

GOAL MULTIPLICITY: A MULTIPLE GOAL  
ORIENTATION

By

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## CHAPTER I

### INTRODUCTION

Becoming a new parent is a joyous occasion. The excitement of sharing the news with everyone, the anticipation of knowing the sex of the child, the overflow of gifts at the baby shower, and the family time at the hospital are all highlights of the journey. However, when the parents bring the newborn home, they quickly realize the new roles and goals they must balance. The goal of being a good parent is at the forefront, but moving up on the career ladder and spending time with the significant other also remain high on their priority list (not to mention any other goals they may have). So what should the parents do in this situation? The answer comes easy for most people. Do them all. But the questions then become, are the parents comfortable with multiple-goal pursuit and would this option be their preference? Knowing this individual difference would ultimately provide information about future goal achievements as well as goal failures.

Understanding goals helps psychologists understand the affect, behavior, and cognitions of person. However, people rarely pursue one goal in seclusion. Multiple goal pursuit has become the norm in human social life with individuals reporting pursuing up to 15 goals at any one time (Little, 1989). Relationships, jobs, careers, education, finances, and various other factors compete for the attention, time, and focus of a person.

Returning to the previous example, the parents who also have professional goals and social goals join millions of Americans who attempt to balance various goal pursuits. All of the goals are equally important such that pursuing one at the cost of the others would rarely be possible or feasible. Thus, it is important to note that prioritization of goals can only apply when the goals are not seen as equally important to the person. Research in the area of goals has largely focused on goal setting and the pursuit of goals, but has yet to speak to antecedents of goal setting and pursuit including individual difference factors that lead a person to utilize a specific strategy for goal pursuit. Furthermore, it will be important for research to examine possible costs and/or benefits of utilizing a specific goal strategy over another as well as the outcomes for people who are placed in situations that do not fit their goal orientation.

The present research focuses on the proclivity to pursue several goals simultaneously or very few. Thus, the current work seeks to extend research in the areas of goal pursuit by providing evidence for individual differences in goal strategies and orientations. Specifically, the current studies seek to extend work in the area of *satisficing*, which suggest a person learns to balance multiple goals without becoming overly focused on any one particular goal (Cantor, Acker, & Cook-Flannagan, 1992; Emmons, 1988; Simon, 1967) by showing this to be an individual difference factor. Furthermore, the present research will seek to provide a complete picture of goal pursuit by including personality traits and situational factors that influence the choice for multiple-goal pursuit.

## CHAPTER II

### REVIEW OF LITERATURE

#### *Multiple Goal Pursuit*

In the last few decades, research on goals has occupied research programs in cognition, personality, and motivation (Allport, 1937; Cofer, 1985; Kluckhohn, Murray, & Schneider, 1953; Landman & Manis, 1983; Murray, 1938; Posner & Shulman, 1979; Weiner, 1991; & Zajonc, 1980). Early research in this area focused on the structure and properties of goals (Emmons, 1989; Markus & Wurf, 1987; Miller et. al., 1960; Pervin, 1989; & Powers, Clark, McFarlan, 1960) as well as the content and establishment of goals (Ford & Nichols, 1987; Locke & Latham, 1990). More recently, goal literature has moved in a different direction that focuses on the striving process of goals and allocation of resources between multiple goals (Gollwitzer, 1999; Louro, Pieters, & Zeelenberg, 2007; Schmidt & Dolis, 2009; Vogt, 2011).

Previous literature strongly emphasizes having/juggling multiple goals; however very few studies have examined the individual differences in goal pursuit strategies that would influence the striving process and resource allocation. Pervin's (1992) work was one of the first to outline the idea of multiple goal pursuit and parallel processing by suggesting people have focal goals that are salient and background goals that are not accessible to working memory but are very much part of the goal system.



This work additionally highlighted the shift in activation of goals over time. More recent work by Kruglanski and colleagues (2002) examined goal systems and how affect related to goal attainment can be transferred across the system. Furthermore, previous research concerning goal hierarchies also supports the idea of multiple-goal pursuit such that goals at different levels affect other goals in the goal system (Cropanzano, James, & Citera, 1992; Miller et al., 1960; Ortony, Clore, & Collins, 1988; Powers, 1973; Wicker, Lambert, Richardson, & Kahler, 1984). For example, a goal hierarchy of a college student may include one higher goal of getting a 4.0 GPA for the semester, 5 middle-level goals of getting an A in each of the 5 courses, and numerous lower-level tasks that involve certain behaviors to fulfill in each class to meet the mid-level goals.

Conversely, all goals will not always facilitate the achievement of other goals in the system and may require the person to make a choice between approaching one goal over the other. This situation has been referred to in the motivation literature as approach-approach conflicts (Hull, 1938). Goal conflict has since been studied exclusively in terms of self-regulation and has been found to be resolved with a tradeoff between the competing goals based on findings that pursuit of the conflicting goals would deplete the person's available resources (Anderson et al., 2004; Baumeister, Bratslavsky, Muraven, & Tice, 1998; Shah, 2005).

One regulatory strategy to deal with conflicting goals outlined by Kuhl (1984, 1986) that has been found to be beneficial in successful goal pursuit and overcomes goal conflict is *action control*. This "shielding" strategy was further investigated by Shah and colleagues (et. al. 2002) and later termed *goal shielding*. Goal shielding is a self-regulatory strategy that can be used to protect the pursuit of a focal goal from alternative

goals that may be in conflict by inhibiting activation of those alternative goals (e.g. protecting the goal of studying for an exam from the goal to hang out with friends). However, if a person has an individual proclivity to pursue multiple goals simultaneously (goal multiplicity) and is committed to all of the goals equally, goal shielding is less likely to occur. Thus, Shah (2002) found in six studies that two key moderators of goal shielding included commitment and the person's goal related-tenacity, which refers to how strongly individuals remain invested in specific goal strivings.

Alternatively, people may find it difficult to prioritize their goal pursuits and thus may partially sacrifice in each of the goal pursuits without giving up on any of them. This phenomenon has been termed *satisficing* in goal literature (Simon, 1967). Evidence of this phenomenon has been suggested in work examining product consumption among people holding multiple goals and the decision-making processes of those individuals with conflicting goals (Chun, 2005; Dhar & Simonson, 1999; Fishbach & Dhar, 2005; Fishbach, Zhang, & Koo, 2009).

Although satisficing may seem to be the optimal choice for people pursuing multiple goals simultaneously, utilizing this strategy can be costly when the goals involve identity, life-tasks, or personal strivings (Cantor, 1994; Emmons, 1988; Wicklan & Gollwitzer, 1982). Specifically, previous research has found that disengagement from a goal (even when temporary or partial) affects one's emotional and physical well-being (Emmons, 1988; Riediger, 2004). Thus, this strategy is appealing in that it allows the individual to pursue multiple goals, but it requires some level of disengagement from each goal. Again returning to the opening example, the parent that seeks to achieve

professional success would not likely disengage from this goal or their social goals even in the slightest because each of these goals makes up their individual and social identity.

The current studies sought to extend work in the area of multiple-goal pursuit by identifying individual differences in goal orientations, such that some people have a chronic orientation for multiple-goal pursuit over single goal pursuits. Furthermore, the current work also sought to highlight the importance of situational factors that can influence the strategy of goal pursuit. For instance, people who have a stronger proclivity for single-goal pursuit would fare worse in situations that call for multiple-goal pursuit because their orientation does not “match” or “fit” situation, which would most likely lead to goal failure. The notion of “fit” between goal orientation and the situation is similar to work by Higgins (1997; 1998) in the area of self-regulation which proposes that when the manner of pursuing a goal suits a person’s regulatory orientation (promotion vs. prevention), the value of the goal pursuit process will increase for the individual. For the present work, it is proposed that when the situation in which the goal pursuit occurs suits the person’s goal orientation, the likelihood of achievement will increase.

### *Goal Multiplicity*

It can be argued that multi-tasking is seen as the best strategy for multiple-goal pursuit due to its ability to allow the pursuer to pursue all goals simultaneously. Multi-tasking has been defined as the cognitive ability to perform “multiple tasks in the same time period by engaging in frequent switches between individual tasks” (Delbridge, 2000, pg. 584). This definition inherently includes the assumption that conflict exists among tasks as well as an urgency to complete multiple tasks within the same time frame. Indeed,

people are thought to utilize multi-tasking, especially when tasks interfere with one another (Monsell, 2003; Pashler, 1994). Specific to the present work, persons who deem all of their current goal pursuits as equally important would be expected to often utilize multi-tasking.

The concept of multi-tasking is not new to the field of psychology. Action theories have long since included assumptions that many different action motives could co-exist (Atkinson & Birch, 1970). Furthermore, research outside of the area of psychology has acknowledged the concept here referred to as goal multiplicity. Hall (1976) was the first to examine cultural differences in multi-tasking and found that some cultures organized activities in a monochronic way or a polychronic way. Individuals in monochronic cultures preferred focusing on a single task in the morning and deemed any unscheduled event as an interruption; whereas, individuals in a polychronic culture preferred to focus on multiple tasks and expected unscheduled events to occur (Hall & Hall, 1990). Later, researchers extended the previous work by examining polychronic views in the context of organizational culture and developed an assessment based on polychronicity, which refers to how many things an individual attends to and is involved with at the same time and the belief that their preference is the ideal option (Bluedon et al., 1998). Since the development of this assessment tool, researchers have set out to find predictors of polychronicity. Although some evidence for variables such as culture and cognitive ability have been found, clear and consistent support has been found for work environment requirements and personality (particularly extraversion) as predictors of polychronicity (Conte & Gintoft, 2005; Conte & Jacobs, 2003; Hecht & Allen, 2005; Payne & Philo, 2002).

Within the framework of polychronicity, researchers have also suggested a person-environment “fit” would lead to higher levels of individual performance (Bluedorn & Jaussi, 2007; Jansen & Kristof-Brown, 2005; Konig & Waller, 2010). Following this framework, the current work seeks to extend the concept of polychronicity in the area of goal pursuit by suggesting an environmental and personality “fit” factor.

The term *goal multiplicity* will be used to refer to a person’s chronic preference for pursuing multiple goals simultaneously to facilitate attainment of all goals. This definition focuses on the person’s chronic proclivity to utilize multi-tasking as a means to facilitate goal pursuit and highlights the level of importance individuals give to each goal in their network. Thus, goal multiplicity should have implications for the individual above and beyond those of multi-tasking alone.

#### *Goal Multiplicity as an Individual-Difference Dimension*

Though Goal Multiplicity may be influenced by the situation, it assumed to represent a dimension of stable individual differences. This possibility is explored in the present research. The development of this individual measure of Goal Multiplicity provides two advantages to the goal pursuit literature. First, it affords a desirable way to differentiate between different goal orientations. Theoretically, individuals who score high on the personality measure of Goal Multiplicity should exhibit similar responses when asked about their choice, feelings, and methods for multiple-goal pursuit. A comparison of results from a personality measure and situational inductions represents a rigorous test of the Goal Multiplicity Scale (GM). Secondly, development of the GM Scale enables the allocation of individual variance to a personality main effect and to the person-situation interaction, reducing error variance and enhancing the statistical power

for assessing situational effects on goal pursuit, which has yet to be discussed in the literature.

### *Present Research*

The present research suggests people differ in their goal orientations and strategies for goal pursuit, specifically the choice to pursue multiple-goals simultaneously or pursuit of one goal at one time. Based on the previously described work, it is predicted there will be differences in goal achievement for people who have a preference for a particular goal orientation (multiple-goal pursuit or single-goal pursuit) but are placed in situations that do not “fit” their goal orientation. Specifically, those who prefer multiple-goal pursuit but must focus on achievement of a single goal should have performance impairment. The opposite should also be true, such that those who prefer single goal pursuit but must juggle several tasks simultaneously should also have performance impairments. Furthermore, it is expected that people who ascribe to a particular goal orientation and are placed in a situation that “fits” their orientation will have little to no performance impairment.

In the following paragraphs, a program of research is described in which an individual difference measure of Goal Multiplicity is developed and tested. First described is the item selection process and basic psychometric work on the scale using Exploratory Factor Analysis (Study 1) and Confirmatory Factor Analysis (Study 2). Subsequently, a report on discriminant validation of the scale against alternative personality measures (Study 2) is provided. Lastly, a report on the behavioral validation of the GM Scale (Study 3) is given.

## CHAPTER III

### STUDY ONE

In developing the GM Scale, initial item-generation processes attempted to capture a broad sense of the construct. Following theory that suggests attitudes affect thoughts, behaviors, and emotions (need reference), it was reasoned that Goal Multiplicity would express itself in numerous ways. Thus, Goal Multiplicity was treated as a latent variable manifest through different aspects (Carver, 1989). In particular, two aspects assumed to broadly represent Goal Multiplicity were identified and generated diverse items corresponding to those constructs. Study 1 sought to examine the structural composition of the GM Scale utilizing principal axis factoring. It was anticipated that the revised scale would have a structural composition that included 2 factors (cognitive/affective and behavioral) based on the modifications to original scale items and including additional items. Pilot study results provided the original pool of items that were modified and expanded to develop the revised GM scale (See Appendix B).

## Method

### *Participants*

Two hundred and fifty-two undergraduates ( $M$  age = 19,  $SD$  = 2.39; 191 females) from Oklahoma State University received credit toward an undergraduate psychology course in exchange for their participation.

### *Procedures and Measures*

Participants completed the GM Scale online by accessing the secure website Psychdata.com<sup>1</sup> where the study was housed.

*Item Selection.* Fourteen items were generated that encompassed all spheres of goal multiplicity using literature and framework from research in the areas of multi-tasking and polychronicity (in particular, an individual's behavioral tendencies, feelings about goal pursuit, and thoughts regarding goal pursuit). The original 9-item scale contained 2 intercorrelated factors ( $r = .34$ ) reflecting affect and behavior (Appendix A). It was subsequently decided to add additional items to include a cognitive factor. Our reasoning was that goal multiplicity would logically have effects on cognition, affect, and behavior, thus all 3 dimensions should be represented. Items were rated on a 7-point scale, anchored from -3 *Strongly Disagree* to + 3 *Strongly Agree*. Using rationale and empirical methods, the scale was reduced to its final form comprising 10 items (Appendix B). Four items assessed behavioral reports of multiple-goal pursuit, four items assessed thoughts about multiple-goal pursuit, and two items assessed feelings toward multiple-goal pursuit. Two items with low inter-item correlations were deleted from these two subscales.

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<sup>1</sup> PsychData has been carefully designed to provide superior online research services to the social science community in a secure setting.



## Results

### *Factor Structure*

From the original 9-item scale 2 items were kept, 7 were modified, and 1 was added, resulting in a revised 10-item scale. Table 1 shows the 10 items selected for the final scale, along with average factor loadings (principal axis factor analysis). The Goal Multiplicity is predicted to be a unitary latent variable manifested in various ways. Thus, it was expected that the confirmatory factor analysis would support a two factor model as the best fit to the data. A principal axis factor analysis revealed that 4 items loaded on the first factor (loadings were  $\geq .60$ ) and explained a substantial amount of the variance (33%) and six items loaded on the second factor (all loadings were  $\geq .40$ ) explaining another small portion of the variance (14%). A scree plot (Gorsuch, 1983) also supported a 2 factor solution.

### *Reliability*

Cronbach's alpha was calculated for both subscales to determine internal consistency. Internal consistency estimates of reliability were reasonably high among the two subscales but modest among the third. The Cronbach's alpha for the behavioral items was .80 and for the affective items was .77. The Cronbach's alpha for the cognitive items was .64. Thus, the behavioral and affective subscales appeared to have adequate internal reliability. However, the cognitive subscale had only modest internal reliability.

## Discussion

The results of Study 1 suggests that goal multiplicity is a two dimensional trait that can be captured by means of self-report. The GM Scale exhibited good reliability in terms of internal consistency among the behavioral and affective subscales (alphas  $\geq .77$ )

but only modest internal consistency among the cognitive subscales ( $\alpha = .64$ ).

Because other important forms of validity were not addressed in Study 1, Study 2 was conducted to examine various forms of validity. Study 2 sought to confirm the structure of the GM Scale and test the convergent, discriminant, and construct validity of the scale.

## CHAPTER IV

### STUDY TWO

The purpose of the second study was to confirm the structural composition of the GM scale found in study 1. Furthermore, Study 2 examined the association between the GM scale and other relevant measures to ascertain whether the GM scale tapped into a unique variable distinct from alternative relevant constructs, and what constructs may influence Goal Multiplicity. Convergent, discriminant, and construct validity of the GM Scale were assessed using the following scales: Inventory of Polychronic Values, Action Control Scale, Brief Self-Control Scale, Rosenberg Self-Esteem Scale, Self-Efficacy Scale, Need for Cognition Scale, Penn State Worry Questionnaire, State-Trait Anxiety Inventory, The Short Grit Scale, and Distress Tolerance Scale.

## Method

### *Participants*

The sample consisted of 234 undergraduates (172 women, 62 men; M age = 20) in an introductory psychology course at Oklahoma State University. Students participated in the study to fulfill a course requirement. The GM scale as well as other measures was completed individually online by accessing the secure website Psychdata.com<sup>2</sup>, where the study was housed, at the start of the semester.

### *Measures*

***Goal Multiplicity Scale (GM)***. Participants completed the same revised 10-item GM Scale developed in Study 1. The items were rated on a 7-point scale ranging from -3 (Strongly Disagree) to 3 (Strongly Agree).

***Inventory of Polychronic Values (IPV)***. Polychronicity was assessed using the 10-item scale developed by Bludorn and colleagues (1999). Example items include “I like to juggle several activities at the same time” and “I believe people do their best work when they have many tasks to do.” The items are rated on a 7-point scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree).

***Action Control Scale (ACS-90)***. The 36-item Action Control Scale (Kuhl, 1994) was used to measure individual differences in action versus state orientation. The ACS-90 consists of three subscales which measure disengagement versus preoccupation, decisiveness versus hesitation, and performance-related action orientation versus volatility. Each item has two alternative answers (A or B), one of which is indicative of action orientation and the other of state orientation.

***Brief Self-Control Scale (BSCS)***. Self-Control was assessed using the 13-item Brief Self-Control Scale (BSCS; Tangney, Baumeister, & Boone, 2004).

This scale measures 5 domains of self-control including controlling thoughts, emotions, impulses, regulating behavior/performance, and habit-breaking. Example items include “I am good at resisting temptation” and “I often act without thinking through all of the alternatives.” Items are rated on a 5-point scale ranging from 1 (*not at all like me*) to 5 (*very much like me*).

**Rosenberg Self-Esteem Scale.** Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965). The 10-item scale assesses an individual’s global self-esteem, which includes their overall feelings of self-worth or self-acceptance. Items are rated on a 4-point scale ranging from 1 (*Strongly Agree*) to 4 (*Strongly Disagree*). Sample items include “On the whole, I am satisfied with myself,” “I take a positive attitude towards myself,” “I feel I do not have much to be proud of,” and “All in all, I am inclined to feel that I’m a failure.”

**Self-Efficacy Scale.** Self-Efficacy was assessed using the 17-item Self-Efficacy Scale (Sherer et al., 1982). The Self-Efficacy Scale focuses on a person’s general set of expectations they carry into new situations. Example items include: “I give up easily” and “I am a self-reliant person”. The responses are on a 5-point scale (1 = strongly disagree, 5 = strongly agree). Higher scores indicate higher self-efficacy.

**Need for Cognition Scale.** The 18-item Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984) was used to assess participants’ tendency to engage in and enjoy thinking. Example items include: “I prefer complex to simple problems” and “I find satisfaction in deliberating hard and for long hours”. Items are rated on a 5-point scale ranging from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*). Higher scores indicate high need for cognition.

***Penn State Worry Questionnaire.*** Participants' worry was assessed using the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). This 16-item inventory measures the generality, excessiveness, and uncontrollability of worry without focusing on particular domains of worry. An example item is: "I do not tend to worry about things". Items are rated on a 5-point scale ranging from 1 (*Not at all typical of me*) to 5 (*Very typical of me*).

***State-Trait Anxiety Inventory - Trait version (STAI-T).*** The STAI-T (Spielberger, et al., 1980) was used to assess anxiety. STAI-T 20-item scale measures the propensity to experience anxiety and tendencies to perceive stressful situations as threatening. Example items include: "I am a steady person" and "I worry too much over something that really doesn't matter". The responses are on a 4-point scale ranging from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). Higher scores indicate high anxiety.

***The Short Grit Scale (Grit-S).*** Perseverance related to goals was assessed using the Short Grit Scale (Duckworth & Quinn, 2009). This scale measures trait-level perseverance and passion for long-term goals. This 8-item scale includes items such as "I often set a goal but later choose to pursue a different one" and "New ideas and projects sometimes distract me from previous ones." Responses are on a 5-point scale ranging from 1 (*Very much like me*) to 5 (*Not like me at all*).

***Distress Tolerance Scale (DTS).*** Participant's perceived ability to tolerate emotional distress, subjective appraisal of distress, attention being absorbed by negative emotions, and regulation efforts to alleviate distress were assessed using the Distress Tolerance Scale (Simons & Gaher, 2005). Example items include: "I can tolerate being distressed or upset as well as most people" and "I am ashamed of myself when I feel distressed or

upset.” The 15 items are rated on a 5-point scale ranging from 5 (*Strongly disagree*) to 1 (*Strongly Agree*). Higher scores represent a higher tolerance for emotional distress.

## Results

### *Factor Structure of the GM*

A confirmatory factor analysis (using LISREL software, Mels, 2006) was performed on a new sample to verify the compositional structure found in study 1. Both factors found in study 1 emerged in the analysis and all paths were significant except for the paths of the items 5 and 6 to the second latent variable. Table 2 summarizes tests of goodness of fit for the hypothesized model that included two correlated factors.

Following recommendations by Hu and Bentler (1998) and MacCallum and Austin (2000), the Root Mean Squared Error of Approximation (RMSEA, Steiger & Lind, 1980), the Standardized Root Mean Squared Residual (SRMR, Hu & Bentler, 1995), and Comparative Fit Index (CFI, Bentler, 1990) were evaluated to determine the goodness of fit of the measurement model and structural model. These indicators have been shown to be most sensitive to models with misspecified factor loadings and factor (co)-variances. According to Hu and Bentler (1999), the combined cut-off values are .06 for RMSEA, .09 for SRMR, and .95 or more for CFI indicate good fit. According to the goodness-of-fit indexes, the hypothesized model seems to provide moderate fit to the data.

### *Reliability*

Reliability analyses replicate the earlier findings in study 1 that the 10-item scale has high internal consistency among the subscales. Cronbach’s alpha for the behavioral subscale was .81 and .21 for the combined affective/cognitive subscale. The poor reliability of the affective/cognitive subscale is in part due to one of the problematic

cognitive items found in the EFA of study 1. When examining the item-total statistics of the affective/cognitive subscale it was found that the Cronbach's alpha of the subscale improves to .67 upon deleting item 5 from the GM scale. Even with this improvement, the subscale needs to be modified to meet the acceptable reliability criterion of .70 or greater. Thus, the behavioral subscale produced acceptable reliability but not the affective/cognitive subscale.

#### *Goal Multiplicity & Polychronicity*

Polychronicity as characterized by Bludorn and colleagues (1999) appears to relate to Goal Multiplicity. The Inventory of Polychronic Values (IPV) is a measure of preference for multi-tasking, so it was expected that the two constructs would be moderately correlated. Given that, multi-tasking is the most effective and efficient way to meet multiple-goal pursuit. Thus, individuals who prefer to pursue multiple goals simultaneously should also have a preference for multi-tasking. Consequently, a moderate, positive correlation was predicted between scores on the GM Scale and the IPV Scale, thereby providing convergent validity.

As expected, the observed correlation between Goal Multiplicity and Polychronicity was moderate and positive ( $r = .502, p < .001$ ). The results are provided in Table 2. This result thus suggests that goal multiplicity and Polychronicity are conceptually related but distinct constructs.

#### *Goal Multiplicity & Action Control*

The concept of action control was first discussed by Kuhl (1994) and the scale encompassing 3 subscales was created to measure disengagement versus preoccupation, decisiveness versus hesitation, and performance versus volatility. Conceptually, Goal



Multiplicity would be related to decisiveness and performance because under high stress of multiple goal pursuit, action control would promote or inhibit enacting intentions and emotional regulation. The importance of these relationships is evidenced by affective and cognitive items generated on the GM Scale. Preoccupation is not expected to be correlated with Goal Multiplicity because this trait would not benefit individuals under high stress that are trying to balance multiple goal pursuit. On the one hand, becoming overly occupied (preoccupation) with one goal causes the individual to sacrifice the other goals in the network. On the other hand, detaching oneself from thoughts of alternative goals (detachment) to focus on the task at hand would help an individual pursuing multiple goals but could not be used to an extreme. Based on previous research examining action control and behavioral intentions (Kuhl, 1994) the correlations observed between the GM Scale scores and subscales of the Action Control Scale provide a test of construct validity.

Preoccupation Action Control scores were not significantly correlated with GM scores ( $r = .11, p = .07$ ). Thus, individuals Furthermore, the observed correlation between Goal Multiplicity scores and Decision Action Control scores was low and positive ( $r = .221, p < .001$ ) suggesting that participants that scored high on the GM Scale also scored relatively high on the decisiveness subscale. This correlation suggests participants high in goal multiplicity are able to easily initiate work on the task at hand. Also as expected, the observed correlation between Goal Multiplicity scores and Performance Action Control scores was low and negative ( $r = -.148, p < .05$ ) suggesting that participants that scored high on the GM Scale scored relatively low on the performance subscale. This correlation also suggests that participants that reported high goal multiplicity were less likely to get

distracted when working on a necessary task. These results are provided in Table 3. Taken together, these results suggest that Goal Multiplicity assesses distinct concepts.

#### *Goal Multiplicity & Self-Control*

The extent to which an individual is able to control thoughts, emotions, impulses, behavior/performance, and habits has been termed self-control (BSCS; Tangney, Baumeister, & Boone, 2004). Goal Multiplicity may be influenced by one's ability to regulate themselves because multiple goal pursuit requires the individual to control their behavior in order to meet the goal as well as the urge to disengage from the goal when it is in conflict with other goals being pursued. Thus, it was hypothesized that there would be a moderate, positive correlation between GM scores and BSC S scores, and that this correlation would also provide another test of construct validity based on previous research in the area of self-regulation and goal-pursuit (Masciampo & Baumeister, 2010).

Contrary to expectations, the GM scores and BSCS scores produced a nonsignificant correlation. This result is provided in Table 3. It thus appears that Goal Multiplicity and Self-Control tap substantially different constructs.

#### *Goal Multiplicity & Self-Esteem*

Individual global self-esteem, which includes overall feelings of self-worth or self-acceptance, was assessed using the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965). Self-esteem was in no way expected to relate to Goal Multiplicity due to its theoretically different concept, and thus provided a test of discriminant validity.

This prediction was supported. As shown in table 3, the GM scores and RSE scores produced a nonsignificant correlation. Therefore, it appears that Goal Multiplicity is a theoretically and distinctly different construct from Self-Esteem.

### *Goal Multiplicity & Self-Efficacy*

Self-Efficacy focuses on a person's general set of expectations they carry into new situations (Sherer et al., 1982). Theoretically, self-efficacy would be relevant to multiple goal pursuit because high self-efficacy would translate into higher expectancies of success in goal pursuits. However, previous research has failed to find a relationship among self-efficacy and goal setting (Mukhopadhyay & Johar, 2005). Thus, it was hypothesized that self-efficacy would not be correlated with Goal Multiplicity. The results are provided in Table 3. As anticipated, the GM scores and Self-Efficacy scores produced a nonsignificant correlation. Thus, it seems that Goal Multiplicity is a distinct concept from Self-Efficacy.

### *Goal Multiplicity & Need for Cognition*

Need for Cognition refers to the extent to which one engages and enjoys cognitive activity and stimulation (Cacioppo & Petty, 1982). Previous research has shown that individuals high in need for cognition process information differently than those low in need for cognition (Cacioppo, Petty, & Morris, 1983). Therefore, there seems to be difference in the amount of information processed by these individuals as well as the elaboration and effort put into the processing of the information. Goal Multiplicity refers to the proclivity to pursue multiple goals simultaneously in order to facilitate achievement of all goals in the goal network. Individuals who pursue multiple goals simultaneously choose to engage in the cognitive activity that is a part of the goal pursuit, and most likely these individuals also enjoy this cognitive stimulation or else they would not pursue multiple goals simultaneously. Thus it was hypothesized that Need for

Cognition would be partially related to Goal Multiplicity. This prediction was supported. As shown in Table 3, the observed correlation between Need for Cognition and Goal Multiplicity was low and positive ( $r = .288$ ). Hence, it seems unlikely that the GM Scale and Need for Cognition Scale reflect the same underlying construct.

#### *Goal Multiplicity & Worry*

Feelings of excessive and uncontrollable worry were assessed using the Penn State Worry Questionnaire in order to determine the emotional influences on Goal Multiplicity (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). Conceptually, Goal Multiplicity should produce worry for individuals that prefer multiple goal pursuits. Thus, no correlation was expected between GM Scale scores and PSWQ scores.

As expected, the GM Scale scores and PSWQ scores produced a nonsignificant correlation. This result is provided in Table 3. Therefore, the concept of worry does not appear to influence individuals who are high Goal Multiplicity.

#### *Goal Multiplicity & Anxiety*

Anxiety is characterized by negative affect and physiological hyper arousal (Clark & Watson, 1991). Symptoms may include feelings of distress, irritability, tension, racing heart, and sweating. Anxiety is usually caused by a perceived unexpected, uncontrollable, or uncomfortable situation for an individual. Therefore, it is highly plausible that anxiety would be experienced by individuals who have a preference for multiple goal pursuit because it can be perceived sometime as an uncontrollable or uncomfortable situation. Thus, it was anticipated that GM scores would partially correlate with STAI-T scores.

This prediction was not supported. The observed correlation between GM scores and STAI-T scores was nonsignificant. From this result it would suggest anxiety does not affect individuals who score high in Goal Multiplicity.

#### *Goal Multiplicity & Grit*

Trait-level perseverance and passion for long-term goals has been recently termed grit by Duckworth and colleagues (2007). This construct, in theory, should have some overlap with Goal Multiplicity due to its focus on perseverance for goals. However, perseverance alone does not determine whether an individual would have a proclivity for multiple goal pursuit. Thus, it was hypothesized that there would be a partial correlation between GM scale scores and Grit-S scores.

Contrary to expectation, the observed correlation was not significant. This result is provided in Table 3. Individuals who scored high in Goal Multiplicity did not report being more perseverant or passionate in their long-term goals.

#### *Goal Multiplicity & Distress Intolerance*

An individual's capacity to experience and withstand negative psychological states has been termed distress tolerance and can be assessed using the Distress Tolerance Scale (Simons & Gaher, 2005). Similar to worry and anxiety, distress tolerance was expected to correlate with Goal Multiplicity. However, this prediction was also not supported. There was no correlation between GM scores and Distress Tolerance scores. Thus, it is unlikely that distress tolerance influences Goal Multiplicity and is a distinct concept.

## Discussion

The Confirmatory Factor Analysis conducted in the present study produced moderate fit. However, two problematic items affected the overall fit of the scale and suggest further modifications should be made. Specifically, reverse scored items should be modified to eliminate the possibility of producing a factor that only includes reverse-scored items. Furthermore, correlations with multi-tasking, components of action-control, and need for cognition highlight personality traits that affect multiple goal pursuit. However, none of the affective measures produced significant correlations with the GM scale scores, which was not anticipated. Overall, these results indicate individual differences exist in preference for multiple goal-pursuit strategies and should be examined further. Study 3 results also provide convergent, discriminant, and construct validity for the GM scale through the expected pattern of correlations with other personality measures. Previous research on the development of the GM Scale suggest a two factor structure, but study 3 extended the work by confirming these two factors and identifying other personality variables that play an important role in the choice to pursue multiple goals simultaneously.

## CHAPTER V

### STUDY THREE

The purpose of study 3 was to provide a behavioral validation of the GM Scale. Study 3 sought to test the hypothesis that performance on tasks requiring executive functioning would be poorer among individuals who ascribe to a particular goal orientation (multiple goal pursuit or single goal pursuit), but who are placed in situations that do not fit this orientation. Self-control was also assessed in this study using the Stroop Task in order to determine whether being placed in a situation/environment mismatch leads to self-control depletion.

## Method

### *Participants and Design*

The sample consisted of 112 undergraduates (76 women, 36 men; Mage = 19) in an introductory psychology course from Oklahoma State University. Participants completed the study to fulfill a course requirement. Pretesting qualification results were used to identify participants high and low in Goal Multiplicity. Participants high or low in GM were randomly assigned to one of two experimental conditions creating a 2 (Goal Multiplicity: high vs. low)  $\times$  2 (goal task: multi-task vs. single task) factorial design. The primary dependent variables were performance scores on a math task, a memory task, and the visual and auditory monitoring tasks (See Figure 1).

### *Procedure*

**Setting and tasks.** The methods for Study 3 followed methods used by Wang, Proctor, and Pick (2009). This manipulation requires the participant to complete two visual tasks and two monitoring tasks (one being auditory). Participants were informed that the study sought to investigate task performance on cognitive and self-regulation measures. Prior to task assignment, participants were asked if they prefer to multi-task or work on tasks sequentially in order to serve as a validation of their Goal Multiplicity Scale score; however random assignment to task condition determined if they completed the tasks sequentially or simultaneously.

The study consisted of two parts and took place in one room. The room was equipped with a computer and a monitor that was used to collect performance data on the four executive functioning tasks and the self-control task, which took approximately 30 minutes. Following the executive functioning and self-control tasks the computer was



also used to administer mood questionnaires and to collect demographic information. Participants completed the experimental procedure individually. Depending on which group the participant was randomly assigned to, the participant completed the four tasks simultaneously (multi-task condition) or sequentially (single task condition). The experiment was conducted using the SYNWORK1 (Version 2.15) software with an interface program that presented instructions. In the display each task occupied one quadrant, or window (see Appendix), shown on a 14-inch VGA color monitor. Responses were made with a Microsoft mouse operated by the right hand. The mouse controlled a cursor that was positioned on response boxes on the screen, and a response was recorded when the left button of the mouse was clicked with the index finger.

***Upper left Window: Memory task.*** A list of five letters were chosen from the alphabet (excluding the letters C, D, M, Q, and V) and were displayed in a box at the top of the window for 5 seconds. After that, it was replaced by the words “retrieve list.” When this message was displayed, clicking the mouse on the list box would result in the display of the list for another 5 seconds, and points were deducted for this retrieval. Probe letters were displayed in the box in the center of the window at a 5-second rate, with the probe removed when a response was made or after 5 seconds had elapsed. The participant’s goal was to indicate whether or not the probe was a member of the list displayed by clicking the mouse on either the “Yes” or “No” box at the bottom of the window before the probe disappeared from the screen. The payoff was 15 points for a correct response, and 5 points was subtracted from the total points for each incorrect response, including failure to respond to the probe.

**Upper right window: Math task.** Two randomly selected three digit numbers were presented. The goal was to add them together, adjusting the answer by clicking on “1” and “2” boxes located below each character of the answer that was initially set to “0000.” Clicking on the “Done” box at the bottom of the window resulted in the presentation of a new problem, as well as the addition of 10 points if the answer was correct, and subtraction of 5 points if it was incorrect. There was no time limit for the completion of each problem, and when a problem was completed, another problem was presented.

**Lower left window: Visual monitoring task.** A white marker moved from the center of a 201-pixel scale, toward either end, at a rate of 10 pixels/sec. Clicking the mouse on a box labeled “Reset” at the top of the window reset the marker to the center of the scale. The marker would reach one end after 10 sec if the participant did not respond. Points were awarded for each reset according to how far the marker was from the center. The maximum payoff was 10 points. If the marker reached the end of the scale, 2 points was subtracted from the total for every second it remains there. The goal was to prevent the pointer from reaching the end of the scale, while scoring the most points.

**Lower right window: Auditory monitoring task.** Tones of brief duration were presented at a 2.5-second rate. The tones were of low (1046 Hz) or of high (1319 Hz) pitch. The low-pitch tone occurred 80% of the time and the high-pitch tone 20% of the time. The orders of the tones were randomly determined. The goal of the task was to click the “High Sound Report” box in the window during the interval between the occurrence of a high-pitch tone and the next tone in the sequence. The payoff was 10 points for correct answers, and 10 points was subtracted for incorrect answers.

***Self-control task.*** Study 2 failed to provide support for a self-control relationship with goal multiplicity. However, previous research has shown that oftentimes chronic personality variables are only expressed under certain situations (Baumeister, 1982). Thus, varying the task manipulations in the present study may provide the optimal situation for the personality differences to be expressed. Therefore, the current study included the Stroop Task at the end of the executive functioning task to assess whether the mismatch of goal-orientation and task situation would lead to depletion effects. The Stroop task is commonly used in cognitive psychology and has been shown to be a good measure of self-control resources (Wallace & Baumeister, 2002). Specifically, participants were presented with words (names of colors) in various ink colors. Participants were instructed to report the ink color (and ignore the actual word) by pressing a key on the computer. When the word and ink color are mismatched in this way (e.g., the word “blue” in red ink), self-control is needed to override the tendency to report the word rather than the ink color the word is printed in. Thus, performance on the Stroop can be used to assess self-control resources. Participants completed a total of 80 word trials.

***Manipulation Check.*** Following the tasks of executive functioning and self-control, manipulation checks were put in place to assure all participants understood and were able to follow task instructions. Participants were asked to report if they felt the SYNWORK task was demanding. Responses to this item were given on a binary scale (1= yes, 2 = no). Participants were also asked to report how stressed and annoyed the task made them feel in addition to how successful they felt they were in accomplishing the task goals. Responses to the stress item were given on a 1 (Neither stressed nor annoyed) to 3

(Extremely stressed and annoyed) scale. Responses to the successful item were given on a -2 (Extremely unsuccessful) to 2 (Extremely successful) scale.

**Mood.** Mood valence and arousal were assessed using the Brief Mood Introspection Scale in order to examine the effects (if any) mood had on the dependent measures (BMIS; Mayer & Gaschke, 1988). The BMIS assesses current mood state by asking participants to rate how they currently feel on 16 adjectives. The scale ranges from 1 (definitely do not feel) to 4 (definitely feel) for each item.

#### *Procedure of Tasks*

At the beginning of the experiment, the participants were informed that they would be performing four tasks concurrently or simultaneously for which they would receive points, and that their goal was to maximize the amount of points they obtain in the session. A running total of points were available in the center box on the screen throughout the session as feedback, although no additional feedback about performance was provided. Payoff was only in terms of points toward the task goal of maximizing total points. Participants then were shown a printout of the screen with the four individual tasks (see Figure 1), and read about each of the four tasks and the points that were gained for each correct response and lost for each incorrect response.

The parameters were set as follows: For the memory task, the memory set was five letters; the presentation time was 5 sec; the interval between stimuli was 5 sec; the payoff for correct responses was 15. For each incorrect response, 5 points was subtracted. For the math task, the stimulus was two 3-digit numbers. For each correct answer, the payoff was 10 points; for each incorrect answer, 10 points was subtracted. For the visual and auditory tasks, the parameters were as those described above.

### *Measure of Dependent Variables.*

The measures of the dependent variables were also adapted from Wang, Proctor, and Pick (2009). Each of the four tasks yielded a performance score (total points received) that was used separately for statistical analyses.

## Results

### *Manipulation Checks*

Responses across the four conditions were compared using a Factorial Analysis of Variance (ANOVA). Participants across the four conditions appeared to be successful in following the task instructions. However, significant differences were found when comparing responses across task conditions for the demanding item,  $F(1, 99) = 13.20$ ,  $p = .001$ ,  $\eta^2 = .12$ . Contrary to predictions, participants in the single-task condition reported the tasks as more demanding ( $M = 1.65$ ,  $SD = .469$ ) than participants in the multi-task condition ( $M = 1.35$ ,  $SD = .483$ ). There were also significant differences found when comparing responses across conditions for success,  $F(1, 99) = 19.89$ ,  $p = .001$ ,  $\eta^2 = .17$ . Overall, participants in the single-task condition thought they were more successful in fulfilling the task goals ( $M = 4.08$ ,  $SD = .560$ ) compared to the multi-task condition ( $M = 3.25$ ,  $SD = 1.15$ ). There were no significant differences reported in stress or annoyance with the SYNWORK tasks. Thus, it appears that the single task condition posed more demands for participants than did the multi-tasking condition but these participants felt they were more successful in the task goals than their counterparts. When considering GM's affect on responses to the manipulation check items, the results only approached significance for the demanding item,  $F(1, 99) = 3.00$ ,  $p = .08$ ,  $\eta^2 = .03$ , such that

participants high in GM found the multi-task condition less demanding ( $M = 1.46$ ,  $SD = .508$ ) than those low in GM ( $M = 1.74$ ,  $SD = .449$ ). However, the opposite trend was not found for participants in the single-task condition. Participants low in GM found the single-task condition more demanding ( $M = 1.64$ ,  $SD = .488$ ) than those high in GM ( $M = 1.23$ ,  $SD = .429$ ).

### *Mood*

Responses across the four conditions were compared using a Factorial ANOVA to ensure that the groups did not differ in terms of their BMIS scores. As predicted, there were no significant differences among goal conditions,  $F(1,101) = 1.33$ ,  $p = .25$ ,  $\eta^2 = .01$ , or tasks conditions,  $F(1, 101) = 1.52$ ,  $p = .21$ ,  $\eta^2 = .01$ . Participants high in GM did not differ in BMIS scores ( $M = 51.54$ ,  $SD = 11.10$ ) compared to those low in GM ( $M = 49.35$ ,  $SD = 8.57$ ). Furthermore, participants in the single task condition did not differ in BMIS scores ( $M = 51.49$ ,  $SD = 9.69$ ) compared to those in the multi-task condition ( $M = 49.27$ ,  $SD = 10.12$ ). Thus, it appears there were no mood differences between participants due to goal or task condition.

### *Task preference*

Prior to task assignment, participants were asked their preference between multi-tasking or working on task sequentially in order to validate their GM scale score. As expected, GM scores significantly predicted task preference,  $\beta = .21$ ,  $t(110) = 2.36$ ,  $p < .02$ . GM scores also explained a significant proportion of variance in task preference,  $R^2 = .05$ ,  $F(1, 110) = 5.59$ ,  $p < .02$ . Thus, the GM scores were validated by participants own response to task preferences.

### *Performance Scores*

The overall memory score, math score, visual monitoring score, and auditory monitoring score were subjected to separate 2 (high vs. low)  $\times$  2 (multi-task vs. single task) Factorial ANOVAs. As predicted, the main effect of goal multiplicity was non-significant for all performance scores ( $p > .23$ ). The pattern of results is presented in Figure 3. This was expected because goal orientation alone should not produce performance differences. Both types of goal orientations should be beneficial to their users when utilized in a “fitting” situation.

As predicted, the main effect of task condition was significant for the Memory score,  $F(1,111) = 12.35$ ,  $p = .001$ ,  $\eta^2 = .10$ , the visual score,  $F(1,111) = 4.21$ ,  $p = .04$ ,  $\eta^2 = .03$ , and moderately significant for the auditory score,  $F(1,111) = 4.21$ ,  $p = .04$ ,  $\eta^2 = .03$ . There was no significant main effect for the math score,  $p > .54$ . The pattern of results is provided in Figure 3. Participants in the single task condition scored fewer points on the memory task ( $M_{\text{memory}} = 276.95$ ,  $SD = 150.22$ ) and the auditory task ( $M_{\text{auditory}} = 42.36$ ,  $SD = 40.73$ ) compared to participants in the multi-task condition ( $M_{\text{memory}} = 432.12$ ,  $SD = 297.56$ ) ( $M_{\text{auditory}} = 65.58$ ,  $SD = 94.62$ ). In addition, participants in the single task condition scored more points on the visual task ( $M = 63.93$ ,  $SD = 72.64$ ) compared to participants in the multi-task condition ( $M_{\text{visual}} = -287.33$ ,  $SD = 129.88$ )

The major prediction of study 3 was that the interaction between goal multiplicity and task condition would be significant, but this was not the case for any of the performance scores (all  $p > .31$ ). For those in the multi-task condition, it was anticipated that participants high in goal multiplicity would have fewer errors and better performance

scores than those low in goal multiplicity. For those in the single task condition, it was anticipated that participants low in goal multiplicity would have fewer errors and better performance scores than those high in goal multiplicity. Although the goal orientation/strategy ascribed by these individuals did not fit the situation, this mismatch did not seem to affect their performance on the different tasks as suggested in the nonsignificant results.

#### *Self-Control Task.*

Consistent with the nonsignificant correlation between GM scale scores and Self-Control scores found in study 2, there were also no significant differences in Stroop task performance between high and low GM,  $F(1,101) = .11, p = .74, \eta^2 = .00$ , or tasks conditions,  $F(1,101) = 2.11, p = .15, \eta^2 = .02$ . Participants in the high GM condition did not differ in Stroop task scores ( $M = 76.70, SD = 10.37$ ) compared to those in the low GM condition ( $M = 76.29, SD = 6.93$ ). Furthermore, participants in the single task condition did not differ in Stroop task scores ( $M = 77.71, SD = 3.05$ ) compared to those in the multi-task condition ( $M = 75.20, SD = 12.11$ ). Thus, it appears self-control resources were not affected due to goal or task conditions.

### Discussion

The purpose of study 3 was to serve as a behavioral validation of the Goal Multiplicity scale. It was hypothesized that the performance on tasks requiring executive functioning would be poorer among individuals who were placed in situations that did not fit their orientation. However, the results did not support this hypothesis. There were no significant differences in the performance scores across goal and task conditions nor were Stroop task performance scores affected by goal or task conditions. Furthermore,



the manipulation check questions did not follow the predicted pattern. Participants in the single task condition reported the task to be more demanding than did those in the multi-tasking condition. This was an unanticipated result that likely affected the interaction effects. These findings and implications for the scale are discussed further.

## CHAPTER VI

### GENERAL DISCUSSION

Juggling relationships with professional life and other important goals has become an everyday occurrence for most people. For example, even when a new mother wants to stay at home with her child, the pressure of maintaining financial security and progressing in her career goals may force her to place the child in daycare or return to work sooner than expected. Multiple goal pursuit has quickly become the norm and not the exception. Therefore, individual difference factors in the area of multiple goal pursuit need to be explored.

The present research sought to examine the individual differences that lie within the area of multiple goal pursuit. The development and testing of the Goal Multiplicity Scale was reported (Study 1 & 2), followed by a validation test to support the outlined construct (Study 3). The results from study 1 suggest Goal Multiplicity can be captured via self-report and is a two-dimensional trait. Study 2 tested the structural composition of the GM scale found in study 1, various forms of validity, and examined the association of the GM scale with other relevant measures to determine whether Goal Multiplicity was a unique variable distinct from alternative relevant constructs.

Results from the Confirmatory Factor Analyses suggested moderate fit of the data to the 2-factor model found in study 1. Items 5 and 6 seemed to be problematical for the

overall fit of the scale and highlight modifications should be made to the scale. Study 2 did, however, find significant correlations with multi-tasking, action-control, and need for cognition, which emphasize personality traits that affect multiple goal pursuit strategies. Furthermore, none of the affective measures were correlated with the GM scale scores suggesting emotions have little to no influence on having a multiple goal orientation. With plans to extend current research in the area of multiple goal pursuit, study 3 anticipated differences would be found in task performance for people who have a preference for a particular goal orientation but are placed in situations that do not “fit” their goal orientation. No evidence for this hypothesis was found in the behavioral validation study. However, some insight into the limitations of the study may help explain the null results.

### *Limitations*

As all new measures go through the process of modification, the results from study 2 suggest the GM scale should also be modified to better capture the concept of Goal Multiplicity. The initial scale sought to include cognitive, affective, and behavioral items. However, in study 1 the cognitive items seemed to produce the lowest reliability and double loadings in the exploratory factor analysis. Furthermore, in study 2 the confirmatory factor analysis produced significant paths for each item except items 5 and 6, which were 2 of the 3 cognitive items. It is possible that the cognitive items are problematic due to some of the wording included. For example, item 5 addresses how participants think about the many things they must accomplish. As stated, participants who do not have multiple goals could respond to this item based on their daily activities and not their major goals they are working towards, increasing error variance for each

item. Thus, it would be beneficial to future work to eliminate such wording from all scale items.

Another limitation of the scale that might have influenced the overall fit results is the inclusion of reverse-scored items. Four of the ten items were reverse-scored items and the EFA found that all reverse scored items loaded on the second factor. It is possible that including reverse-scored items increased the likelihood that all reverse scored items would load together due to measurement error. Further modification of the scale is necessary to remedy these problematic items and measurement issues.

Another major limitation of the present work is the type of task utilized for the behavioral validation. Specifically, in study 3 participants in the single task condition reported that the task was more demanding than those in the multi-task condition, which was opposite of the predicted findings. This finding along with the null results for performance scores brings attention to the problems of the task. Although the SYNWORK task provided the manipulation of goals and the task condition (single vs. multi-task), this program did not capture the goal pursuit experienced by the participants in everyday life. The concept of Goal Multiplicity highlights goal pursuits that are broad and somewhat long-term. Thus, laboratory manipulations that do not take time into effect would not capture the individual differences in multiple goal pursuit. Future research would benefit from longitudinal approaches to the concept of Goal Multiplicity.

The unexpected findings surrounding how demanding participants reported the single-task condition compared to the multi-task condition could also be explained by the concept of choice. In both the single task and multi-task condition the participants were informed that they would be completing four tasks. However, participants in the multi-

task condition were allowed to choose which task they wanted to focus their attention on and whereas those in the single task condition were forced to work on task in the order they were presented and not given any choice. Previous research has shown that task choice processes are separate from processes used for task readiness (Butler, Arrington, & Weywadt, 2011). Therefore, working on a task that the individual did not have the opportunity to select may have been enough for participants to perceive the single-task condition as more difficult.

### *Conclusion*

The concept of Goal Multiplicity showcases how personality variables such as need for cognition and multitasking interact with situational variables such as job requirements and time to produce individual differences in goal pursuit strategies. This work is not only needed but necessary in order to extend and build upon previous research that has shown individuals can balance conflicting goal pursuits without sacrificing or giving up on any of them (Cantor, Acker, & Cook-Flannagan, 1992; Emmons, 1988 Simon, 1967). The first step of extending this work has been completed with the development of the Goal Multiplicity Scale. However, revisions and modifications of the scale are necessary.

Future work would benefit from further investigation of Goal Multiplicity and its relationship with other individual difference variables. One variable in particular that would help explain the variations in Goal Multiplicity is metacognition. Work by Dunning and colleagues (2003) have highlighted the inability of people to accurately assess their skills and expertise. Thus, even when people have personality or situational factors that lead them to choose multiple goal pursuit, if they are unaware of their

incompetence this strategy would reduce the likelihood of goal achievement. Research in the area of goal pursuit has provided many insights into goal achievement but the current work highlights personality and situational factors that play a role in goal orientations that ultimately affect goal achievement.

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## APPENDICES

### APPENDIX A – ORIGINAL 9 ITEM SCALE

Please indicate the extent to which you agree or disagree with each of the following statements. Use the following 5 point rating scale. Write the number corresponding to your rating on the blank line at the end of each statement.

Strongly Disagree	Disagree	Somewhat Disagree	Neither nor Disagree	Agree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7	

1. I have a hard time focusing on just one goal at a time. \*
2. I feel like my attention is often split between several goals.
3. I feel overwhelmed by my goals. \*
4. I feel that there is not enough time in the day to work on all of my goals.
5. I am comfortable with multi-tasking.
6. When I have accomplished a goal I take time out to enjoy it. \*
7. I feel exhausted when working on more than one goal at a time. \*
8. I feel like I am juggling too many goals at once.
9. I typically take on many different tasks at the same time.
10. I must accomplish one goal before proceeding to another. \*
11. In the past, I have made progress on several goals simultaneously.
12. I feel stressed out when trying to work on more than one goal at a time. \*
13. I put forth a lot of effort when working on several goals simultaneously.
14. I often pursue numerous goals at the same time.

\* Reverse keyed item    \_\_\_ Item dropped

## APPENDIX B – 10 ITEM SCALE

Please indicate the extent to which you agree or disagree with each of the following statements. Use the following 7 point rating scale. Write the number corresponding to your rating on the blank line at the end of each statement.

Strongly		Somewhat	Neither	Agree	Somewhat	Strongly
Disagree	Disagree	Disagree	nor	Disagree	Agree	Agree
-3	-2	-1	0	1	2	3

1. I feel like my attention is often split among several goals.
2. I am comfortable with multi-tasking.
3. Working on more than one goal at a time mentally exhaust me.\*
4. I don't have to accomplish one goal before proceeding to another.
5. In the past, I have made progress on several goals simultaneously.
6. I feel stressed out when trying to work on more than one goal at a time.\*
7. I am not frustrated when working on several goals simultaneously.
8. I often pursue numerous goals at the same time.
9. I am constantly thinking about the different things I have to do.
10. I am happier when I can work on several things at one time.
11. I have trouble focusing on one thing because I often think about the many tasks I must complete.
12. I tend not to worry when working on multiple goals at one time.
13. Having several goals makes me feel ambitious.
14. I feel restless when I don't have enough goals.
15. When working on several goals, I work hard and quickly to accomplish them.
16. When working on several goals, I like to multi-task.
17. Working on one goal makes me feel underproductive.
18. Working on several goals makes me feel overwhelmed.\*

19. I prefer to work on one task at a time.\*
20. I prefer to pursue multiple goals at one time.
21. I prefer to focus my attention on one goal at a time. \*
22. I prefer to split my attention across multiple tasks simultaneously
23. When I have lots of tasks to complete, I find it hard to focus on just one task at a time.\*
24. When I have a big task coming up, I become easily distracted by the other things in my life that need to be done.
25. I feel better when I can work on things one at a time.\*

\* Reverse keyed item \_\_ Item dropped

Table 1

*Factor Loadings for Exploratory Factor Analysis with Promax Rotation of Goal**Multiplicity Scale*

Item	Behavioral GM	Affective/Cognitive GM
I am comfortable with multi-tasking (GM1)	<b>.64</b>	.02
I often pursue numerous goals at the same time (GM4)	<b>.76</b>	-.11
When working on several goals, I like to multi-task (GM7)	<b>.75</b>	-.01
I prefer to pursue multiple goals at one time (GM9)	<b>.65</b>	.06
I feel stressed out when trying to work on more than one goal at a time (GM3R)	.32	<b>.56</b>
I am constantly thinking about the different things I have to do (GM5)	.54	<b>-.60*</b>
I have trouble focusing on one thing because I often think about the many tasks I must complete (GM6)	.08	<b>-.69</b>
Working on more than one goal at a time mentally exhaust me (GM2R)	.35	<b>.44</b>
Working on several goals makes me feel overwhelmed (GM8R)	.35	<b>.55</b>
When I have lots of tasks to complete, I find it hard to focus on just one task at a time (GM10R)	-.06	<b>.67</b>
Eigen values	3.89	2.01
% of variance	33.95	14.82

*Note. Factor Loadings > .40 are in boldface. \*Item cross loaded on both factors, higher loading used to for interpretation.*

Table 2

*Fit Indexes and Chi-Square Difference Tests from Confirmatory Factor Analyses of the Goal Multiplicity Scale*

	Study 2 (n = 234)
Test	
Test of 2-factor model/uncorrelated errors within facets	
$\chi^2$	303.90
<i>df</i>	34
CFI	.85
RMSEA	.18
SRMR	.12

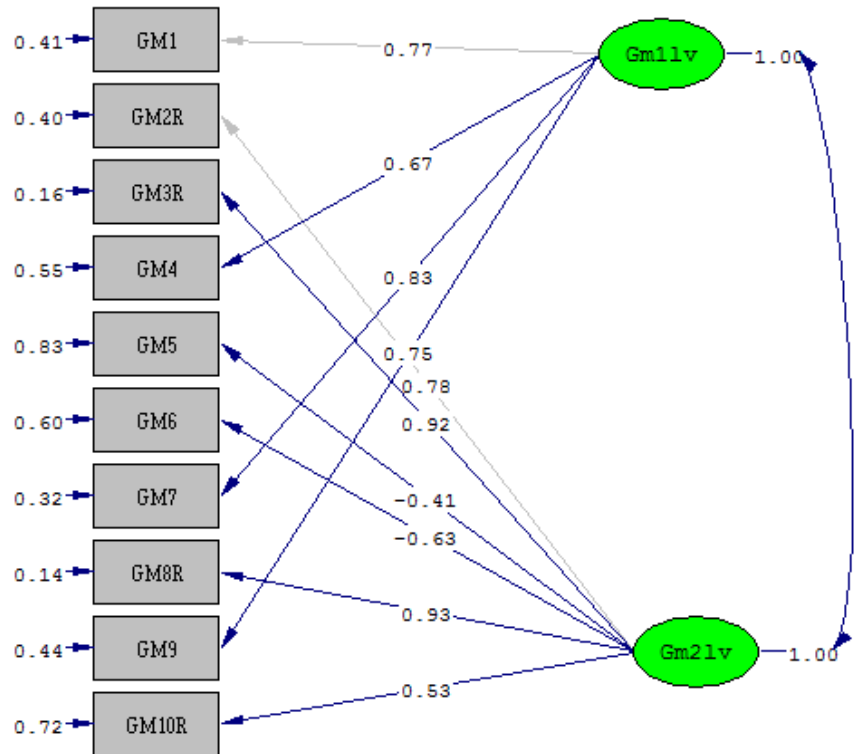
\*  $\chi^2$  difference is significant at  $p < .001$ .

Table 3

*Correlations of Goal Multiplicity Scale with other relevant personality measures*

Personality Measure	Goal Multiplicity Scale
Polychronicity (IPV) Scale	.50*
Action Control Scale	
Failure action orientation	.11
Decision action orientation	.22*
Performance action orientation	-.14*
Brief Self-Control Scale	-.08
Self-Esteem Scale	.05
Self-Efficacy Scale	-.01
Need for Cognition Scale	.28*
Penn State Worry Questionnaire	-.08
Trait Anxiety Scale	-.04
Grit Scale	.01
Distress Intolerance Scale	.06

*Note.* For all scales, higher scores are indicative of more extreme responding in the direction of the construct assessed. \*  $p < .01$



Chi-Square=276.77, df=34, P-value=0.00000, RMSEA=0.175

Figure 1. Confirmatory Factor Analysis of Goal Multiplicity Scale. Completely standardized robust maximum likelihood parameter estimates. The residual variance components (error variances) indicate the amount of unexplained variance for each scale item. \*  $p < .05$

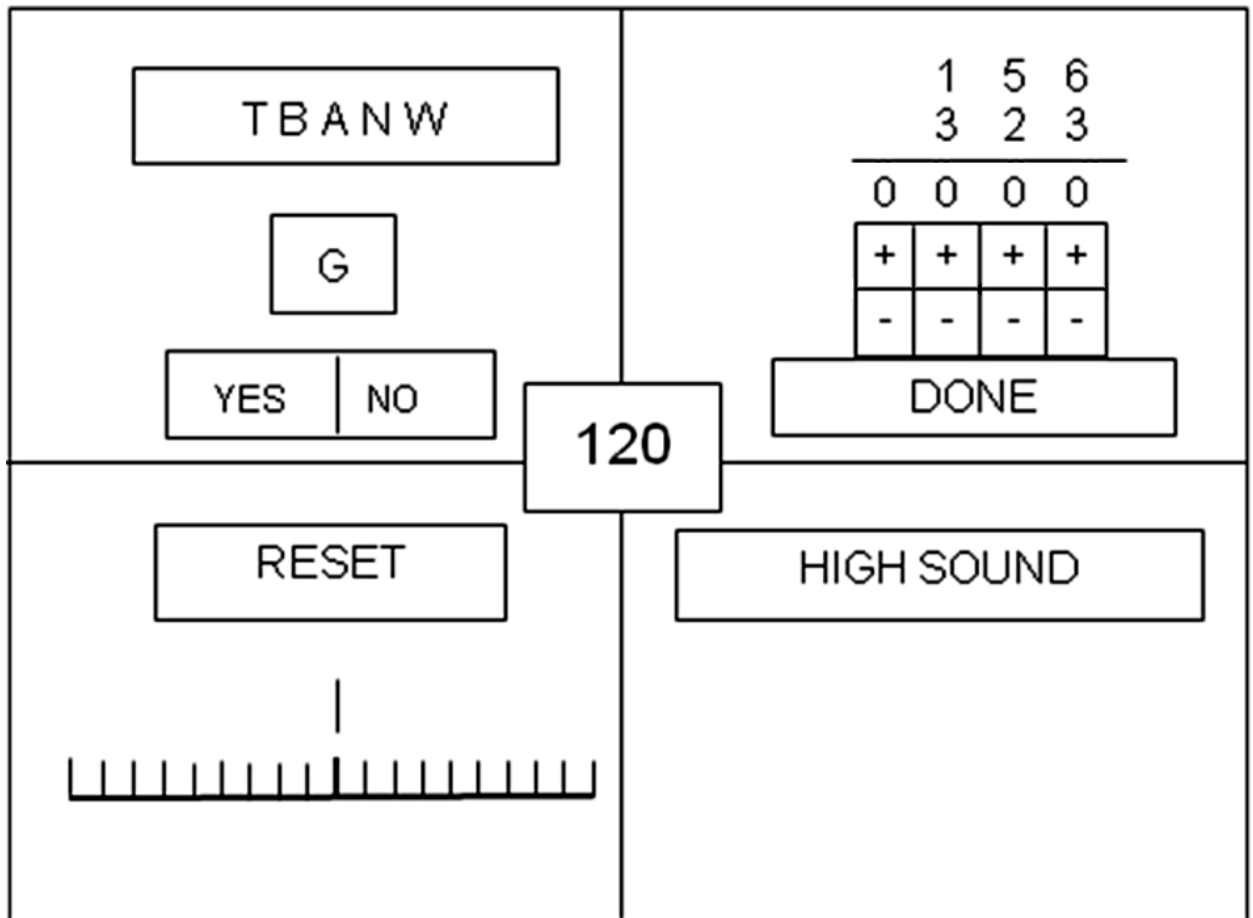


Figure 2. Depiction of display for SYNWORK1. Total points are shown in the centered box. The memory task is in the upper left quadrant, the math task in the upper right quadrant, the visual monitoring task in the lower left quadrant, and the auditory monitoring task in the lower right quadrant.



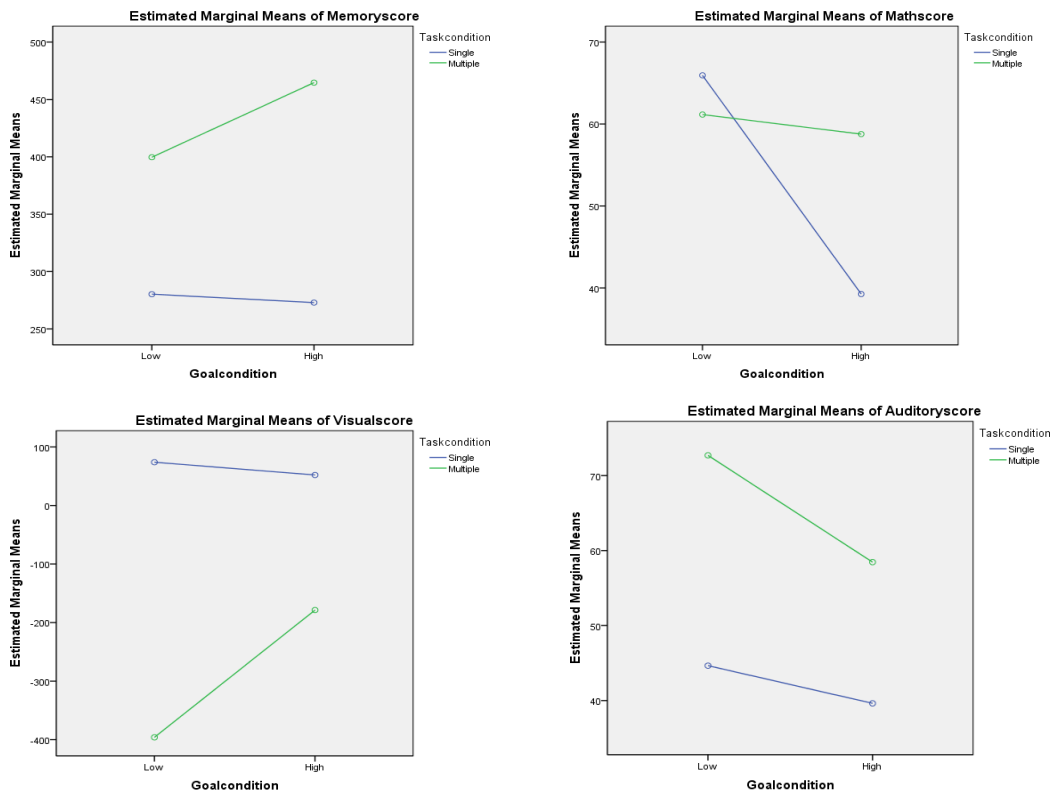


Figure 3. Interaction effects for performance scores

VITA

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Scope and Method of Study:

Previous research has examined concepts such as goal systems, networks, and resource allocation in multiple-goal pursuit but one area that has received little attention is goal orientation. The present research discusses the development of the Goal Multiplicity Scale (GM) using an Exploratory and Confirmatory Factor Analysis followed by a behavioral validation study using an experimental design. The GM scale assesses an individual's proclivity to pursue multiple goals simultaneously in order to meet all goals.

Findings and Conclusions:

The development and testing of the Goal Multiplicity Scale was reported (Study 1 & 2), followed by a validation test to support the outlined construct (Study 3). The results from study 1 suggest Goal Multiplicity can be captured via self-report and is a two-dimensional trait. Results from the Confirmatory Factor Analyses suggested moderate fit of the data to the 2-factor model. In spite of problematic study 2 did find significant correlations with multi-tasking, action-control, and need for cognition, which emphasize personality traits that affect multiple goal pursuit strategies. With plans to extend current research in the area of multiple goal pursuit, study 3 anticipated differences would be found in task performance for people who have a preference for a particular goal orientation but are placed in situations that do not "fit" their goal orientation. No evidence for this hypothesis was found in the behavioral validation study.

The concept of Goal Multiplicity showcases how personality variables such as need for cognition and multitasking interact with situational variables such as job requirements and time that produce individual differences in goal pursuit strategies. This work is not only needed but necessary in order to extend and build upon previous research that has shown individuals can balance conflicting goal pursuits without sacrificing or giving up on any of them. The first step of extending this work has been completed with the development of the Goal Multiplicity Scale. However, revisions and modifications of the scale are necessary. This work has implications for goal achievement in that it can shed light upon both personality and situational factors that affect goal pursuits.

ADVISER'S APPROVAL: Edward Burkley, Ph.D.