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Effects of a 10-week mental skills training intervention infused into a pre-existing English composition course

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EFFECTS OF A 10-WEEK MENTAL SKILLS TRAINING INTERVENTION INFUSED INTO A PRE-EXISTING ENGLISH COMPOSITION COURSE

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ABSTRACT

Academic performance is a complex phenomenon that is shaped by a wide variety of factors which extend beyond the traditional notions of academic skills and content knowledge (Rosen et al., 2010). Dweck and colleagues (2011) – in coining the term *academic tenacity* - have suggested that educational interventions which target non-cognitive skills (such as goal-setting, motivation, and resilience) can have transformative effects on students' experience/achievement. However, few in academia have taken Dweck and colleagues (2011) advice and developed interventions specifically targeting this skill set. In this study, "academic tenacity" was taught by infusing mental skills-related material into a pre-existing 10-week long English composition course. The class was taught by a member of the English department faculty who led students through a series of readings and assignments related to grit, growth-mindsets, and mental toughness. A sport psychology trained graduate assisted by providing one-on-one feedback on these concepts during each class session. Participants included students in the MST themed English course (n = 50) and students in a companion English course as a control (n=14). Instruments were administered to both conditions in pre-post format and included the MTQ-15 (Pickering, 2015), the Grit-S (Duckworth & Quinn, 2009), and the CNAAQ-2 (Biddle, Wang, Chatzisarantis & Spray, 2003). Results revealed that students in the themed course improved on all of the non-cognitive skill variables of interest and on some of the academic success indicators relative to students in the control condition. This suggests that the "infusion" of MST into undergraduate college courses may be a viable mechanism by which to improve student cognitions, and to a lesser extent, student academic performance.

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Chapter 1

Introduction

Academic performance is a complex phenomenon that is shaped by a wide variety of factors which extend beyond the traditional notions of academic skills and content knowledge (Rosen, et al., 2010). While this statement may seem obvious, especially to those in the professional academic community, the research supporting this notion is still in an emergent stage. It wasn't until the early 2000's Nobel prize-winning economist James Heckman (Heckman & Rubinstein, 2001) popularized the term *non-cognitive skills, w*here he first presented the argument that factors such as motivation, time management, and self-regulation are critical for positive life outcomes (Heckman referred to these factors as "non-cognitive" because they are not measured by commonly administered cognitive tests such as IQ or academic examinations).

Heckman's work has spurred a wide range of subsequent studies where non-cognitive attributes have been shown to be related to successful academic outcomes. In a comprehensive review of many of these works, Farrington and colleagues (2012) identified a host of non-cognitive factors which appear to influence academic performance including: persistence, resilience, grit, goal-setting, help-seeking, cooperation, conscientiousness, self-efficacy, self-regulation, self-control, self-discipline, mindsets, effort, work habits, and organization. More specifically, Duckworth and Seligman (2005) suggested that academic performance is dependent in large part on students' self-control. They claimed that measures of self-discipline are far more predictive of positive academic outcomes than are measures of IQ. According to Duckworth, Peterson, Mathews and Kelly (2007) the most impactful of these correlates

of self-discipline is “grit” – which can be defined as one’s passion and perseverance for achieving long term goals. Further, Dweck and colleagues (2011) expanded on these notions of the importance of non-cognitive skills by coining the term *academic tenacity* as one of the keys to academic achievement. They suggested educational interventions and initiatives which target non-cognitive factors can have transformative effects on students’ experience and achievement and may have long-lasting effects on core academic outcomes such as GPA and test scores.

Thus, it’s clear that in addition to content knowledge and study skills, students must develop sets of “non-cognitive” behaviors, skills, attitudes, and strategies in order to perform well academically. However, few in academia have taken Dweck and colleagues (2011) advice and developed interventions which specifically target this skill-set - despite the apparent need for new curricular models. One such model, Mental Skills Training (MST), has been used extensively in sport and military environments for years, is rooted in “non-cognitive” theory, and may provide a useful platform to address these concerns.

The idea behind mental skills training is to teach non-cognitive skills (e.g., goal-setting, self-confidence, coping skills, energy management, concentration, motivation, etc.) to performers with the aim of enhancing both psychological functioning and human performance. This paradigm has been widely applied and confirmed in competitive sport contexts (e.g., Gould., Dieffenbach & Moffat, 2001; Greenleaf, Gould & Dieffenbach, 2001; Meyers, Whelan & Murphy, 1996) as well as in the military (e.g., Hammermeister, et al., 2010; Hammermeister, Pickering & Lennox, 2011; Hammermeister, et al., 2012). For example, Hammermeister and colleagues (2010) conducted a large-scale randomized control trial (n = 2566) using MST techniques with basic trainees in the U.S. Army and

found small, but significant, effects revealing better use of mental skills, mental health, and improved performance for soldiers in the treatment condition relative to controls.

Since MST has shown its' utility in both sport and military settings, it is surprising the application of MST-related training in academic settings has been relatively unexplored. In one of the very few data-based intervention studies utilizing MST as a protocol for enhancing academic performance Hammermeister and colleagues (2012) found that first generation college students exposed to 10-weeks of MST material scored higher on a variety of indicators of mental fitness, stress hardiness, and academic success compared to peers in a control condition. A follow-up study by Hammermeister in 2015 using college students enrolled in an undergraduate English course utilized a more complex intervention and found that students exposed to an experimental curriculum which emphasized Angela Duckworth's (2007) concept of "grit" faired better on MST and academic success related variables than peers in alternative treatment conditions. The major conclusion from this study was that "dose" (i.e., amount of time exposed to the intervention) was a key mechanism which drove the advances in success related cognitions.

Purpose Statement

Given the paucity of research in the academic setting, the objective of the present study was to expand on Hammermeister et al.'s (2012b; 2015) previous work with college students and further determine if sport-related mental skills can be utilized as a training framework to enhance the mental skills, academic motivation, and study skill habits of undergraduate college students enrolled in an introductory English composition course. Specifically, this study utilized the aforementioned "grit" curriculum as our experimental condition but also raised the "dose" of exposure to MST-related concepts by providing

supplemental individual coaching to the intervention group by a sport psychology trained graduate student.

Delimitations and Limitations

This study was delimited to participants enrolled in English 101 courses at Eastern Washington University. Further, this mixed-methods study had two obvious potential limitations. First, this study utilized a new instrument to measure mental toughness (the MTQ-15 – described below) for which validity and reliability have yet to be shown. Second, our use of a quasi-experimental design limited our ability to make cause / effect inferences.

Operational Definitions

Mental toughness: Mental toughness was operationalized by a score on the Mental Toughness Questionnaire (MTQ-15; Pickering, 2015).

Mindset: Mindset was operationalized by a score on the Conceptions of the Nature of Athletic Ability Questionnaire Version 2 (CNAAQ-2; Biddle, Wang, Chatzisarantis & Spray, 2003).

Grit: Grit was operationalized by a score on the Short Grit Scale (Grit-S; Duckworth & Quinn, 2009).

Coping: Coping was defined by students score on the Coping Inventory for Task Stress (CITS; Matthews & Campbell, 1998).

Study habits: Study habits will be defined by students score on the Revised Study Process Questionnaire (R-SPQ-2F; Biggs, Kember, & Leung, 2001).

Study skills: Study skills was defined by a score on the Study Skills Self-Assessment: University of Central Florida (UCF).

Hypotheses

There were six testable null hypotheses that were formulated:

H_0: There will be no significant difference on mindset between the students who receive exposure to mental fitness skills and the students who do not.

H_0: There will be no significant difference on grit between the students who receive exposure to mental fitness skills and the students who do not.

H_0: There will be no significant difference on study habits between the students who receive exposure to mental fitness skills and the students who do not.

H_0: There will be no significant difference on coping skills between the students who receive exposure to mental fitness skills and the students who do not.

H_0: There will be no significant difference on mental toughness between the students who receive exposure to mental fitness skills and the students who do not.

H_0: There will be no significant difference on study skills between the students who receive exposure to mental fitness skills and the students who do not.

Exploratory Question

Of further interest, the present study hoped to show the occurrence of mental skill language in students' writing. Thus, the following exploratory question was also examined:

Do students exposed to the experimental condition reference the importance of mental skill use in their writing more frequently than peers in a control condition?

Significance of Study

The efficacy of MST interventions in sport and military settings has become relatively well established, however, this degree of validation is not yet the case in higher education. This study will attempt to bridge this gap in the literature through the delivery

of a robust MST intervention with college students enrolled in a freshman level English course. The findings from our study may be informative for college teachers and administrators wishing to enhance students' non-cognitive skills through the slight modification of already pre-existing English courses taught at most universities in the United States.

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Chapter 2

Review of Literature

This section will give an in-depth background on the origins of mental skills training, how they can be taught, what interventions have been successful thus far, and how these interventions can be improved.

Origins of Mental Skills

Coleman Griffith is widely regarded as the father of sport psychology in the United States (Gould & Pick, 1995; Green, 2003; Kroll & Lewis, 1970). Griffith was a graduate student in 1918 at the University of Illinois when he initiated a series of informal observations into the nature of psychological factors involved in basketball and football (Gould & Pick, 1995). In 1925, the University of Illinois funded the first sport psychology laboratory in the United States and Griffith was appointed the director in the research areas of learning athletic skills, psychomotor skills and personality variables (Gould & Pick, 1995; Kroll & Lewis, 1970). This laboratory flourished, but in 1932 Griffith's lab was closed due to lack of funding (Gould & Pick, 1995). In 1938 Griffith was hired by the Chicago Cubs baseball team to be the team sport psychologist and examine player ability, baseball skill learning, personality, leadership, and social psychological factors influencing performance. (Gould & Pick, 1995; Green, 2003). Thus, Griffith was the first to start the systematic exploration and application of mental training which has continued, in various ways, until the present day.

After Griffith's groundbreaking efforts, mental training suffered a bit of a lull with only a small number of practitioners and researchers engaging in substantial systematic efforts. For example, in the 1940's Dorothy Yates worked with the boxing

team at San Jose State College where she worked with athletes on a number of performance enhancement techniques – with a special emphasis on progressive relaxation (Yates, 1943). Bruce Ogilvie and Thomas Tutko, in their classic work, *Problem Athletes and How to Handle Them* (1966), were among the first to suggest that coach behaviors should be the primary consideration upon which all other techniques for developing athlete mentality should depend. Richard Suinn engaged US Ski Team members during the early 1970's and developed an imagery based technique – visual motor behavior rehearsal – which proved useful for Winter Olympians and provided some much needed traction for the use of mental skills in the sport environment (Suinn, 1973). However, it's safe to say that the use of mental skills in sport didn't become a primary focus until after the Soviet Union had great success at the 1976 Montreal Olympics. The eastern bloc countries attributed much of their success to the integration of mental training skills into the athletes' preparation for the competition (Ryba & Wright, 2005; Stambulova, Wrisberg, & Ryba, 2006). This laid the foundation for the U.S. Olympic Committee (USOC) to integrate sport psychology into athletic programs and provide psychological support services for U.S. Olympic athletes at the 1984 Olympics in Los Angeles (Ryba & Wright, 2005). The 1984 Olympics utilized 11 sport psychologists providing the following mental training services: concentration, coach-athlete communications, crisis management, goal setting, relaxation, group cohesion and morale, self-regulation, stress management, self-talk, thought management and visualization (Suinn, 1985).

As sport psychology advanced, it grew along two main branches of emphasis: academic and practicing. Academic sport psychology is characterized by its concern with applying the rules of science in a way considered acceptable among behavioral

researchers while practicing sport psychology focused on developing psychological skills training (PST) programs (Suinn, 1985) which emphasized helping athletes learn emotional control (especially anxiety and anger), attention skills, goal-setting skills and interpersonal skills (Suinn, 1985). These two branches eventually converged into one with the understanding that the field of sport psychology can acquire knowledge much more rapidly by developing solutions to practical problems, such as PST programs for athletes, as long as the solutions are based on validated experiential knowledge (Suinn, 1985). This convergence of thinking led to the formation of the Association of Applied Sport Psychology (AASP) in 1985, two new journals being established (Sport Psychologist 1987 and the Journal of Applied Sport Psychology 1989), division of Exercise and Sport Psychology in the American Psychological Association being established in 1987, certification program for sport psychology consultants by AASP in 1991 and numerous books focused on mental training interventions (Vealey, 2007). These developments have set the stage for the modern era of sport psychology which emphasizes rigorous standards for both researchers and practitioners.

Mental Skills Training

The objective of mental skills training (MST) is to assist sport participants in the development of mental skills to achieve performance success and well-being (Vealey, 2007). Burton & Raedeke (2008) suggested that MST is a consistent and systematic utilization of mental training tools (i.e. goal-setting, self-talk) to facilitate the enhancement of mental skills (i.e. motivation, self-confidence). Further, since MST is a systematic approach it takes time, effort and patience to learn the skills. Specifically, MST is developed in three phases. The first phase, the education phase is where an

awareness of mental strengths and weaknesses is developed, rationales for learning a skill is provided and information about what the skill is and how it's developed is provided (Burton & Raedeke, 2008). The second phase is the acquisition phase where skill basics are developed (Burton & Raedeke, 2008). While the last phase, the implementation phase is where extensive practice and execution of the skills take place (Burton & Raedeke, 2008). Ultimately, the process of enhancing mental skills is similar to teaching the physical tools and skills in a sport (Burton & Raedeke, 2008). One would build their fundamentals first, followed by practicing them and then moving on to applying them in real-life situations.

Mental Training Tools

Mental training tools are the methods utilized to develop individuals' mental skills (Burton & Raedeke, 2008). Specifically, Burton & Raedeke (2008) identified the four most utilized mental training tools as goal-setting, imagery, self-talk and relaxation/energization. The following section will describe the methods utilized to implement these mental training tools.

Goal-setting. A goal can be defined as the object or aim of any action (Locke & Latham, 2002; Locke & Latham, 2006) and facilitates focus toward what skills a person will need to accomplish the goal (Locke & Latham, 2002). It is suggested that individuals' who set goals usually increase their effort when trying to be successful in a task (Burton & Weiss, 2008; Locke & Latham, 2002; Lock & Latham, 2006). Further, when setting goals, individuals whose goals are specific and difficult have shown higher levels of performance than those that do not set goals or vague goals (Burton & Weiss, 2008).

Locke & Latham (1985) indicated setting difficult, short-term goals led to better performance, facilitated achievement for long-term goals and increased the individuals' effort, persistence, motivation and attention. Further demonstrating the many advantages goal- setting has to offer such as directing focus, increasing effort, persistence, self-confidence and influencing performance positively (Burton & Weiss, 2008; Locke & Latham, 2002; Locke & Latham, 2006). The following section will focus on types of goals that facilitate positive outcomes and the widely utilized goal-setting model that was developed by Burton & Weiss (2008).

Process, performance and outcome goals. Performance has been shown to be influenced by setting process, performance and outcome goals. Process goals are aimed to influence form, techniques or strategies such as running form or study habits (Burton & Weiss, 2008; Hardy, 1997; Kingston & Hardy, 1997). These goals assist in reducing anxiety by focusing attention on the short term aspects of a larger task that one can control. Performance goals are specific to the individuals' personal performance such as a final time in the 400-meter dash or a final grade on a test (Burton & Weiss, 2008; Hardy, 1997; Kingston & Hardy, 1997). Thus, outcome goals are the final product, such as winning the contest or passing a class (Burton & Weiss, 2008; Hardy, 1997; Kingston & Hardy, 1997). However, while outcome goals can help facilitate long-term goal focus, if an individual only sets outcome goals, it can potentially lead to problematic views of confidence (Burton & Weiss, 2008; Hardy, 1997; Kingston & Hardy, 1997). Whereas, performance and process goals are more controllable and flexible, thus promoting positive performances and enhancing individuals' motivation to set specific expectations for themselves rather than depend on others (Burton & Weiss, 2008; Hardy, 1997;

Kingston & Hardy, 1997). Further, these types of goals assisted in setting the guidelines for the goal-setting styles developed in the competitive goal setting model established by Burton & Weiss (2008).

Competitive goal setting model (CGS). The first CGS model was developed in 1992 and expanded to the most recent version CGS-3 (Burton & Weiss, 2008). Burton's first CGS model shows the process of motivation and self-evaluation of one's goals. The CGS-3 model has become increasingly convinced that focusing on process and performance goals rather than outcome goals is the most important fundamental goal concept in sport (Burton & Weiss, 2008). This new model is based on the belief that one's ability or intelligence determines one's goal orientation, thus facilitating perceived ability and fostering three distinct goal setting styles: performance-orientated, success-oriented, and failure-oriented (Burton & Weiss, 2008). Burton & Weiss (2008) believe that these goal-setting styles along with the situational factors (i.e. situation type, activity importance, ask complexity, performance expectancies) will influence the goals that an individual sets.

Performance oriented goal-setters. A performance-oriented (PO) individual will give consistently high effort to promote maximum learning and improvement (Burton & Weiss, 2008). Thus, PO individuals prefer difficult tasks and will select learning opportunities even if there is a risk of displaying mistakes (Burton & Weiss, 2008). Further, PO individuals view their success being attributed to high effort while failure is due to low effort (Burton & Weiss, 2008). Thus contributing to PO individuals tending to be positive and optimistic, responding to failure with increased effort (Burton & Weiss, 2008).

Success oriented goal-setters. A success-oriented (SO) individual will only give as much effort as needed to win/complete a task and demonstrate positive social comparison (Burton & Weiss, 2008). Thus, SO individuals prefer moderately difficult tasks and will sacrifice learning if a chance of error could occur (Burton & Weiss, 2008). Further, SO individuals demonstrate a high ability to perform the task due to socially comparing well to others (Burton & Weiss, 2008). Thus contributing to SO individuals usually possessing positive attitudes, but responding to failure with increased effort just enough to win or complete the task (Burton & Weiss, 2008).

Failure oriented goal-setters. A failure-oriented (FO) individual tends to avoid all competition for the fear of displaying low ability (Burton & Weiss, 2008). Thus, FO individuals prefer easy tasks or very hard tasks so that they easily have an excuse for the outcome (Burton & Weiss, 2008). Further, FO individuals will sacrifice learning to avoid displaying low ability, thus attributing their success to external factors (i.e. luck or an east task) or failure due to low ability (Burton & Weiss, 2008). FO individuals tend to be negative and pessimistic thus responding to failure by usually giving up or dropping out (Burton & Weiss, 2008).

Burton & Weiss (2008) further suggested that goal commitment and feedback are two important moderators that potentially effect goal setting styles in the CGS model. Goal commitment is suggested as most important when goals are specific and difficult further increasing commitment when goals are perceived as important and attainable (Locke & Latham, 2002; Locke & Latham, 2006). For instance, an individual who is involved in the goal-setting process is more likely to commit to their goals, have input in

developing effective goal strategies and more likely to attain these goals than those who don't set goals (Burton & Weiss, 2008).

Feedback is indicated to enhance an individual's ability to be accountable when working towards a goal (Locke & Latham, 2002; Locke & Latham, 2006). Goals that are set with receiving feedback are shown to be more effective in increasing individuals' motivation (Burton & Weiss, 2008; Locke & Latham, 2002; Locke & Latham, 2006). Further, feedback allows the ability to keep goals flexible for adjustments thus increasing the chances of the goal being completed (Burton & Weiss, 2008; Locke & Latham, 2002; Locke & Latham, 2006).

Imagery. Vealey & Walter (1993) defined imagery as using all of one's senses to recreate or create an experience in the mind. Involving all of one's senses assists individuals in creating the most vivid images. Thus, the more vivid the image, the more effective imagery will be. For instance, individuals experiencing anxiety must be able to recreate the emotions in their minds in order to start reducing the triggers (Vealey & Walter, 1993). In order to accomplish this, two perspectives of imagery were defined: internal imagery, where an individual sees the image from behind their own eyes as if they were inside their body and external imagery, where an individual sees the image from outside their body such as a video recorder (Vealey & Walter, 1993).

These two perspectives have assisted imagery in facilitating many benefits including enhancing physical skills (i.e. learning skills, practicing skills, problem solving), enhancing perceptual skills (i.e. learning strategies, practicing strategies, problem solving) and enhancing psychological skills (i.e. emotion control, stress management, goal-setting, self-confidence, concentration) (Hall et al., 2009; Murphy,

Nordin & Cumming, 2008; Vealey & Walter, 1993). Further, research conducted supports the notion that performance increases positively when imagery is utilized before, during or after performance appropriately or included in other mental training programs (Hall et al., 2009; Martens, 1982; Munroe-Chandler, Hall, Fishburne, & Shannon, 2005; Munroe-Chandler, Hall, C., Fishburne, & Hall, N., 2007; Kendall, G., Hrycaiko, Martin, & Kendall, T., 1990). There are four common theories that are widely utilized for imagery that will be discussed in this section: psychoneuromuscular, symbolic learning, bioinformational and attention-arousal set.

Psychoneuromuscular theory. Psychoneuromuscular theory states that vivid, imagined events produces stimulation to the muscles that is similar to that produced by physical execution of the event (Murphy, Nordin, & Cumming, 2008; Vealey & Walters, 1993). Edmund Jacobson (1930), the first to examine this theories accuracy, found that imagining the movement of bending the arm, created contractions in the flexor muscles of the arm. Further increasing validity of this theory, Hale (1982) found that individuals using internal imagery demonstrated increased activity of the biceps muscle during an imagined dumbbell curl. Thus, if individuals actually perform the movements or just imagine themselves performing them vividly, similar pathways to the muscles are utilized. However, the research for this theory does support imagery producing low levels of muscle stimulation, but needs more support to say it facilitates performance.

Symbolic learning theory. Symbolic learning theory suggested that imagery facilitates performance by helping individuals code their movements into symbolic components, making the movements more familiar and maybe more automatic (Murphy, Nordin, & Cumming, 2008; Vealey & Walters, 1993). For example, Sackett (1934)

demonstrated that performance on a finger-maze task improved after rehearsing the movement patterns involved using imagery. Thus, demonstrating that it is possible that imagery enables individuals to become more familiar with symbolic or cognitive aspects of the skills they will perform (Murphy, Nordin, & Cumming, 2008). However, symbolic learning has been criticized for its inability to explain why imagery enhances strength and motor tasks (Murphy, Nordin, & Cumming, 2008).

Bioinformational theory. Bioinformational theory suggests that individuals respond to imagery through programming personalized and appropriate responses to specific situations thus creating an individuals' response set (Murphy, Nordin, & Cumming, 2008; Vealey & Walter, 1993). For instance, Hecker & Kaczor (1988) discovered that heart rates increased when softball players imagined a competitive anxiety scene that included response propositions that facilitated anxiety. Furthermore, Pietrini et al. (2000) discovered that participants experienced an increase in anger, frustration, anxiety and a significant increase in blood pressure when imagining scenes that involved aggressive behavior compared to an emotionally neutral scene. These studies findings support the notion that bioinformational theory has an influence on performance.

Attention-arousal set theory. Attention-arousal set theory suggested that imagery causes individuals to optimize arousal and focus their attention on relevant cues prior to the task at hand (Murphy, Nordin, & Cumming, 2008; Vealey & Walters, 1993). For example, a sprinter may use imagery prior to their race to either pump themselves up or calm themselves down thus focusing their attention on the particular strategy to win the race. When the individual focuses their attention on a set strategy, this theory has been

suggested to facilitate performance by occupying the majority of the individual's attention capacity so that task-irrelevant thoughts/images are prevented from disrupting the ongoing priming of the muscles for action. (Grouios, 1992).

Self-Talk. Hackfort & Schwenkmezger (1993) defined self-talk (ST) as "an internal dialogue in which individuals interpret feelings and perceptions, regulate and change evaluations and cognitions and give themselves instructions and reinforcement" (p. 355). In simpler terms, ST refers to any statements individuals make either internally or externally to themselves. ST is categorized as either instructional or motivational. Instructional ST are statements related to concentration, technical information and tactical decisions (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004). Whereas motivational ST are statements related to building confidence, how much effort is put in and positive moods (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004).

Thus, ST can be either positive or negative. Positive ST assists individuals in staying focused, straying from dwelling on past mistakes, and disabling projecting too far into the future (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004). Research conducted suggests that the benefits of positive ST are legion from attention control to building self-efficacy (Bunker, Williams & Zinsser, 1993; Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004; Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2011). Whereas Negative ST leads to anxiety production and can result in individuals' labeling themselves negatively (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004). Self-labeling is problematic as it can be destructive of one's mental health (Ellis, 1988), perhaps the genesis of depression (Seligman, 1991). The following section will discuss the most utilized techniques to combat negative self-talk.

Thought stoppage. This technique eliminates counterproductive thoughts by using a trigger word to interrupt the thought (Bunker, Williams & Zinsser, 1993). For instance, if an individual is having an issue with test anxiety and thinks that they will fail, then the individual can use thought stoppage by tapping their pencil each time they thought something negative thus assisting in making the individual aware of those thoughts. However, in order for this theory to be of assistance, one must be able to recognize negative thoughts and be motivated to stop them.

Countering. Bunker, Williams & Zinsser (1993) define countering as the ability for an individual to use facts and reasons to refute the negative beliefs and assumptions that lead to their negative thoughts. This technique is utilized to allow the individual to argue against their negative thought instead of simply accepting it.

Reframing. Reframing is the process of transforming a negative thought into a strength or possibility by viewing it in a different way (Gauron, 1984). Research has shown that this technique allows the individual to decide how to use the thought to their best advantage without making them ignore something that troubles them (Burton & Raedeke, 2008; Gauron, 1984; Hughes, Gourley, Madson, & Blanc, 2011).

Identifying irrational and distorted thinking. Ellis (1982) identified four basic irrational beliefs that effect individuals' progress and satisfaction: (1) an individual must at all time perform outstandingly well, (2) others whom an individual hold significant to them have to approve and love them, (3) everyone has to treat the individual kindly and fairly and (4) the conditions of the individual's life must be arranged so that they get what they want when they want. Ellis demonstrated that these types of thoughts will have negative influences on performance, self-confidence and the individuals' own self-

concept. Thus, Ellis believes that individuals' can learn to change these beliefs by acknowledging their negative thoughts and learning to recreate them into positive thoughts thus changing the response to the trigger (Ellis, 1982; Ellis & Dryden, 1987).

Relaxation & Energization. The key in relaxation and energization is accepting the fact that one has control over his/her own behavior and that arousal allows one to learn and develop the skills/strategies necessary to consciously regulate his/her responses to maintain an optimal performance level (Harris & Williams, 1993). Thus, Harris & Williams (1993) suggested it is important individuals learn to relax first before moving on to energization exercises. However, in order for relaxation techniques to be effective, individuals' must be aware of their breathing. The most common breathing techniques are rhythmic breathing (inhale a breath for 4 counts, hold for 4 counts and then exhale for 4 counts and repeat), complete breath (individuals imagine their lungs have three parts and they need filled with oxygen one by one), and concentrated breathing (individuals' focus on their breathing rhythm) (Harris & Williams, 1993). Once an individual has become aware of their breathing, relaxation techniques can be implemented.

There are two categories of techniques for relaxation: (1) muscle to mind techniques established by Jacobson (1938) commonly termed muscle relaxation that trains the muscles to become sensitive to tension and then release it, and (2) mind to muscle techniques that include Benson's (1975) relaxation response, meditation, autogenic training and imagery. The following section will describe the different techniques utilized for relaxation.

Muscle to mind techniques. Jacobson (1938) developed a relaxation technique that consisted of a series of exercises that involve contracting a specific muscle group,

holding it for several seconds and then relaxing the muscle followed by a quick body scan for any tension left. If individuals have muscles that are still tense, they can repeat the muscle relaxation for that muscle group. The purpose of this technique is to teach individuals an awareness and sensitivity to muscle tension while facilitating relaxation in times of anxiety, competition and so on (Harris & Williams, 1993).

Mind to muscle techniques. Benson (1975) developed a relaxation response technique that is similar to Jacobson's technique. Benson's (1975) relaxation technique instructs an individual to sit comfortably and close their eyes, relax all their muscles, beginning at their feet and progressing to their face. The individual is taught to concentrate on their breathing while attempting this technique for 10-20 minutes followed by self-reflection on whether one's body is relaxed at the completion of the exercise (Benson, 1975).

Another utilized technique is autogenic training consisting of a series of exercises designed to produce the sensations of warmth and heaviness with attention focused on the sensations one's trying to produce (Harris & Williams, 1993). Harris & Williams (1993) state there are six stages to autogenic training: (1) focusing attention in a passive manner on the dominant arm repeating the phrase (my __ arm is heavy) three to five times during a minute followed by repeating these instructions with both arms and legs, (2) the sequence is repeated but with the phrase (my __ arm is warm) for both arms and legs in the warmth stage, (3) regulating the heart and repeating the above sequences (i.e. my heartbeat is regular and calm), (4) regulating the breathing and repeating the above sequence (i.e. my breathing rate is slow, calm and relaxed), (5) warmth in the solar plexis, repeating the above sequence (i.e. my solar plexis is warm with hand placed on

the upper abdomen), and (6) coolness of the forehead, repeating the sequence above with the phrase my forehead is cool.

Harris & Williams (1993) suggested that once individuals develop autogenic training on its own, one can combine training with imagery. In order to accomplish this, the individual is asked to form an image in its entirety, followed by the image in a static position and then asked to visualize some abstract concept to this such as confidence. The purpose of this exercise is to re-experience the event through some state or feeling that was positive through imagery (i.e. winning or peak performance) (Harris & Williams, 1993). The individual is instructed to practice self-regulation of arousal and re-experience thoughts, feelings and states that led to the positive outcome (Harris & Williams, 1993).

Once individuals have learned relaxation, one can also develop skills to speed up the heart rate and respiration rate to facilitate energy on short notice or when brief bursts are needed (Harris & Williams, 1993). These skills are commonly termed energization techniques. Energization techniques include: breathing (focus on producing energy instead of reducing tension), using energized imagery (individuals imagine they are capable of generating energy at will) and formulate energizing verbal cues (word cues or images that one can quickly associate with energy) (Harris & Williams, 1993).

Mental Training Skills

Mental skills are steps that an individual can utilize to control their mind the most efficient and consistent way when performing any sort of task. This can be accomplished by using the mental training *tools* (described above) to develop *skills* such as emotion control and concentration, while increasing the efforts of personal growth such as self-

esteem and self-confidence. The following section will discuss the different skills that are commonly enhanced through the tools previously mentioned.

Emotion Control. Deci (1980) defines emotion as a reaction to a stimulus that can be either real or imagined. Thus, a reaction may form from stimuli in the environment such as a visual stimulus or an internal stimulus such as negative self-talk or increased heart rate. Lazarus (1991) suggested that cognitive processing determines the relevance of an event or object that results in the emotion. Further, Lazarus (1991) developed a theory called the cognitive-motivational-relational theory (CMRT) to describe the cognitive processes involved in the generation of specific emotions.

CMRT further developed three types of processes when appraising emotional situations: primary appraisal, secondary appraisal and coping strategies (Lazarus, 1991). Primary appraisal is the assessment of the importance of the task and what the impact of the task will have on an individuals' well-being (Lazarus, 1991). Secondary appraisal is where an individual assesses what their options are to cope with the task and process the task if they possess the skills to overcome or reduce the stressor (Lazarus, 1991). Coping strategies are the tools an individual utilizes to handle high emotional situations (Lazarus, 1991). Thus, Lazarus (1991) suggested that CMRT potentially connects emotion with an individual's motivation by the reaction the individual takes through the three processes.

Further, Jones (2003) posits there are specific characteristics that emotional responses facilitate that include physiological changes, subjective experiences and action tendencies. Physiological changes refer to changes that are a part of an emotional response such as blushing from embarrassment or going pale from fright, changes that occur during the response through biomechanics such as a facial expression and an

increase in arousal such as anxiety or excitement or a decrease in arousal such as guilt (Jones, 2003). Whereas subjective experiences refer to what an individual consciously experiences during emotions such as missing a question on a test, the individual may feel angry or disappointment (Jones, 2003). While action tendencies refer to the actions that either mediate or energize behaviors following an emotion such as an individual who has answered questions in class wrong may be embarrassed and avoid answering any further questions in class (Jones, 2003). Thus, combining the principles of the CMRT model and Jones's (2003) suggestions on characteristics that facilitate emotional responses may provide a better understanding of the following techniques that are commonly utilized for emotion control including rational emotive behavior therapy, self-talk, imagery and vicarious learning.

Specifically, self-talk can be utilized in two ways to alter emotional states (Jones, 2003). One way is by replacing a negative self-statement with a positive or neutral one which removes a stimulus that could produce a negative emotion (Jones, 2003). Second, an individual may use specific self-statements as a stimulus to generate an appropriate emotion such as telling oneself they tried their hardest on the test, thus generating feelings of happiness or accomplishment (Jones, 2003).

Further, research has supported the notion that imagery can also facilitate a decrease in emotions (Hall et al., 2009; Jones et al., 2002; Martin, Moritz, & Hall, 1999; Munroe, Giacobbi, Hall, & Weinberg, 2000). For instance, Munroe and colleagues (2000) found that not only did imagery increase excitement, but also assisted in maintaining composure during the task. Martin et al. (1999) found that imagery representing effective coping and mastering of the task resulted in higher levels of self-

efficacy and a more positive emotional state. Furthermore, Jones et al. (2002) found that individuals utilizing a motivational imagery script had higher levels of self-efficacy before completing the task and lower levels of distress before and after the task. While self-talk and imagery are useful techniques in emotion control, the most widely utilized technique is a form of rational emotive behavior therapy developed by Albert Ellis.

Ellis (2001) proposed a framework that facilitates changing an individual's beliefs, thus changing the emotional consequence that occurs. This framework is termed the ABC's (Ellis, 2001). A stands for an activating event that can be stimulated by thoughts, fantasies, emotions or other people (Ellis, 2001). B stands for the belief of the activating event and can be either rational or irrational (Ellis, 2001). A rational thought is a positive thought, where as an irrational thought is negative or crooked thinking (Ellis, 2001). C stands for the consequence that occurs from the activating event (Ellis, 2001). However, Ellis (2001) is an expansion of the original rational emotion therapy and thus has added two additional letters: D and E. D stands for disputing the belief if irrational and E stands for a new emotional consequence that develops from the disputed belief (Ellis, 2001). Individuals must be aware that they cannot change the consequence, but can change their beliefs (Ellis, 2001). Therefore, D and E are utilized when the individual's original emotional consequence is negative.

A positive example of this framework in action would be a student taking a test, but they fail. However, the student's belief about the failure is that they should've tried harder. This belief leads the student to feel content and increase their efforts in the future. Whereas a negative example of this framework in action where D and E are needed would be a student taking a test and they fail. However, the student's belief about the

failure is that the teacher doesn't care for them and that it isn't their fault. This belief leads the student to become angry. The student needs to dispute their irrational belief by reflecting on why they failed (changing their belief to they didn't try hard enough) thus producing a new emotional consequence of disappointment and increasing their efforts in the future. Thus, learning how to control emotions, individuals could potentially experience an increase in concentration.

Concentration. Concentration is the ability to focus on an event or activity even when distractions are present (Nideffer, 1993; Weinberg & Gould, 2015; Williams et al., 2010). Nideffer (1993) suggested that concentration has both width and direction components further developing a framework with four different quadrants: broad-internal, broad-external, narrow-internal, and narrow-external. Thus, different situations will need different forms of concentration and an individual needs to be able to switch back and forth (Nideffer, 1993; Weinberg & Gould, 2015; Williams et al., 2010). For instance, broad-internal is required in tasks where analyzing or planning occurs such as developing a game plan or writing a paper (Nideffer, 1993; Williams et al., 2010). Broad-external is used when assessments of the environment need to be done quickly, such as a quarterback assessing the position of the defensive backs (Nideffer, 1993; Williams et al., 2010). Further, narrow-internal is used when mental practice or rehearsal is occurring, such as relaxation exercises or rephrasing the task at hand (Nideffer, 1993; Williams et al., 2010). Whereas narrow-external is utilized when the task is taking place and the individual is focused on one or two external cues such as taking a test (Nideffer, 1993; Williams et al., 2010). These different components lead Williams et al. (2010) to suggest that individual differences do exist in the ability to concentrate and that certain

individuals are better at utilizing narrow types of concentration while others utilize broad types of concentration better.

Further, while there may be different components of concentration, factors that may cause disruption are equally important and may be both internally and externally sourced. Weinberg & Gould (2015) identify internal distractions as past events: dwelling on past mistakes, future events: anxiety of outcomes of future events, choking: overcome with pressure, overanalyzing: focus too much on mechanics and movement, fatigue and inadequate motivation: not motivated and extra mental space is filled with irrelevant thoughts. Whereas external distractions are visuals: large crowds of spectators and auditory: loud noises such as airplanes flying overhead (Weinberg & Gould, 2015). Thus, to improve concentration, individuals should be trained to focus on process goals, not outcome goals so that the individuals can see the steps rather than only seeing the outcome (Nideffer, 1993; Williams et al., 2010). Individuals should also be taught how to manage their self-talk properly and change any negative talk into positive thus facilitating in decreased anxiety and boosting confidence at the task at hand Hatzigeorgiadis, Theodorakis & Zourbanos, 2004; Williams et al., 2010). When individuals' concentration is high, the likelihood of task completion increases, and can directly influence self-confidence.

Self-Confidence. Self-confidence is the internal belief one has towards his/her ability to achieve a task (Holland, Woodcock, Cumming, & Duda, 2010; Vealey & Chase, 2008; Weinberg & Gould, 2015). Self-confidence is a fragile skill and must be practiced in order to fully develop (Vealey & Chase, 2008; Weinberg & Gould, 2015).

There are two highly utilized theories that conceptualize self-confidence: Albert Bandura's self-efficacy theory (1997) and Vealey's sport-confidence model (2008).

Self-efficacy. Albert Bandura (1997) defined self-efficacy as "belief in one's capabilities to organize and execute the course of action required to produce given attainments" (p. 3). Research has shown that individuals who possess high self-efficacy have better coping strategies, higher goal completion, take on riskier activities, and possess higher motivation and resilience (Bandura, 1990; Bandura 1997; Weinberg & Gould, 2015). Whereas individuals who possess low self-efficacy tend to have avoidance behaviors such as avoiding tasks that they feel they may fail at (Bandura, 1990; Bandura 1997; Weinberg & Gould, 2015). Bandura (1997) and Weinberg & Gould (2015) indicated there are four main sources of efficacy that can either help or deter performance: performance accomplishments, vicarious experience, verbal persuasion and physiological and emotional states.

Bandura (1997) believes that performance accomplishments have the highest influence on efficacy due to its ability to measure ones past performance successes. For instance, if an individual starts a task that they were successful at completing previously, then they have a past example of success which there for can be utilized to facilitate self-efficacy (Bandura, 1997). Further, Bandura (1997) believes that if self-efficacy can be built on a notion that one is capable of overcoming tough situations by simply remembering a past success then when an obstacle arrives, the individual will have high self-efficacy.

Vicarious experience is the process of watching another individual successfully complete a task (Bandura, 1997; Vealey & Chase, 2008; Weinberg & Gould, 2015). By

observing, an individual can receive instructional views of how something is done correctly or compare their performance to another individual to know if they did something correct (i.e. a student comparing a grade on a project) (Bandura, 1997; Weinberg & Gould, 2015). Vicarious experiences will be most successful if the individuals are using examples that are similar to their ability or only slightly higher. This is important because these types of examples will provide the best proportional information (Bandura, 1997; Weinberg & Gould, 2015).

Verbal persuasion is being told that one is successful, usually in the form of feedback and self-talk (Bandura, 1997; Weinberg & Gould, 2015). Bandura (1997) believes that verbal persuasion isn't as important in increasing self-efficacy as it is in motivating persistence. The individual giving the praise plays an integral part in the influence the feedback will facilitate. For instance, if the individual is trusted, possesses high credibility and ability then they will have more power to persuade (Bandura, 1997). Weinberg & Gould (2015) also attest to verbal persuasion in the form of self-talk and that self-talk has been shown to increase feelings of self-efficacy.

A physiological state is the state of being ready for action, such as the strength and fitness level in the body (Bandura, 1997; Weinberg & Gould, 2015). If an individual is physically ready to meet the demands of the task at hand along with controlling their emotions, it will lead to successful completion of the task and increase the individual's self-efficacy (Bandura, 1997; Weinberg & Gould, 2015). Bandura (1997) states that an individual's interpretation of their own physiological and emotional state is very important. For instance, if an individual views their physiological arousal as incompetence, failure or poor performance then self-efficacy will decrease, whereas if

they view it as facilitative, self-efficacy will increase (Weinberg & Gould, 2015). Vealey (1986) expanded on these four sources in her sport confidence model.

Sport confidence model. Vealey (1986) defined sport confidence as, "the belief or degree of certainty individuals possess about their ability to be successful in sport" (p. 222). Vealey's model has been modified for sport, but is in part based on Bandura's efficacy model (Vealey & Chase, 2008). Vealey determined there are nine sources of confidence which drive three different types of confidence that are determined to be most relevant for athletes. Vealey's sources of confidence include mastery, demonstration of ability, physical and mental preparation, physical self-presentation, social support, vicarious experience, coach's leadership, environmental comfort, and situational favorableness (Vealey & Chase, 2008).

Mastery is confidence formed from mastering or improving personal skills. Demonstration of ability is the ability to demonstrate more ability than another individual while physical and mental preparation is feeling physically and mentally fit with a main focus on performance. Physical self-presentation is how one perceives themselves in others eyes and social support is one's perception of the support and encouragement received from significant others. Vicarious experience is watching others perform successfully while coach's leadership is one's belief that their coach is skilled in decision-making and leadership. Environmental comfort is the feeling of comfortability in a competitive environment and situational favorableness is the feeling that the situation is going in one's favor (Vealey & Chase, 2008). These sources of confidence provide a baseline for the three types of confidence: confidence in physical skills, confidence in cognitive efficiency and confidence in resiliency Vealey & Chase (2008) developed.

Specifically, confidence in physical skills is one's belief that they can execute the skills necessary to perform successfully. Confidence in cognitive efficiency is one's belief they can mentally focus, stay concentrated and make effective decision to perform successfully. While confidence in resiliency is one's ability to regain focus after performances, bounce back from setbacks or poor performances and perform successfully (Vealey & Chase, 2008). Thus. when individuals experience higher concentration and increased self-confidence, it can directly influence one's motivation.

Motivation. Sage (1977) defines motivation as the direction and intensity of one's efforts. Thus, Weinberg & Gould (2015) identified three views to motivation which include trait-centered: states that motivated behaviors are a primary function of one's individual characteristics, situation-centered: states motivation is determined primarily by one's situation and interactional: states that motivation results from a mixture of individual characteristics and situational factors. Further, Weinberg & Gould (2015) also contend there are five guidelines to follow to build motivation which include: considering both situations and traits in motivating individuals, understand individuals' multiple motives for involvement, change the environment to enhance motivation, influence motivation and use behavior modifications to change individuals' undesirable motives. However, in order to fully understand motivation, we must look at the theories that contribute to motivation being achieved.

Need achievement theory. Atkinson & Raynor (1974) suggested that individuals are motivated by personal and situational factors. Thus, five components were developed in this theory which included personality motives, situational factors, resultant tendencies, emotional reactions and achievement-related behaviors. Personality motives

refer to individuals having two motives, either to avoid failure or achieve success (Atkinson & Raynor, 1974). Situational factors refer to an individual recognizing two specific considerations, the probability of success and the value of success (Atkinson & Raynor, 1974). The probability of success is dependent on the difficulty of the task, where the value of success depends on how you view the difficulty. For instance, if an average individual were to compete against a professional athlete their probability of winning would be lower than competing against someone with their own skill level, but the individuals' value of success would be higher because they would find increased satisfaction if they beat the professional (Atkinson & Raynor, 1974).

Resultant tendencies refer to individuals' motives in relation to the situational factors. For instance, low achievers avoid challenges and will aim for more easy tasks (easily attainable) or very hard tasks (certainty to fail) (Atkinson & Raynor, 1974). Emotional reactions refer to how much shame or pride individuals' experience (Atkinson & Raynor, 1974) and achievement-related behaviors refer to how high and low achievers utilize the first four components (Atkinson & Raynor, 1974). For instance, high achievers will select challenging tasks and perform better when evaluated, but low achievers will avoid challenges and perform worse when evaluated (Atkinson & Raynor, 1974). Need achievement theory paved the way for Deci and Ryan's (2008) self-determination theory to be developed.

Self-determination theory (SDT). Deci and Ryan (2008) posits that individuals are motivated by three basic needs: competence, autonomy and relatedness. Competence being the reflection that one perceives their behavior and interaction with the environment as effective (Deci &Ryan, 2008; Ryan & Deci, 2000). Autonomy being the

reflection that ones' behaviors and thoughts are self-driven (Deci &Ryan, 2008; Ryan & Deci, 2000). While relatedness is ones' perception of feeling and ability to relate to others (Deci &Ryan, 2008; Ryan & Deci, 2000). Further, Ryan & Deci (2002) outline four sub theories based on these needs that provide support for this model including cognitive evaluation theory, organismic integration theory, causality orientations theory, and basic needs theory.

Cognitive evaluation theory. Cognitive evaluation theory (CET) helps to explain the effects that social context such as rewards or interpersonal relationships have on individuals' intrinsic motivation (Deci &Ryan, 2008; Ryan & Deci, 2000, 2002). Intrinsic motivation can be defined as an individuals' own desire to pursue personal interests (Ryan & Deci, 2002). Thus, CET focuses on two cognitive processes that affect intrinsic motivation: autonomy or perceived locus of causality and perceived competence (Deci &Ryan, 2008; Ryan & Deci, 2000). For example, if an individual feels control is no longer in their hands, intrinsic motivation will become undermined, but if a task is believed to be a choice of the individual then intrinsic motivation will increase thus increasing an individual's autonomy (Deci &Ryan, 2008; Ryan & Deci, 2000, 2002). Perceived competence can follow the same concept, tasks that increase perceived competence increase intrinsic motivation, whereas tasks that decrease competence will decrease motivation (Deci &Ryan, 2008; Ryan & Deci, 2000, 2002).

Organismic integration theory. Organismic integration theory (OIT) was designed to explain the different levels of motivation, mainly extrinsic motivation (Deci &Ryan, 2008; Ryan & Deci, 2000, 2002). Extrinsic motivation can be defined as engaging in an activity for instrumental reasons (Deci & Ryan, 1985). OIT is a system set up on a

continuum with intrinsic motivation on the right, with amotivation or no motivation on the far left with the different levels of extrinsic motivation in the middle (Deci & Ryan, 1985). Thus, to determine an individual's motivation, one must determine their locus of causality first (Deci &Ryan, 1985, 2008; Ryan & Deci, 2000, 2002). In order to determine an individuals' locus of causality, one must determine where they fall on the continuum first.

The continuum identifies four types of regulation for external motivation: external regulation, introjected regulation, identified regulation and integrated regulation. External regulation is one step to the right from amotivation and is motivated by gaining rewards and avoiding punishment with locus of causality being all external (Deci &Ryan, 2008; Ryan & Deci, 2000, 2002). Introjected regulation is two steps to the right from amotivation and motivated to avoid shame and gain self-esteem with locus of causality being somewhat external (Deci &Ryan, 2008; Ryan & Deci, 2000, 2002). Identified regulation is when an individual determines the task as important and will accept it as one's own, locus of causality is moving closer to intrinsic (Deci &Ryan, 2008; Ryan & Deci, 2000, 2002). Integrated regulation is closest to intrinsic and is defined when an individual's goals match the value/goal of the task, but since there are personal gains in the outcome, integrated is still considered extrinsic (Deci &Ryan, 2008; Ryan & Deci, 2000, 2002). OIT believes that the concept of relatedness promotes integrated regulation. (Deci &Ryan, 2008; Ryan & Deci, 2000).

Causality orientation theory. Causality orientation theory (COT) focuses on individuals' internal determinants of motivation whereas CET focused on the external elements (Deci &Ryan, 1985, 2008; Ryan & Deci, 2000, 2002). Deci and Ryan (1985)

determined there are three differences between individuals' motivational orientations: autonomy orientation, controlled orientation and impersonal orientation. Autonomy orientation is behaviors guided by self-selected goals and interests (Deci &Ryan, 2008; Ryan & Deci, 2000). Controlled orientation is the tendency for external regulators or self-directed pressures to determine behaviors (Deci &Ryan, 2008; Ryan & Deci, 2000). Impersonal orientation is in close relation to amotivation and individuals will lack motivation and possess feelings of helplessness (Deci &Ryan, 2008; Ryan & Deci, 2000). An individual doesn't just have one of these orientations, they possess all three to some level (Ryan & Deci, 2002).

Basic needs theory. Basic needs theory (BNT) is the notion that the need for competence, autonomy and relatedness are universal (Deci & Ryan, 2008; Ryan & Deci, 2002). BNT acknowledges that how an individual satisfies these needs will not be the same for everyone, but simply acknowledges that all individuals require a sense of competence, autonomy and relatedness to function optimally (Deci & Ryan, 2008; Ryan & Deci, 2002).

Further, motivation facilitates increased effort to pursue goals, increased intensity to pursue goals and increases persistence in the face of failure (Weinberg & Gould, 2015). Now that an established ground work has been laid on what mental fitness tools are and mental skills are, the following section will give an overview on the different disciplines that have utilized mental fitness training.

Mental Skills Intervention Methods

Athletic settings. Research supports the notion that mental skills interventions in the sports realm have a positive impact (Birrer & Morgan, 2010; Hacker, 2000; Hall &

Rodgers, 1989; Holliday et al. 2008; Kahrovic et al. 2014; Silva, 1982; Thelwell & Greenlees, 2003; Thelwell et al. 2006; Vealey, 2007; Weinburg, 2008). For instance, Hacker (2000) acknowledged that mental skills training is not new, but that the psychological side to athletic success is usually given less attention than the technical, tactical and physiological pieces of success. Thus, Hacker (2000) suggested that mental skills should mirror an individual's' physical training parameters and as mental skills are developed with consistent, qualified, and systematic training, the benefits accumulating from such training increase over time. Further, Hacker (2000) developed a mental skills training that included relaxation techniques, imagery, concentration and distraction control strategies, pre-practice and pre-competition preparation, positive self-talk and performance cues, goal setting, and team building. Specifically, athletes were encouraged to systematically and effectively self-monitor. Following, self-monitoring Hacker (2000) utilized workbooks to explain the various interventions. Post-performance and self-monitoring worksheets were the evaluation tools found to be most helpful to measure effectiveness (Hacker, 2000).

Birrer and Morgan (2010) examined psychological skills training in high intensity sport. They concluded there is five critical skills needed in high intensity sport which included self-skills: appraisal of an individual's capability to complete a task, arousal regulation: overcoming pressure and fear, volitional and pain management skills: overcoming fatigue and pain, recovery skills: possessing good recovery capabilities in order to facilitate beneficial training and associative and dissociative strategies: individuals ability to focus on bodily sensations and performance cues while also possessing the ability to distract one's self from pain or other indicators of low exertion

(Birrer & Morgan, 2010). Thus, Birrer & Morgan (2010) suggested that mental skills training should assist athletes in training their hardest, competing to their fullest potential, maintaining or adjusting goals as needed and taking care of themselves to their best potential. The positive effects that mental skills trainings in athletic settings have demonstrated, further set a path for other disciplines to tap into this phenomenon.

Military. Research supporting mental skills training in the military setting has become increasingly robust (Adler et al., 2015; Cornum, Matthews, & Seligman, 2011; Dewiggins, Hite, & Alston, 2010; Gottman, Gottman, & Atkins, 2011; Hammermeister, Pickering, & Ohlson, 2009; Hammermeister, Pickering, McGraw, & Ohlson, 2012a; McGraw, Pickering, Ohlson, & Hammermeister 2012; Meland, Fonne, Wagstaff, & Pensgaard, 2015; Pickering et al., 2010; Reivich, Seligman, & McBride, 2011; Taylor et al., 2011). For instance, Adler et al. (2015) the most recent research published was a longitudinal randomized trial examining cognitive skills in a high risk occupation. Adler et al. (2015) concluded that soldiers who received cognitive skills training resulted in greater use of the cognitive skills taught, mainly self-talk and relaxation, along with developing increased levels of self-confidence earlier in training and demonstrating better performance relative to the control condition. This research along with the many that preceded it have shown mental skills training has a positive impact in other disciplines besides sport.

Academic settings. Research in the academic setting has become increasingly popular in the last decade, specifically research examining interventions to reduce depression in children to teens (Cutuli et al., 2013; Freres, Gillham, Reivich, & Shatte, 2002; Gillham, Brunwasser, & Freres, 2008; Gillham et al., 2007; Gillham et al., 2006;

Gillham et al., 2012; Kranzler, Parks, & Gillham, 2011; Reivich, Gillham, Chaplin, & Seligman, 2005; Seligman et al., 2009). Specifically, the Penn Resiliency Program (PRP) can be identified as its own version of mental skills training through cognitive-behavioral and social problem-solving skills. However, the PRP has explored the use of some mental skills, such as self-talk, emotion control and relaxation among school age children. Several longitudinal studies have been conducted that further validate the validity of the PRP with an increase in resilience, positive emotions and engagement (Gillham et al., 2007; Kranzler, Parks & Gillham, 2011; Seligman et al., 2009). Thus, the PRP has paved the way for higher education to tap into this concept.

Higher Education. Research supporting the notion of mental skills in higher education is lacking, but the studies facilitated thus far have produced positive results on multiple skills including self-efficacy, motivation and emotion control (Hammermeister et al., 2012b; Hammermeister et al., 2016). Specifically, Hammermeister et al. (2012b) was a quasi-experimental design to test for the effects of mental skills training, psychological resilience, stress and other identifiers of dealing with academic challenges in First Generation College Students (FGCS). This was the first study to attempt incorporating mental fitness skills into pre-existing curriculums. The study was designed to facilitate stand-alone classes for the FGCS with 30 hours of mental skills training with a certified consultant in sport psychology over a 10-week quarterly period. The mental skills that were targeted included self-talk, goal-setting, confidence, relaxation, emotion control, imagery along with academic skills that included study skills, test taking strategies, time management and preparation techniques for finals (Hammermeister et al.,

2012b). Hammermeister (2012b) found positive effects on psychological resilience as well as academic achievement measured by grade point average.

Further, Hammermeister et al. (2016) expanded on the previous work and designed a study examining the effects that mental skills in a pre-existing introductory English composition course has on low-income undergraduate college students. Specifically, this intervention found that the sport psychology condition differed over time relative to the other conditions on emotion control, attention control and self-efficacy, while the grit condition increased in self-confidence relative to the other conditions involved (Hammermeister et al., 2016). These findings suggested that more research be done in higher education settings to better determine what could be influenced positively.

Summary

Mental fitness skills have been around since the 1980's, but until the last decade these skills weren't examined in other disciplines. Given the amount of research that has been conducted corroborating the positive effects of mental skills training across multiple disciples, it can be suggested that further studies of the use of mental skills would be beneficial. Specifically, the lack of research in higher education is alarming. The positive effects of research in higher education suggests that further studies should be conducted to identify the best way to utilize mental skills training in this discipline.

Chapter 3

Methods

The primary objective of this study was to further determine if sport-related mental skills can be utilized as a training framework to enhance the mental skills, academic motivation, and study skill habits of undergraduate college students enrolled in an introductory English composition course. Furthermore, the present study was interested in examining one exploratory question: Does exposure to the experimental condition result in more frequent references to mental skills in student writing?

In order to accomplish these purposes, this study utilized a mixed methods design. A quasi-experimental design was implored with pre-post testing and delivery of a treatment over a 10-week quarter of an existing introductory English course. Assessment of data employed analysis of variance (ANOVA). Further, content analysis of participants writing was implored during and post treatment in order to examine whether mental skills appeared in student writing.

Participants

The participants were 64 students enrolled in an entry-level English composition course at Eastern Washington University. In terms of gender, we had a close 50/50 distribution between males and females (51.6% males; 48.4% females). Specifically, we had 33 males and 31 females with age ranges from 16 to 30 years old. The majority of participants were Caucasian (53.1%) with other ethnicities including: African American (23.4%), Latino (12.5%), Asian (4.7%) and other (6.3%).

Instruments

In order to conduct this study, it was necessary to collect six different types of data for each participant: mindset, process of studying, grit, mental toughness, coping strategies and self-assessment of study skills (Appendix A).

Mindset. To assess mindset, the Conceptions of the Nature of Athletic Ability Questionnaire Version 2 (CNAAQ-2; Biddle, Wang, Chatzisarantis & Spray, 2003) was utilized. This instrument is a 12-item questionnaire that is measured on five-point Likert scale ranging from *strongly disagree* to *strongly agree*. This instrument examines whether one believes their ability to master a craft is innate or learned. This instrument has four subscales: two reflect beliefs that ability is learned and two that reflect ability is innate. Beliefs being learned can be termed Growth Mindset, and beliefs that are innate can be termed Fixed Mindset. The CNAAQ-2 was found to have acceptable internal consistency with Cronbach's alpha varying from .74 - .80 (Biddle, Wang, Chatzisarantis & Spray, 2003).

Process of studying. To assess participants' process of studying, the Revised Study Process Questionnaire (R-SPQ-2F; Biggs, Kember, & Leung, 2001) was utilized. This instrument is a 20-item questionnaire that is measured on a five-point Likert scale ranging from *never or only rarely true of me* to *always or almost always*. R-SPQ-2F evaluates students' approaches across two dimensions: learning through surface approach (students only give minimal effort) and deep approach (students put worth maximal effort). Biggs, Kember & Leung (2001) found acceptable internal consistency with Cronbach's alpha ranging from .64 - .73.

Grit. To quantify grit, the Short Grit Scale (Grit-S; Duckworth & Quinn, 2009) was utilized. This instrument is an 8-item questionnaire measured on a five-point Likert scale ranging from *not like me at all* to *very much like me* that evaluates students' trait-level perseverance (effort to persevere) and their passion for long term goals (consistency of interest). Duckworth & Quinn (2009) found acceptable internal consistency with Cronbach's alpha of .82.

Mental Toughness. To quantify mental toughness, the Mental Toughness Questionnaire (MTQ-15; Pickering, 2015 in progress validation) was utilized. This instrument is a 15-item questionnaire measured on a seven-point Likert scale ranging from *strongly disagree* to *strongly agree*. The MTQ-15 evaluates students' mental toughness overall based on a 3x3 framework that was developed in a previous study that examines three points of mental toughness: a) *Ready* which means an anticipatory factor of a performance, b) *Right Now* which addresses when an individual is engaged in a performance and something goes wrong and c) *Resilience* which means when a performance doesn't go as expected, how well does the individual bounce back. Internal consistency has not been previously established.

Coping strategies. To assess participants' coping strategies, the Coping Inventory for Task Stress (CITS; Matthews & Campbell, 1998) was utilized. This instrument is a 14-item questionnaire evaluating students coping strategies as either a) task focused or b) emotion focused. CITS is measured on a five-point Likert scale ranging from *not at all* to *extremely* and Matthews & Campbell (1998) found acceptable internal consistency with Cronbach's alpha ranging from .84 to .86.

Self-assessment of study skills. To assess participants' study skills, the Study Skills Self-Assessment: University of Central Florida (UCF) was utilized. This instrument is a 51-item questionnaire measured on a three-point Likert scale ranging from *rarely* to *often*. Study Skills Self-Assessment: UCF examines six critical study skill dimension students need to consistently develop: text book reading, note taking, memory, test preparation, concentration, and time management. For the purpose of this study, this instrument was delimited to only 12 items (two from each skill). This instrument provides face validity.

Procedures

After gaining ethical clearance from the Institutional Review Board (IRB) of Eastern Washington University to perform the research, the six instruments described above were uploaded onto SurveyMonkey.com. Participants were then assessed at two time points (weeks one and ten of the quarter). The questionnaire was administered during the two time points on laptops provided at the beginning of the class period. The questionnaire took approximately 15 to 20 minutes to complete. Prior to the first data collection, participants were informed their participation was strictly voluntary and that their responses to any part of the research would be confidential and electronically submitted. The participants then were administered consent forms that asked their permission to use their responses from the questionnaires and their responses from their informal writing assignments. Participants were then instructed to choose whether or not to check either box while being informed that they could withdraw from the research at any point. Upon completion of the consent form, the participants who agreed to participate signed the form and returned it to the researcher. At the completion of both

data collections, submissions were downloaded from SurveyMonkey and stored in a locked office while being analyzed. More so, informal writing assignments from participants who gave consent were downloaded and stored in a file in a locked office while being studied for trends.

Treatment

Participants in the treatment condition received both a specialized course curriculum and specialized coaching (Figure 1).

Curriculum. Participants were exposed to an experimental curriculum which emphasized Duckworth's (2007) concept of grit. The instructor of the English 101 course delivered this material through the participants' daily reading and writing assignments. The instructor designed a week by week curriculum examining the many facets of grit, which included the importance of growth mindsets, resilience, and persistence. Readings were formed from academic and popular press documenting the importance of non-cognitive skills in academics, career and personal success. Specifically, the students were given four graded writing assignments throughout the quarter that coincided with the mental skills objectives (Appendix B). Throughout the entire quarter, the participants were exposed to not only grit, but also challenged to increase their ability to peer edit along with other objectives needed to pass the course.

Coaching. Participants were also provided with individual coaching. This specialized coaching was delivered by a graduate student trained in sport psychology. The grad student was present in the course for all 10 weeks of the academic quarter. The individual was in charge of facilitating in class supplemental instruction on mental skills that were deemed most valuable to the students, responding to students' informal writing

assignments and meeting with students' twice over the quarter to monitor their academic progress.

Supplemental instruction. Participants' were exposed during the second week of the quarter to goal-setting. The individual trained in sport psychology gave a lesson on goal-setting followed by a goal-setting worksheet. This worksheet was designed to be the foundation for the quarter by specifically setting up the participants with a reference to keeping on track. The worksheet was designed in four steps. Step one was designed for participants to write down what their outcome goal was followed by what things they needed to develop to meet that goal. Step two was designed for participants to make a plan for improvement. For example, participants identified three performance goals and then established three process goals under each performance goal. These process goals were designed to be a "to-do list" to assist them in reaching their performance goals. Step three was designed to have participants commit to their goal and monitor their progress. For example, the participants would choose what commitment strategy they wanted to implore and then they would identify three roadblocks and a strategy to overcome each one. Step four was designed to have participants identify how they would reward themselves after reaching the performance goals they set for themselves.

The individual trained in sport psychology gave three more supplemental sessions on self-talk, self-confidence and imagery (highlighted in Appendix B). Self-talk was addressed in week four. Self-confidence was addressed in week five. Imagery was addressed in week six. The sport psychology trained graduate student had a brief Powerpoint lecture over each skill and then followed up with an activity that required the participants to share with each other. For example, the self-confidence lesson started with

a Powerpoint presentation and a couple short videos followed by the activity which required the students to imagine something they accomplished that they never thought they could. While they thought about this accomplishment, they were instructed to write down specific details of these accomplishments such as addressing what their senses were, addressing the five W's, and giving a good chronological order of events. Once they had completed their writing assignment, the participants assembled into small groups to share what their accomplishments were.

One-on-one meetings. Participants' and the graduate student trained in sport psychology met twice over the 10-week quarter during class time to monitor how the participants progress towards their goals were going and identifying roadblocks and solutions to overcome them. The schedule of meetings was designed by the graduate student and was posted on the participants' canvas website so they were able to prepare themselves for the meeting. These meetings lasted 15 minutes and were facilitated in the lead instructor's office.

Informal writing assignments. Participants were assigned seven informal writing assignments by the lead instructor. These assignments were designed to have the participants' read an article based on a particular topic and then answer some follow up questions that addressed content from the articles, but also had supplemental questions that were geared towards mental skills (Table 1). For example, informal writing assignment number two was on self-talk. The article was called "Achievement Gap" and asked the students the following questions: (1) describe what you are feeling in regards to reading this article, writing about this article and having an exam on this article, (2) describe what you think will be the most challenging aspect of reading this article and (3)

what do you think this article will be about using your own language to explain it to a friend? For the purpose of the responses, the individual trained in sport psychology addressed questions one and two in regards to their self-talk statements that were made in this assignment. The individual read each student's response and then addressed the class with one response that represented the overall observations made and then gave some tips on how to combat negative self-talk and increase positive self-talk. This process was repeated for each informal writing assignment. Appendix C shows the informal writing topic with the corresponding writing prompts that were utilized for these informal writing assignments.

Control Condition

Students in a companion English composition course who did not receive mental skills training related material were utilized as a control. This control group only participated in the questionnaire portion of the research which examined mindsets, process of studying, grit, mental toughness, coping strategies and self-assessment of study skills.

Data Analysis

Questionnaire. Statistical Package for Social Sciences (SPSS) version 23 was utilized to analyze the questionnaire data collected. The data was cleaned and internal consistency was calculated for each instrument utilizing Cronbach's alpha. Descriptive statistics for participant demographics, age, and gender were obtained. An ANOVA was conducted to determine whether a difference existed between the students in the treatment and control conditions on the MFS and academic success-related variables of interest.

Content analysis. Informal writing assignments were downloaded from the participants who gave permission to use them and then printed off for analysis. The researcher went through each writing assignment and highlighted particular words or quotes that had meaning and then formed a descriptive word for that particular piece. The researcher continued this process for each participant's assignments until completed. Once completed with this step, the researcher uploaded the assignments into Atlas.ti where they were highlighted and categorized exactly the same as the hard copy. The assignments were analyzed for positive and negative trends among the responses and hoped to have common themes emerge.

Chapter 4

Results

Prior to the main analyses, the data was screened for multivariate outliers by calculating Malahanobi's distances based on centroids of the MTQ-15 variables for the *after* subscale of the MTQ-15 (Tabachnick & Fidell, 2007). This subscale focuses on how well individuals perceive their ability to retain focus and commitment to their goals after experiencing adversity. Three multivariate outliers were identified as exceeding a chi-square critical value of 0.10, thus these outliers' data were not retained for further analyses. The following sections in this chapter will provide results from Cronbach's alpha coefficients and null hypotheses findings.

Cronbach's Alpha Reliability Coefficients

Cronbach's alpha provides a measure of internal consistency (reliability) of a set of items such as a scale or subscale. For this study, Cronbach's alpha (Cronbach, 1951) was calculated for all subscales and scales without subscales. The Grit-S scale had acceptable internal consistency with a Cronbach's alpha of $\alpha = .819$. The majority of subscales for the following scales were found to have acceptable internal consistency: CNAAQ-2 (fixed = .858, growth = .796), R-SPQ-2F (surface approach = .834, deep approach = .851) and Coping (citsemot = .822, citstask = .745). However, MTQ-15 was found to have one subscale that had questionable internal consistency while the other two were acceptable (before = .661, during = .888, after = .790). Further, the subscales for the Study Skills Self-Assessment: UCF revealed four subscales that had questionable internal consistency (studying = .581, preparing for tests = .688, time management = .483 and note taking = .683) while the other two subscales had acceptable internal consistency

(memorizing = .745, read textbook = .824). Alpha levels that are questionable may be influenced by a number of factors such as poor inter-relatedness, low number of items in the scale or unrelated constructs (Tavakol et al., 2011).

Null Hypothesis One

A repeated measures ANOVA performed on the mindset subscales (fixed and growth) revealed no significant difference over time between the students who received mental skills and the students who did not. Specifically, the repeated measures ANOVA on the fixed subscale revealed no significant difference between the treatment and control conditions, p= .251. A repeated measures ANOVA performed on the growth subscale also revealed no significant difference over time between the treatment and control conditions, p = .494. See Figures 2 and 3.

Null Hypothesis Two

Repeated measures ANOVA results revealed that there was no significant difference on grit between the students who received exposure to mental skills and the students who did not, p = .461. See Figure 4.

Null Hypothesis Three

Repeated measures ANOVA revealed that there was no significant difference on study habits between the intervention and control groups. Specifically, results revealed that there was no significant difference between the control and treatment conditions on the deep approach to studying subscale, p = .305. Further, the surface approach subscale also showed no significant difference between the treatment and control conditions, p = .197. See Figures 5 and 6.

Null Hypothesis Four

Repeated measures ANOVA results revealed no significant difference on coping between students who received exposure to mental skills and the students who did not. See Figures 7 and 8.

Null Hypothesis Five

The MTQ-15 utilized three subscales: MT before adversity, MT during adversity and MT after adversity. A repeated measures ANOVA revealed a significant difference on MT during adversity between the students who received exposure to mental skills and the students who did not, $p = .041$. Repeated measures ANOVA results on the other two MTQ-15 subscales (before and after) revealed no significant differences over time between the two groups. See Figures 9,10, and 11.

Null Hypothesis Six

There were six study processes subscales utilized in this study: reading school text, note taking, hours studying, memorization, preparing for tests and time management.

Reading school text. A repeated measures ANOVA on the subscale reading school text revealed no significant difference between the treatment condition and the control condition, $p = .752$. See Figure 12.

Note taking. Repeated measures ANOVA on note taking revealed no significant difference between the treatment and control conditions, $p = .768$. See Figure 13.

Hours spent studying. Results revealed no significant difference between the treatment and control conditions on hours spent studying, $p = .560$. See Figure 14.

Memorization. Repeated measures ANOVA on memorization revealed no significant difference between the treatment and control conditions, p = .581. See Figure 15.

Preparation for tests. Repeated measures ANOVA on preparing for tests showed no significant difference between the treatment and control conditions, p = .445. See Figure 16.

Time management. Repeated measures ANOVA on time management revealed no significant difference between the treatment and control conditions, p = .824. See Figure 17.

Mental Skills Appearance in Student Writing

There were seven themes which emerged from a qualitative examination of the students writing: goal-setting, self-talk, goal behaviors, mindsets, emotion control, in-class analysis and reflection. The in-class analysis and reflection had commonalities of using the first five themes along with support and self-confidence. These themes were directly linked to the students' informal writing. Twenty-one codes were formed total (see Table 2).

Goal-setting. Goal-setting had six codes established. The first code was positive goal-setting which had 31 quotes attached to it. The following five codes were positive goal-setting with a specific thought attached to it (i.e. career oriented). Code two was positive goal-setting career which had 8 quotes attached. The third code was positive goal-setting family with 6 quotes attached. The fourth code was positive goal-setting future with 6 quotes attached. The fifth code was positive goal-setting happiness with two

quotes attached. The final code established was positive goal-setting personal with four quotes attached.

Self-talk. There were two codes established for self-talk. The first code was negative self-talk with 8 codes attached. The second code was positive self-talk with 23 quotes attached.

Goal behaviors. Goal behaviors had two codes established. The first code was negative goal behaviors with 21 quotes attached. The second code was positive goal behaviors and had 101 quotes attached.

Mindsets. Two codes were established for mindsets. The first code was negative fixed mindset and had five quotes attached. The second code was positive growth mindset and had 36 quotes attached.

Emotion control. Two codes were established for emotion control. The first code was negative emotion control with 13 quotes attached. The second code was positive emotion control and had 15 quotes attached.

In-class analysis. Codes established for the in-class analysis included 6 previously established codes: negative self-talk, positive self-talk, negative goal behaviors, positive goal behaviors, negative goal setting and positive goal setting and three new codes. The first new code was self-talk and had 7 quotes attached. This code was established based on the statement the student said wasn't necessarily positive or negative. The second new quote was emotion control and had 3 codes attached. This code was established based on statements students made that weren't necessarily positive or negative. The third new code was imagery and had 15 quotes attached.

Reflection. Codes established for the reflection included 10 previously established codes: imagery, emotion control positive self-talk, negative self-talk, negative emotion control, negative goal behaviors, positive goal behaviors, positive goal setting positive growth mindset and negative fixed mindset and three new codes. The first new code was negative self-confidence with two codes attached. The second new code was self-confidence with 18 quotes attached. This code was designed based on students' statements made perceiving improved self-confidence. The third new code was support and had 10 quotes attached. This code was established based on statements students made that expressed their thoughts on the instructors support as well as peer support as being beneficial to their success.

Chapter 5

Discussion

As aforementioned the primary objective of this study was to further determine if sport-related mental skills can be utilized as a training framework to enhance the mental skills, academic motivation, and study skill habits of undergraduate college students enrolled in an introductory English composition course. Furthermore, the present study was interested in examining whether mental skills appear in student writing.

This chapter will discuss our findings according to each specific hypothesis.

Null Hypothesis One

The first null hypothesis proposed there will be no significant difference on mindset between the students who receive exposure to mental fitness skills and the students who do not. Repeated measures ANOVA results revealed no significant difference on mindset between the students who received exposure to mental skills and those who did not. Therefore, the null hypothesis is accepted. However, a closer examination of the plots shows the treatment condition experienced a slight decrease in "fixed" mindset patterns over time while the control group showed a slight increase (see Figures 2,3). While not mathematically significant it's plausible the intervention may have had a small influence on students' ability beliefs. Our relatively small sample size may have contributed to our lack of statistical significance – which should be interpreted slightly differently than "practical" significance. Future research may wish to examine this notion with sample sizes large enough to capture this effect in a more robust way.

Null Hypothesis Two

The second null hypothesis proposed there will be no significant difference on grit between the students who receive exposure to mental fitness skills and the students who do not. Analyses revealed no significant difference between the groups, thus, the null hypothesis is accepted. Again, a visual examination of the plots (see Figure 4) shows a slight advantage for the control group over time relative to the intervention group. This suggests our curriculum may need to be further refined to better connect with the participants in the intervention group. For example, some students didn't understand the reasoning behind why they were instructed to read so many articles that came back to the same topic 'grit.' One way to make this clear could be to design a follow up activity that is engaging and intellectual where the students can connect the importance of the article to the main topic.

Null Hypothesis Three

The third null hypothesis stated that there will be no significant difference on study habits between the students who receive exposure to mental fitness skills and the students who do not. Repeated measures ANOVA results revealed no significant difference on either study habit subscale (deep approach, $p = .305$; surface approach, $p = .197$). Therefore, the null hypothesis is accepted. However, a visual examination of the plots (see Figures 5,6) suggests the treatment condition may have enjoyed a slight advantage over time on both approaches to studying. While not conclusive, this emergent trend shows the intervention may have had a small effect on study habits. This makes sense given the emphasis placed on giving maximum effort to understand, comprehend and complete assignments in the intervention group. Further, the control group seemed

to slip into more of a surface approach over time while those in the intervention group did not – which gives more credence to the notion that some of the work ethic message embedded in the intervention was absorbed by those in that group.

Null Hypothesis Four

The fourth null hypothesis stated there will be no significant difference on coping skills between the two groups. Repeated measures results showed no significant difference between either group on either of the coping subscales. Therefore, the null hypothesis is accepted. However, a more granular examination of the plots (see Figure 7,8) shows the treatment condition increased over time on task coping while the control condition appears to decrease suggesting that this intervention may have had a small influence on students' coping abilities. Again, this makes sense given the fact that task coping was an emphasis of the intervention and refers to an individual focusing on the task at hand (i.e. a single assignment at a time and how to improve it) versus emotion coping where an individual focuses solely on their emotional response (i.e. bad grade on a paper means I am not good enough).

Null Hypothesis Five

The fifth null hypothesis proposed there will be no significant difference on mental toughness between the students who receive exposure to mental fitness skills and the students who do not. Analyses revealed no significant difference on mental toughness before and after adversity occurs, (MT before, $p = .284$, MT after, $p = .766$). However, analyses for MT during adversity revealed a significant difference between students in the intervention group and those in the control condition. Therefore, the null hypothesis is partially rejected and we partially accept the alternative hypothesis that there will be a

significant difference between MT during adversity between students who receive mental skills and those who do not. Furthermore, these results are suggestive that this intervention may positively influence students' ability to react and handle adversity while it is occurring.

Null Hypothesis Six

The final null hypothesis proposed there will be no significant difference on study skills between the students who receive exposure to mental fitness skills and the students who do not. Analyses revealed no significant difference between students who received mental skills and those who did not on all six of the study skills subscales. Therefore, the null hypothesis is accepted. However, closer visual examination of the plots shows that students in the treatment condition displayed a slight advantage over time on all six subscales compared to the control condition. Again, our small sample size may have hurt our ability to produce mathematically significant effects, however, these trends suggest the intervention may have had some positive influence on study skill habits. This makes sense – especially given the emphasis placed on a "gritty" approach to studying in the intervention group.

Mental Skills Appearance in Student Writing

This study was interested in whether or not mental skills appeared in student writing. Qualitative analyses revealed that yes, mental skills do appear in student writing. The following section will discuss quotes that further provide evidence that this intervention had successful components. Specifically, 101 statements were made by students that provided evidence that their goal behaviors improved. For instance, participant 8 stated what they needed to change in order to meet their goals,

> Going to bed earlier, having a planner, and just being more organized. Sacrifices I would make would probably be going out with my friends too much.

And participant 16 stated,

> I would step up my responsibilities and use my free time as a time to get my assignments and work done instead of just doing nothing all day and cramming at night.

Similarly, 31 statements were made by students' demonstrating long-term commitment to their goal of graduating in four years. For instance, participant 20 stated,

> There is nothing that I want more in this world than to be able to say that I completed my education and then have so many doors opened and available to me.

And participant 22 shared,

> Graduating college on time is an important goal that I have set for myself. I value a happy life doing something I love and have a desire to do, I'm waking up and going to this job that I picked and that I know knowledge in and I'm good at.

36 statements were made by students that expressed change in their beliefs in their own abilities. For example, participant 26 discussed developing a growth mindset while reading research and writing a paper,

> As time went on I continued to try and understand what is important for the reader to know also how a good piece of writing was formatted. After practice, taking in input, revising, and listening to what others had to say I finally turned in a good piece of writing.

And participant 15 discussed learning how to longboard and how they had to take a growth mindset to mastering this task,

> I spent hours just focusing on my balance which I found out was the behind all of it. After about a week or so of working on that I started to get the hang of it. Next, I worked on evening out my weight on it and once I got that down I knew that I was getting close to mastering the technique.

23 statements were made by students' demonstrating an improvement in positive self-talk. For example, participant 25 discussed how they felt when performing an exercise that required them to skim a difficult academic article and write about how they initially felt,

> I'll say right now I'm not too keen on taking an exam on this article but I will do my best if it is something I need to do, writing about it I'm not very worried.

And participant 24 for the same exercise stated,

> I will most likely need to look up some words to figure out and understand exactly what is being.

Further, there were 15 positive emotion control statements made. For instance, participant 7 discussed how they overcame a poor test score,

> I stopped moping around and analyzed what I did wrong, and attempted to change my method of studying.

And participant 13 discussed the strategy they implored to make it through a tough math course by asking for assistance from the instructor versus giving up and letting emotions get the best of them,

> I would come to school a half hour early a few times a week and I would stay after school most days and I would work with her on all the math problems I was struggling with.

However, there were 6 codes established for negative statements. Specifically, there were 21 negative statements made by students in regards to their goal behaviors. For example, participant 9 stated,

> Another place I fall into is not "doing the work" meaning not taking as much time to study and go over work as much as I should.

And participant 11 when discussing where their behaviors fall stated,

> I fall into the lazy category that I don't see college as a full time job and I don't study as much as I should.

While these statements are negative, these students are demonstrating becoming more aware of their negativity which, in and of itself, can be viewed as a positive takeaway they have gleaned from participating in our intervention.

13 negative statements were made by students' in regards to their emotion control. Participant 8 discussed how they let their emotions overcome them when they struggled while writing an academic paper,

> It made me cry a lot because I was determined for a perfect grade and I felt like every one of my drafts was just not good enough.

And participant 10 discussed how they coped with leaving their family to attend college,

> I was super homesick and it was getting to me so bad that I even fainted one morning in the dorm bathrooms.

While these particular statements are negative, it's important to note that we were only able to find 64 negative statements as opposed to 207 positive statements regarding the most referenced MST-related concepts.

Furthermore, there were 53 statements that were not classified as positive or negative, but were statements that were influential in the students' mental skills recollection. Of these 53 statements, 5 codes were established. Specifically, 18 statements of self-confidence were made by students. For instance, participant 23 stated,

> This class really boosted my self-confidence by earning about growth mindsets and how being in that kind of mindset can really help with my confidence and enabling me to expand my knowledge of how to write essays about my own achievements.

And participant 6 stated,

> After taking this class I am way more confident with my English skills.

Further, 15 statements were made by students in regards to utilizing imagery. For example, participant 9 discussed how they use imagery as a strategy to reach their goals,

> I visualize by telling myself that I am going to sit down in a certain place whether it be in the library or in the PUB, and do homework for a certain amount of town, then take a small break. I repeat about four to five times, or until I reach my goal for the day.

And participant 12 shared how they use imagery to complete each day,

> I've visualized how I would execute each day and strive to achieve. I've attempted to plan out all my work, fun, etc.

These statements made by students' further suggest that an MST-based intervention has the potential to positively influence students' ability to view them as positive contributors to their personal success. For example, participant 17 stated,

> I have begun to set goals and work to complete them by a certain date using strategies I also learned in this class, self-talk and visualization being chief amongst them.

And participant 1 stated,

> Positive self-talk, emotion control, visualization and support networks have really helped me evaluate myself and how I approach things not only in my school but also in everything.

Limitations

The present study had several limitations that took place over the 10-week intervention. First and foremost, our inability to randomize (i.e., students self-registered) resulted in the use of a quasi-experimental design which impacts our ability to make any cause and effect inferences.

Second, we experienced some attrition over the course of the 10-weeks which further lowered our sample size and resulted in a decrease in mathematical power.

Lastly, we experienced some minor issues with student compliance (i.e., missing class, showing up late, etc.) – which can be expected in any freshman level course - but resulted in an uneven distribution of the treatment among the students in the treatment group.

Future Research Recommendations

First, future research should attempt to implement studies that utilize a true randomized experimental design. These types of "gold standard" designs would clearly help provide more robust insight into this line of research. Secondly, exposing participants to a larger "dose" of MST training may prove fruitful. The participants in this intervention were part of a mandatory college English course that required a substantial focus on non-MST concepts (e.g., like learning English composition fundamentals). Lastly, the use of more extensive qualitative designs that provide for in-depth participant interviews may provide more insight into the true effectiveness of these types of MST interventions.

Conclusion

The primary objective of this study was to further determine if sport-related mental skills can be utilized as a training framework to enhance the mental skills, academic motivation, and study skill habits of undergraduate college students enrolled in an introductory English composition course. The results from this study only partially support the belief that MST interventions can have a positive influence on students' performance-related cognitions, mindset mental toughness, and habits related to academic success. Future research with larger samples, randomized designs, and a larger dose of MST training may help shed more light on the efficacy of this approach.

References

Adler, A. B., Bliese, P. D., Pickering, M. A., Hammermeister, J., Williams, J., Harada, C., & Ohlson, C. (2015). Mental Skills Training with Basic Combat Training Soldiers: A Group-Randomized Trial. *Journal of Applied Psychology*, *100*(6), 1752-1764.

Astin, A. W. (1984). Student Involvement: A Developmental Theory for Higher Education. *Journal of college student personnel*, *25*(4), 297-308.

Atkinson, J. W., & Raynor, J. O. (1974). *Motivation and Achievement.* Washington, DC: V.H. Winston & Sons.

Bail, F. T., Zhang, S., & Tachiyama, G. T. (2008). Effects of a Self-Regulated Learning Course on the Academic Performance and Graduation Rate of College Students in an Academic Support Program Support Group. *Journal of College Reading and Learning*, 39(1), 54-73.

Bandura, A. (1990). Perceived Self-Efficacy in the Exercise of Personal Agency. *Journal of Applied Sport Psychology, 2*(2), 128-163.

Bandura, A. (1997). Self-Efficacy: The Exercise of Control. New York: W. H. Freeman and Company.

Benson, H. (1975). The Relaxation Response. New York: William Morrow and Company.

Biddle, S. J. H., Wang, C. K. J., Chatzisarantis, N. L. D., & Spray, C. M. (2003). Conceptions of the Nature of Athletic Ability Questionnaire Version 2.

Biggs, J., Kember, D., & Leung, D. Y. (2001). The Revised Two-Factor Study Process Questionnaire: R-SPQ-2F. *British Journal of Educational Psychology, 71*(1), 133-149.

Birrer, D., & Morgan, G. (2010). Psychological Skills Training as a Way to Enhance an Athlete's Performance in High-Intensity Sports. *Scandinavian Journal of Medicine & Science in Sports, 20*, 78-87.

Bunker, L., Williams, J. M., & Zinsser, N. (1993). Cognitive Techniques for Improving Performance and Building Confidence. *Applied sport psychology: Personal growth to peak performance, 2*, 225-242.

Burton, D., & Raedeke, T. D. (2008). *Sport Psychology for Coaches*. Champaign, IL: Human Kinetics.

Burton, D., & Weiss, C. (2008). The Fundamental Goal Concept: The Path to Process and Performance Success. *Advances in sport psychology, 3*, 339-375.

Cornum, R., Matthews, M. D., & Seligman, M. E. P. (2011). Comprehensive Soldier Fitness: Building Resilience in a Challenging Institutional Context. *American Psychologist, 66*(1), 4-9.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297−334.

Cutuli, J. J., Gillham, J. E., Chaplin, T. M., Reivich, K. J., Seligman, M. E. P., Gallop, R. J., & Freres, D. R. (2013). Preventing Adolescents' Externalizing and Internalizing Symptoms: Effects of the Penn Resiliency Program. *The International Journal of Emotional Education, 5*(2), 67-79.

Deci, E. L. (1980). *The Psychology of Self-Determination*. Free Press.

Deci, E.L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. New York: Plenum Press.

Deci, E. L., & Ryan, R. (2002). Overview of Self-Determination Theory: An Organismic Dialectical Perspective. *Handbook of Self-Determination Research*, 3-33.

Deci, E. L., & Ryan, R. M. (2008). Facilitating Optimal Motivation and Psychological Well-Being across Life's Domains. *Canadian Psychology, 49*(1), 14-23.

Dewiggins, S., Hite, B., & Alston, V. (2010). Personal Performance Plan: Application of Mental Skills Training to Real-World Military Tasks. *Journal of Applied Sport Psychology*, *22*(4), 458-473.

Dweck, C., Walton, G. M., & Cohen, G. L. (2011). Academic tenacity: Mindsets and skills that promote long-term learning. *Gates Foundation. Seattle, WA: Bill & Melinda Gates Foundation*.

Duckworth, A. L., & Seligman, M. E. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological science*, *16*(12), 939-944.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of personality and social psychology*, *92*(6), 1087.

Duckworth, A. L., & Quinn, P. D. (2009). Development and Validation of the Short Grit Scale (GRIT–S). *Journal of Personality Assessment, 91*(2), 166-174.

Ellis, A. (1982). Self-Direction in Sport and Life. *Rational Living, 17*(1), 27-33.

Ellis, A., & Dryden, W. (1987). *The Practice of Rational-Emotive Therapy (RET).* Springer Publishing Co.

Ellis, A. (1988). Can we Legitimately Evaluate Ourselves? A reply to Robert C. Roberts. *Psychotherapy: Theory, Research, Practice, Training, 25*(2), 314-316.

Ellis, A. (2001). *Overcoming Destructive Beliefs, Feelings, and Behaviors: New Directions for Rational Emotive Behavior Therapy*. Prometheus Books.

Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). *Teaching Adolescents to Become Learners: The Role of Noncognitive Factors in Shaping School Performance--A Critical Literature Review*. Consortium on Chicago School Research. 1313 East 60th Street, Chicago, IL 60637.

Freres, D. R., Gillham, J. E., Reivich, K., & Shatté, A. J. (2002). Preventing Depressive Symptoms in Middle School Students: The Penn Resiliency Program. *International Journal of Emergency Mental Health, 4*(1), 31-40.

Gauron, E. F. (1984). *Mental Training for Peak Performance*. Sport Science Association.

Ghazzawi, I., & Jagannathan, C. (2011). Bridging the Gap: The Role of Outreach Programs in Granting College Access to First Generation Students. *Academy of Educational Leadership Journa*l, 15(1), 117-137.

Gillham, J. E., Reivich, K. J., Freres, D. R., Lascher, M., Litzinger, S., Shatté, A., & Seligman, M. E. P. (2006). School-Based Prevention of Depression and Anxiety Symptoms in Early Adolescence: A Pilot of a Parent Intervention Component. *School Psychology Quarterly, 21*(3), 323-348.

Gillham, J. E., Reivich, K. J., Freres, D. R., Chaplin, T. M., Shatté, A. J., Samuels, B., & Seligman, M. E. P. (2007). School-Based Prevention of Depressive Symptoms: A

Randomized Controlled Study of the Effectiveness and Specificity of the Penn Resiliency Program. *Journal of Consulting and Clinical Psychology, 75*(1), 9-19.

Gillham, J. E., Brunwasser, S. M., & Freres, D. R. (2008). Preventing Depression in Early Adolescence: The Penn Resiliency Program. 309-322. New York, NY, US: Guilford Press.

Gillham, J. E., Reivich, K. J., Brunwasser, S. M., Freres, D. R., Chajon, N. D., Kash-MacDonald, V., & Seligman, M. E. P. (2012). Evaluation of a Group Cognitive-Behavioral Depression Prevention Program for Young Adolescents: A Randomized Effectiveness Trial. *Journal of Clinical Child and Adolescent Psychology, 41*(5), 621-639.

Gottman, J. M., Gottman, J. S., & Atkins, C. L. (2011). The Comprehensive Soldier Fitness Program: Family Skills Component. *American Psychologist, 66*(1), 52-57.

Gould, D., & Pick, S. (1995). Sport Psychology: The Griffith Era, 1920-1940. *Sport Psychologist, 9*(4), 391-405.

Gould, D., Dieffenbach, K., & Moffett, A. (2002). Psychological Characteristics and Their Development in Olympic Champions. *Journal of Applied Sport Psychology*, 14, 172-204.

Green, C. D. (2003). Psychology Strikes Out: Coleman R. Griffith and the Chicago Cubs. *History of Psychology, 6*(3), 267.

Greenleaf, C., Gould, D., & Dieffenbach, K. (2001). Factors Influencing Olympic Performance: Interviews with Atlanta and Negano US Olympians. *Journal of applied sport psychology, 13*(2), 154-184.

Grouios, G. (1992). Mental Practice: A Review. *Journal of Sport Behavior, 15*(1), 42-59.

Hacker, C. M. (2000). Women's World Cup: Performance Enhancement through Mental Skills Training. *Professional Psychology: Research and Practice, 31*(4), 363-364.

Hackfort, D., & Schwenkmezger, P. (1993). Anxiety. *Handbook of research on sport psychology*. 328–364.

Hale, B. D. (1982). The Effects of Internal and External Imagery on Muscular and Ocular Concomitants. *Journal of Sport Psychology*, 4, 379-387.

Hall, C. R., & Rodgers, W. M. (1989). Enhancing Coaching Effectiveness in Figure Skating through a Mental Skills Training Program. *Sport Psychologist, 3*(2), 142-154.

Hall, C. R., Munroe-Chandler, K., Cumming, J., Law, B., Ramsey, R., & Murphy, L. (2009). Imagery and Observational Learning Use and their Relationship to Sport Confidence. *Journal of Sports Sciences, 27*(4), 327-337.

Hammermeister, J., Pickering, M. A., & Ohlson, C. J. (2009). Teaching Mental Skills for Self-Esteem Enhancement in a Military Healthcare Setting. *Journal of Instructional Psychology, 36*(3), 203-209.

Hammermeister, J., Pickering, M., & Lennox, A. (2011). Military applications of performance psychology methods and techniques: An overview of practice and research. *The Journal of Performance Psychology*, *3*.

Hammermeister, J., Pickering, M. A., McGraw, L., & Ohlson, C. (2012a). The Relationship between Sport Related Psychological Skills and Indicators of PTSD among Stryker Brigade Soldiers: The Mediating Effects of Perceived Psychological Resilience. *J Sport Behavior, 35*(1), 40-60.

Hammermeister, J. J., Jordan, C., Briggs, L., Galm, R., & Pickering, M. (2012b). Using a Mental Fitness Curriculum to Elicit Changes in Psychological Resilience in an Academic Success Setting. *Journal of Performance Psychology,* 5, 1-35.

Hammermeister, J., Briggs, L., Young, J., Conway, B., Flynn, C., & Pickering, M. (2015). Where Sports Meets Arts and Letters: A Mental Skills Training Intervention infused into a College English Composition. *Journal of Performance Psychology,* 8, 2-34.

Hardy, L. (1997). The Coleman Roberts Griffith Address: Three Myths about Applied Consultancy Work. *Journal of Applied Sport Psychology, 9*(2), 277-294.

Harris, D. V., & Williams, J. M. (1993). Relaxation and Energizing Techniques for Regulation of Arousal. *Applied sport psychology: Personal growth to peak performance*, *2*, 188-199.

Hatzigeorgiadis, A., Theodorakis, Y., & Zourbanos, N. (2004). Self-Talk in the Swimming Pool: The Effects of Self-Talk on Thought Content and Performance on Water-Polo Tasks. *Journal of Applied Sport Psychology, 16*(2), 138-150.

Hatzigeorgiadis, A., Zourbanos, N., Galanis, E., & Theodorakis, Y. (2011). Self-Talk and Sports Performance: A Meta-Analysis. *Perspectives on Psychological Science, 6*(4), 348-356.

Hecker, J. E., & Kaczor, L. M. (1988). Application of Imagery Theory to Sport Psychology: Some Preliminary Findings. *Journal of Sport & Exercise Psychology, 10*(4), 363-373.

Heckman, J. J., & Rubinstein, Y. (2001). The importance of noncognitive skills: Lessons from the GED testing program. *The American Economic Review, 91*(2), 145-149.

Holland, M. J., Woodcock, C., Cumming, J., & Duda, J. L. (2010). Mental Qualities and Employed Mental Techniques of Young Elite Team Sport Athletes. *Journal of Clinical Sport Psychology, 4*, 19-38.

Holliday, B., Burton, D., Sun, G., Hammermeister, J., Naylor, S., & Freigang, D. (2008). Building the Better Mental Training Mousetrap: Is Periodization a More Systematic Approach to Promoting Performance Excellence? *Journal of Applied Sport Psychology, 20*(2), 199-219.

Howland, J. M. (2006). Mental Skills Training for Coaches to Help Athletes Focus Their Attention, Manage Arousal, and Improve Performance in Sport. *Journal of Education, 187*(1), 49-66.

Hughes, J. S., Gourley, M. K., Madson, L., & Blanc, K. L. (2011). Stress and Coping Activity: Reframing Negative Thoughts. *Teaching of Psychology, 38*(1), 36-39.

Jacobson, E. (1930). Electrical Measurements of Neuromuscular States During Mental Activities. *American Journal of Physiology-Legacy Content, 91*(2), 567-608.

Jacobson, E. (1938). Progressive Relaxation. *The American Journal of the Medical Sciences, 196*(5), 732.

Johnes, J. (1990). Determinants of Student Wastage in Higher Education. *Studies in Higher education, 15*(1), 87-99.

Jones, M. V., Mace, R. D., Bray, S. R., MacRae, A. W., & Stockbridge, C. (2002). The Impact of Motivational Imagery on the Emotional State and Self-Efficacy Levels of Novice Climbers. *Journal of Sport Behavior, 25*(1), 57-73.

Jones, M. (2003). Controlling Emotions in Sport. *The Sport Psychologist, 17*, 471-486.

Kahrovic, I., Radenkovic, O., Mavric, F., & Muric, B. (2014). Effects of the Self-Talk Strategy in the Mental Training of Athletes. *Facta Universitatis: Series Physical Education & Sport, 12*(1), 51-58.

Kendall, G., Hrycaiko, D., Martin, G. L., & Kendall, T. (1990). The Effects of an Imagery Rehearsal, Relaxation, and Self-Talk Package on Basketball Game Performance. *Journal of Sport and Exercise Psychology, 12*(2), 157-166.

Keup, J. R., & Barefoot, B. O. (2005). Learning How to be a Successful Student: Exploring the Impact of First-Year Seminars on Student outcomes. *Journal of The First-Year Experience*, 17(1), 11-47.

Kingston, K. M., & Hardy, L. (1997). Effects of Different Types of Goals on Processes that Support Performance. *The Sport Psychologist, 11*(3), 277-293.

Kranzler, A., Parks, A. C., & Gillham, J. (2011). Illustrating Positive Psychology Concepts Through Service Learning: Penn Teaches Resilience. *The Journal of Positive Psychology, 6*(6), 482-486.

Kroll, W., & Lewis, G. (1970). America's First Sport Psychologist. *Quest, 13*(1), 1-4.

Lazarus, R. S. (1991). Progress on a Cognitive-Motivational-Relational Theory of Emotion. *American Psychologist*, 46(8), 819-834.

Locke, E. A., & Latham, G. P. (2002). Building a Practically Useful Theory of Goal Setting and Task Motivation. *American Psychologist, 57*(9), 705-717.

Locke, E. A., & Latham, G. P. (2006). New Directions in Goal-Setting Theory. *Current Directions in Psychological Science, 15*(5), 265-268.

Martens, R. (1982). Imagery in Sport. Paper presented at the *Medical and Scientific Aspects of Elitism in Sport Conference, Brisbane, Australia.*

Martens, R. (1987). Science, Knowledge, and Sport Psychology. *The Sport Psychologist, 1*(1), 29-55.

Martin, K. A., Moritz, S. E., & Hall, C. R. (1999). Imagery Use in Sport: A Literature Review and Applied Model. *Sport Psychologist, 13*(3), 245-268.

Matthews, G., & Campbell, S. E. (1998). Task-Induced Stress and Individual Differences in Coping. Paper presented at the *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 42*(11) 821-825.

McGraw, L., Pickering, M. A., Ohlson, C., & Hammermeister, J. (2012). The Influence of Mental Skills on Motivation and Psychosocial Characteristics. *Military Medicine, 177*(1), 77-84.

Meland, A., Fonne, V., Wagstaff, A., & Pensgaard, A. M. (2015). Mindfulness-Based Mental Training in a High-Performance Combat Aviation Population: A One-Year Intervention Study and Two-Year Follow-Up. *The International Journal of Aviation Psychology, 25*(1), 48-61.

Munroe, K. J., Giacobbi Jr, P. R., Hall, C., & Weinberg, R. (2000). The Four W's of Imagery Use: Where, When, Why, and What. *The Sport Psychologist, 14*(2), 119-137.

Munroe-Chandler, K., Hall, C. R., Fishburne, G. J., & Shannon, V. (2005). Using Cognitive General Imagery to Improve Soccer Strategies. *European Journal of Sport Science, 5*(1), 41-49.

Munroe-Chandler, K., Hall, C. R., Fishburne, G., O, J., & Hall, N. (2007). The Content of Imagery Use in Youth Sport. *International Journal of Sport and Exercise Psychology, 5*(2), 158-174.

Murphy, S., Nordin, S. M., & Cumming, J. (2008). Imagery in Sport, Exercise and Dance. *Advances in Sport Psychology,* 3, 297-323.

Nideffer, R. M. (1993). Concentration and Attention Control Training. *Applied sport psychology: Personal growth to peak performance*, 2, 243-261.

Ogilvie, B. C., & Tutko, T. A. (1966). *Problem Athletes and How to Handle Them.* London: Pelham Books.

Pickering, M. A., Hammermeister, J., Ohlson, C., Holliday, B., & Ulmer, G. (2010). An Exploratory Investigation of Relationships Among Mental Skills and Resilience in Warrior Transition Unit Cadre Members. *Military Medicine, 175*(4), 213-219.

Pietrini, P., Guazzelli, M., Basso, G., Jaffe, K., & Grafman, J. (2000). Neural Correlates of Imaginal Aggressive Behavior Assessed by Positron Emission Tomography in Healthy Subjects. *American Journal of Psychiatry*, *157*(11), 1772-1781.

Reivich, K., Gillham, J. E., Chaplin, T. M., & Seligman, M. E. P. (2005). From Helplessness to Optimism: The Role of Resilience in Treating and Preventing Depression in Youth. *Handbook of Resilience in Children,* 223-237.

Reivich, K. J., Seligman, M. E., & McBride, S. (2011). Master Resilience Training in the US Army. *American Psychologist*, *66*(1), 25.

Rosen, J. A., Glennie, E. J., Dalton, B. W., Lennon, J. M., & Bozick, R. N. (2010). *Noncognitive Skills in the Classroom: New Perspectives on Educational Research*. Research Triangle Park, NC: RTI International.

Ryan, R. M., & Deci, E.L. (2000). Self Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist*, *55*(1), 68-78.

Ryba, T. V., & Wright, H. K. (2005). From Mental Game to Cultural Praxis: A Cultural Studies Model's Implications for the Future of Sport Psychology. *Quest, 57*(2), 192-212.

Sackett, R. S. (1934). The Influence of Symbolic Rehearsal Upon the Retention of a Maze Habit. *Journal of General Psychology, 10*, 376-398.

Sage, G. H. (1977). *Introduction to Motor Behavior: A Neuropsychological Approach* (2nd ed.). Reading, MA: Addison-Wesley.

Seligman, M. E. (1991). *Learned Optimism*. New York: AA Knopf.

Seligman, M. E., Ernst, R. M., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive Education: Positive Psychology and Classroom Interventions. *Oxford Review of Education, 35*(3), 293-311.

Silva, J. M. (1982). Competitive Sport Environments - Performance Enhancement through Cognitive Intervention. *Behavior Modification, 6*(4), 443-463.

Stambulova, N. B., Wrisberg, C. A., & Ryba, T. V. (2006). A Tale of Two Traditions in Applied Sport Psychology: The Heyday of Soviet Sport and Wake-Up Calls for North America. *Journal of Applied Sport Psychology, 18*(3), 173-184.

Suinn, R. (1973). Visuo-Motor Behavior Rehearsal for Athletes. *Sports Medicine Journal, 1*(6) 1950-1980.

Suinn, R. M. (1985). The 1984 Olympics and Sport Psychology. *Journal of Sport Psychology, 7*(4), 321-329.

Suinn, R. M. (2005). Behavioral Intervention for Stress Management in Sports. *International Journal of Stress Management, 12*(4), 343-362.

Tabachnick, B.G., & Fidell, L.S. (2007). *Using Multivariate Statistics* (5th ed.). Boston: Allyn and Bacon.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, *2*, 53-55.

Taylor, M. K., Stanfill, K. E., Padilla, G. A., Markham, A. E., Ward, M. D., Koehler, M. M., & Adams, B. D. (2011). Effect of Psychological Skills Training During Military Survival School: A Randomized, Controlled Field Study. *Military Medicine, 176*(12), 1362-1368.

Terenzini, P. T., & Pascarella, E. T. (1991). Twenty Years of Research on College Students: Lessons for Future Research. *Research in Higher Education, 32*(1), 83-92.

Thelwell, R. C., & Greenlees, I. A. (2003). Developing Competitive Endurance Performance using Mental Skills Training. *Sport Psychologist, 17*(3) 318-337.

Thelwell, R., Greenlees, I., & Weston, N. (2006). Using Psychological Skills Training to Develop Soccer Performance. *Journal of Applied Sport Psychology, 18*(3), 254-270.

Tinto, V. (1975). Dropout from Higher Education: A Theoretical Synthesis of Recent Research. *Review of educational research*, *45*(1), 89-125.

Tinto, V. (1993). Building Community. *Liberal Education*, *79*(4), 16-21.

Vealey, R. S. (1986). Conceptualization of Sport-Confidence and Competitive Orientation: Preliminary Investigation and Instrument Development. *Journal of Sport Psychology, 8*(3), 211-246.

Vealey, R. S., & Walter, S. M. (1993). Imagery Training for Performance Enhancement and Personal Development. *Applied sport psychology: Personal growth to peak performance*, *2*, 200-221.

Vealey, R. S. (2007). Mental Skills Training in Sport. *Handbook of Sport Psychology, Third Edition*, 285-309.

Vealey, R. S., & Chase, M. A. (2008). Self-Confidence in Sport. *Advances in sport psychology*, *3*, 65-97.

Wang, C., Liu, W., Biddle, S. J., & Spray, C. M. (2005). Cross-Cultural Validation of the Conceptions of the Nature of Athletic Ability Questionnaire Version 2. *Personality and Individual Differences, 38*(6), 1245-1256.

Weinberg, R. (2008). Does Imagery Work? Effects on Performance and Mental Skills. *Journal of Imagery Research in Sport and Physical Activity*, *3*(1), 1-21.

Weinberg, R. S., & Gould, D. (2015). *Foundations of Sport and Exercise Psychology, 6E*. Champaign, IL: Human Kinetics.

Williams, J. M., Nideffer, R. M., Wilson, V. E., Sagal, M., & Peper, E. (2010). Concentration and Strategies for Controlling It. *Applied Sport Psychology: Personal Growth to Peak Performance, 6*, 336-358.

Yates, D. H. (1943). A Practical Method of Using Set. *Journal of Applied Psychology, 27*(6), 512-519.

Table 1

Informal Writing Topic and the Corresponding Mental Skill

Informal Writing Topic	Corresponding Mental Skill
Geniuses Work Hard	Mindset- Growth vs. Fixed
Self-Talk	Self-Talk
Retention	Goal-Setting
Graduate On-Time	Goal-Behaviors
Struggle	Emotion Control
In-Class Process Analysis	Checkpoint- Self- Confidence, Imagery, Goals
Reflection	Final Checkpoint

Table 1

Table 2

Codes Developed for the Appearance of Mental Skills in Student Writing

Codes Developed	Number of Statements
Negative Emotion Control	13
Negative Fixed Mindset	5
Negative Goal Behavior	21
Negative Goal-Setting	6
Negative Self- Confidence	2
Negative Self-Talk	8
Positive Emotion Control	15
Positive Goal Behavior	101
Positive Growth Mindset	36
Positive Goal-Setting	31
Positive Goal-Setting- Career	8
Positive Goal-Setting- Family	6
Positive Goal-Setting- Future	6
Positive Goal-Setting- Happiness	2
Positive Goal-Setting- Personal	4
Positive Self-Talk	23
Self-Confidence	18
Self-Talk	7
Support	10
Emotion Control	3
Imagery	15

Table 2

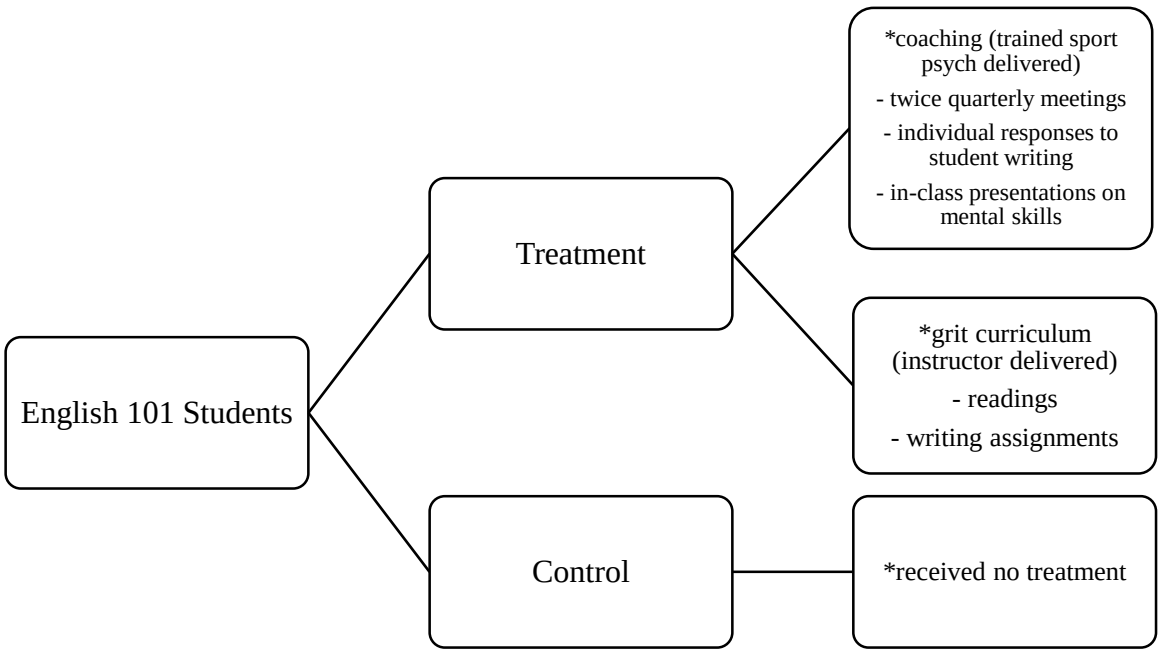

Figure 1. Schematic of the Treatment versus Control Conditions.

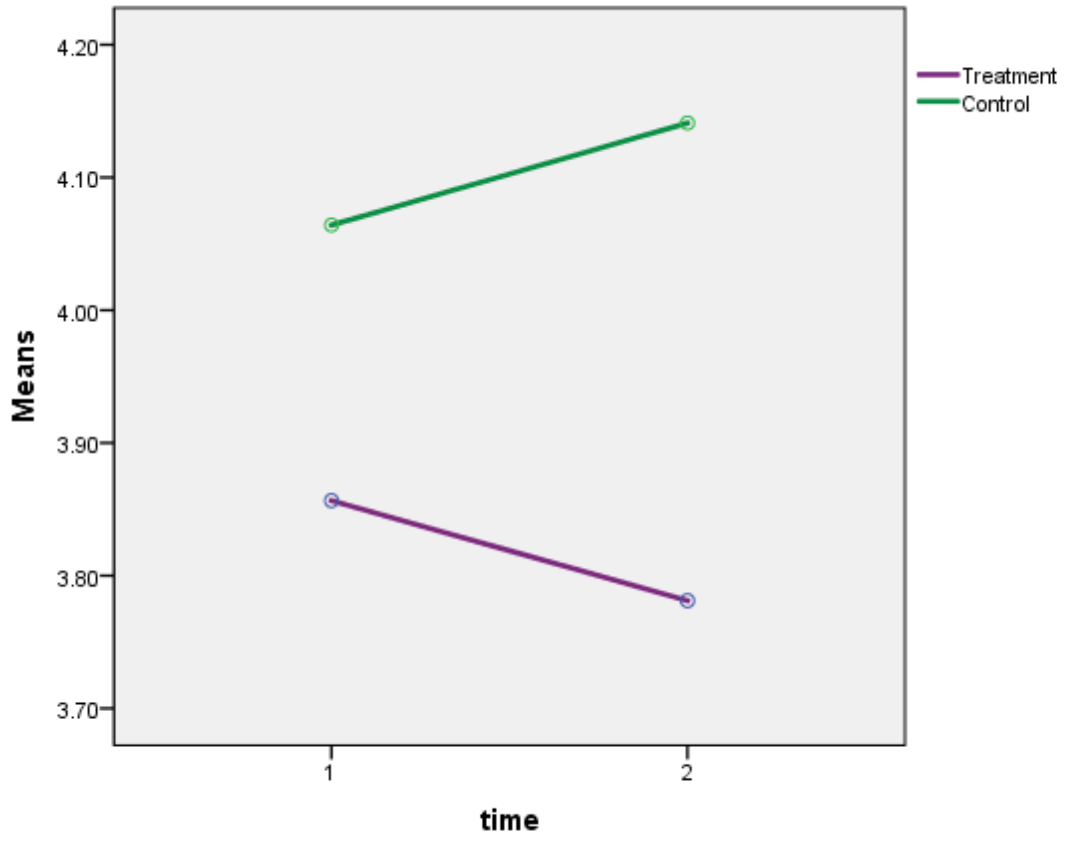

Figure 2. Repeated Measures Results for Treatment and Control Groups on Fixed Mindset.

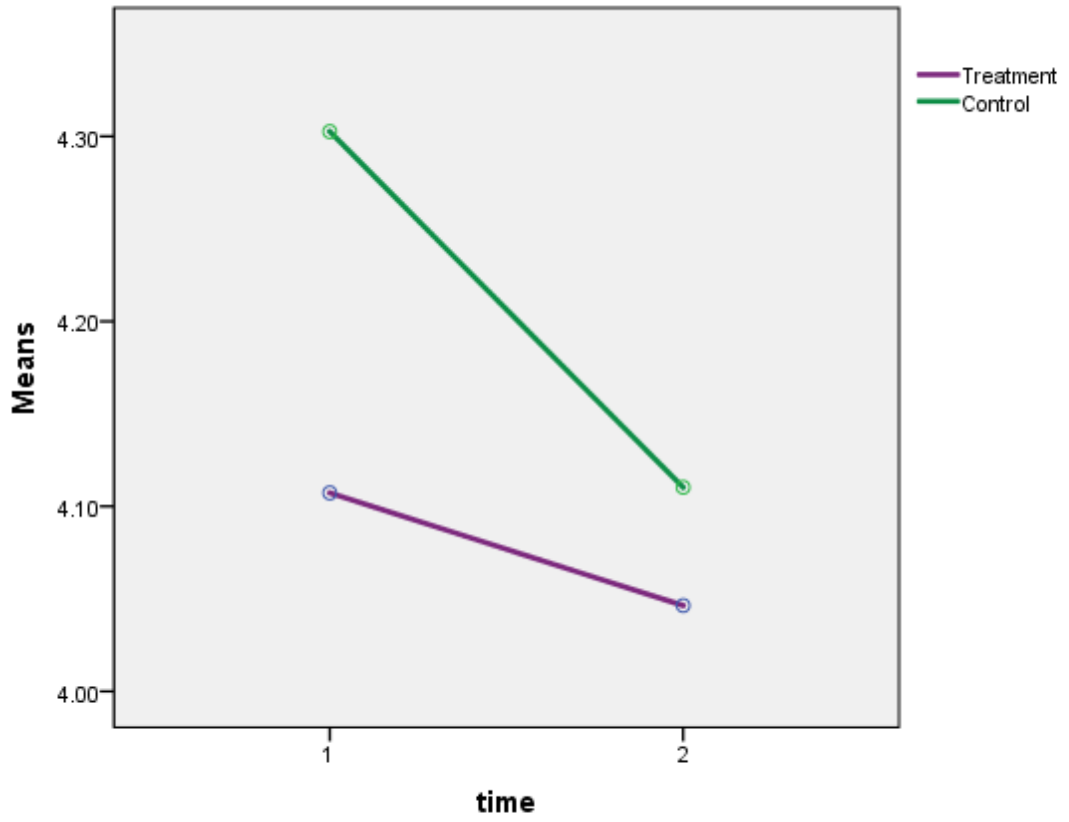

Figure 3. Repeated Measures Results for Treatment and Control Groups on Growth Mindset.

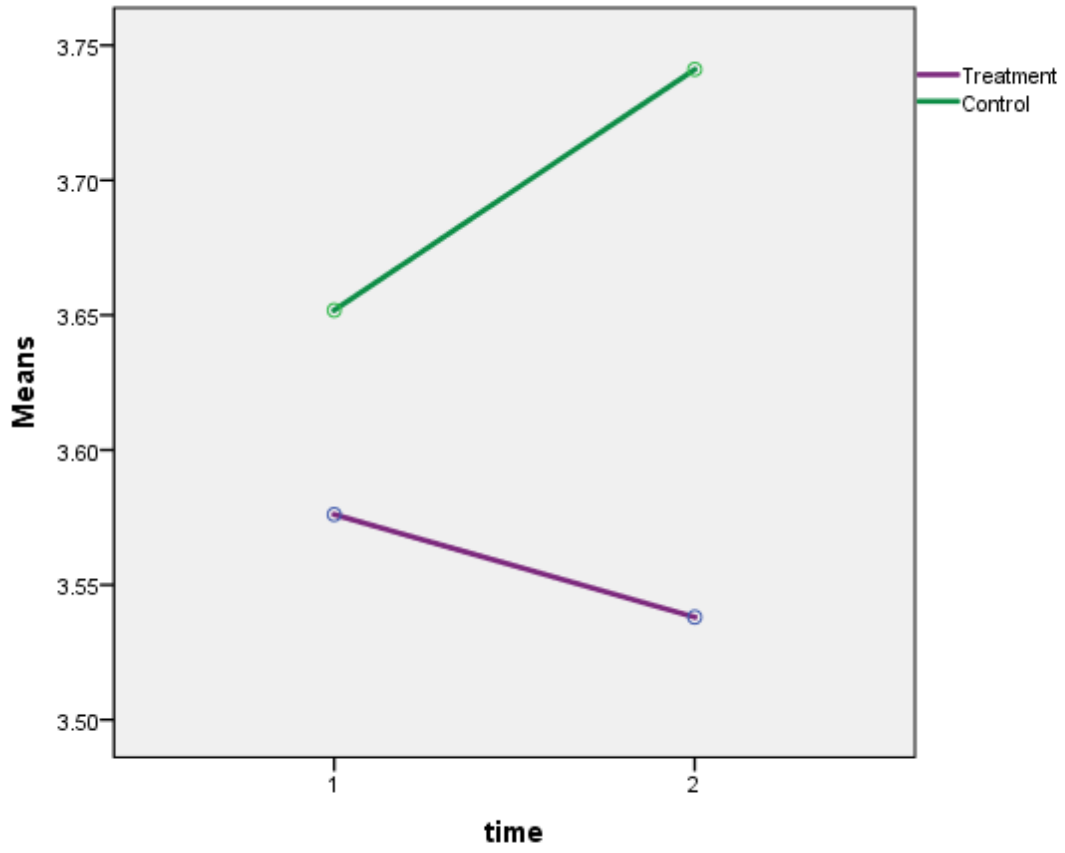

Figure 4. Repeated Measures Results for Treatment and Control Groups on Grit.

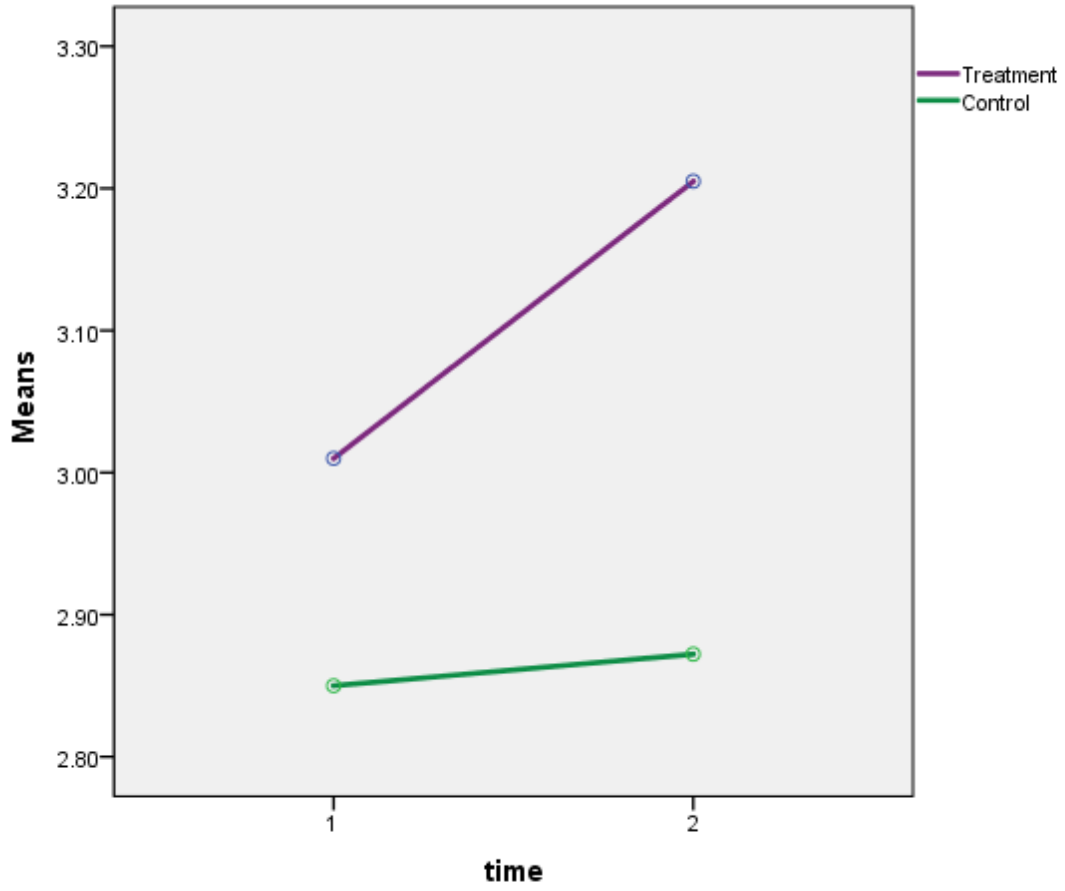

Figure 5. Repeated Measures Results for Treatment and Control Groups for Deep Approach to Studying.

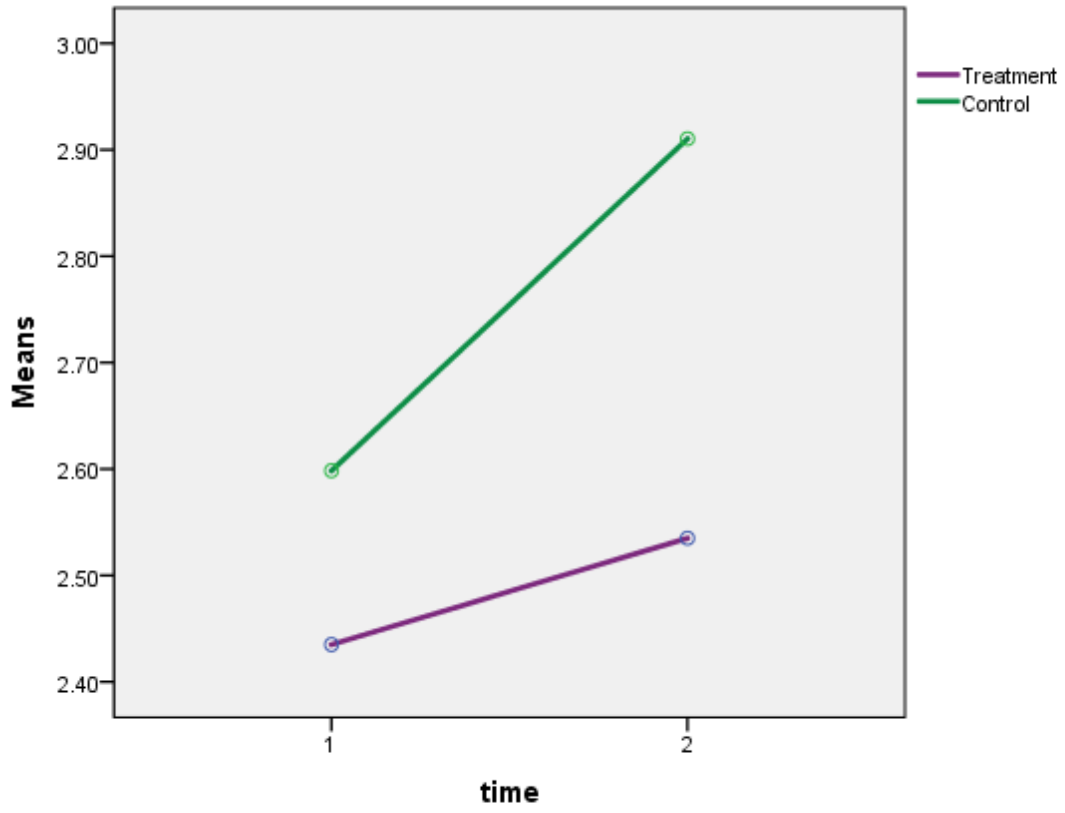

Figure 6. Repeated Measures Results for Treatment and Control Groups for Surface Approach to Studying.

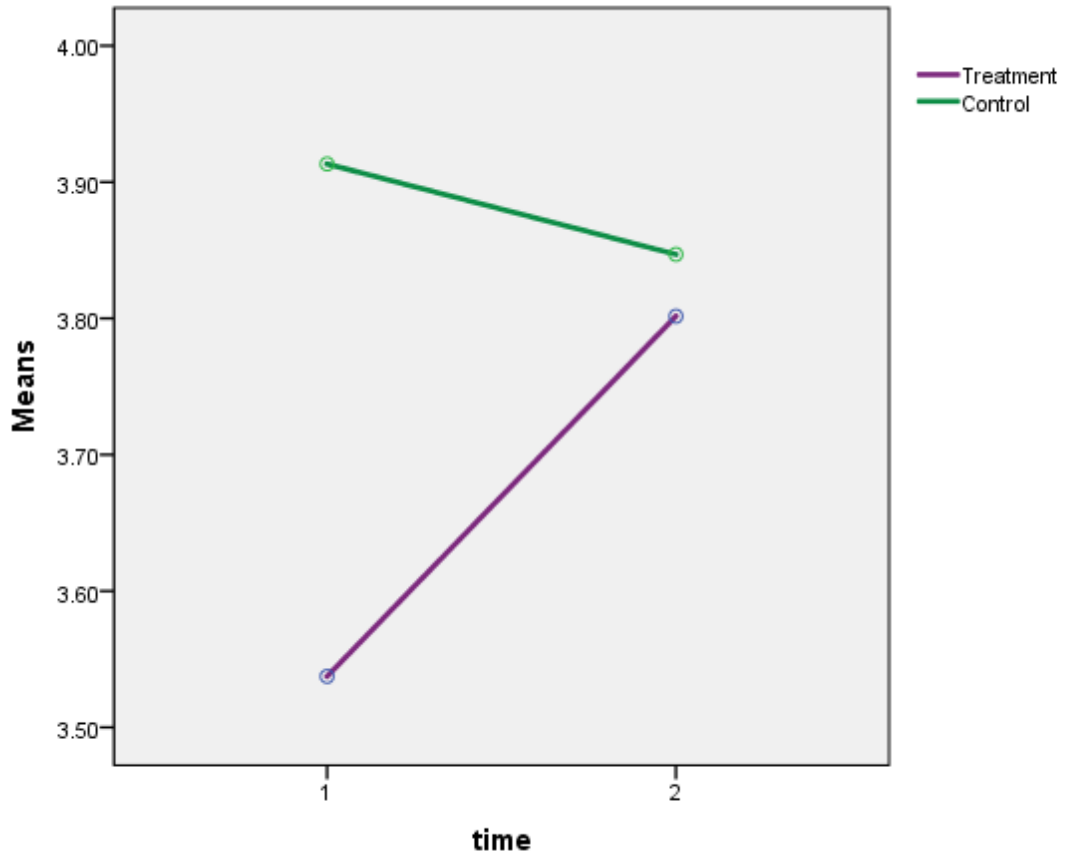

Figure 7. Repeated Measures Results for Treatment and Control Groups on Task Coping.

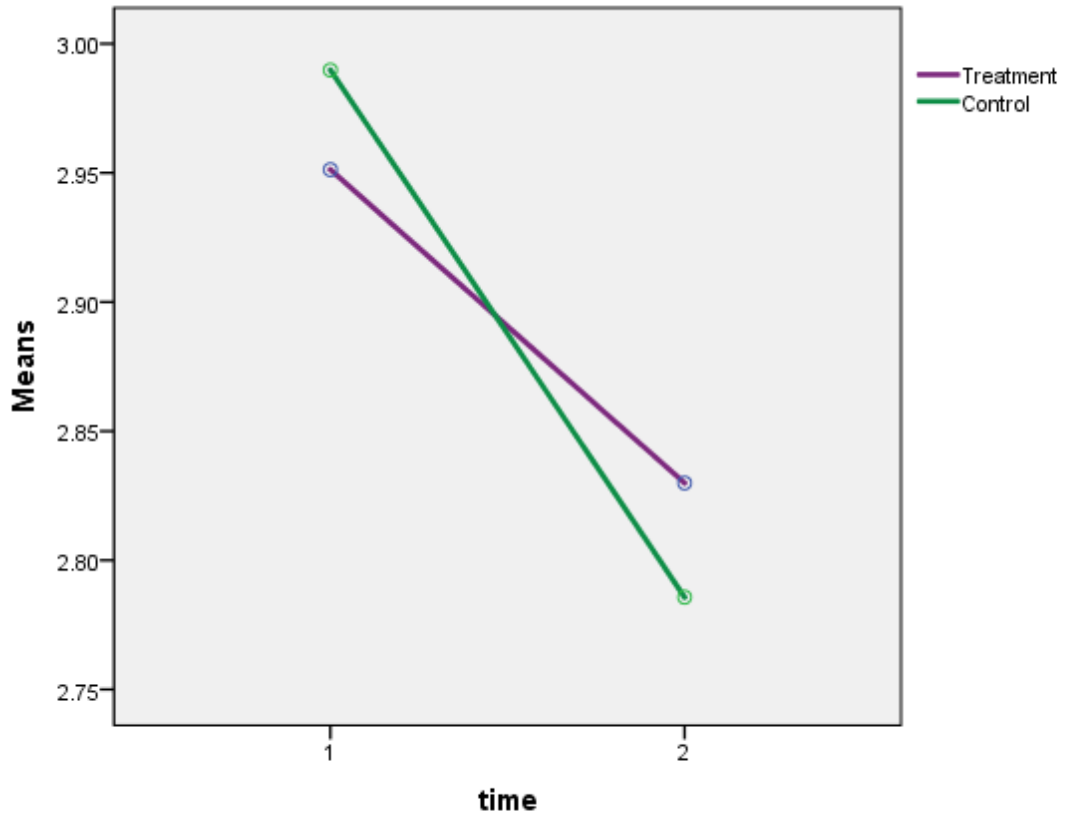

Figure 8. Repeated Measures Results for Treatment and Control Groups on Emotion Coping.

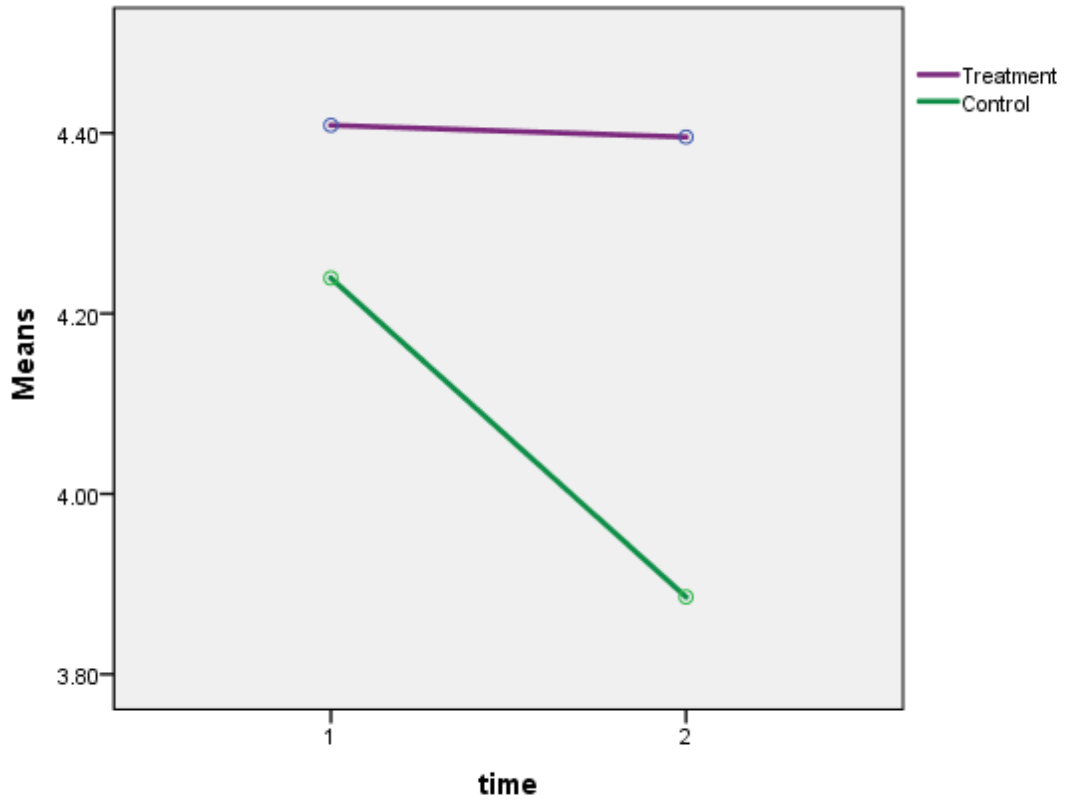

Figure 9. Repeated Measures Results for Treatment and Control Groups on Mental Toughness Before Adversity.

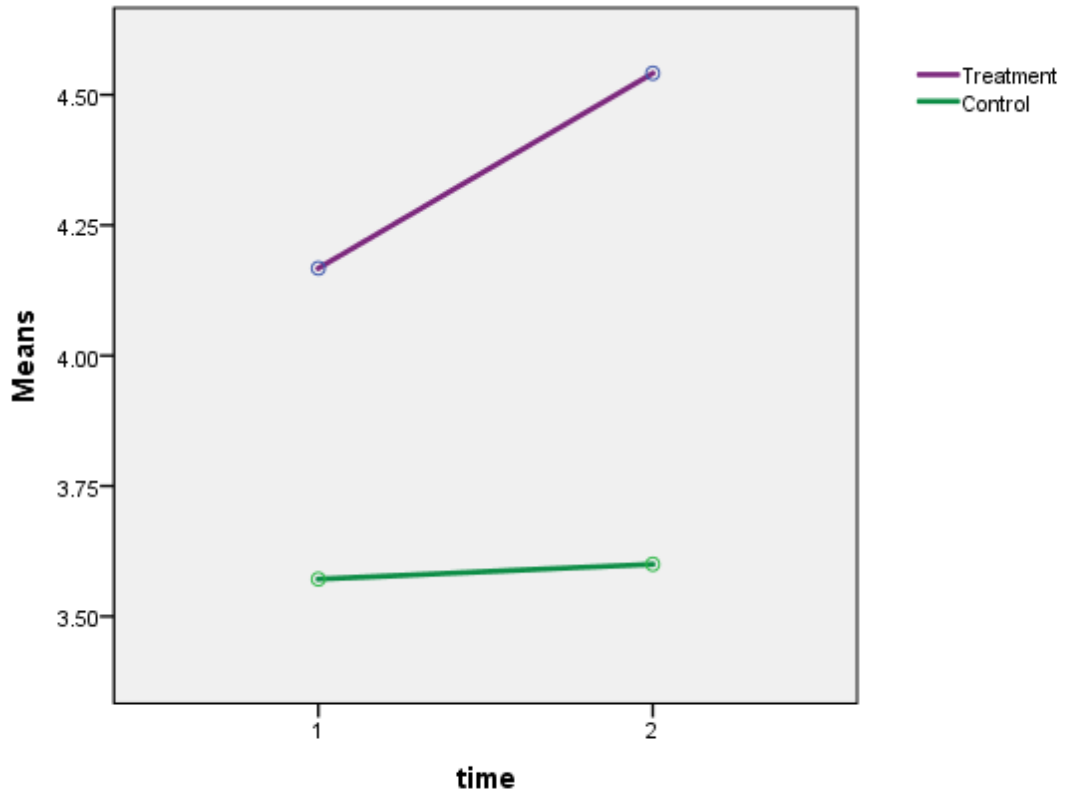

Figure 10. Repeated Measures Results for Treatment and Control Groups on Mental Toughness During Adversity.

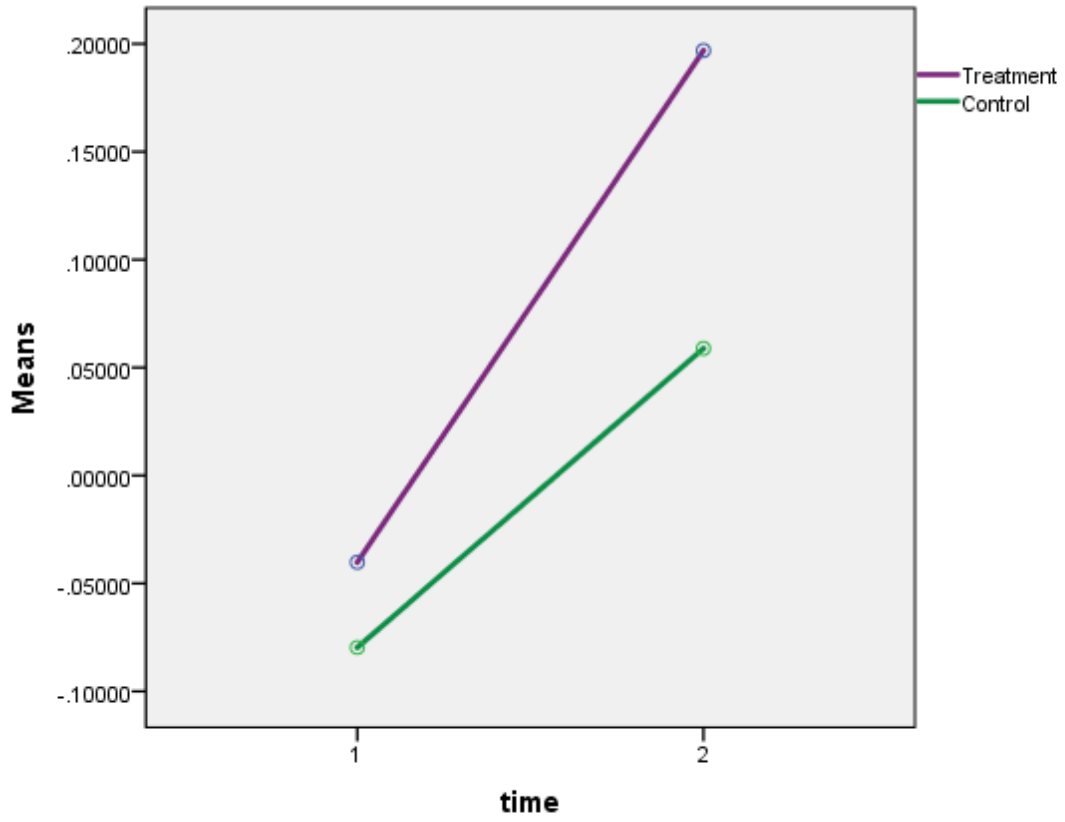

Figure 11. Repeated Measures Results for Treatment and Control Groups on Mental Toughness After Adversity.

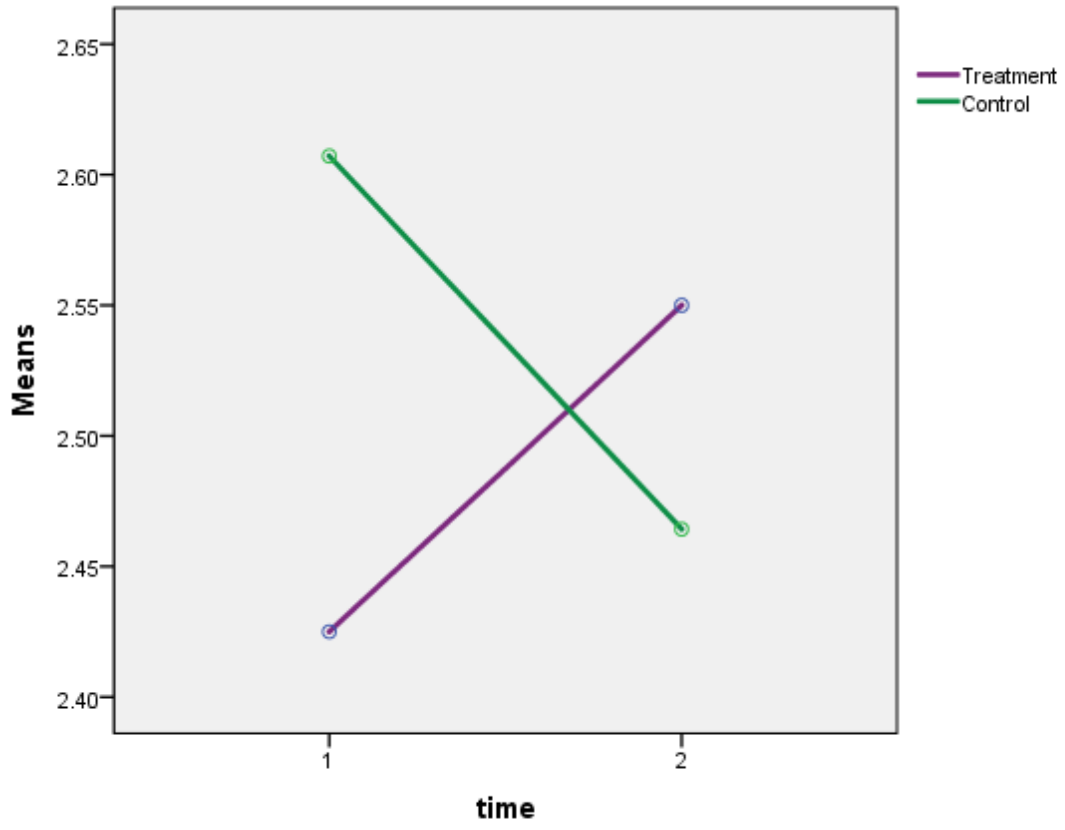

Figure 12. Repeated Measures Results for Treatment and Control Groups on Reading School Text.

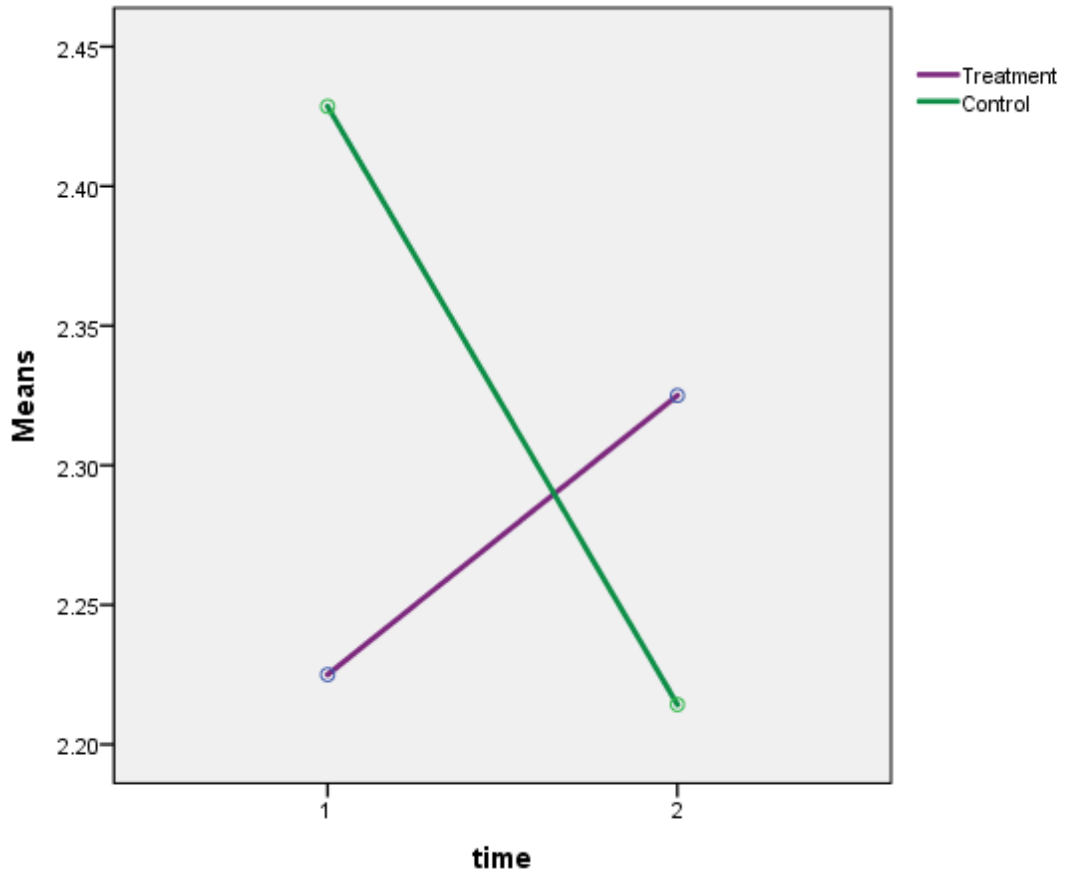

Figure 13. Repeated Measures Results for Treatment and Control Groups on Note Taking.

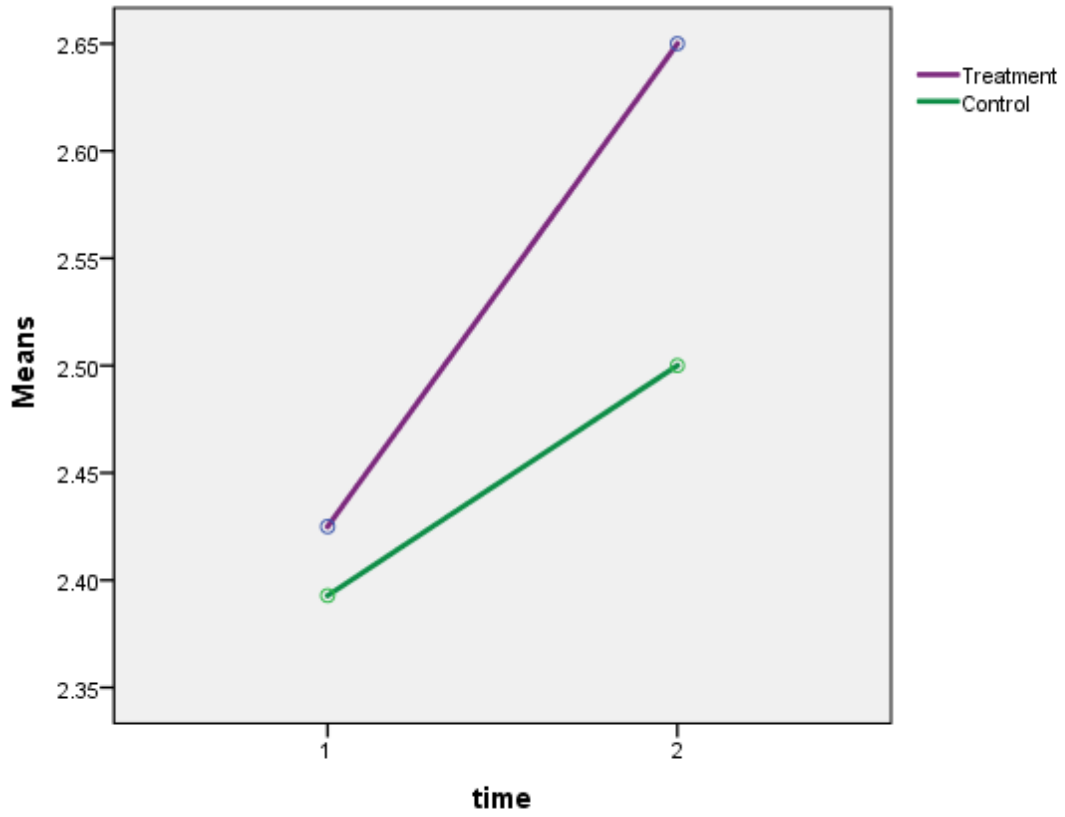

Figure 14. Repeated Measures Results for Treatment and Control Groups on Hours Spent Studying.

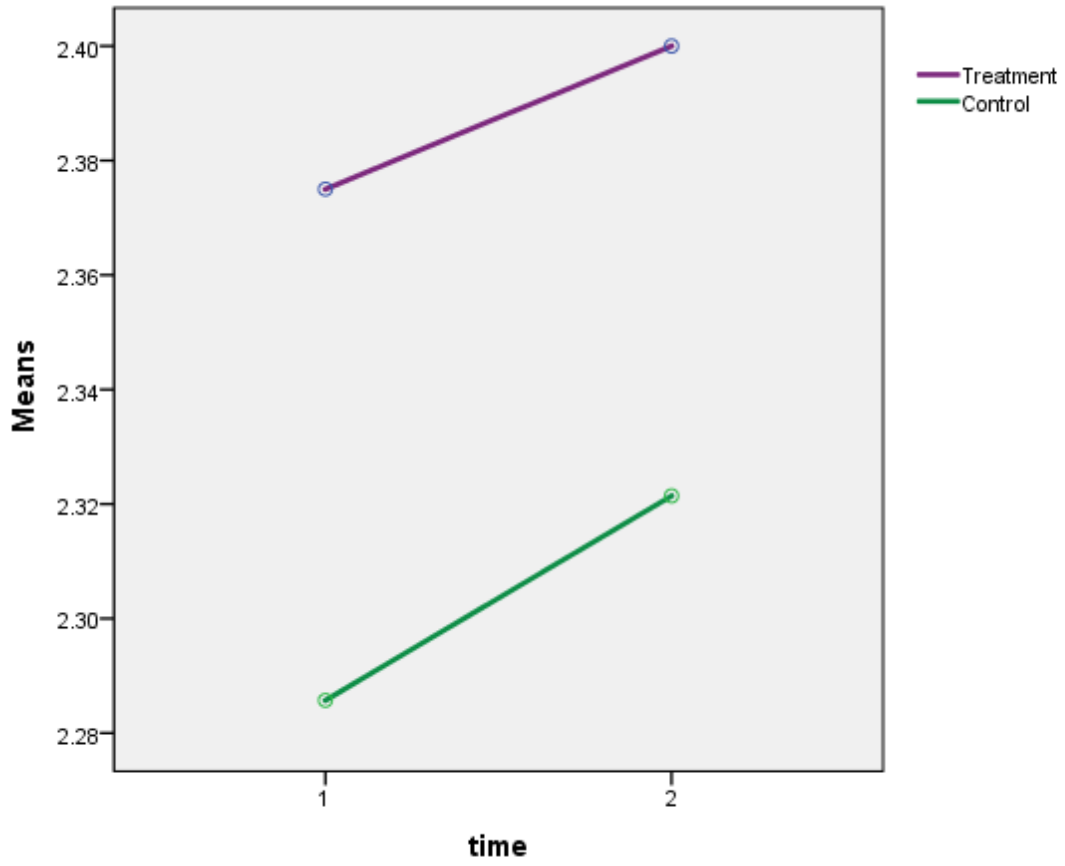

Figure 15. Repeated Measures Results for Treatment and Control Groups on Memorization.

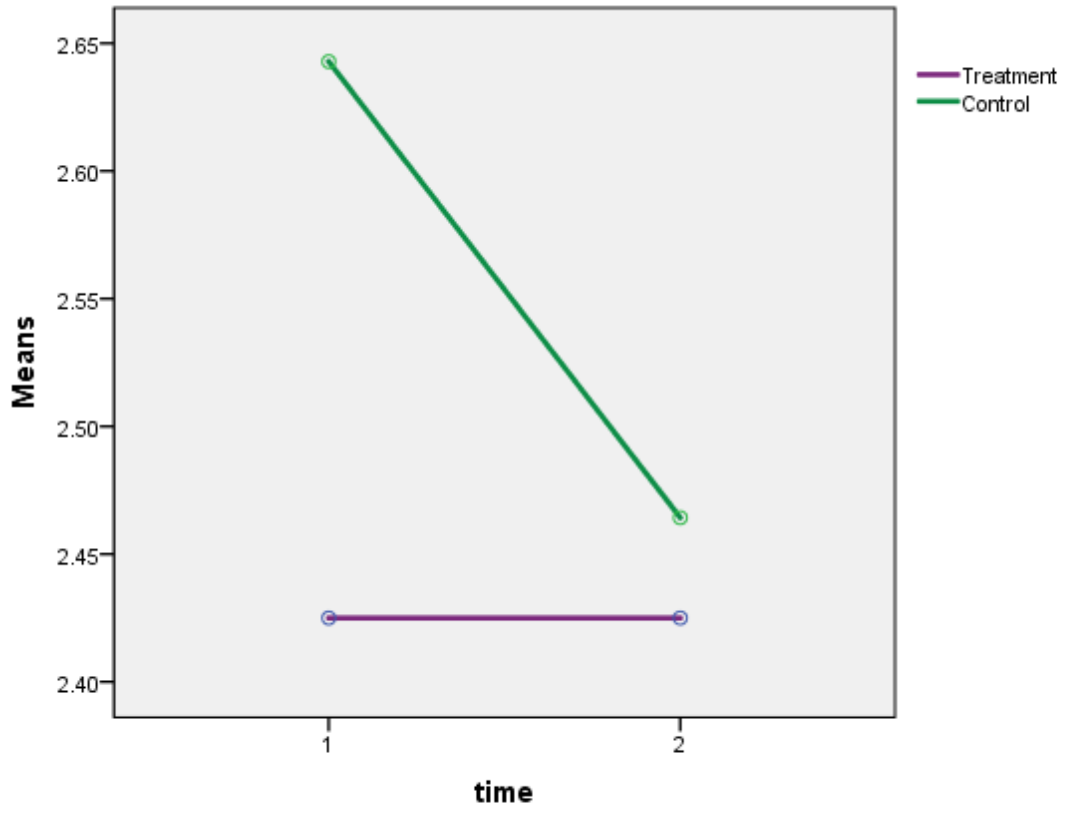

Figure 16. Repeated Measures Results for Treatment and Control Groups on Preparation for Tests.

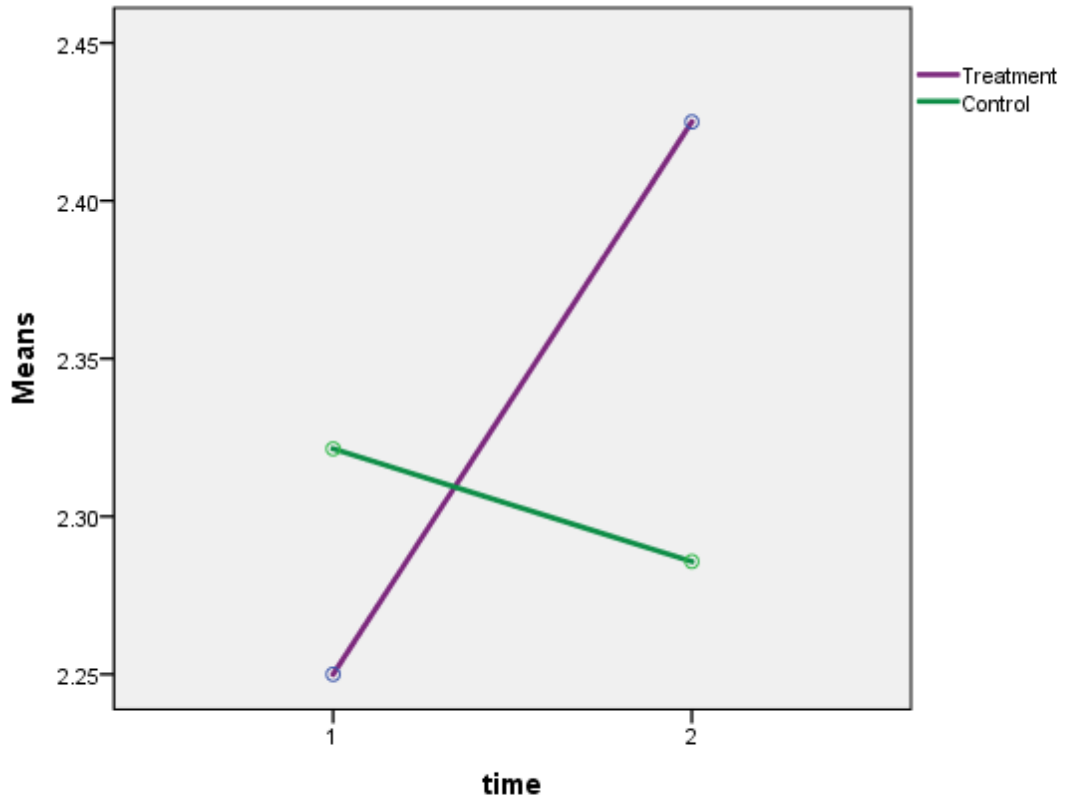

Figure 17. Repeated Mesaures Results for Treatment and Control Groups on Time Management.

Appendix A

Questionnaire

General Questions

What is the two digit class code for the course for which you are currently enrolled (e.g., 01, 02, 03....10, 11)?

What is your first and middle initial followed by the day of your birth (e.g., Jim Bob Smith born on May 9th would be jb09)? Please use lower case letters for initials and two digits for day.

What is your gender? Male or Female

What is your age in years?

What is your ethnicity? Caucasian, African American, Latino, Asian or other

Conceptions of the Nature of Athletic Ability Questionnaire (CNAAQ-2)

	Strong Disagree 1	2	3	4	Strongly Agree 5
You were born with a certain level of academic ability and you cannot really do much to change that					
If you practice diligently, you can overcome a lack of academic talent					
To reach a high level of performance in academics, you must go through long periods of learning and practice					
You need a very high level of natural talent to be good at school					
If you work hard you can learn to be great academically - no					

matter your talent level					
If you work hard at your school, you will always get better					
To be great academically, you need to be born with abilities that enable you to be successful					
One's academic ability will always improve if you work at it					
Improving how good you are academically is very difficult - even if you work hard					
To be good at school, you need to be naturally talented					
If you put enough effort into it, your school work, you can always get better					
The amount of training and practice you do will only have a small impact on the success you will have					

Short Grit Scale (Grit-S)

	Not like me at all 1	Not much like me 2	Somewhat like me 3	Mostly like me 4	Very much like me 5
I often set a goal but later choose to pursue a different one					
I have been obsessed with a certain idea or project for a					

short time but later lost interest					
I have difficulty maintaining my focus on projects that take more than a few months to complete					
New ideas and projects sometimes distract me from previous ones					
I finish whatever I begin					
Setbacks don't discourage me					
I am diligent					
I am a hard worker					

Mental Toughness Questionnaire (MTQ-15)

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
I avoid academic tasks I expect will go poorly							
When school work becomes difficult, I am able to think more clearly							
After a difficult academic situation occurs, I perform better in the future							
I become easily distracted when I anticipate that adversity may occur							
My focus improves when my I see my grades are really bad							
Performing academic tasks under pressure							

(e.g., tests, meeting deadlines, etc.) brings out the best in me							
I start to panic when I expect my school work could go poorly							
If failure in a class seems likely, I find other things to do							
I execute my academic tasks even better during a crisis							
Setbacks do not discourage me for long							
After failure, I respond by working at getting better							
Stress improves my focus on the academic tasks at hand							
In my academic career, adversity teaches me how to improve							
The possibility of failure scares me							
After a poor academic performance, I attend to what matters most							

Coping Inventory for Task Stress

During a stressful/adverse academic situation I…	Not at all	A little bit	Somewhat	Very much	Extremely
Worked out a strategy for successful performance					

Worried about what I would do next					
Blamed myself for not doing better					
Became preoccupied with my problems					
Concentrated hard on doing well					
Focused my attention on the most important parts of the task					
Wished that I could change what was happening					
Blamed myself for not knowing what to do					
Worried about my inadequacies					
Made every effort to achieve my goals					
Blamed myself for becoming too emotional					
Was single-minded and determined in my efforts to overcome any problem					
Was careful to avoid mistakes					
Did my best to follow instructions for the task					

Revised Study Process Questionnaire

Please choose the **one** most appropriate response to each question…	Never or rarely true of me	Sometimes true of me	True of me about half the time	Frequently true of me	Always or almost always
I find that times studying gives me a feeling of deep personal satisfaction					

I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied					
My aim is to pass the course while doing as little work as possible					
I only study seriously what's given out in class or in the course outlines					
I feel that virtually any topic can be highly interesting once I get into it					
I find most new topics interesting and often spend extra time trying to obtain more information about them					
I do not find my course very interesting so I keep my wok to a minimum					
I learn some things by rote, going over and over them until I know them by heart even if I do not understand them					
I find that studying academic topics can at times be as exciting as a good novel or movie					
I test myself on important topics until I understand them completely					
I find I can get by in most assessments by memorizing key sections rather than trying to understand them					
I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra					
I work hard at my studies because I find the material interesting					
I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes					

I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics					
I believe that lecturers shouldn't expect students to spend significant amounts of time studying material everyone knows won't be examined					
I come to most classes with questions in mind that I want answered					
I make a point of looking at most of the suggested readings that go with the lectures					
I see no point in learning material which is not likely to be in the examination					
I find the best way to pass examinations is to try to remember answers to likely questions					

Study Skills Self-Assessment: University of Central Florida

Read each statement and think about how it currently relates to you academically	Rarely	Sometimes	Often
I try to get the meaning of new words as I see them for the first time			
I look for the main ideas as I read			
I take notes as I read my text books			
I try to organize main ideas and details into meaningful method			
I study where it is quiet and has few distractions			
I set study goals, such as the number of problems I will do or pages I will read			
I quiz myself over material that could appear on future exams and quizzes			

I try to create associations between new material I am trying to learn and information I already know			
I do all homework assignments and turn them in on time			
I anticipate what possible questions may be asked on my test and make sure I know the answers			
I use a “to-do” list to keep track of completing my academic and personal activities			
I start studying for quizzes and tests at least several days before I take them			

Appendix B

Weekly Course Schedule

Unit	*MFT Concept*	*ENGL 101 Goals Emphasized*	*Connections*
Essay Exam	Wk 1 Goal setting (general introduction) Wk 2 Goal setting (specific for class) Wk 3 Emotion control	-Reading comprehension, analyze texts -Identify elements of rhetorical situation -Use academic discourse	The essay exam is a familiar context and a fairly simple rhetorical situation. Readings will be challenging and will require students to summon emotional control to persevere through "boring" texts, to harness the power of stress in the writing situation, and to use self-talk to help them organize and analyze during the exam situation.
Autobiography	Wk 4 Self-talk Wk 5 Self-confidence	-tone -writing process -use evidence -collaboration -freedom from error	An academic autobiography presents a complex rhetorical situation using forms of evidence easy to access though challenging to present appropriately. Using visualization/imagery in MFT echoes the skill set needed to present focused and persuasive retrospective evidence in the autobiography.
Research paper	Wk 6 Visualization/imagery Wk 7 Thinking traps Wk 8 Resilience (after draft is returned) Wk 9 Support networks	-logical fallacies -using evidence -error freedom -rhetorical situation -academic discourse	The research paper requires students to both analyze the needs of an academic reader and to join the academic discourse community as a producer of knowledge. Students need to build self-confidence as they read complex texts that are not shared by the entire class. They also need to avoid the thinking traps and self-doubt that can creep in during a project that feels enormous and stretches over many weeks. Students may need to consciously invoke their goals and resilience strategies after they receive feedback on their first complete drafts. In addition, because their research writing is the start of their membership in an academic discourse community, they can begin to think about how to develop, choose, and sustain relationships (with real people and with

			scholars) to enable them to reach their goals.
Reflection	Wk 9 Goal setting	-reflection	A review of the goals students set for ENGL 101 and the degree to which they achieved them, the strategies that they invoked or failed to invoke, and the effect of these strategies will provide a framework for their reflection.

Appendix C

Informal Writing Assignment Prompts

Informal Writing Topic	Question Prompts Evaluated for Topic
1. Geniuses Work Hard Article: *Geniuses Work Hard*	Write at least 150 words describing something that you could not do at one time that you can now do. Describe how you became able to do this thing.
2. Self-Talk Article: *Achievement Gap*	1. Describe what you are feeling with regard to reading this article, writing about this article, and having an exam on this article. Write at least 150 words. 2. Describe what you think will be the most challenging aspect of reading this article.
3. Retention	1. How important is it to you that you persist in college and graduate in four years? 2. How important is it to other people that you persist in college and graduate in four years? 3. What do you value that leads you to view graduation with this level of importance?
4. Graduate On-Time Article: *Graduate from College on Time*	1. Where do you fall, realistically, in the behaviors and attitudes he describes? 2. If you were to take his advice, what changes would you have to make? What sacrifices would that involve?
5. Struggle Article: *Struggle*	Describe a time when you struggled with something. Describe how you felt, how you reacted to the struggle and how you dealt with the struggle. Write at least 150 words.
6. In-class process analysis	1. What is your goal for the paper both with regard to the grade and what you hope to learn? How is this goal related to your goal for the quarter and for school? 2. What are your indicators that you are reaching your goal? What intermediate or process goals have you or others assessed? 3. What are the strategies that you have used or are using to reach this goal? Have you employed self-talk, have you visualized what success would look and feel like? Have you looked at the model paper? Asked for help from me, from peers, from the Writers' Center?

	4. What steps do you still need to take in order to achieve your goal for this paper? 5. What is your time frame for taking these steps? 6. Will you have to make any changes in your life to accomplish your goal? If so, what are they, and how will you make those changes?
7. Reflection	In this final writing, you will look back over your work and assess how well you have achieved the goals of this course. This is a personal essay, so it is appropriate to use "I" as you consider your progress, the obstacles you encountered, the strategies that you employed to get around the obstacles, and the academic choices that you made. This course also seeks to prepare students for success in college and beyond through the development and enhancement of habits of mind that will make them more resilient. These will be referred to as "Mental Fitness Goals." *Mental Skill Training or Grit Goals* Students will be able to: A. articulate specific academic goals for the quarter and year B. comprehend, recall, and apply research about what enables college students to be academically successful C. use strategies, including the following, which will help them achieve their goals: -Positive self-talk - Emotion control -Visualization -Support networks

VITA

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