that the motivational traits personal mastery and motivation related to anxiety are consistent predictors of task-specific self-efficacy but inconsistent predictors of self-set goal level while competitive excellence entirely unrelated to motivational outcomes. Motivational traits failed to provide any significant increment in the prediction of task-specific self-efficacy over respective goal orientation constructs. Implications and future directions are discussed.

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## Introduction

Individual differences in motivation have historically been considered important factors in determining human behavior. Researchers such as Murray (1938) and McClelland, Atkinson, Clark, and Lowell (1976) noted and empirically supported several individual differences in motivation, most notably Need for Achievement (nAch). Despite support for theories that conceptualized stable individual differences in motivation, systematic study of individual differences in motivation slowed considerably during the 1970's and early 1980's. During this time, most research focused on situational (e.g., Job Characteristics Model; Hackman & Oldham, 1976) and cognitive (e.g., expectancy theory, Vroom, 1964; self-efficacy theory, Bandura 1982; and goal setting theory, Locke & Latham, 1990) theories of motivation. Although individual differences in motivation did not disappear from the academic literature, theoretically derived, systematic studies of individual differences in motivation were rare (Kanfer & Heggestad, 1997).

In the 1980's and 1990's, research concerned with the taxonomic structure of personality surged back into the scientific literature. Historically, personality structure research has included lexical analyses (e.g., Norman, 1963; and Goldberg, 1981) and analyses of a priori developed personality scales (e.g. Eysenck, 1960 and Costa & McCrae, 1985) to determine cohesive structures of personality. Results provided evidence for useful personality structures ranging from three (Eysenck, 1960; and Costa & McCrae, 1985) to five (Norman, 1963 and Goldberg, 1981) to 16 (Cattell, 1994) factors. Currently, the dominant theory in personality structure is the Big-5 (e.g., Barrick & Mount, 1991).

Subsequent research on the underlying structure of personality revealed promising relationships between personality variables in the positive agency domain (e.g., Conscientiousness), motivation, and performance (e.g., Barrick, Mount, & Strauss, 1993).

Similar to personality structure research, goal orientation (GO) was a previously known motivational individual difference in educational psychology research that began to gain traction in the larger research community (e.g., Dweck, 1986). Almost simultaneously, personality constructs relevant to motivation and GO were identified as important individual differences related to goal directed behaviors. However, as noted by several individuals (e.g., Austin & Klein, 1996; Heggestad & Kanfer, 2000; and Kanfer, 1990), motivationally-specific individual difference variables such a goal orientation often do not have a cohesive, guiding framework from which researchers can theorize about relationships with more proximal determinants of action (i.e. performance goals; Austin & Klein, 1996; DeShon & Gillespie, 2005).

The Motivational Traits and Skills framework (MTS; Kanfer & Heggestad, 1997) was specifically designed as a cohesive framework that attempts to organize the entirety of motivationally relevant individual differences. Many researchers (e.g., Austin & Klein, 1996; Kanfer, 1990; and Kanfer & Heggestad, 1997) have noted the lack of a cohesive perspective on individual differences in motivation research. Development of a proper and cohesive framework from which researchers can identify and test individual differences in integrated motivation research is essential for a complete understanding of what motivates action (Kanfer, 1990). The purpose of the present study is to explore the motivational traits portion of the MTS framework by analyzing relationships with known proximal determinants of behavior (i.e. goal setting and self-efficacy), over and above the effects of existing motivational individual difference constructs (i.e. goal orientation).

Currently, the dominant framework of motivational study with the largest body of supporting evidence is goal setting theory. Hundreds of studies across various tasks, situations and cultures have concluded that goal setting can substantially improve performance (Locke &

Latham, 1990). Goals have two properties, content and intensity. Goal content is usually defined as the object or outcome to be pursued while goal intensity is defined as the relative importance of the goal itself. Most of the goal intensity research has focused on goal commitment. The majority of goal content research has focused on the specificity and difficulty of individual goals and this area is where the greatest amount of goal setting research lies.

One critical proposition of goal setting theory is that difficult goals lead to heightened performance in contrast to "do your best" goals or no goals. Several meta-analyses in support of this proposition have found effect sizes ranging from .52 to .82 (Mento, Steel & Karren, 1987; Tubbs, 1986; and Wood, Mento & Locke, 1987). Also central to the supporting literature of goal setting theory is the proposition that specific, difficult goals increase performance. Again, meta-analyses support this finding reporting effect sizes ranging from .42 to .80 (Hunter & Schmidt, 1983; Mento, Steel & Karren, 1987; Tubbs, 1986; and Wood, Mento, & Locke, 1987). As an entire body of work, conclusions are that goal specificity and difficulty motivate behavior by providing a clear standard for attainment while "do your best" goals are ambiguous, providing no such standard and subsequently, lower levels of motivation.

Along with goal setting mechanisms, Self-efficacy is a very important component of the motivational hub. Self-efficacy is an internal judgment of how effectively one can act in a given situation (Bandura, 1982). Research has shown that it is at least partly through efficacy beliefs that people choose courses of action, amount of effort to be expended, and how long to persist in action, otherwise known as self-regulation (Bandura & Cervone, 1983). Empirical research reviewed by Locke & Latham (1990), illustrate relationships between self-efficacy, goal setting and performance where self-efficacy is directly related to performance ($r = .39$), personal goals are directly related to performance ($r = .42$), and self-efficacy affects the level of goals set ($r =$

.39). Later meta-analysis performed by Stajkovic and Luthans (1998) indicated that self-efficacy demonstrates a significant positive relationship with task performance, across task complexity levels (r = .38). Together, goal setting and self-efficacy make up proximal determinants of action also termed the "motivational hub" (Locke, 1991).

Research conceptualizing work motivation as a characteristic of the person focuses on non-ability individual differences related to behavior. The following review of individual differences in motivation research will consist of four sections discussing: 1) Early research in the realm of individual differences in motivation, 2) The value of personality research, 3) Specific theories regarding dispositional tendencies in goal-directed behavior, 4) The importance and potential of MTS theory. As recognized by many motivation researchers (e.g., Kanfer, 1990), individual differences represent distal determinants of behavior and will be discussed as such. Thus, within each section, pathways between distal individual differences and proximal motivational mechanisms (e.g., goal setting) will be included where appropriate.

*Early Research on Individual Differences in Motivation*

Theories of individual differences in motivation have been around for quite some time. For example, Murray (1938) described motives in the form of various psychological needs measured with the Thematic Apperception Test (TAT). The TAT, a projective instrument, measured needs purported to be enduring personality characteristics related to behavior by energizing, directing, and/or selecting behavior. Of the various needs presented by Murray, the most researched is need for achievement (*nAch*). Generally defined as the motive to increase one's competence in achievement settings, early conceptualizations held that it is a psychological need satiated by success and aroused by failure similar to models of physiological needs (McClelland, Clark, Roby, & Atkinson, 1949). Researchers such as Atkinson (1957),

McClelland, Atkinson, Clark, and Lowell (1976) and Heckhausen (1967 in Heckhausen, 1991) established *nAch* as a useful motivational variable in explaining human behaviors such as risk taking. Others found relationships between *nAch* and student ability (Uhlinger & Stephens, 1960), as well as relationships between *nAch* and entrepreneurial success (Wainer & Rubin, 1969).

During this time, concern about the dimensionality of the achievement motive construct was evident. Clark, Teevan, and Ricciuti (1956), for instance, conceptualized *nAch* as occurring along a single continuum with hope of success and fear of failure on opposite ends. Alternatively, Atkinson and Litwin (1960) argued that the *nAch* construct and anxiety constructs (i.e., test anxiety) were in fact independent constructs or distinct motives of behavior. In fact, Atkinson and Litwin (1960) found no significant relationships between *nAch* and a validated measure of test anxiety (Test Anxiety Questionnaire; Mandler & Sarason, 1952). The results of this research ultimately led to a split of the achievement motive into two independent constructs; motive to approach success and motive to avoid failure. Today, the distinction between approach and avoidance motives remains.

Interestingly, in the same study, Atkinson and Litwin (1960) attempted to quantify goal setting in the form of self-reported probability of success. Weak relationships between individual differences in *nAch* and goal setting did exist, identifying proximal pathways through which *nAch* may impact behavior. Later research focusing on self-efficacy and goal setting processes found that *nAch* was indirectly related to behavior through goal setting and/or self-efficacy (e.g. Matsui, Okada, & Kakuyama, 1982;Yukl & Latham, 1978). Cumulatively, *nAch*, research indicated that individual differences are important motivational constructs that operate on human behavior through proximal mechanisms (i.e., self-efficacy and goal setting).

Although individual differences in motivation did not disappear, direct research concerning individual differences in motivation faded during the 1970's and 1980's. For instance, situational theories of work motivation (e.g., Hackman & Oldham, 1976) focused on the motivational influence of environmental characteristics while only paying lip service to the potential moderating influence of individual differences such as growth need strength. Other important motivation theories of the time include Vroom's (1964) expectancy theory, Locke and Latham's (1990) goal setting theory, and Bandura's (1989) theory of self-efficacy. Interestingly, expectancy theory, goal setting theory, and self-efficacy theory all posit that individual differences in motivation will affect important components of their respective models yet all fail to directly research pertinent individual differences in motivation.

*Personality Trait Research*

Throughout its relatively long history, the study of personality structure has resulted in several conceptualizations of useful taxonomic personality frameworks. Importantly, resurgence of interest in individual differences has spurred inquiry into motivationally relevant individual differences. Researchers such as Schmidt and Hunter (1992) admit that specific phenotypic personality variables (i.e., conscientiousness) may provide motivationally specific information.

Indeed, across several meta-analyses of note the motivationally relevant personality construct conscientiousness has emerged as a significant predictor of human behavior (Barrick & Mount, 1991; Hogan & Holland, 2003; Hurtz & Donovan, 2000; Tett, Jackson, & Rothstein, 1991). Although conceptualizations differ somewhat, high conscientiousness usually reflects being dependable, responsible, careful, hardworking, achievement-oriented, and persevering (Barrick & Mount, 1991). Broadly speaking, conscientiousness reflects a portion of the positive agency domain of personality (Heggestad & Kanfer, 2000). As indicated by Schmidt and Hunter

(1992) as well as Heggestad and Kanfer (2000), motivation is closely related to personality variables in the positive agency (approach) domain. Additionally, Kanfer, Ackerman, and Heggestad (1996) found that motivation is negatively related to personality variables in the avoidance domain such as Neuroticism. As a whole, personality research results provide support for the existence of motivationally relevant individual differences in both the approach and avoidance domain.

Both Austin and Klein (1996) and Locke and Latham, (1990) argued that theoretically derived individual differences constructs may affect goal setting processes. In support of this proposition, Barrick. Mount, and Strauss (1993) identified proximal mechanisms through which motivationally relevant individual differences in personality may impact behavior. Barrick et al. (1993) provided evidence that employees high in conscientiousness were more likely to set and be committed to goals. Such results concerning motivationally relevant individual differences and proximal mechanisms through which they operate have contributed to increased vigor in research on motivationally specific individual differences (Heggestad & Kanfer, 2000).

*Goal Orientation*

As personality researchers focused their efforts on developing taxonomies of personality structure, some researchers in the field of education began to focus on achievement motivation as a means of explaining why students of comparable ability differed in performance levels (e.g., Ames, 1984; Diener & Dweck, 1978; Dweck, 1975; Dweck & Reppucci, 1973; and Nicholls, 1984). Early research identified important and seemingly distinct patterns of behavior driven both by individual beliefs and cognitions that had differential effects on subsequent performance. Later termed goal orientation (GO), research in this vein eventually found a home in the organizational psychology literature (e.g., Button, Mathieu, & Zajac, 1996; Farr, Hoffman &

Rigenbach, 1993; and VandeWalle, 1997). The quality and sheer amount of research concerning GO within the organizational literature has put it forth as a leading motivationally-specific individual difference construct.

The majority of Dweck's early theorizing on achievement motivation came from her work on learned helplessness in which she noted that attributions of failure to either ability level or effort expenditure were associated with performance decrements and increased vigilance respectively (Dweck, 1975; Dweck & Reppucci, 1973). In 1978, Diener and Dweck classified children as either helpless or mastery-oriented based on their tendencies to neglect or emphasize effort in determining failure. Results of their study identified distinct classes of behavior patterns following failure. In the helpless oriented behavior pattern, children attributed failure to uncontrollable factors resulting in large performance decrements. In the mastery oriented behavior pattern, children engaged in solution directed behaviors following failure (such as increased effort) and exhibited performance enhancement. In the work of Ames (1984) and Nicholls (1984), ability attributions were also directly related to the type of cognitions utilized in achievement settings. To this point, researchers had identified two patterns of goal directed behavior determined by ability beliefs. In the adaptive/mastery-oriented pattern, an incremental theory of ability results in mastery orientation associated with challenge seeking and maintenance of effort. In the helpless/maladaptive pattern, a fixed entity theory of ability results in helpless orientation associated with avoidance of challenge and deteriorating effort.

Subsequent theorizing indicated that broad classes of achievement goals adopted by students, termed performance and learning goals, orient them toward either helpless or mastery behavior patterns respectively (Dweck, 1986). Performance goals emphasize maintenance of positive ability judgments in relation to others, while learning goals emphasize increasing

competence through effort. Elliott and Dweck (1988) supported assumptions that students in the helpless behavioral pattern held performance goals while mastery oriented students held learning goals. Different achievement goals (performance or learning) determined which behavioral patterns students' exhibited (helpless or mastery) and were related to performance during difficulty.

Along with Dweck and Leggett (1988), educational researchers created the constructs of learning goal orientation (LGO) and performance goal orientation (PGO) and incorporated these individual differences into research concerning motivation and performance. Persons with a behavioral tendency toward choosing learning goals are said to have a learning goal orientation that is the direct result of an incremental theory of ability and is strongly related to the mastery oriented behavioral pattern. Persons with a behavioral tendency toward choosing performance goals are said to have a performance goal orientation that is the direct result of an entity theory of ability and is strongly related to the helpless oriented behavioral pattern. Empirical evidence presented by Dweck and Leggett (1988) supported postulations that theory of ability is related to GO and subsequent performance through either helpless or mastery oriented behaviors.

Elliot and his colleagues utilized classic approach and avoid motivation distinctions (e.g., Atkinson & Litwin, 1960; McClelland, Atkinson, Clark, & Lowell, 1976) as a basis for an alternative conceptualization of achievement goals. Elliot and Church (1997), for instance, contend that achievement goals consist of three independent dimensions: Mastery goals, performance-approach goals, and performance-avoid goals. This ran counter to the original GO construct that was conceptualized as unidimensional (e.g., Dweck & Leggett, 1988) with LGO and PGO on opposite ends of the same achievement goal continuum, as well as subsequent measures that conceptualized GO as two rather than three independent constructs (Button,

Mathieu, & Zajac, 1996). Elliot and colleagues posit that mastery goals, performance-approach goals, and performance-avoid goals together compose achievement motivation. Although not conceptualized as trait constructs, they are purported to be independent motivational tendencies differentiated by normative or personal standards of excellence as well as approach or avoid motives. Mastery goals are focused on attaining competence and mastering skills. Performance-approach goals are focused on gaining favorable judgments from others regarding competence. Performance-avoidance goals are focused on avoiding unfavorable judgments from others regarding competence. Additionally, the Elliot achievement goal model posits that achievement goals are systematically linked to more distal constructs such as approach and avoidance temperaments as well as more proximal determinants of behavior such as performance goals. (Elliot & Thrash, 2002).

Although Dweck and Elliot seem to disagree on the correct dimensional conceptualization of the achievement goal construct (i.e., two or three constructs and whether they are independent) both seem to agree that GO is too proximal to be considered a trait-like construct. Dweck and Leggett (1988) contend that the most stable construct in GO theory is student implicit theory of intelligence. LGO and PGO were purported to be tendencies in general goal choice predicted by implicit theory of intelligence. Studies such as that of Ames and Archer (1988) viewed learning and mastery goals as dependent upon situations in which they were made more or less salient, indicating that they are not conceptualized as individual traits. Interestingly, as in the study by Elliott and Dweck (1988), theory of intelligence was also often situationally induced. Thus, trait theorists would not consider either Dweck's or the previously discussed achievement goal theory of Elliot as one of individual differences in motivational traits. Constructs within both Dweck's and Elliot's achievement goal conceptualizations seem to be

dependent upon specific achievement situations, vulnerable to situational induction, more proximal than dispositions or temperaments and, therefore, not a reflection of trait-like individual differences that are stable across situations and time.

In 1993, Farr, Hofmann, and Ringenbach argued that GO was a valuable avenue for researchers in Industrial and Organizational Psychology attempting to understand the role of individual differences in goal setting behaviors. Farr et al. (1993) noted that specific individual difference constructs seemed be missing from goal-based models of motivation. Contrary to Dweck's (e.g., Dweck, 1986) conceptualization of GO, Farr et al. (1993) offered arguments that GO should be used to fill the individual differences gap, essentially equating LGO and PGO to dispositional individual difference constructs. Soon after Farr et al's (1993) theoretical piece, Button, Mathieu, and Zajac (1996) argued that if GO was to be integrated into organizational research, it needed conceptual clarity as well as a, "validated dispositional measure" (p.26). As such, Button et al. (1996) generated a pool of items tapping into the LGO and PGO constructs proffered by Dweck and her colleagues. After a series of factor analyses, as well as findings that the derived LGO and PGO constructs were uncorrelated, Button et al. (1996) offered a global measure of independent LGO and PGO constructs. Don VandeWalle (1997) then offered a work domain measure of GO that closely aligned with Elliot's (e.g., Elliot & Church, 1997) conceptualization of achievement goals in that it differentiated performance goals into independent prove and avoid constructs. Interestingly, both Button et al (1996) and VandeWalle (1997) pursue GO as if it is a broad, distal, trait-like individual difference rather than a situationally dependent, mid-level construct as it was originally conceptualized.

Continuing to conceptualize GO as a trait-like construct, Phillips and Gully (1997) and Chen, Gully, Whiteman, and Kilcullen (2000) further integrated GO into work motivation

research. Both studies found that GO is indirectly related to goal setting through self-efficacy such that those higher on LGO are more likely to have higher self-efficacy and set higher goals than those lower on LGO. Conversely, those higher on PGO are less likely to have high self-efficacy and set higher goals than those lower on PGO. Other research found similar results concerning relationships between both the two-dimensional (i.e., Button et al, 1996) and three-dimensional (i.e., VandeWalle, 1997) treatments of goal orientation, self-efficacy, goal setting, and various performance measures from sales performance to learning (Colquitt & Simmering, 1998; Fisher & Ford, 1998; Ford, Smith, Weissbein, Gully, & Salas 1998; Koslowski, Gully, Brown, Salas, Smith, & Nason, 2001; Mangos & Steele-Johnson, 2001; VandeWalle, Brown, Cron, & Slocum, 1999). Overall, empirical research treating GO as a trait construct established relationships between GO, proximal self-regulation constructs (i.e. goal setting and self-efficacy), and performance. The most recent meta-analysis conducted by Payne, Youngcourt, and Beaubien (2007) found that LGO correlated with goal setting ($\rho$ = .19), self-efficacy ($\rho$ = .37), and various performance categories ($\rho$ = .05 to .18); Prove-PGO was largely uncorrelated with goal setting, self-efficacy, and performance; and Avoid-PGO was correlated with goal setting ($\rho$ = -.17), self-efficacy ($\rho$ = -.26), and various performance categories ($\rho$ = -.06 to -.17).

Kanfer (1990) advocated the distinction and systematic study of theoretical pathways between distal constructs and proximal constructs in the study of motivation. Some authors took Kanfer's (1990) advice in designing their own research. For example, Chen, Gully, Whiteman, and Kilcullen (2000) distinguished between trait-like individual differences (i.e. GO) and state-like individual differences (i.e. anxiety and goal setting) in their study of learning performance. Breland and Donovan (2005) utilized similar logic in their study of the effects of state- and trait-GO on goal establishment. Breland and Donovan (2005) found that the effects of distal

manifestations of GO on goal establishment processes are mediated by more proximal manifestations of the same constructs (i.e. state GO). Even more recently, Payne, Youngcourt, and Beaubien (2007) found that state-GO is a proximal consequence of trait GO. It is evident that although GO was initially treated as a distal, trait-like construct in the Industrial and Organizational Psychology literature, researchers may have been too hasty to assume that this was true.

To date, the majority of individual differences in motivation research attempted to both more accurately describe GO constructs and use them in models of motivation. The voluminous empirical research done on GO as a dispositional construct has currently made it a preeminent motivationally specific individual differences construct. Important paradigms have been established such as distinctions between approach and avoidance goals as well as the establishment of proximal pathways through which GO constructs exert their influence on performance (state GO, goal setting and self-efficacy). It is evident that the foundational theory underlying GO does not conceptualize it as a trait, rather, it is purported to be highly susceptible to achievement situations and/or situational and experimental inductions. Simply treating GO as a disposition upon its introduction into Industrial and Organizational Psychology research may have generated promising empirical findings, but has yet to help motivation researchers clarify the role of motivationally specific individual differences in motivational processes. Heggestad and Kanfer (1997) point out that no functional framework has yet to be put forth to organize distal, motivationally specific, person characteristics that affect behavior through proximal mechanisms. Several reasons are cited as to this deficiency but the disorganization of research as a whole regarding the role of individual differences in motivation research as well as inadequate measurement of motivational traits by any one measure are the leading criticisms. As noted by

Kanfer and Heggestad (1997), GO research is prolific but the constructs as they are currently used and measured do not provide a useful taxonomy of motivationally specific individual differences from which researchers may make theoretical hypotheses about the role of motivational traits in cohesive models of motivation.

*Motivational Traits and Skills*

In their 1997 piece, Kanfer and Heggestad attempted to organize advances in individual differences motivation research into a taxonomic framework of motivational traits and skills. Initially, a series of studies reported by Kanfer, Ackerman, and Heggestad (1996) demonstrated that individual difference aspects of self-regulatory skills, distinct from induced mechanisms (e.g., goal setting and state goal orientation), provide important information for predicting learning performance. Individual differences in self-regulatory skills from the approach and avoid domains provided incremental validity for performance on a simulated air traffic control task (in both laboratory and field training settings.) over extant ability and non-ability constructs. It is important to note that Kanfer et al. (1996) provided evidence that both state and trait constructs are important pieces of cohesive models of motivation, and that researchers should strive to delineate explanatory models containing both.

Building on Kanfer et al.'s (1996) findings and the advances in motivation research discussed previously, Kanfer and Heggestad (1997) conceptualized an individual differences approach to work motivation that distinguished between motivational traits and skills. In the motivational traits and skills (MTS) framework, motivational skills are defined as self-regulation competencies used during goal striving while motivational traits are stable individual differences in approach and avoidance goal directed effort. MTS theory suggests that motivational traits are

distal, dispositional, constructs that lead to the development and use of more proximal and situationally sensitive motivational skills.

Motivational skills encompass self-regulatory strategies used by individuals during goal striving (Kanfer & Heggestad, 1997). The authors argue that previous differentiation of determinants of motivation as either traits or situations obscures the possibility of developmental motivation processes. This line of theorizing and a review of self-regulation mechanisms led Kanfer and Heggestad (1997) to identify two overarching motivational skills constructs; motivation control and emotion control. Emotion control encompasses self-regulatory skills designed to protect effort expenditure from distracting emotional states such as anxiety or worry. Motivation control encompasses self-regulatory skills designed to maintain high levels of effort and attention such as goal setting. Self-regulation, represented here by skills rather than traits or situations, is developed across situational encounters and related to individual differences. Although partially dependent upon the situation, well-developed self-regulatory skills would allow a person to demonstrate high work motivation in various settings (Kanfer & Heggestad, 1997).

Utilizing trait clustering similar to that of Snow, Corno, and Jackson (1996), as well as classic approach/avoidance motivation paradigms, Kanfer and Heggestad (1997) attempted to identify potential motivational traits from the extant achievement motivation and personality taxonomy research streams. The result was formulation of two super-ordinate trait complexes, Achievement and Anxiety.

Within the Achievement complex lie the motivational traits Personal Mastery (PM) and Competitive Excellence (CE). Identification of these traits came from thorough review of literature in both achievement motivation (e.g., Atkinson, 1957; Elliot & Church, 1997; and

McClelland, 1951) and personality taxonomy (e.g., Barrick & Mount, 1991 and Murray, 1938) approaches to motivation.

The PM construct has its roots in *nAch* (Murray, 1938) and can be defined similarly to Helmreich and Spence's (1978) Mastery, and/or Dweck and Leggett's (1988) Learning Orientation. Thus, PM is conceptualized as a self-referent, achievement striving construct encompassing all of the previously mentioned constructs. A person high on PM will utilize personal improvement standards of excellence and persist in the face of frustrated attempts to achieve those standards. The CE construct is based loosely on Jackson, Ahmed, and Heapy's (1976) competitive acquisitiveness and status, Elliot and Church's (1997) performance-approach goals, and Cassidy and Lynn's (1989) Status Aspiration, Competitiveness, Acquisitiveness, and Dominance. Thus, CE is conceptualized as an other-referent, achievement striving construct. A person high on this trait will likely utilize normative standards of excellence and define success relative to others. Together, PM and CE encompass the entirety of the approach motivation (achievement) construct space.

Within the Anxiety complex lie the motivational traits of Failure Avoidance (FA) and Achievement Anxiety (AA). Kanfer and Heggestad (2000) identified these traits after conducting an extensive literature search of the general anxiety, fear of failure, and test anxiety lines of research. However, it was Heckhausen's (1991) contention that test anxiety and avoidance behavior are distinct phenomenon that led to the eventual classification of two separate but related motivational traits, FA and AA. FA is designed to encompass avoidance behaviors such as those represented in research on *n*Infavoidance (Murray, 1938) and fear of failure (McClelland et al., 1953). A person high in FA would be expected to avoid achievement situations due to an experience of anxiety caused by the possibility of failure. AA is designed to

encompass classic test anxiety notions with the primary distinction that it is adapted to fit a wider breadth of failure threatening situations. For instance, a person high in AA would be expected to experience anxiety in testing situations, deadline enforcement situations, and athletic competition. AA and FA encompass all trait constructs in the avoidance motivation (Anxiety) construct space. Subsequent factor analytic research (Heggestad & Kanfer, 2000) described below, found that both FA and AA load on a single avoidance motivation construct, Motivation Related to Anxiety (MRA). As a whole, MTS theory cohesively defines dispositional, distal, approach and avoidance motivational traits as well as state-like, proximal, self-regulation constructs in a single theory designed to coherently guide future motivation research.

After a review of the extant literature in the Achievement and Anxiety trait complexes, Heggestad & Kanfer (2000) concluded that, "…no instrument was capable of providing construct appropriate, independent assessments of each of the motivational traits of the achievement and anxiety complexes." The Achievement motivation measures reviewed included, but are not limited to, the Thematic Apperception Test (Murray, 1943), Aberdeen Academic Motivation Inventory (Entwistle, 1968), the Work and Family Orientation Questionnaire (Helmreich & Spence, 1978), and the Achievement Motivation Questionnaire (Lynn, 1969). Additionally, goal orientation measures were reviewed such as those of Ames and Archer (1988), Button, Mathiew, and Zajac, (1996), and Vande Walle (1997). Examination of these measures found that they contained many items related to PM and/or CE traits but did not specify separate scales for each trait nor did they find any items related to the Anxiety trait complex. Similarly, many instruments intended to measure traits associated with the Anxiety complex were reviewed, including the Fear of Failure scale (Good & Good, 1975), *n*Infavoidance (Murray, 1938), Debilitating Anxiety Questionnaire (Alpert & Haber, 1960), and

the Test Anxiety Scale (Sarason, 1978). All measures either failed to provide scales differentiating between AA and FA traits or they only assessed one of the motivational traits under the Anxiety complex, while failing to assess the other. Again, MTS theory is designed to provide a cohesive framework of both the Achievement and Anxiety motivational trait complexes, while previous theories and/or measures may be too narrowly or poorly defined to provide any taxonomy as such.

Heggestad and Kanfer (2000) reported two studies evaluating an instrument developed to appropriately measure the entire motivational trait domain, the Motivational Trait Questionnaire (MTQ). Using trait definitions such as those above to generate or adapt items from existing sources, they created scales for each motivational trait. Participants in the two reported studies provided results of a confirmatory factor analysis for the proposed traits, PM, CE, FA and AA. In both studies, the proposed four-factor model provided good fit while additional item level analysis identified and refined facets of each trait. PM contained three facets: determination, desire to learn, and mastery goals. CE contained two facets: other referent goals, and competition seeking. AA contained three facets: worry, emotionality, and interference. Finally, FA had one facet: active avoidance. Upon further examination and as previously mentioned, AA and FA were merged into one MRA construct.

Test-retest correlations were found above .80 for all traits and facets and facets within traits were highly correlated ranging from .61 to .78. Later research by Diefendorff et al. (2005) found that only the relationship between CE and MRA achieved significance (r=.21) while relationships between PM and CE and PM and MRA were insignificant indicating the relative independence of MTQ constructs. It appears that the multi-dimensional MTQ instrument provides a cohesive measure for research on motivationally specific individual differences within

both the Achievement and Anxiety complexes. As the MTQ encompasses all aspects of both the Achievement and Anxiety motivation construct space, Heggestad and Kanfer (2000) posit that their measure will provide a more thorough assessment of motivational traits and thus, more accurate prediction of proximal motivational mechanisms than measures such as GO that do not assess the entire motivational trait construct space.

*Motivational Traits and Skills Research*

After its introduction, very few attempts have been made to establish the validity of MTS theory. Initial tests of construct validity were performed by Heggestad and Kanfer (2000) via extension analysis (Dwyer, 1937). Specifically, extant measures including the Work and Family Orientation Questionnaire (WOFO; Helmreich & Spence, 1978), the Multidimensional Personality Questionnaire (MPQ; Telegen, 1982), the State-Trait Anxiety Inventory (STAI; Speilberger, 1983), and the NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992) were used to define factor loadings of extant scales on MTQ factors and interpreted as relationships between the scales and externally measured latent constructs. Of special note are the strong factor loadings of Neuroticism on MRA as a factor (.63), Conscientiousness on PM as a factor (.71), and Agreeableness on CE as a factor (-.60) indicating that Big-5 constructs are related to MTQ constructs in a theoretically appropriate manner.

Kanfer and Ackerman (2000) also provide evidence for the construct validity of MTQ constructs. In a sample of college students, PM, CE, and MRA were measured using a shortened (48-item) version of the MTQ (MTQ-S). All were directly compared to four personality scales from Tellegen's (1982) Multi-dimensional Personality Questionnaire (MPQ), social potency, social closeness, absorption, and traditionalism. As Church (1994) points out, MPQ constructs are aligned with Big-5 constructs such that social potency and social closeness are well

represented by extroversion, absorption is well represented by openness to experience, and traditionalism is well represented by conscientiousness. Expected relationships between MTQ constructs and MPQ constructs occurred. Within the PM trait construct, the desire to learn facet was significantly related to social potency (.20), and absorption (.26) while the mastery facet was significantly related to social potency (.31), social closeness (.18), absorption (.26) and traditionalism (.25). Within the CE trait construct, the other referenced goals and competitiveness facets were significantly related to social potency (.32 and .45 respectively). Finally, within the MRA trait, the worry scale had a significant negative relationship with the social potency (-.19) and social closeness (-.18) scales. Kanfer and Ackerman (2000) go on to distinguish PM, CE, and MRA from both fluid and crystallized intelligence, demonstrating that no significant relationships exist between constructs. Together, Heggestad and Kanfer (2000) and Kanfer and Ackerman (2000) provide initial construct validity evidence for MTQ constructs demonstrating significant relationships with similar personality constructs and no significant relationships with unrelated intelligence variables.

Hinsz and Jundt (2005) performed an examination of the MTQ in a goal setting laboratory situation. Their analysis provided additional evidence for the internal consistency of MTQ scales (i.e., Desire to Learn, $\alpha = .81$; Mastery, $\alpha = .82$; Other Referenced Goals, $\alpha = .83$; Competitiveness, $\alpha = .89$; Worry, $\alpha = .84$; Emotionality, $\alpha = .80$). Hinsz and Jundt (2005) and also provided initial predictive validity evidence for MTQ constructs in a laboratory based idea-generation task. Relationships with task performance and pertinent self-regulation variables such as self-efficacy, self-set goal level, and goal commitment were as hypothesized. Specifically, PM and CE were positively related to practice performance while only PM was positively related to later task performance measures. MRA was unrelated to either task performance measure. PM

also exhibited positive relationships with personal goals, self-efficacy, and goal commitment while CE was positively related only to personal goals and self-efficacy, not goal commitment. Finally, the emotionality scale of the MRA construct exhibited negative relationships with both personal goals and self-efficacy. Regression analysis revealed that goal setting and self-efficacy mediated the relationships between MTQ constructs and performance. As a whole, Hinsz and Jundt (2005) provided initial evidence of distal to proximal pathways through which MTQ trait constructs affect behavior.

Diefendorff, Richard, and Robie (2005), examined the relationship between motivational traits and exam performance mediated by daily measures of self-regulatory skills and task-specific motivation. Measures of self-regulatory skills included: attention control, emotion control, motivation control, and comparison to others. Task-specific motivation measures included: task-specific self-efficacy and average daily goal. The authors also included measures of academic goal orientation constructs (i.e. learning, performance-prove, and performance-avoid) in an attempt to determine the relative influence of goal orientation constructs and MTQ constructs in the performance model. Results showed significant relationships between all MTQ constructs and self-regulatory skills, while only CE was significantly related to task-specific motivation (i.e., self-efficacy). However, none of the goal orientation constructs exhibited significant relationships with any self-regulatory skills or task-specific motivation. The lack of significant relationships between GO constructs and the proposed mediators could very well be the result of the specific measure employed (i.e., academic goal orientation; VandeWalle, 1996), the small number of subjects used in the study (i.e., 113), and/or the analytical techniques employed. In any case, it was found that these self-regulatory skills and task-specific motivation constructs mediated the motivational trait-performance relationship. In short, Diefendorff et al.

(2005) succeeded in providing evidence for the proximal pathways through which MTQ constructs influence behavior. Yet, because none of the goal orientation constructs included in the study demonstrated significant relationships with self-regulation mechanisms direct comparisons between GO constructs and MTQ constructs remain to be seen.

In sum, the empirical research concerning MTS theory is sparse but promising. The potential of Heggestad and Kanfer's (2000) MTS framework for organizing motivational trait constructs has been clearly established. Psychometric qualities of the MTQ appear to be acceptable (e.g., Heggestad & Kanfer, 2000), correlations with theoretically related and unrelated constructs occur as hypothesized (e.g., Kanfer & Ackerman, 2000), and proximal pathways through which MTQ traits operate on behavior have been established (e.g., Hinsz & Jundt, 2005 and Diefendorf et al, 2005). However, until the MTQ is established as a superior taxonomy and measure of motivational traits over and above currently accepted GO constructs, its worth in research and practice is relatively unknown.

*Study Overview*

The MTS framework attempted to provide a comprehensive theory capturing the entirety of approach and avoidance motivational traits. Subsequent research provides validation evidence for the MTQ, a measure of three trait motivation constructs. Results to date are encouraging regarding relationships between MTQ constructs, self-regulation, and behavior. However, as noted previously, further exploration is needed to strengthen predictive validity evidence for MTQ constructs while clearly delineating proximal pathways through which they affect behavior. Additionally, comparing MTQ trait constructs to currently accepted motivational constructs is imperative. MTQ constructs were designed to provide complete coverage of the motivational trait construct space (Heggestad & Kanfer, 2000), subsuming important constructs

such as GO as well as providing additional coverage of trait motives. Establishing the utility of the MTQ portion of the MTS framework for organizing motivational traits depends on its ability to provide more information for predicting behaviors than constructs within currently accepted measures (i.e., GO).

*Hypotheses*

Although significant evidence supports the psychometric properties of the MTQ, to date, few empirical analyses have been conducted regarding the predictive accuracy of MTQ constructs. Though empirical results are sparse concerning the predictive ability of MTQ constructs, findings from Diefendorff et al. (2005) and Hinsz and Jundt (2005) both highlight that motivational traits demonstrate indirect relationships task performance through goal setting and self-efficacy. Specifically, Diefendorff et al. (2005) found that only CE was indirectly related to test performance through self-efficacy. Hinsz and Jundt (2005), found that relationships between PM and task performance as well as MRA and task performance became statistically insignificant when accounting for self-efficacy and goal setting. Both empirical studies indicate that MTQ constructs are not directly related to task performance, but mediated by self-efficacy and goal setting mechanisms. Interestingly, neither study found significant relationships between all three MTQ constructs, self-regulation, and performance. In fact, Diefendorff et al. (2005) found that CE demonstrated the most predictive ability while Hinsz and Jundt found that PM and MRA demonstrated the most predictive ability. In all, additional predictive validity evidence is needed to clarify relationships between MTQ constructs, self-efficacy, and goal setting. It is evident, however, that relationships between MTQ constructs and behaviors are fully mediated by self-efficacy and goal setting mechanisms.

The critical proposition of goal setting theory is that difficult goals are the most proximal determinant of performance in contrast to "do your best" goals or no goals. Several meta-analyses in support of this proposition have found effect sizes ranging from .52 to .82 (Mento, Steel & Karren, 1987; Tubbs, 1986; and Wood, Mento & Locke, 1987). Self-efficacy is usually defined as internal judgments of how effectively one can act in achievement situations (Bandura, 1982). Research has shown that it is at least partly through efficacy beliefs that people chose self-regulatory activities (Bandura & Cervone, 1983). Empirical research, as reviewed by Locke & Latham (1990), revealed that self-efficacy partially determines the level of goals set (r =. 39). Together, goal setting and self-efficacy make up proximal determinants of action also termed the "motivational hub" (Locke, 1991).

PM represents a self-referent motivational trait in the achievement complex and individuals with high standing on the PM trait scale will likely pursue personal improvement, persist in the face of frustration, and prefer challenging tasks. Theory has identified PM as an appetitive motivational trait and empirical evidence has shown that high PM individuals are likely to exhibit high levels of self-regulation (e.g., Diefendorff et al., 2005; Hinsz & Jundt, 2005). Importantly, both Hinsz and Jundt (2005) and Diefendorff et al. (2005) indicate that PM is indirectly related to goal level through self-efficacy. This proposition is aligned with the empirical evidence presented by Locke and Latham (1990) that task-specific self-efficacy determines self-set goal level. Thus, it is expected that the relationship between PM and self-set goal level will be mediated by task-specific self-efficacy.

*Hypothesis 1a:* PM will be positively related to task-specific self-efficacy and self-set goal level.

*Hypothesis 1b:* The relationship between PM and self-set goal level will be fully mediated by task-specific self-efficacy.

CE represents an other-referent motivational trait in the Achievement complex and as such an individual with a high standing on CE will likely approach excellence in achievement situations. In contrast to high PM individuals, high CE individuals define success normatively with little regard to their own absolute levels of performance, persistence, or skill attainment. Theory has identified CE as an approach-oriented motivational trait and empirical evidence has shown that individuals with high CE are more likely to exhibit high levels of self-regulation (e.g., Diefendorff et al., 2005; Hinsz & Jundt, 2005). Again, both Hinsz and Jundt (2005) and Diefendorff et al. (2005) indicate that CE is indirectly related to goal level through self-efficacy. Empirical works summarized in Locke and Latham (1990) appear to support this self-regulation pattern demonstrating that self-efficacy determines goal level. As such, it is expected that the relationship between CE and self-set goal level will be fully mediated by task-specific self-efficacy.

*Hypothesis 2a:* CE will be positively related to task-specific self-efficacy and self-set goal level.

*Hypothesis 2b:* The relationship between CE and self-set goal level will be fully mediated by task-specific self-efficacy.

MRA is an avoidance-oriented trait encompassing the Anxiety trait complex. A person high on MRA is likely to avoid achievement situations, experience significant levels of anxiety when placed in such situations, and would chose to avoid situations that could possibly result in

failure. Theory has identified MRA as a motivational trait in the avoidance complex and empirical evidence has shown that high MRA individuals are likely to exhibit lower self-efficacy and goal level (e.g., Hinsz & Jundt, 2005). Hinsz and Jundt (2005) also suggest that MRA is indirectly related to goal level through self-efficacy. A mediated relationship from MRA to goal level through self-efficacy is a proposition aligned with the empirical evidence presented by Locke and Latham (1990) that task-specific self-efficacy determines self-set goal level. Thus, it is expected that the relationship between MRA and self-set goal level will be mediated by task-specific self-efficacy.

*Hypothesis 3a:* MRA will be negatively related to task-specific self-efficacy and self-set goal level.

*Hypothesis 3b:* The relationship between MRA and self-set goal level will be fully mediated by task-specific self-efficacy.

GO has emerged as the leading individual difference construct in motivation theory, garnering the lion's share of research attention in this domain. The abundance of empirical research concerning GO has increased our understanding of individual difference motivation variables, proximal pathways through which they affect behavior, and their predictive accuracy. However, theoretical foundations of GO constructs, now used as traits in Industrial – Organizational Psychology, may not merit the status that they have achieved. For instance, neither Dweck's nor Elliot's original conceptualizations consider GO constructs to be stable, trait-like individual differences as they are currently being used. Through empirical scrutiny, related issues have come to light such as distinctions between state and trait manifestations of GO constructs originally thought to be distal motivational dispositions, not to mention the many empirical demonstrations of modest predictive accuracy. Meanwhile, authors such as Kanfer

(1990) and Austin and Klein (1996) have called for a valid taxonomy of individual differences in motivation to organize a framework for future research. Theoretical justification for the use of GO as such simply does not exist. GO not only lacks an adequate theoretical basis from which to form a valid taxonomy, it also lacks necessary breadth to capture the entirety of the motivational trait construct space. Nonetheless, GO continues to enjoy preeminence in individual differences in motivation research and is in need of direct comparison to a more theoretically sound conceptualization of individual differences in motivation.

Horvath, Scheu, and DeShon (2001) conceptualize and measure GO in the spirit of traditional achievement motivation literature that distinguishes between approach and avoid motivational tendencies. The results of which differentiate between three independent goal orientation constructs; Performance-Avoid (PAGO), Performance-Prove (PPGO) and Mastery (MGO). In a theoretical sense, Horvath et al. (2001) conceptualize GO in such a way that provides broad coverage of the motivational trait construct space. In addition to using both approach and avoid motivational tendencies, they did not base their measure on any one context yielding a relatively broad measure. This achieves a more general construct measurement than even Button et al.'s (1996) global GO conceptualization offering only LGO and PGO constructs with little regard for approach and avoid motivation distinctions.

While the constructs within Horvath et al.'s (2001) measure provide breadth of coverage advantages over other GO measures (e.g., Button et al., 1996), it provides no theoretical underpinnings that would allow for a valid organization of motivationally specific trait constructs. Take, the fact that the authors note the possibility of measurement deficiencies within existing GO questionnaires, but then proceed to use items from those measures to help populate the item pool for their questionnaire development. As I have noted from the work of Kanfer,

Ackerman, and Heggestad (1996) and Kanfer and Heggestad (1997), the motivational trait construct space includes constructs from the Achievement and Anxiety complexes outside that of GO constructs. For instance, personality constructs such as conscientiousness, and anxiety constructs such as test anxiety are important parts of the motivational trait construct space that Horvath et al. (2001) fail to assess. Kanfer and Heggestad, (1997) designed MTQ constructs to cover the entirety of the approach and avoid motivational trait construct space including self-referent achievement striving, other-referent achievement striving, fear of failure, and anxiety. MTQ constructs are purported to not only subsume GO constructs, cover the entirety of the known approach and avoid motivational trait construct space, and predict behavior through proximal mechanisms at a higher level, but are also embedded in an organizing framework (i.e., MTS theory) from which researchers can hypothesize relationships between distal, proximal, and outcome variables. It is a wonder, then, that GO constructs continue to enjoy preeminence in research concerned with individual differences in motivation. Direct comparisons of the predictive validity provided by MTQ constructs and similar GO constructs will shed light on the utility that each provides for predicting important outcomes such as self-efficacy and goal setting.

Horvath et al. (2001) has designed a dispositional, domain neutral GO measure with constructs in both the approach and avoid achievement motivation domains. MGO is one of the appetitive GO constructs within the Horvath et al. (2001) conceptualization and is closely aligned with Dweck's (1986) original conceptualization of LGO. One high in MGO defines success in relation to the self, will seek to attain new skills, seek challenging tasks, and persist in the face of failure. Studies such as Chen, Gully, Whiteman, and Kilcullen (2000) have demonstrated relationships between MGO, self-efficacy, and goal setting in performance

situations. PM was designed to account for all of the self-referent achievement striving motivational trait construct space including but not limited to MGO as proposed by Horvath et al. (2001). Similar to MGO, PM has demonstrated relationships with self-efficacy and goal setting (e.g., Diefendorff et al., 2005; Hinsz & Jundt, 2005). However, as Heggestad and Kanfer (2000) point out, the PM construct should not only subsume MGO but also account for personality constructs related to motivation such as achievement striving, hard work, and conscientiousness. The results of which should be more powerful prediction of proximal determinants of action such as self-efficacy and goal setting.

As both MGO and PM represent appetitive motivation constructs, it is expected that both would demonstrate positive relationships with proximal self-regulation constructs. However, both MGO and PM are expected to exhibit an indirect relationship with self-set goal level through task-specific self-efficacy consistent with the empirical evidence reviewed in Locke and Latham (1990) that self-efficacy determines goal levels. As such, when comparing the predictive validity of MGO and PM, the relationship of interest is limited to the link with task-specific self-efficacy. Thus, when analyzed in relation to MGO, PM will demonstrate significant incremental validity in the prediction of task-specific self-efficacy.

*Hypothesis 4:* PM will provide significant incremental validity, over that of MGO, in the prediction of task-specific self-efficacy.

PPGO is the other appetitive GO construct within the Horvath et al. (2001) conceptualization. PPGO is closely aligned with the Performance-Approach and Prove GO constructs of Elliot and Church (1997) and VandeWalle (1997). One high in PPGO will define success relative to others, seek approval from others regarding skills, and persist in the face of failure in order to gain favorable judgments. Studies such as VandeWalle, Cron, and Slocum Jr.

(2001) have demonstrated relationships between PPGO, self-efficacy, and goal setting in achievement situations. CE was designed to account for the entirety of other-referent achievement striving motivational tendencies including but not limited to PPGO as proposed by Horvath et al. (2001). Similar to PPGO, CE has demonstrated relationships with self-efficacy and goal setting (e.g., Diefendorff et al., 2005; Hinsz & Jundt, 2005). However, as Heggestad and Kanfer (2000) point out, the CE construct not only subsumes PPGO but also accounts for personality constructs related to motivation such as competitive acquisitiveness and status aspiration. The results of which should be more powerful prediction of proximal determinants of action such as self-efficacy and goal setting.

As both PPGO and CE represent appetitive motivation constructs, it is expected that both would demonstrate positive relationships with proximal self-regulation constructs. However, both PPGO and CE are expected to exhibit an indirect relationship with self-set goal level through task-specific self-efficacy consistent with the empirical evidence reviewed in Locke and Latham (1990) that self-efficacy determines goal levels. As such, when comparing the predictive validity of PPGO and CE, the relationship of interest is limited to the link with task-specific self-efficacy. Thus, when analyzed in relation to MGO, PM will demonstrate significant incremental validity in the prediction of task-specific self-efficacy.

*Hypothesis 5:* CE will provide a significant amount of incremental validity, over that of PPGO, in the prediction of task-specific self-efficacy.

PAGO is an avoidance GO construct within Horvath et al.'s (2001) conceptualization. PAGO is very similar to the Performance-Avoidance and Avoid GO constructs of Elliot and Church (1997) and VandeWalle (1997). One high in PAGO will avoid failure-threatening situations, and define success as adequately avoiding negative outcomes. Empirical evidence

(i.e., VandeWalle, Cron, and Slocum Jr., 2001) has demonstrated negative relationships between PAGO, self-efficacy, and goal setting in achievement situations. MRA was designed to account for the entirety of the Anxiety motivational trait complex including but not limited to PAGO as proposed by Horvath et al. (2001). Similar to PAGO, MRA has demonstrated relationships with self-efficacy and goal setting (e.g., Hinsz & Jundt, 2005). However, as Heggestad and Kanfer (2000) point out, the MRA construct not only subsumes PAGO but also accounts for other anxiety constructs related to motivation such as fear of failure and test anxiety. The results of which should be more powerful prediction of proximal determinants of action such as self-efficacy and goal setting.

As both PAGO and MRA represent avoidance motivation constructs, it is expected that both would demonstrate negative relationships with proximal self-regulation constructs. However, both PAGO and MRA are expected to exhibit an indirect relationship with self-set goal level through task-specific self-efficacy consistent with the empirical evidence reviewed in Locke and Latham (1990) that self-efficacy determines goal levels. As such, when comparing the predictive validity of PAGO and MRA, the relationship of interest is limited to the link with task-specific self-efficacy. Thus, when analyzed in relation to PAGO, MRA will demonstrate significant incremental validity in the prediction of task-specific self-efficacy.

*Hypothesis 6:* MRA will provide a significant amount of incremental validity, over that of PAGO, in the prediction of task-specific self-efficacy.

*Present Study Summary*

To date, MTS framework is the only comprehensive taxonomy of individual differences related to motivation. As noted by Kanfer (1990) and Austin and Klein (1996), it is necessary to obtain a cohesive picture of individual differences in motivation in order to integrate

motivational theories and move the field forward. The present study intends to move the field toward a more cohesive picture of individual differences in motivation by exploring the usefulness of MTQ trait constructs. Evidence concerning the validity of the MTS framework for predicting human behavior will be presented along with proximal pathways through which MTQ constructs affect behavior. It is imperative, however, to understand the usefulness of MTQ constructs in relation to currently accepted GO constructs. The proposed study will clarify this very issue by presenting evidence of relationships between MTQ constructs, self-efficacy, and goal level while accounting for the effects of GO constructs.

## Method

### *Participants*

The current study utilized a sample of 198 college students enrolled in Psychology courses at a large southeastern university. Student participants were compensated for their time with extra course credit. The number of participants used in the current data set is based upon Fritz and MacKinnon's (2007) sample size recommendations for adequate (i.e., .80) power to detect the mediated effect. Based on findings from previous research, the estimated α path was set at .26, the estimated β path was set at .39, and the estimated τ' path was set at .14. These values correspond to the HM condition from Table 3 of Fritz and MacKinnon's (2007) recommendations. In the HM condition, the required sample size to achieve .80 power in testing the mediated effect is 179. Data from 198 participants were collected in case any data was deemed unfit for analysis and discarded.

97 % (192) of participants successfully completed all performance trials. The specific breakdown of participants in each trial are as follows: 198 participants provided data for the Trial 1 analyses, 197 provided data used in the Trial 2 analyses, and 192 participants provided data for

all trials. The sample consisted of 66 (33.3%) males and 132 (66.7%) females. Although this may seem like a large proportion of females in the sample, it is reflective of the proportion of females in psychology courses overall. The mean age of participants was 20 with 99.5% falling between 18 and 23 years of age (one participant was 51 years of age). 89 (44.9%) participants were freshmen, 47 (23.7%) were sophomores, 34 (17.2%) were juniors, 27 (13.6%) were seniors, and 1 (.5%) was a non-matriculated student. 163 (82.3%) participants were Caucasian, 9 (4.5%) were African-American, 22 (11.1%) were Asian-American, 2 (1%) were Native-American, and 2 (1%) were Hispanic/Latino. In all, the sample demographics are reflective of the overall population from which it was taken.

*Task*

A computer based puzzle task served as the performance task during the current study. The task begins when participants are presented with a picture that is divided into a 5 X 5 grid. After 10 seconds the program randomly scrambled the grid pieces. The task of the participants' was to reconstruct the original picture as quickly as possible, swapping the location of one puzzle piece for that of another using their computer mouse. The time taken to complete the puzzle served as the performance measure for each performance trial. The puzzle task has been successfully used in previous studies involving goal directed behavior and achievement motivation (e.g., Breland, 2004; and Hafsteinsson, 2004).

*Procedure*

During part one of the study, participants completed the MTQ-S and GO measures via web-based survey constructed with SNAP survey software. Once participants completed and received credit for part one, they were eligible to sign up and complete part two of the study. Part two consisted of a computer lab session proctored by the primary investigator. During this

computer session, participants provided task-specific SE and self-set goal levels for three trials of the puzzle task. During parts one and two, participants were provided with an informed consent form and indicated their voluntary consent by continuing the completion of the web survey and puzzle tasks respectively.

During part two, subjects completed a brief demographic questionnaire, then began a simple (3 X 3) practice trial of the puzzle task to ensure their understanding of how the task works. Once they verbally indicated that they understood the task, participants were then instructed to solve a series of three consecutive practice puzzles on their own (3 X 3, 3 X 4, and 4 X 4), the purpose of which was to familiarize subjects with the task and allow them information needed to formulate their self-set goals and task-specific self-efficacy levels for subsequent puzzles. The session did not move forward until all subjects had completed the practice puzzles and indicated that they understood and felt comfortable with how the puzzle task worked.

At this point, all subjects were asked to provide a self-set goal (in minutes and seconds), and fill out a 10-item task-specific self-efficacy measure for solving the subsequent puzzle. Participants were then required to solve the puzzle and performance was assessed by the elapsed time for puzzle completion. The first self-set goal level, task-specific self-efficacy, and puzzle task make up Trial 1. During Trial 2, participants were asked to provide their self-set goal level and task-specific self-efficacy for another puzzle after which they completed a second puzzle. In Trial 3, participants were once again asked to provide their self-set goal level and task-specific self-efficacy for the final puzzle and subsequently completed the third and final puzzle. After Trial 3, participants were debriefed and dismissed. In all, students spent no more than 30 minutes completing the brief questionnaires and tasks presented in part two.

*Measures*

*Motivational Traits.* Deriving a short form of the MTQ (Heggestad & Kanfer, 2000), Kanfer and Ackerman (2000) reported on a 48-item measure of motivational traits termed the Motivational Traits Questionnaire Short Form (MTQ-S). The MTQ-S measures three motivational trait dimensions (*PM, CE, and MRA*) with two subscales within each dimension. *PM* (16 items; α = .89) is composed of the *Desire to Learn* subscale and the *Mastery* subscale. *CE* (13 items; α = .90) is composed of the *Other Referenced Goals* subscale and the *Competition Seeking* subscale. *MRA* (19 items; α = .91) is composed of the *Worry* subscale and the *Emotionality* subscale. All items utilize a 6-point likert response scale ranging from 1 (*very UNTRUE of me*) to 6 (*very TRUE of me*). For specific items, please refer to Appendix A.

*Goal Orientation*. For the sake of ensuring a more conservative comparison of GO constructs to MTQ constructs, a GO measure that assesses both approach and avoid dimensions and that contains no domain specificity was deemed most appropriate for the present study. As such, GO was measured using a 15-item instrument designed and validated by Horvath, Scheu, and DeShon (2001). Three subscales are included: 1) Five items measuring MGO (α = .84) 2) Five items measuring PPGO (α = .83) 3) Five items measuring PAGO (α = .71). All items utilize a 7-point likert response scale ranging from 1 (*strongly disagree)* to 7 (*strongly agree).* For specific items, please refer to Appendix B.

*Goal Setting.* Self-set goal level was assessed with the following item: "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." It should be noted that a lower score on the self-set goal level measure indicates a more difficult goal as a shorter time to complete the puzzle task is more difficult.

*Self-Efficacy.* Previous research (e.g., Maurer & Pierce, 1998) has indicated that Likert-type measures of self-efficacy demonstrate reliability, criterion validity, and factor structures as adequately as traditional measures of self-efficacy. Previous research has also successfully utilized Likert-type self-efficacy measures in research concerning goal directed behavior and achievement goals (e.g., Hafsteinsson, 2004; and Phillips & Gully, 1997). As such, a likert measure of self-efficacy was utilized for the present study. The self-efficacy measure consists of 10 responses to specific statements adapted from items used in previous research (Mone, 1994; Phillips & Gully, 1997; and Wood & Locke, 1987). All responses were made on a 5-point scale ranging from 1 (*strongly disagree)* to 5 (*strongly agree)*. For specific items, please refer to Appendix C.

*Task Performance.* The elapsed time, in seconds, taken to complete the puzzle task served as the performance measure for the present study. It should be noted that lower scores on this measure are indicative of higher performance.

## Results

### *MTQ Scales*

Means, standard deviations, internal consistency coefficients, and intercorrelations for MTQ scales can be seen in Table 1. Similar to previous research (i.e., Kanfer & Ackerman, 2000 and Hinsz & Jundt, 2005) each of the MTQ scales demonstrated good internal consistency with Cronbach's alpha reliability statistics above .80. MTQ scale intercorrelations also occurred as expected. PM and CE were found to be related ($r$ = .15), CE and MRA were also found to be related ($r$ =.14), while PM and MRA were unrelated ($r$ =.02).

*GO Scales*

Two of the three GO scales demonstrated adequate internal consistency (i.e., $\alpha \geq .80$), however, the 5-item PAGO scale yielded a less than ideal internal consistency coefficient (5 items, $\alpha = .71$). This is interesting as previous research found adequate reliability statistics for the PAGO scale ($\alpha = .80$; Horvath et al., 2005) but not entirely surprising as the scale consists of only 5 items. GO scale correlations did occur as expected with MGO related to PPGO ($r = .25$), PPGO related to PAGO ($r = .35$), and MGO unrelated to PAGO ($r = -.06$).

Of special note are the correlations between GO constructs and their MTQ counterparts. Specifically, PM and MGO demonstrated a very high correlation ($r = .76$, $p < .01$). CE and PPGO also demonstrated a strong correlation ($r = .63$, $p < .01$). MRA and PAGO demonstrated a high correlation as well ($r = .65$, $p < .01$). Correlations of this magnitude may make the detection of incremental validity for Hypotheses 4 – 6 very difficult due to multicollinearity. As such, the analysis of Hypotheses 4 – 6 will also include collinearity indices.

*Task-Specific SE*

For each of the three performance trials, the 10-item SE scale demonstrated adequate internal consistency with Cronbach's alpha reliability statistics above .80. Upon examination, relationships between SE and MTQ constructs were not as expected. Only MRA demonstrated a significant relationship with task-specific SE during trial 1 ($r = -.25$, $p < .01$), trial 2 ($r = -.22$, $p < .01$), and trial 3 ($r = -.15$, $p < .05$). Meanwhile, PM only demonstrated a significant correlation with task-specific SE during trial 2 ($r = .20$, $p < .01$) with trials 1 and 3 approaching, but not achieving significance. CE was significantly related to task-specific SE during trial 1 ($r = .15$, $p < .05$), yet correlations with trials 2 and 3 did not achieve significance. Of the MTQ constructs,

MRA seems to be most strongly tied to the task-specific SE of participants while PM and CE demonstrate very inconsistent relationships with the SE of participants during the same task.

Upon initial examination, relationships between SE and GO constructs were also not as expected. MGO was significantly related to the SE of participants in trial 1 ($r = .15$, $p < .05$), trial 2 ($r = .19$, $p < .01$), and trial 3 ($r = .14$, $p < .05$). Similarly, PPGO was significantly related to the SE of participants in trial 1 ($r = .21$, $p < .01$), in trial 2 ($r = .18$, $p < .01$), and in trial 3 ($r = .22$, $p < .01$). PAGO, however, was significantly related to only the trial 2 measurement of task-specific SE ($r = -.17$, $p < .05$). Of the GO constructs, it appears that MGO and PPGO are consistently related to participants' task-specific SE while PAGO demonstrated a rather inconsistent relationship with SE.

*Self-Set Goal Level*

Descriptive statistics for self-set goals revealed that the means and standard deviations for all three trials are somewhat curious and may indicate non-normal data (i.e., high standard deviations). However, upon closer inspection of the data, (i.e., histogram, skewness, and kurtosis indices) it was revealed that the data structure was positively skewed and leptokurtic for all measurement trials of self-set goal level (depicted in Figures 1 – 3). The most non-normal of which was trial 1 goal level with a skewness statistic of 4.997 (std. error of skewness = .173) and a kurtosis statistic of 34.782 (std. error of kurtosis = .345). Trial 2 was also positively skewed (skewness = 1.287; std. error of skewness = .174) and leptokurtic (kurtosis = 1.634; std. error of kurtosis = .346). Trial 3 was positively skewed (skewness = 3.312; std. error of skewness = .175) and leptokurtic (kurtosis = 5.382; std. error of kurtosis = .349) as well.

After finding such badly skewed and kurtotic distributions of scores for each trial, it was decided that a data transformation would be required. Without some type of data transformation,

all significance tests involving these data would likely have been compromised. As such, all self-set goal level data underwent a log transformation (i.e., the log of each value was used in place of the actual value) before it was used in any analyses involving significance testing (e.g., correlations and regressions). Please note that all correlations reported above and all further analyses involving significance testing utilize log transformed data for self-set goal level. The resulting skewness and kurtosis values of the log transformed data were much more acceptable. Log transformed trial 1 goal level yielded a skewness statistic of .841 (std. error of skewness = .173) and a kurtosis statistic of 1.034 (std. error of kurtosis = .345). Log transformed trial 2 goal level was not skewed, (skewness = .213; std. error of skewness = .174) and was no longer kurtotic (kurtosis = -.455; std. error of kurtosis = .346). Log transformed trial 3 goal level was only slightly skewed (skewness = .393; std. error of skewness = .175) and no longer kurtotic (kurtosis = -.341; std. error of kurtosis = .349).

Correlations between the log transformed self-set goal level and task-specific SE occurred as expected. Trial 1 SE was significantly related to trial 1 goals ($r = -.35$, $p < .001$), trial 2 SE was significantly related to trial 2 goals ($r = -.30$, $p < .001$), and trial 3 SE was significantly related to trial 3 goals ($r = -.28$, $p < .001$), indicating that high task-specific SE is consistently associated with more difficult self-set goals. Contrary to previous research, only MRA demonstrated a significant relationship with the trial 1 measurement of self-set goal level ($r = .14$, $p < .05$) while none of the self-set goal level trials were related to the remaining MTQ or GO constructs.

*Hypotheses 1a, 2a, and 3a*

Regression analysis was used to test the direct effects of Hypotheses 1a, 2a, and 3a. Hypothesis 1a proposed that PM would be a significant predictor of task-specific SE and self-set

goal level. Similarly, Hypothesis 2a proposed that CE would be a significant predictor of task-specific SE and self-set goal level. Finally, Hypothesis 3a proposed that MRA would be a significant predictor of task-specific SE and self-set goal level. As can be seen in Table 1, gender was a significantly related to task-specific SE in all trials. As such, all regression models using task-specific SE as a DV will control for the effects of gender during step one of the analyses. Unstandardized regression coefficients (*b*), standardized regression coefficients (β) and change in the proportion of variance accounted for ($\Delta R^2$) in each SE measurement trial by each MTQ construct (PM, CE, and MRA) are present in Table 2.

Hypothesis 1a found minimal support in the regression models tested. For Trial 1, PM was neither a significant predictor of task-specific SE (β = .13), nor a significant predictor of self-set goal level (β = -.08). For trial 2, PM was a significant predictor of task-specific SE (β = .18, $p < .01$) accounting for 3.9% ($R^2 = .039$) of the variance in participants' SE. However, PM was not a significant predictor of self-set goal level for trial two (β = -.06). In trial 3, PM was again a significant predictor of task-specific SE (β = .14, $p < .05$) accounting for 1.9% ($R^2 = .019$) of the variance SE scores. PM was not, however, a significant predictor of self-set goal level during trial 3 (β = -.00). In short, only during trial 2 did PM exhibit the hypothesized direct effect with task-specific SE while PM never exhibited a significant direct effect with self-set goal level.

Hypothesis 2a found no support in the regression models tested. For trial 1, CE was not a significant predictor of task-specific SE (β = .10) or self-set goal level (β = -.00). During trial 2, CE was not a significant predictor of task-specific SE (β = .07) or self-set goal level (β = -.06). In trial 3, CE did not significantly predict either task-specific SE (β = .08) or self-set goal level (β = -.09). In none of the 6 hypothesized relationships did CE achieve significance.

Hypothesis 3a was met with partial support in the regression models tested. For trial 1, MRA was a significant predictor of task-specific SE ($\beta = -.23$, $p < .01$) accounting for 5.2% ($R^2 = .052$) of the variance in trial 1 SE. MRA was also a significant predictor of self-set goal level during trial 1 ($\beta = .14$, $p < .05$) accounting for 2% ($R^2 = .020$) of the variance in trial 1 self-set goal level. MRA again demonstrated significant prediction of task-specific SE during trial 2 ($\beta = -.21$, $p < .01$) accounting for 4.2% ($R^2 = .042$) of the variance in trial 2 SE. However, during trial 2, MRA was not a significant predictor of self-set goal level ($\beta = .06$). In contrast, during trial 3, MRA was not a significant predictor of task-specific SE ($\beta = -.13$) and did not significantly predict self-set goal level ($\beta = .12$). In sum, MRA was a significant predictor of task-specific self-efficacy during two of the three trials. Meanwhile, MRA only predicted self-set goal level in the first performance trial.

*Hypotheses 1b, 2b, and 3b.*

Tests for mediation followed Baron and Kenny's (1986) causal-steps procedure for establishing the presence of the mediated effect. In Hypotheses 1b, 2b, and 3b it was argued that the relationship between MTQ constructs (PM, CE, and MRA) and self-set goal level would be mediated by task-specific SE. The analyses conducted to test Hypotheses 1a and 2a have already dismissed any idea that a mediated effect occurred between PM and self-set goal level as well as between CE and self-set goal level. This is because during step one of the causal-steps procedure, the IV (PM or CE) is regressed on the DV (self-set goal level) to establish whether the relationship is significant as well as the magnitude of the relationship ($\tau$). We have already seen that neither PM nor CE exhibited any relationships with self-set goal level trials. In simple terms, Hypotheses 1b and 2b are not supported in the present analyses, as during step one of the causal-steps procedure, the '$\tau$' path was insignificant.

In the case of Hypothesis 3b, however, the causal-steps procedure did produce a significant 'τ' path (β = .14, $p < .05$) during trial 1. In step two of the causal-steps procedure, the IV was regressed on the mediator and must achieve significance (α). In this case, MRA was regressed on trial 1 SE and yielded a significant 'α' path (β = -.23, $p < .01$). In step three of the causal-steps procedure, the mediator was regressed on the DV while controlling for the IV and must achieve significance (β). In this case, trial 1 SE was a significant predictor of trial 1 goals (β = -.33, $p < .01$, $R^2 = .020$) while controlling for the effects of MRA indicating a significant 'β' path. If steps one through three produce significant results, the relationship between the IV and the DV while controlling for the mediator must decrease or become non-significant (τ'). In this case, the relationship between MRA and trial 1 goals while accounting for trial 1 SE (the τ' path) decreased to the point of non-significance (β = .06, $p > .40$) indicating that the relationship between MRA and self-set goal level was fully mediated by task-specific self-efficacy.

*Supplemental Analyses*

As a supplement to the causal steps procedure tests of Hypotheses 1 and 2, Sobel (1982) tests of the mediated effect were conducted. Otherwise known as a product of coefficients test, the Sobel (1982) test takes the estimate of the mediated effect or the product of the 'α' and 'β' path estimates and divides them by the standard error of the product. The resulting ratio is then compared to a normal distribution (Z distribution) for significance testing. As in most cases, values greater than +/- 1.96 indicate significance at the .05 level and that the mediated effect is greater than zero. Importantly, the Sobel (1982) test does not require a significant 'τ' path to determine if there is a significant mediated effect.

None of the product of coefficients tests for CE achieved significance in any of the three trials. Also, neither trial one nor trial three indicated a significant mediated effect between PM

and self-set goal level. However, during trial two, the Sobel test indicated that the relationship between PM and self-set goal level is mediated by task-specific SE ($Z = 2.39$, $p < .05$). Though the relationship between PM and self-set goal level for trial 2 did not achieve significance, it appears that whatever relationship does exist is carried by the mediator task-specific SE.

*Hypotheses 4-6*

Hypotheses 4 – 6 proposed that MTQ trait constructs would demonstrate significant incremental validity in the prediction of task-specific self-efficacy over corresponding GO constructs. Only the direct effects of IV constructs on task-specific self-efficacy were analyzed to determine any increment in variance accounted for by MTQ constructs. The hierarchical regression analyses performed involved a three-step procedure. Specifically, during step one of the analysis for Hypothesis 4, gender was regressed on task-specific SE and the percent of variance accounted for in the DV was recorded. In step two, MGO was regressed on task-specific self-efficacy and the change in percent of variance accounted for in the DV was recorded. In step three, PM was entered into the regression model. The significance of the increment of variance accounted for in the DV by adding PM to the model after MGO served as the test of incremental validity for PM in determining task-specific self-efficacy. The same procedure will occur for the incremental variance test of CE over PPGO and MRA over PAGO.

The preceding procedure was also performed a second time with the IV's entered in reverse order, Hypotheses 4-6 were postulated because it is assumed that MTQ constructs subsume corresponding GO constructs. As such, not only should MTQ constructs provide an increment in the prediction of task-specific SE but it should not be possible for GO constructs to provide an increment over MTQ constructs. It then becomes important to assess the ability of GO constructs to provide an increment in variance accounted for in task-specific SE over that of

MTQ constructs and the only way to do so is reverse the procedure described in the paragraph above.

Hypothesis 4 received no support from the present analyses. Table 3 summarizes the findings of the incremental variance analyses for trial 1 data. At step 1 of the analysis, gender was a significant predictor of trial 1 SE, accounting for 4.8% ($R^2 = .048$) of the variance. At step 2, MGO was a significant predictor ($\beta = .17$, $p < .05$), accounting for an additional 2.7% ($\Delta R^2 = .027$) of the variance in trial 1 SE. In step 3, PM accounted for an insignificant amount of additional variance in trial 1 SE ($\Delta R^2 = .000$). Interestingly, neither MGO ($\beta = .16$) nor PM ($\beta = .01$) remained as significant predictors of trial 1 SE when both predictors were included in the final model. Upon reversing the order of entry into the hierarchical regression equation, PM was not a significant predictor during step two ($\beta = .13$). During step three, MGO did not account for a significant amount of additional variance ($\Delta R^2 = .010$). Again neither PM nor MGO provided significant prediction of trial 1 SE when present in the final regression model. As alluded to earlier, the high correlation between these two constructs may be introducing a multicollinearity problem to the regression models.

The results for trial 2 SE are very similar. During step 2, MGO was a significant predictor ($\beta = .21$, $p < .01$), accounting for an additional 4.4% ($\Delta R^2 = .044$) of the variance. In step 3 of the procedure, PM provided an insignificant increment in variance accounted for over MGO ($\Delta R^2 = .003$). When the order of entry was reversed, PM was a significant predictor during step 2 ($\beta = .20$, $p < .01$), accounting for an additional 3.9% ($\Delta R^2 = .039$) of the variance. In step 3, MGO provided an insignificant increment in variance accounted for over PM ($\Delta R^2 = .008$). Again, both predictors failed to significantly predict trial 2 SE in the final regression equation. The results for trial 3 SE were also similar to those of trials 1 and 2. During step 2 of the procedure, MGO was a

significant predictor (β = .17, $p < .05$), accounting for an additional 3% ($\Delta R^2 = .030$) of the variance. Again, in step 3, PM failed to provide a significant increment in variance accounted for over MGO ($\Delta R^2 = .000$). When the order of entry was reversed, PM was a significant predictor during step 2 (β = .16, $p < .05$), accounting for an additional 1.9% ($\Delta R^2 = .019$) of the variance. In step 3, MGO also failed to provide a significant increment in variance accounted for over PM ($\Delta R^2 = .011$). Again, neither PM nor MGO remained as significant predictors of trial 3 SE when in the final regression equation.

As noted previously, PM and MGO are highly correlated (r = .76, $p < .01$) suggesting that collinearity may be in issue when using both in regression analysis. Additionally, the tolerance (Tol. = .417 - .422) and variance inflation index (VIF = 2.367 - 2.400) from the Hypothesis 4 analyses are relatively high, suggesting that collinearity may be an issue. Multicollinearity may cause regression coefficients to be unstable (Pedhauzer & Schmelkin, 1991), making it very difficult to assess the relative influence of either PM or MGO in the regression models. That being said, from the present analysis it appears that either MGO or PM alone predict task-specific self-efficacy. However, the lack of any significant incremental validity results in the present analysis suggests substantial overlap in the constructs.

Hypothesis 5 received no support from the present analyses. Table 4 summarizes the findings of the incremental variance analysis for trials 1 – 3. In step two of the procedure, PPGO was introduced to the model and significantly predicted trial 1 SE (β = .17, $p < .05$), accounting for 2.9% ($\Delta R^2 = .029$) of the variance. In the third step, CE was entered into the regression equation and accounted for no additional variance over PPGO ($\Delta R^2 = .000$). Upon reversing the order of entry into the hierarchical regression equation, CE was a non-significant predictor (β = .10) at step 2. When PPGO was entered into the regression equation during step three, it emerged

as a significant predictor (β = .18, $p < .05$), accounting for an additional 1.9% of the variance over CE ($\Delta R^2 = .019$).

The results for trial 2 SE are very similar. CE provided no significant increment in variance accounted for over PPGO ($\Delta R^2 = .001$). PPGO, however, provided a significant increment in variance accounted for over CE ($\Delta R^2 = .020$). The results for trial 3 again provided similar results to trials 1 and 2. CE failed to provide a significant increment in variance accounted for over PPGO ($\Delta R^2 = .002$). PPGO again provided a significant increment in variance accounted for over CE ($\Delta R^2 = .027$).

The Hypothesis 5 analysis provided absolutely no support for the proposition that CE should provide an increment in the prediction of task-specific SE over PPGO. In fact, it appears that PPGO provides much better prediction of task-specific SE than does CE. The results are fairly compelling and occur despite the fact that regression models include CE, which is highly correlated with PPGO ($r = .63$, $p < .01$). Given that the tolerance (Tol. = .592 - .602) and variance inflation index (VIF = 1.662 – 1.691) values in the Hypothesis 5 analysis are relatively low, it appears that PPGO and CE are likely related but distinct constructs.

Hypothesis 6 was minimally supported in the present analysis. Table 5 contains the incremental validity analyses for trials 1 – 3. In trial 1, PAGO was not a significant predictor during step two of the procedure (β = -.08). In the third step of the procedure, MRA was a significant predictor of trial 1 SE (β = -.31, $p < .01$), accounting for an additional 5.3% ($\Delta R^2 = .053$) of the variance. Reversing the order of entry into the hierarchical regression equation, in step two, MRA was a significant predictor (β = -.23, $p < .01$) accounting for an additional 10% ($\Delta R^2 = .100$) of the variance in SE scores. PAGO was then entered into the regression equation,

failing to provide significant prediction (β = .12). By adding PAGO to the equation, it accounted for only .8% of additional variance over MRA ($\Delta R^2 = .008$).

During trial 2, PAGO was a significant predictor in step two of the procedure (β = -.16, $p < .05$), accounting for an additional 2.7% ($\Delta R^2 = .027$) of the variance. In step three of the procedure, MRA failed to provide a significant increment in variance accounted for over PAGO ($\Delta R^2 = .017$). When the order of entry was reversed, PAGO again provided an insignificant increment in variance accounted for over MRA ($\Delta R^2 = .002$). In trial 3, PAGO did not provide significant prediction of task-specific SE (β = -.10). In the third step of the procedure, the addition of MRA into the equation also failed to provide a significant increment in variance accounted for over PAGO ($\Delta R^2 = .006$). In reverse order, MRA did not significantly predict trial 3 SE (β = -.13). With the addition of PAGO into the regression equation, there was again no significant addition in variance accounted for over MRA ($\Delta R^2 = .001$).

The Hypothesis 6 analyses produced very little support for propositions that MRA would provide a significant increment in variance accounted for in task-specific SE over PAGO. In fact, the only significant increment in variance accounted for by MRA occurred during trial 1, when PAGO was not a significant predictor of SE. Though the incremental validity hypothesis was unsupported in the present study, it does appear that MRA is a much more consistent predictor of task-specific SE than PAGO. Finally, similar to Hypothesis 5, because tolerance (Tol. = .575 - .582) and variance inflation index (VIF = 1.719 – 1.739) values in the Hypothesis 6 analysis are relatively low, it appears that PAGO and MRA are related but distinct constructs.

*Supplemental Analysis*

In general, the relationships between MTQ constructs, task-specific SE and self-set goal level did not occur as hypothesized. I occurred to us that this might be due to a bandwidth

mismatch between predictors and criterion. Therefore, we looked at the relationships between MTQ facets within PM, CE, and MRA, task-specific SE and self-set goal level. It appears that the same pattern of results emerges when facets within PM and CE are used in place of the traits. Specifically, the desire to learn (DTL) and mastery goals (MG) facets within the PM trait were only related to trial 2 SE ($r$ = .17 and .18, respectively; both $p < .05$). Neither facet was related to any of the self-set goals across trials. Additionally, of the two facets contained within the CE trait, other referenced goals (ORG) and competition seeking (CS), only CS exhibited a significant relationship with trial 1 SE ($r$ = .14, $p < .05$).

Results for the facets within MRA, however, demonstrated slightly different relationships with task-specific SE and self-set goal level than the trait. MRA contains the facets worry (W) and emotionality (E). W was related to trial 1 ($r$ = -.17, $p < .05$) and trial 2 SE ($r$ = -.17, $p < .05$), while E was related to trial 1, trial 2 and trial 3 SE ($r$ = -.30, -.25, and -.19 respectively; $p < .01$). Interestingly, W was unrelated to self-set goal level in all trials while E was related to trial 1 and trial 3 self-set goal level ($r$ = .18 and .15 respectively; $p < .05$). The relatively consistent relationship found between the E facet within the MRA trait, task-specific self-efficacy, and self-set goal level appears to be the only bright spot in the retrospective analysis.

For direct effects, E significantly predicted task-specific SE for trials 1-3 above the effects of gender ($\beta$ = -.27, -.23, and -.15 respectively; $p < .05$) accounting for 7.2, 4.9, and 2.3% of the variance ($\Delta R^2$ = .072, .049, and .023 respectively). E also predicted trial 1 and trial 3 self-set goal level ($\beta$ = .18 and .15 respectively; $p < .05$) accounting for 3.1 and 2.3% of the variance ($\Delta R^2$ = .031 and .023 respectively). Causal-steps procedures were then conducted to determine if the relationship between E and self-set goal level is mediated by task-specific SE for trial 1 and trial 3. In trial 1 and trial 3, the '$\tau$' ($\beta$ = .18 and 15 respectively; $p < .05$), '$\alpha$' ($\beta$ = -.27 and -.15

respectively; $p < .05$), and β (β = -.32 and -.31 respectively; $p < .01$) paths were all significant. Importantly, for trial 1 and trial 3 the effect of E while accounting for the mediator (i.e., the τ' path) shrunk to non-significance (β = .08 and β = .10 respectively). Thus indicating that the relationship between E and self-set goal level is mediated by task-specific SE. As seen earlier, MRA failed to provide an increment in prediction of task-specific SE over PAGO during trial 2. This is important because trial 2 offers the only opportunity for the hypothesized pattern of relationships to occur, as both PAGO and MRA are significant predictors of SE. We re-ran the same analysis using E in place of MRA and found that E does account for an additional 2.4% of the variance in trial 2 SE over PAGO ($\Delta R^2 = .024$).

For PM and CE it seems that a more narrowband analysis does not help explain the lack of support for Hypotheses 1a, 2a, 1b, 2b, 4 and 5. When the facets within MRA were used, however, it appears that the more narrowband E is a better predictor of task-specific SE and self-set goal level. Additionally, it appears that the use of E in place of MRA yields clearer results concerning mediation by task specific SE as well as incremental variance over PAGO. In short, a more narrowband analysis seems to be appropriate and helps explain lacking support for Hypotheses 3a, 3b, and 6.

## Discussion

The present study intended to explore the motivational trait portion of the MTS framework in two ways. First, by exploring relationships between MTQ constructs and the proximal determinants of action task-specific SE and self-set goal level. Second, by exploring these relationships while accounting for the currently accepted GO constructs MGO, PPGO, and PAGO. Past research has already found that GO constructs are significant predictors of task-specific SE and self-set goal level (Payne, Youngcourt, & Beaubien, 2007). However, the

theoretical foundations underlying MTQ constructs, as well as the breadth of coverage inherent in the measurement of MTQ constructs not only suggest that they should predict task-specific SE and self-set goal level, but that they should also provide a significant increment in prediction over GO constructs.

*Motivational Traits, Task-Specific SE, and Self-Set Goal Level*

To date, only two empirical studies have been conducted concerning relationships between MTQ constructs, task-specific SE, and self-set goal level. Diefendorff et al. (2005) found that only PM and CE were significantly related to task-specific SE and self-set goal level. Meanwhile, Hinsz and Jundt (2005) found that PM, CE and MRA were all significantly related to task-specific SE and self-set goal level. Additionally, they found that task-specific SE mediated the relationship between MTQ constructs and self-set goal level. Hypotheses 1a, 2a and 3a intended to add to the limited corpus of evidence concerning relationships between MTQ constructs, task-specific SE, and self-set goal level. Hypotheses 1b, 2b, and 3b aimed to add to the limited evidence that task-specific SE mediates relationships between MTQ constructs and self-set goal level.

*Hypotheses 1a, 2a, and 3a*

Results largely did not support Hypotheses 1a, 2a and 3a. During the course of the present study, we found that PM and MRA were moderate predictors of task-specific SE, while CE did not predict task-specific SE. During trial 2 and trial 3, PM demonstrated a significant relationship with task-specific SE, accounting for 1.9 - 3.9% of the variance in SE scores. PM did not, however, predict self-set goal level in any trial. MRA fared slightly better as a predictor of task-specific SE, achieving significant results during trial 1 and trial 2, accounting for 5.2%

and 4.2% of the variance, respectively. MRA was a relatively poor predictor of self-set goal level, only achieving significance during trial 1, accounting for 2% of the variance in goal level.

The present results suggest that MTQ constructs are generally better predictors of task-specific SE than self-set goal level. As SE is theoretically more distal from behavior than goals, it makes sense that the distal MTQ constructs and SE would demonstrate stronger relationships than MTQ constructs and goals. Past research has also found that MTQ constructs are more closely related to SE than goals (Diefendorff et al., 2005;Hinsz & Jundt, 2005). More specifically, we found that MRA and PM were the best predictors of motivational outcomes while CE simply did not predict any motivational outcomes. This finding is relatively novel as the other two empirical studies to date examining MTQ constructs (Diefendorff et al., 2005; Hinsz & Jundt, 2005) found that CE were significantly related to SE and goals.

It is interesting that CE did not predict either SE or goals at any time. Previous research has found that PM, CE and MRA are significantly related to task-specific SE and self-set goal level. Because CE did not predict SE and because PM, CE, and MRA were either unrelated or only weakly related to self-set goal level, the present results seem rather odd. Our first concern was that PM, CE and MRA may not have been measured consistently with previous research. However, the means (PM = 4.41; CE = 3.93; MRA = 3.63), standard deviations (PM = .63; CE = .81; MRA = .78), and internal consistency coefficients (PM = .89; CE = .90; MRA = .91) for the current measurement of PM all appear acceptable and very similar to past research.

Hypotheses 1a, 2a, and 3a attempted to establish the direct effects of MTQ constructs on SE and goals. The limited empirical research to date has found that MTQ constructs are related to both SE and goals. Therefore, a thorough exploration as to the cause of the unsupportive results was sought. In addition to initial concerns of the measurement of MTQ constructs noted

above, we felt that two specific issues within the data needed to be addressed. First, we addressed the possibility of range restriction in task-specific SE and self-set goal level that could possibly impact the outcome of Hypotheses 1a, 2a and 3a. Second, we examined the possibility that outliers may have adversely affected the regression analyses used to test these hypotheses.

Of course, it has already been argued that the distribution of scores for self-set goal level were non-normal. However, that issue was dealt with early on by using a log-transformation of the self-set goal level data before any analyses were carried out. Examination of the task-specific self-efficacy data revealed that the data were slightly negatively skewed and leptokurtic. This would have been concerning if it was obvious that relationships with task-specific SE were systematically not achieving significance. However, there were consistently significant correlations between task-specific SE and self-set goal level ($r$ = -.28 to -.35), task-specific SE and gender ($r$ = -.16 to -.24), task-specific SE and MRA ($r$ = -.15 to -.25), task-specific SE and MGO ($r$ = .14 to .19), and task-specific SE and PPGO ($r$ = .18 to .22), suggesting that this was not the case. Based upon this evidence, we concluded that range restriction in our outcome variables were not an issue.

Additionally, we felt that the possibility of outliers in the data may have adversely affected the tests of Hypotheses 1a, 2a, and 3a. The basic concern was that a few individuals might be so far from the predicted regression values (i.e., exceedingly high standardized residuals) that they alter significance tests (i.e., through inflated standard errors). Therefore, when the analyses for Hypotheses 1a, 2a, and 3a were performed, standardized residuals were saved and used to identify any individuals with exceedingly large differences from the predicted values. In all analyses, no more than 3 individuals were identified with standardized residuals above 3, suggesting that there were very few potential outliers within the dataset. Further, when

these potential outliers were removed from the data and the analyses were conducted again, the same pattern of results emerged. Based upon this information, it appears that the lack of significant results for hypotheses 1a, 2a and 3a is not a consequence of outliers in the data.

Subsequently, we began to consider more fundamental issues that may help explain our results. First, it must be noted that there is very little empirical research that includes either the MTQ the Horvath et al. (2005) GO measure employed in the current study. Therefore, we explored the possibility that these two measures do not function properly for prediction. Second, we considered the fact that MTQ constructs are "wide band" predictors and that more "narrow band" predictors may be useful for the prediction of task-specific SE and self-set goal level. Third, the current study's procedure may have introduced systematic differences between past data and current data.

In the current study, neither the MTQ measure nor the GO measure by Horvath et al. (2005) produced consistent prediction of self-set goal level. This is surprising, as studies in the past have found consistent relationships between GO and self-set goal level using the same performance task (e.g., Breland, 2004; Hafsteinsson, 2004). Therefore, we felt that the relatively untested measures used in the present study may not be performing well as predictors. Luckily, during the course of this study, a second GO measure (VandeWalle, 1997) was given to participants. This provided us an opportunity to analyze relationships between a more empirically established measure of GO, SE and goals. However, when the VandeWalle (1997) scales were used, MGO was only significantly related to trial 2 SE ($r = .19$, $p < .01$) and unrelated to any of the self-set goal level trials. Similarly, PPGO was only significantly related to trial 3 SE ($r = .14$, $p < .05$) and unrelated to any of the self-set goal level trials. Meanwhile, PAGO was unrelated to any of the task-specific SE, or self-set goal level trials. In short, it

appears that our results are not due to the untested nature of the MTQ and Horvath et al (2005) GO measures.

For the MTQ measure specifically, it is possible that the inconsistent prediction exhibited by the broad motivational traits might be the product of some type of bandwidth mismatch between predictor and criterion. Bandwidth issues are not new to the area of personality predictors (e.g., Ones & Viswesvaran, 1996 and Paunonen, Rothstein, & Jackson; 1999) and it is frequently argued that narrower constructs (i.e., facet-level) provide important predictive information. Therefore, we looked at the relationships between the MTQ facets within PM, CE, and MRA, task-specific SE and self-set goal level. Results show that the same pattern of results emerge when the facets within PM and CE are used in place of the traits. MRA, on the other had, provides some evidence that the more narrowband facet E is a more accurate predictor of task-specific SE and self-set goal level. Additionally, E is the only construct in the current investigation to consistently predict self-set goal level, to demonstrate the mediating effects of task-specific SE, and provide an increment in the prediction of task-specific SE over its corresponding GO construct. From the current study, it seems that the use of narrowband predictors provide a slight advantage over broad traits that are limited to facets within the MRA construct.

In assessing differences between the present study and past studies that utilized the same puzzle task, our procedure included a time lag between administration of the survey instruments and participation in the puzzle task. Upon conception of the study, we felt that a time one – time two procedure would have no impact on the data because the measured constructs are assumed to be temporally stable. Evidence does exist to suggest that MTQ constructs are stable over time. Heggestad and Kanfer (1997) found test-retest correlations above .82 for all trait constructs with

2 – 5 weeks elapsing between administrations. Horvath et al. (2005), however, provide test-retest correlations between .52 and .59 with roughly one semester elapsing between administrations. It seems that the GO scales employed in the current study are somewhat lacking in temporal stability but the MTQ scales are stable over time. The elapsed time between administrations should have had no impact on relationships between MTQ constructs and motivational outcomes meaning that some other type of systematic effect may be responsible.

In past research, measures of dispositional constructs were administered during the computer lab sessions in which subjects completed computer tasks. During the present procedure, the measures were completed via the Internet and include important differences. Researchers in the personality domain have found that web-based administrations of measures produce roughly equivalent measurement of constructs to traditional administrations of the same measures (Buchanan, 2002). However, the equivalence of web-based versus traditional administrations of the measures used in the present study have yet to be established. Also, instructional sets accompanying the measures in the present study were different from the instructional sets accompanying the measures in past research using the same task. We know from personality research (e.g., Pauls & Crost, 2005) that different instructional sets can change how the constructs manifest themselves when using the same instrument. The current study used an instructional set with the web-based measures that contains no references to the task to be completed in part two of the study or the timed nature of the task. In all previous studies that utilize the same task, the measures had instructional sets that referenced the task to be completed as well as the timed nature of the task. It is plausible that the instruction set accompanying the current administration of the MTQ and GO measures has changed the manifestation of the constructs in comparison with past administrations. Past instruction sets may have indicated to

participants that they would be entering an achievement setting, which would prime different motives from individuals taking the survey with no knowledge of performing a task such as the current administration.

*Hypotheses 1b, 2b, and 3b*

Obviously, Hypotheses 1b and 2b received no support whatsoever as we found no significant direct effects between either PM and self-set goal level or CE and self-set goal level. Otherwise known as the 'τ' path, the relationship between the IV and the DV must first prove significant to move on with the causal-steps procedure for detecting the mediated effect. Supplemental Sobel tests did, however, indicate that what relationship did exist between PM and self-set goal level during trial two was carried by task-specific SE. The same Sobel test failed to find any significant mediating effects between CE and self-set goal level As a result, the present study largely to replicate the findings of Hinsz and Jundt (2005) where the relationship between PM and self-set goal level as well as the relationship between CE and self-set goal level was mediated by task-specific SE.

Hypothesis 3b, on the other hand, received limited support for the proposition that the relationship between MRA and self-set goal level is fully mediated by task-specific SE. The support is obviously extremely limited, however, as the only trial for which this effect can be tested is trial 1. During trial 1, the relationship between MRA and self-set goal level was indeed fully mediated by task-specific SE. For this trial, indications are that MRA affects self-set goal level through task-specific SE. Supplemental analysis revealed that the facet E within MRA was significantly related to trial one and trial two self-set goal level only through task-specific self-efficacy. These findings are consistent with research summarized by Locke and Latham (1990) that indicate distal motivational constructs affect behavior through the proximal determinants of

action SE and goal setting. Similarly, Phillips and Gully (1997) found that goal orientations only affect behavior through SE and goals. As for the specific relationship that MTQ constructs have with SE and goal setting, limited empirical research indicates that MTQ constructs affect goals and subsequent behavior through SE (Hinsz & Jundt, 2005) and the present study provides more evidence that MTQ constructs are indirectly related to goal setting through task-specific SE.

*Incremental Validity of MTQ Constructs*

Hypotheses 4 - 6 posited that MTQ constructs would provide significant increments in the proportion of variance accounted for in task-specific SE, over that of their corresponding GO constructs. As can be seen in Tables 3 - 5, almost no support for this proposition emerged. Of course, the desired pattern of relationships for these hypotheses would require that GO constructs first predict task-specific SE and then the corresponding MTQ construct would increment that prediction. However, for each hypothesis, that specific pattern of results did not emerge.

In Hypothesis 4 it appears that multicollinearity prevented regression analyses from detecting the independent effects of either PM or MGO in predicting task-specific SE. The desired pattern of relationships for Hypothesis 5 were also not seen in the present study. This was because CE failed in every trial to significantly predict task-specific SE after accounting for gender and PPGO. In fact, had CE been a significant predictor of task-specific SE over gender, it is likely that in the reverse models PPGO would have provided a significant increment in the prediction of task-specific SE. CE, however, did not support that possibility, in the present study due to the lack of any significant prediction of task-specific SE.

Hypothesis 6, on the other hand provided the only opportunity for the hypothesized pattern of relationships to emerge. Only during trial 2 did both PAGO and MRA significantly predict task-specific SE while accounting for gender. Of course, in that trial, MRA failed to

provide a significant increment in the prediction of task-specific SE only accounting for an additional 1.7% of the variance in efficacy scores. Supplemental analysis, however, revealed that the more narrowband E facet within MRA did provide a significant increment in prediction over PAGO. Although limited, this finding suggests that E may offer adequate construct coverage to subsume the PAGO construct.

From the results of the incremental validity analyses for Hypotheses 4 – 6, we cannot conclude that MTQ constructs subsume their GO counterparts from a predictive validity standpoint. It does appear that PM and MGO are very similar constructs that each predict task-specific SE and account for almost the same amount of construct space. Unfortunately, due to collinearity, the independent effects of each remain to be seen. PPGO emerged as a significant predictor of task-specific SE, while CE lacked any predictive power in the present study. It seems that PPGO provides a good assessment of the other-referent portion of the achievement trait complex and, in fact, may provide more construct coverage than CE. Finally, PAGO and MRA both appear to predict task-specific SE reasonably well. It does seem that MRA, specifically the E facet within MRA, is a stronger predictor of task-specific SE, indicating that it provides a more thorough assessment of the anxiety construct space than PAGO. It is interesting that in the present study each MTQ construct was highly correlated with its GO counterpart. It seems that although they are each related, the nature of their relationships are different. Specifically, it appears that PM and MGO are so highly related that distinguishing between the two is very difficult. However, CE and PPGO as well as MRA and PAGO are related but easily distinguished constructs.

*Conclusions/Future Directions*

The present study proposed that the MTQ portion of the MTS framework should yield significant relationships with task-specific self-efficacy and self-set goal level. Also, because of the theoretical breadth inherent in the MTQ construct measures, the study proposed that MTQ constructs would provide an increment in predictive validity over GO constructs. Obviously, the results of the study allow for very few supportive conclusions regarding the proposed hypotheses. The results do, however, provide ample direction for future research.

Including the present study, there has been only very limited empirical analyses of MTQ constructs and proximal determinants of action. Empirical research to date (other than the present study) does indicate that MTQ constructs are significantly related to task-specific SE and self-set goal levels. The present study, and the research of Hinsz and Jundt (2005) indicate that the relationship between MTQ constructs and self-set goal level is fully mediated by task-specific SE. Yet, with only the three empirical studies to date, relatively little in the way of empirical evidence regarding relationships between MTQ constructs and goal processes has been firmly established. In the future, studies that attempt to connect MTQ constructs and behavior should consider task-specific self-efficacy and self-set goal level. This would both serve to replicate the limited findings to date and extend them to a variety of tasks.

Due to the results of the present study, it seems that further assessment of any relationships between MTQ constructs and proximal determinants of action should consider at least one additional feature; Any time lag between instrument administration and task completion should be directly assessed or manipulated. Unfortunately, in the present study, time lag was not recorded as a part of the data collection procedures. As a result, the possible effects of time lag could not be assessed. It would be interesting to see if relationships between MTQ constructs and

proximal determinants of action differ for data where survey instruments were completed at the same time as task performance, if tasks were completed after a short time lag, and if tasks were completed after a long time lag. Results of such an analysis would provide an index of the impact of time lag on the predictive validity of MTQ constructs.

Additionally, equivalence of web-based and traditional administrations of the measures used in the current study need to be evaluated for changes in construct validity. On a related note, the instructional sets accompanying MTQ and GO measures appear to have an impact on the constructs. If the constructs that these measures assess can be manipulated by the instructions accompanying them, assigning subjects to different conditions with different instruction sets would be a valuable systematic study of how that manipulation occurs. In either case, the construct validity of MTQ and GO measures would be better understood if we knew about the effects of administration equivalence and instruction sets.

The incremental validity analyses of Hypothesis 4 brought to light a separate issue altogether: multicollinearity and the definite possibility of construct confusion. It appears that the PM and MGO constructs are interrelated to the point that determining the unique effect of each is impossible when they are both included in the same analysis. This is not surprising when the magnitude of the correlation between PM and MGO constructs is considered ($r$ = .76). Taken with the correlations between CE and PPGO ($r$ = .63) as well as between MRA and PAGO ($r$ = .65), one could reasonably argue that MTQ constructs have yet to demonstrate either construct independence or the ability to subsume more narrow constructs such as GO. As such, it is apparent that MTQ constructs, especially PM, are in need of further construct validation evidence. Confirmatory factor analysis in which both GO and MTQ constructs are included

could go a long way toward determining the construct independence and/or the ability of MTQ constructs to subsume GO constructs.

It seems that changing the bandwidth of MTQ constructs had varying results for increasing the effectiveness of prediction. The predictive power of PM and CE were not improved by using more narrow band facets within each. MRA did find some success by using narrow band facets. Specifically, the E facet was the only construct to consistently predict SE and goals. It appears that varying the bandwidth of MTQ predictors will increase prediction in some cases but not for all MTQ constructs. Strategies for increasing predictive power, however, appear to have some level of success with the MTQ.

There are other ways of increasing both the meaning and predictive ability of distal constructs such as PM, CE, and MRA. Namely, the identification and use of distinct patterns of MTQ constructs may drastically increase both our understanding of the constructs as well as their predictive ability. Pattern approaches have been successfully used with other distal constructs including personality (Smith & Foti, 1998) and goal orientation (Fortunato & Goldblatt, 2006). It seems that a person's standing on all of the constructs provides a more person centered and informative assessment of their individual level motivation. For instance, if one person's standing is high on PM, high on CE, and high on MRA are they distinct from one who is high on PM, high on CE, and low on MRA? Logically, it makes sense that because these MTQ constructs are independent of one another, useful patterns of peoples' standing on them can be identified, will likely be more meaningful, and produce better prediction of proximal outcomes. The MTS framework itself was designed as a "person-centered" (Kanfer & Heggestad, 1997) approach to motivation.

*Study Limitations*

First, it should be noted that the sample of the present study consisted entirely of college students performing a task that with very few consequences or advantages for completion. That being said, the precepts of any motivational trait theory stipulate that one high in trait motivation would strive for excellence in a large variety of tasks, and thus the nature of the task should not preclude the presence of these types of motivated beahvior. Additionally, the task used in the present study has been utilized successfully in previous research involving motivated action and individual differences.

Second, a multicollinearity problem seemed to be problematic for the analysis of incremental validity in Hypothesis 4. It is glaringly apparent that PM and MGO are highly intercorrelated thus making it very difficult to examine the independent effect of each on task-specific SE. In actuality, the possibility of multicollinearity should also be accounted for in analyses involving CE and PPGO as well as MRA and PAGO due to the high correlations found in the present study.

Finally, the simple nature of the puzzle task may have adversely affected the distribution of self-set goal level scores as well as relationships between distal predictors and proximal outcomes. It is not likely, however, that this was the case as past research has used the same exact task to successfully analyze relationships between GO, self-efficacy, and goals. The possibility remains that the use of a more complex task may be more appropriate for the analysis of MTQ constructs and their relationships with proximal determinants of action.

*Conclusion*

The present study has provided a valuable empirical assessment of the relationship between MTQ constructs and task-specific SE. Although the results largely did not support the

proposed relationships, there is some evidence to suggest that MTQ traits can successfully predict self-efficacy in some instances, and that task-specific SE may mediate the relationship between MTQ constructs and self-set goal level. Further, incremental validity analyses suggest that further construct validation research is badly needed to determine the nature of MTQ constructs and GO constructs within the trait motivation construct space. Future research would do well to explore construct validity issues related to this measure in the hope of providing a measure that may have more utility in the prediction of motivated behavior. Finally, it seems that strategies to increase that predictive power, such as identification of meaningful patterns of MTQ construct standings, may further enhance our prediction of these behaviors.

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# APPENDIX A.

## MOTIVATIONAL TRAITS QUESTIONNAIRE SHORT FORM.

1. ____ When I become interested in something, I try to learn as much about it as I can.
2. ____ I set goals as a way to improve my performance.
3. ____ It really upsets me when someone does something better than I do.
4. ____ I perform best when I compete with others.
5. ____ When working on important projects, I am constantly fearful that I will make a mistake.
6. ____ If I know someone is judging me, I get so focused on how I am doing that I have difficulty concentrating on the task.
7. ____ When I am learning something new, I try to understand it completely.
8. ____ If I already do something well, I don't see the need to challenge myself to do better.
9. ____ I tend to put extra effort into tasks that involve competition with others.
10. ____ I am not a competitive person.
11. ____ I do not get nervous in achievement settings.
12. ____ My heart beats fast before I begin difficult tasks.
13. ____ Even when I have studied hard enough to get a good grade, I study more because I want to completely understand the material.
14. ____ When learning something new, I focus on improving my performance.
15. ____ It is important for me to outperform my co-workers.

16. ____ I try to avoid competitive situations.

17. ____ I am unconcerned even if I know that other people are forming an unfavorable impression of me.

18. ____ I have trouble relaxing because I worry about things at work.

19. ____ I like to take classes that challenge me.

20. ____ I compete with myself -- challenging myself to do things better than I have done before.

21. ____ Whether or not I feel good about my performance depends on how it compares to the performance of others.

22. ____ I would rather cooperate than compete.

23. ____ Before beginning an important project, I think of the consequences of failing.

24. ____ I am unable to concentrate fully in stressful situations.

25. ____ I am an intellectually curious person.

26. ____ I set high standards for myself and work toward achieving them.

27. ____ I am motivated to do things better than others.

28. ____ I like to turn things into a competition.

29. ____ I am afraid of other people noticing my shortcomings.

30. ____ I get headaches when I have a lot of important things to do.

31. ____ I prefer activities that provide me the opportunity to learn something new.

32. ____ I work hard at everything I undertake until I am satisfied with the result.

33. ____ I strive to do my job better than the people I work with.

34. ____ Even in non-competitive situations, I find ways to compete with others.

35. ____ I get nervous just thinking about having an important project evaluated.

36. ____ I am able to remain calm and relaxed in stressful situations.

37. ____ I am naturally motivated to learn.

38. ____ I do not set difficult goals for myself.

39. ____ I compare my performance to that of others.

40. ____ I worry about the possibility of failure.

41. ____ I am able to remain calm and relaxed before I take a test.

42. ____ I thirst for knowledge.

43. ____ My personal standards often exceed those required for the successful completion of a project.

44. ____ I get tense when other people assess my progress.

45. ____ I get an uneasy feeling in my stomach when working toward something I really want to accomplish.

46. ____ I worry about how others will view my work performance.

47. ____ I lose sleep because I am troubled by thoughts of failure.

48. ____ I am cautious about trying to do something that could lead to embarrassment.

# APPENDIX B.

## GOAL ORIENTATION.

1. ____ I try to hide from others that they are better than me.
2. ____ It makes me anxious when I know my family and friends will compare my failures to those of others.
3. ____ When I know my work will be compared to that of others, I get so nervous that I procrastinate.
4. ____ I try to avoid discovering that others are better than me.
5. ____ I am reluctant to ask questions because others may think I'm incompetent.
6. ____ It makes me feel good to have an audience when I outperform others.
7. ____ It is important to me to perform better than others.
8. ____ I want others to recognize that I am one of the best.
9. ____ I enjoy proving my ability to others on tasks.
10. ____ I feel good when I can prove to myself that I am better than others.
11. ____ I feel good when I am doing something that helps me grow.
12. ____ I enjoy challenging and difficult tasks where I'll learn new skills.
13. ____ I enjoy opportunities to extend the range of my abilities.
14. ____ The opportunity to learn new things is important to me.
15. ____ The opportunity to do challenging work is important to me.

# APPENDIX C.

## SELF-EFFICACY LIKERT MEASURE.

1. ____ I feel confident in my ability to perform well on the upcoming puzzle.
2. ____ I think I can eventually complete this puzzle in a satisfactory time.
3. ____ I am not confident that I will do as well on the upcoming 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 this puzzle.
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 this puzzle as I am.

Tables

Table 1.

*Means, Standard Deviations, and Intercorrelations*

| | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Gender | | | --- | | | | | | | | | | | |
| 2. PM | 4.41 | .63 | .01 | ***.89*** | | | | | | | | | | |
| 3. CE | 3.93 | .81 | -.24** | .15* | ***.90*** | | | | | | | | | |
| 4. MRA | 3.63 | .78 | .11 | .02 | .14* | ***.91*** | | | | | | | | |
| 5. MGO | 5.50 | .85 | .01 | .76** | .15* | -.01 | ***.84*** | | | | | | | |
| 6. PPGO | 5.10 | 1.09 | -.19** | .15* | .63** | .22** | .25** | ***.83*** | | | | | | |
| 7. PAGO | 3.87 | 1.14 | .01 | -.13 | .25** | .65** | -.06 | .35** | ***.71*** | | | | | |
| 8. Trial 1 SE | 3.84 | .52 | -.22** | .13 | .15* | -.25** | .15* | .21** | -.08 | ***.85*** | | | | |
| 9. Trial 2 SE | 3.66 | .57 | -.16* | .20** | .10 | -.22** | .19** | .18* | -.17* | .85** | ***.86*** | | | |
| 10. Trial 3 SE | 3.69 | .59 | -.24** | .13 | .13 | -.15* | .14* | .22** | -.10 | .75** | .80** | ***.88*** | | |
| 11. Trial 1 Goal | 52.75 | 62.43 | .04 | -.08 | -.00 | .14* | -.07 | -.04 | .09 | -.35** | -.22** | -.15* | --- | |
| 12. Trial 2 Goal | 90.77 | 47.79 | .00 | -.06 | -.06 | .06 | -.07 | -.04 | .01 | -.31** | -.30** | -.19** | .53** | --- |
| 13. Trial 3 Goal | 93.65 | 49.74 | .02 | -.00 | -.09 | .12 | .01 | -.06 | .06 | -.30** | -.24** | -.28** | .45** | .74** |

*Note*. n ≥ 192. Internal consistency coefficients (α) are italicized on the diagonal. PM = Personal mastery. CE = Competitive Excellence. MRA = Motivation related to anxiety. MGO = Mastery goal orientation. PPGO = Preformance-prove goal orientation. PAGO = Performance avoid goal orientation. Trial 1 SE = Task-specific self-efficacy for trial 1. Trial 2 SE = Task-specific self-efficacy for trial 2. Trial 3 SE = Task-specific self-efficacy for trial 3. Mean and SD for self-set goal level are in the minutes and seconds metric while correlations were analyzed with the log transformed data of self-set goal level data.

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

Table 2.

*Relationships between MTQ Constructs, Task-Specific SE, and Self-Set Goal Level*

| | PM | | | CE | | | MRA | | |
|---|---|---|---|---|---|---|---|---|---|
| DV | *b* | β | $\Delta R^2$ | *b* | β | $\Delta R^2$ | *b* | β | $\Delta R^2$ |
| Trial 1 SE | .11 | .13 | .017 | .07 | .10 | .010 | -.15** | -.23 | .052 |
| Trial 2 SE | .18** | .20 | .039 | .05 | .07 | .004 | -.15** | -.21 | .042 |
| Trial 3 SE | .13* | .14 | .019 | .06 | .08 | .006 | -.10 | -.13 | .016 |
| Trial 1 Goal | -.04 | -.08 | .007 | -.00 | -.00 | .000 | .06* | .14 | .020 |
| Trial 2 Goal | -.02 | -.06 | .003 | -.02 | -.06 | .004 | .02 | .06 | .004 |
| Trial 3 Goal | -.00 | -.00 | .000 | -.02 | -.09 | .008 | .03 | .12 | .015 |

*Note.* $n \geq 192$. All regression coefficients involving task-specific SE account for gender as a covariate. DV = Dependent variable list. Trial 1 SE = Task-specific self-efficacy for trial 1. Trial 2 SE = Task-specific self-efficacy for trial 2. Trial 3 SE = Task-specific self-efficacy for trial 3. Trial 1 Goal = Self-set goal level for trial 1. Trial 2 Goal = Self-set goal level for trial 2. Trial 3 Goal = Self-set goal level for trial 3. PM = Personal mastery. CE = Competitive excellence. MRA = Motivation related to anxiety. *b* = Unstandardized regression coefficient. β = Standardized regression coefficient. $R^2$ = Increase in the proportion of variance in the DV accounted for by the addition of the predictor in the regression model.

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

Table 3.

*Hypothesis 4: Analysis of Incremental variance accounted for in Task-Specific SE by PM and MGO*

| DV | Model | IV's Entered | β | $R^2$ | $\Delta R^2$ | F-change | Tol. | VIF |
|---|---|---|---|---|---|---|---|---|
| Trial 1 SE | 1 | Gender | -.22** | .048 | | | | |
| | 2 | MGO | .17* | .075 | .027 | 5.79** | | |
| | 3 | PM | .01 | .075 | .000 | .01 | .413 | 2.421 |
| | 1 | Gender | -.22** | .048 | | | | |
| | 2 | PM | .13 | .065 | .017 | 3.56 | | |
| | 3 | MGO | .16 | .075 | .010 | 2.18 | .410 | 2.440 |
| Trial 2 SE | 1 | Gender | -.16* | .026 | | | | |
| | 2 | MGO | .21** | .070 | .044 | 9.15** | | |
| | 3 | PM | .09 | .073 | .003 | .71 | .414 | 2.416 |
| | 1 | Gender | -.16* | .026 | | | | |
| | 2 | PM | .20** | .065 | .039 | 8.12** | | |
| | 3 | MGO | .14 | .073 | .008 | 1.69 | .410 | 2.437 |
| Trial 3 SE | 1 | Gender | -.24** | .056 | | | | |
| | 2 | MGO | .17* | .086 | .030 | 6.18* | | |
| | 3 | PM | .02 | .086 | .000 | .02 | .419 | 2.388 |
| | 1 | Gender | -.24** | .056 | | | | |
| | 2 | PM | .14* | .075 | .019 | 3.94* | | |
| | 3 | MGO | .16 | .086 | .011 | 2.21 | .414 | 2.417 |

*Note.* n ≥ 192. DV = Dependent variable list. Trial 1 SE = Task-specific self-efficacy for trial 1. Trial 2 SE = Task-specific self-efficacy for trial 2. Trial 3 SE = Task-specific self-efficacy for trial 3. Gender = Gender of participants. PM = Personal mastery. MGO = Mastery goal orientation. β = Standardized regression coefficient. $R^2$ = Proportion of variance in the DV accounted for by the model. $\Delta R^2$ = Change in variance accounted for by the addition of predictors in the model. F-change = F-ratio assessing whether incremental variance is greater than zero. Tol.= tolerance. VIF = Variance inflation factor.

*p < .05 **p < .01

Table 4.

*Hypothesis 5: Analysis of Incremental variance accounted for in Task-Specific SE by CE and PPGO*

| DV | Model | IV's Entered | β | $R^2$ | $\Delta R^2$ | F-change | Tol. | VIF |
|---|---|---|---|---|---|---|---|---|
| Trial 1 SE | 1 | Gender | -.22** | .048 | | | | |
| | 2 | PPGO | .17* | .077 | .029 | 6.12* | | |
| | 3 | CE | -.01 | .077 | .000 | .01 | .588 | 1.700 |
| | 1 | Gender | -.22** | .048 | | | | |
| | 2 | CE | .10 | .058 | .010 | 2.07 | | |
| | 3 | PPGO | .18* | .077 | .019 | 3.99* | .600 | 1.668 |
| Trial 2 SE | 1 | Gender | -.16* | .026 | | | | |
| | 2 | PPGO | .15* | .048 | .022 | 4.49* | | |
| | 3 | CE | -.05 | .049 | .001 | .29 | .576 | 1.736 |
| | 1 | Gender | -.16* | .026 | | | | |
| | 2 | CE | .07 | .030 | .004 | .78 | | |
| | 3 | PPGO | .18* | .050 | .020 | 3.96* | .592 | 1.689 |
| Trial 3 SE | 1 | Gender | -.24** | .056 | | | | |
| | 2 | PPGO | .18* | .087 | .031 | 6.51* | | |
| | 3 | CE | -.06 | .089 | .002 | .37 | .576 | 1.736 |
| | 1 | Gender | -.24** | .056 | . | | | |
| | 2 | CE | .08 | .062 | .006 | 1.21 | | |
| | 3 | PPGO | .21* | .089 | .027 | 5.62* | .590 | 1.694 |

*Note.* n ≥ 192. DV = Dependent variable list. Trial 1 SE = Task-specific self-efficacy for trial 1. Trial 2 SE = Task-specific self-efficacy for trial 2. Trial 3 SE = Task-specific self-efficacy for trial 3. Gender = Gender of participants. CE = Competitive excellence. PPGO = Peformance-prove goal orientation. β = Standardized regression coefficient. $R^2$ = Proportion of variance in the DV accounted for by the model. $\Delta R^2$ = Change in variance accounted for by the addition of predictors in the model. F-change = F-ratio assessing whether incremental variance is greater than zero. Tol.= tolerance. VIF = Variance inflation factor.
*p < .05 **p < .01

Table 5.

*Hypothesis 6: Analysis of Incremental variance accounted for in Task-Specific SE by MRA and PAGO*

| DV | Model | IV's Entered | β | $R^2$ | $\Delta R^2$ | F-change | Tol. | VIF |
|---|---|---|---|---|---|---|---|---|
| Trial 1 SE | 1 | Gender | -.22** | .048 | | | | |
| | 2 | PAGO | -.08 | .055 | .007 | 1.35 | | |
| | 3 | MRA | -.31** | .108 | .053 | 11.52** | .570 | 1.753 |
| | 1 | Gender | -.22** | .048 | | | | |
| | 2 | MRA | -.23** | .100 | .052 | 11.21** | | |
| | 3 | PAGO | .12 | .108 | .008 | 1.69 | .578 | 1.731 |
| Trial 2 SE | 1 | Gender | -.16* | .026 | | | | |
| | 2 | PAGO | -.16* | .053 | .027 | 5.48* | | |
| | 3 | MRA | -.17 | .070 | .017 | 3.46 | .562 | 1.780 |
| | 1 | Gender | -.16* | .026 | | | | |
| | 2 | MRA | -.21** | .068 | .042 | 8.73** | | |
| | 3 | PAGO | -.05 | .070 | .002 | .31 | .570 | 1.754 |
| Trial 3 SE | 1 | Gender | -.24** | .056 | | | | |
| | 2 | PAGO | -.10 | .066 | .010 | 2.07 | | |
| | 3 | MRA | -.11 | .072 | .006 | 1.27 | .567 | 1.765 |
| | 1 | Gender | -.24** | .056 | | | | |
| | 2 | MRA | -.13 | .072 | .016 | 3.23 | | |
| | 3 | PAGO | -.03 | .073 | .001 | .12 | .573 | 1.747 |

*Note.* $n \geq 192$. DV = Dependent variable list. Trial 1 SE = Task-specific self-efficacy for trial 1. Trial 2 SE = Task-specific self-efficacy for trial 2. Trial 3 SE = Task-specific self-efficacy for trial 3. Gender = Gender of participants. MRA = Motivation related to anxiety. PAGO = Peformance-avoid goal orientation. β = Standardized regression coefficient. $R^2$ = Proportion of variance in the DV accounted for by the model. $\Delta R^2$ = Change in variance accounted for by the addition of predictors in the model. F-change = F-ratio assessing whether incremental variance is greater than zero. Tol.= tolerance. VIF = Variance inflation factor.
*p < .05 **p < .01

# Figure Captions

*Figure 1:* Histogram of Trial 1 Self-Set Goal Data.

*Figure 2:* Histogram of Trial 2 Self-Set Goal Data.

*Figure 3:* Histogram of Trial 3 Self-Set Goal Data.

# Figures

*Figure 1.*

Histogram of Trial 1 Self-Set Goal Data

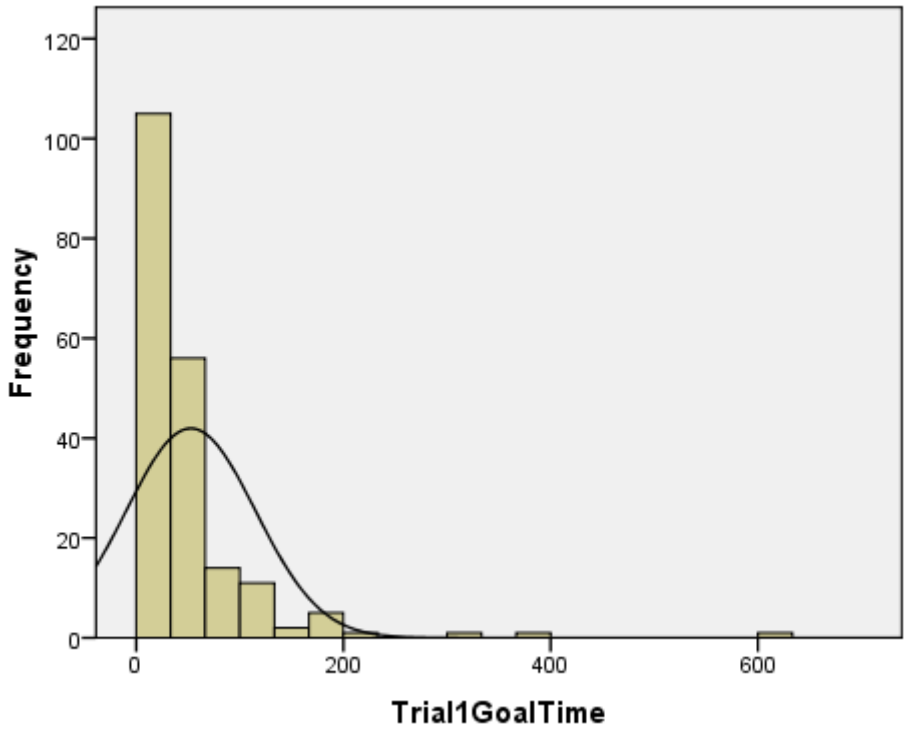

*Figure 2.*

Histogram of Trial 2 Self-Set Goal Data

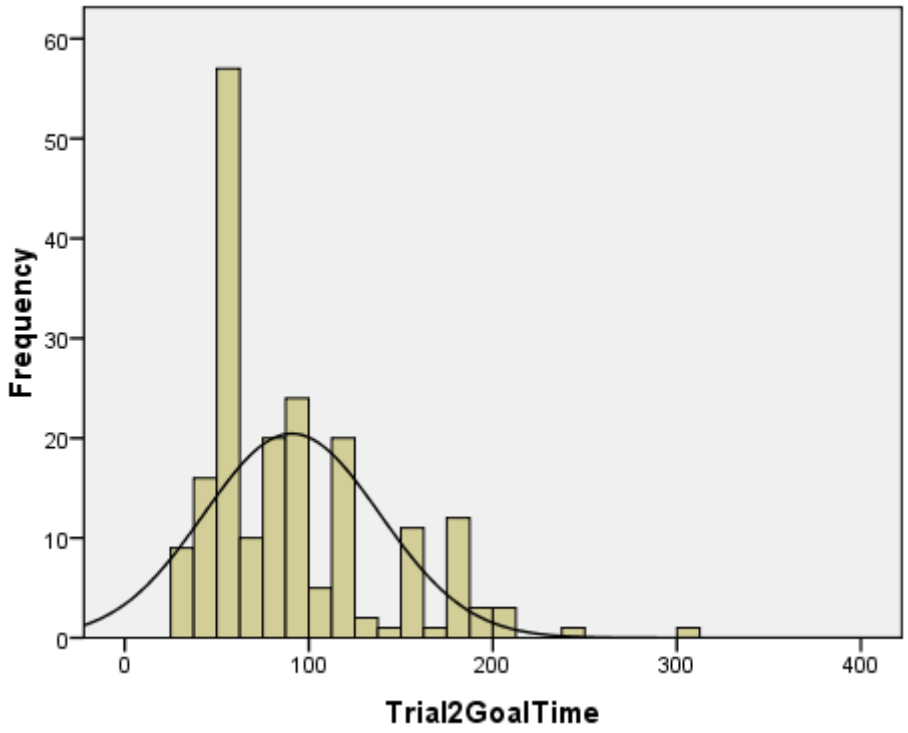

*Figure 3.*

Histogram of Trial 2 Self-Set Goal Data