THE RELATIONSHIP OF SELF-REGULATION, EXERCISE SELF-EFFICACY, AND SELF-COMPASSION WITH COMMITMENT TO PHYSICAL ACTIVITY IN COLLEGE STUDENTS

By

JOSHUA T. GILBERTSON

Bachelor of Science in Psychology
Newman University
Wichita, KS
2010

Master of Science in Clinical Psychology
Emporia State University
Emporia, KS
2012

Submitted to the Faculty of the Graduate College of the Oklahoma State University in partial fulfillment of the requirements for the Degree of DOCTOR OF PHILOSOPHY
July, 2016
THE RELATIONSHIP OF SELF-REGULATION, EXERCISE SELF-EFFICACY, AND SELF-COMPASSION WITH COMMITMENT TO PHYSICAL ACTIVITY IN COLLEGE STUDENTS

Dissertation Approved:

Bridget Miller, Ph.D.
Dissertation Adviser

Julie Koch, Ph.D.
Committee Chair

John Romans, Ph.D.

Sue C. Jacobs, Ph.D.

Thad Leffingwell, Ph.D.
DEDICATION

This dissertation is dedicated to the memory of Ms. Renee LaFever; without whom, I likely would not have decided to study psychology. Your compassion, enthusiasm for teaching, and gift for connecting with others was a positive force in the lives of so many people. You challenged me to embrace new and different perspectives and taught me the value of empathy and benevolence. Your relentless and unconditional support will always be remembered. Thank you for being you.
ACKNOWLEDGEMENTS

There are a countless number of friends and family members who deserve my appreciation. Thank you all for the encouragement and support throughout this process. Special thanks to Ryan and Miguel; your friendship and support means more to me than you’ll ever know. Thank you, Dr. Merrifield, for challenging me to go to graduate school and helping me to recognize my potential. Thanks to the best cohort members and faculty a guy could ask for; your roles in this process have been invaluable.

Special recognition to Dr. Winterowd; thank you for working closely with me on this project early on.

Many thanks to my dissertation advisor, Dr. Miller; my committee chair, Dr. Koch; and the rest of my committee, Drs. Romans, Jacobs, and Leffingwell.

Endless appreciation to my mom and dad for encouraging me to pursue any endeavor, no matter how great or unlikely. Your support has been overwhelming in the best way possible and I could not have done this without you.

Alaina, Clayton, Corbin, and Harvey, thank you for understanding that daddy had to work a lot. You are my inspiration and motivation and I hope I’ve made you proud!

Alexa, anything I have accomplished in the past 10 years is credited to you. Thank you for putting up with all the late nights, time away from home, and numerous conversations about topics of little interest to you. Thank you for never giving up on me and for making me a better person. We did it!
Abstract: The physical, cognitive, and emotional benefits of exercise and physical activity have been well established. Still, there are high levels of inactivity frequently found among college students. Most people are able to begin an exercise or physical activity regimen; however, maintaining the behavior appears to be problematic. While there can potentially be certain physical barriers, it is the psychological barriers that seem to be significantly hindering college-aged people committing to exercise. Research related to Social Cognitive Theory has indicated that an individual’s level of self-efficacy and self-regulation may impact their ability to persist with a task or maintain certain behaviors. Emerging research also suggests that self-compassion may increase self-improvement motivation and provide an alternative view of self to protect against the self-evaluative components of self-regulation and self-efficacy. 338 college undergraduate and graduate students completed a series of online self-report questionnaires to explore psychological variables (e.g., task, coping, and scheduling self-efficacy, self-regulation, and six elements of self-compassion) and the impact that they have on an individual’s commitment to physical activity as well as their current physical activity behaviors. Results indicate that self-compassion, self-efficacy, and self-regulation are all positively related to physical activity commitment. Self-compassion was not found to account for a significant amount of variance in commitment to physical activity beyond the variance accounted for self-efficacy and self-regulation. Self-regulation, coping and scheduling self-efficacy, and commitment all predicted physical activity behavior among the participant sample. Implications and directions for future research are also discussed.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Commitment to Physical Activity &amp; Exercise</td>
<td>3</td>
</tr>
<tr>
<td>Factors Associated with Physical Activity Commitment</td>
<td>5</td>
</tr>
<tr>
<td>Social Cognitive Theory</td>
<td>8</td>
</tr>
<tr>
<td>Exercise Self-Efficacy</td>
<td>10</td>
</tr>
<tr>
<td>Self-Regulation</td>
<td>12</td>
</tr>
<tr>
<td>Self-Compassion</td>
<td>13</td>
</tr>
<tr>
<td>Research Questions &amp; Hypotheses</td>
<td>16</td>
</tr>
<tr>
<td>II. METHODOLOGY</td>
<td>18</td>
</tr>
<tr>
<td>Participants</td>
<td>18</td>
</tr>
<tr>
<td>Procedures</td>
<td>19</td>
</tr>
<tr>
<td>Measures</td>
<td>21</td>
</tr>
<tr>
<td>Demographic Form</td>
<td>21</td>
</tr>
<tr>
<td>CPA</td>
<td>21</td>
</tr>
<tr>
<td>SCS</td>
<td>22</td>
</tr>
<tr>
<td>SSRQ</td>
<td>24</td>
</tr>
<tr>
<td>MSES</td>
<td>25</td>
</tr>
<tr>
<td>IPAQ</td>
<td>26</td>
</tr>
<tr>
<td>III. RESULTS</td>
<td>29</td>
</tr>
<tr>
<td>Hypothesis 1</td>
<td>30</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>31</td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td>31</td>
</tr>
<tr>
<td>Hypotheses 4 - 5</td>
<td>31</td>
</tr>
<tr>
<td>Hypothesis 6</td>
<td>33</td>
</tr>
<tr>
<td>IV. DISCUSSION</td>
<td>36</td>
</tr>
<tr>
<td>Addressing the Hypotheses</td>
<td>36</td>
</tr>
<tr>
<td>Limitations and Strengths</td>
<td>39</td>
</tr>
<tr>
<td>Implications</td>
<td>43</td>
</tr>
<tr>
<td>Counseling Psychology</td>
<td>45</td>
</tr>
<tr>
<td>Conclusion</td>
<td>47</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (continued)

V. REFERENCES.......................................................................................................49

VI. APPENDICES .......................................................................................................67

Appendix A: Extended Literature Review...............................................................68
  Physical Activity and Exercise ..................................................................68
  Exercise and Physical Activity Commitment ............................................75
  Theoretical Influence .................................................................................78
  Exercise Self-Efficacy ...............................................................................80
    Coping, Scheduling, and Task Self-Efficacy ............................................88
    Exercise Commitment and Self-Efficacy ..............................................89
  Self-Regulation ..........................................................................................90
  Self-Compassion ........................................................................................94
  References ..................................................................................................99

Appendix B: Tables and Figures......................................................................123
  Table 1: Demographic Characteristics .....................................................124
  Table 2: Variable Measure Frequency Data ............................................125
  Table 3: Zero-Order Correlation Matrix for Hypotheses 4 & 5 ...............126
  Table 4: Predictors of Commitment to Physical Activity .......................127
  Table 5: Zero-Order Correlation Matrix for Hypothesis 6 ......................128
  Figure 1: Direct Effects on Physical Activity Behavior ..........................129

Appendix C: Informed Consent & Surveys .........................................................130
  Informed Consent .....................................................................................131
  Demographics ..........................................................................................132
  Commitment to Physical Activity (CPA) ....................................................134
  Self-Compassion Scale (SCS) ....................................................................135
  Short Self-Regulation Questionnaire (SSRQ) .............................................137
  Multidimensional Self-Efficacy for Exercise Scale (MSES) ......................140
  International Physical Activity Questionnaire (IPAQ) ............................141
  Validity Item ............................................................................................143

Appendix D: Curriculum Vita ...........................................................................144
INTRODUCTION

With all the research and advances in medical technology, there still fails to be a guaranteed formula for good health. However, there is a tremendous amount of empirical support to suggest that frequent exercise contributes greatly to better health (Brown, 2005; Desai, Miller, Staples, & Bravender, 2008; Mack et al., 2012). Researchers and medical professionals argue that adherence to a vigorous or at least consistent exercise regimen helps the human body function more effectively (McArdle, Katch, & Katch, 2010). Further, commitment to regular exercise is correlated with lower rates of obesity, heart disease, and diabetes (Warburton, Nicol, & Bredin, 2006). Exercise improves an individual’s chances of living longer, protects against illness and disease, relieves symptoms of depression and anxiety, prevents weight gain and/or promotes weight loss, and improves sleep hygiene (Haskell et al., 2007). Conversely, a sedentary lifestyle contributes to the opposite—increasing the chances of being overweight and developing a number of diseases or medical issues (Cecchini, Sassi, Lauer, Lee, Guajardo-Barron, & Chisholm, 2010). Penedo and Dahn (2005) speculate that sitting for hours on end likely changes individuals’ metabolisms in ways that promote obesity, heart disease, diabetes, and other chronic conditions. In the next section, the researcher briefly illustrates some of the current public health concerns in the United States.
In the past several decades, physical and psychological health risks for individuals living in the United States have increased exponentially. For example, according to the National Center for Health Statistics (2011), the number of adults and children suffering from obesity has more than doubled since the 1970’s. Obesity is a leading public health problem because related conditions (e.g., heart disease, stroke, type 2 diabetes, certain types of cancer, etc.) are some of the leading causes of preventable death in the United States, surpassing tobacco use. Ogden, Carroll, Kit, and Flegal (2014) reported that more than two-thirds of U.S. adults are overweight, a third of whom fall under the category of obese. In 2001, the Center for Disease Control (CDC) reported upwards of nine million cases of cardiovascular disease costing more than $24 billion in medical expenses (Warburton et al., 2006).

However, obesity and related health conditions, especially heart disease, are not the only increasing concerns of public health. Rates of depression and anxiety are also increasing. The National Institute of Mental Health (NIMH, 2012) reported that more than 16 million adults endorsed symptoms meeting criteria for at least one major depressive episode, which represents nearly 7% of all adults in the United States. Additionally, the NIMH reported that more than 18% of U.S. adults suffer from an anxiety disorder; 22.8% of those cases (over 4% of the U.S. adult population) were categorized as severe (Kessler, Chiu, Demler, & Walters, 2005).

If the benefits of physical activity are so great and well-known, as are the adverse effects of a strict sedentary lifestyle, then why do only 30% of U.S. adults report getting an adequate amount of exercise and nearly 40% report getting no physical activity in their daily routine at all (National Center for Health, 2011)? Further, what can be done to promote
healthier lifestyles and how can psychologists contribute to the increase in physical activity of their clients, including their commitment to exercise?

**Commitment to Exercise and Physical Activity**

The constructs of exercise adherence and maintenance appear to be more frequently researched than physical activity or exercise commitment. While there appears to be a great deal of overlap in defining the variables, adherence refers more to the extent in which an individual acts in accordance with an advised exercise regimen (Courneya & McAuley, 1995); whereas physical activity commitment focuses more on voluntary pursuit and maintenance of participation in physical activities and exercise behaviors. For this study, the researcher focused on commitment as it has been defined in previous research: a global psychological construct reflecting an individual’s pledge or obligation to involvement in a particular behavior (Martin & Hausenblaus, 1998). Scanlan, Carpenter, Schmidt, Simons, and Keeler (1993) developed a sport commitment model designed to account for persistence behavior. Initially, this was targeted primarily in youth sports. They determined that an individual’s level of commitment to sports was impacted by several components including enjoyment, personal investment, social constraints, fewer involvement alternatives, and personal investment of time and energy. More recent research has started to utilize this sport commitment framework in relation to general exercise behaviors (Wilson et al., 2004). While sport commitment research outside of youth samples has been somewhat limited, research on exercise commitment has examined participants across different age groups.

Some of the first research on commitment to exercise was conducted by Carmack and Martens (1979) who explored factors predicting commitment to running including state of mind, perceived addiction to running, and length of run. Carmack and Martens’ (1979)
initial research was later extended and broadened by Corbin, Nielson, Borsdorf, and Laurie (1987). Corbin et al. (1987) investigated commitment more broadly by looking at general commitment to physical activity as opposed to a specific type of activity (i.e., running). These early studies tended to look at exercise or physical activity commitment as a unidimensional construct which could be measured through a 12-item scale (Corbin et al., 1987). Additionally, exercise and physical activity were not easily differentiated. Corbin et al.’s results indicated that more frequent exercise was reported more by people with higher levels of commitment than those with lower levels of commitment. While these previous researchers attempted to determine levels of commitment, it was not until Wilson et al.’s study (2004) that exercise commitment was thoroughly analyzed and dissected in detail.

To examine the multidimensional aspect of sport commitment, Wilson et al. (2004) looked to see whether the determinants of sport commitment in Scanlan et al.’s (1993) Sport Commitment Model could predict exercise commitment. The Exercise Commitment Scale (ECS) was created to measure different determinants of exercise commitment including satisfaction (i.e., “I find exercising to be very rewarding”), social constraints (i.e., “I feel pressure from other people to exercise”), involvement alternatives (i.e., “I would be happier doing something else instead of exercising”), personal investments (i.e., “I have invested a lot of energy into exercising”), involvement opportunities (i.e., “Exercising gives me the opportunity to improve my health and fitness”), and social support (i.e., “People important to me encourage me to exercise”). Two dimensions of exercise commitment (i.e., “want to” commit and “have to” commit) were also incorporated as vital components to the measure. The “want” to commit to sports dimension indicates respondents’ voluntary desire to participate in exercise. This tends to correlate highly with enjoyment in the activity. The
“have” to commit to sports dimension indicates respondents’ obligatory feelings and attitudes toward exercise behavior. Through exploratory and confirmatory factor analysis, Wilson et al. (2004) established that the ECS effectively measured the five determinants and two dimensions of commitment.

As indicated, researchers have explored commitment to exercise behaviors with greater breadth and depth than physical activity. Physical activity differs from exercise in that it is a broader construct, encompassing not only exercise (e.g., aerobics, weight training, etc.) but also activities such as walking the dog, gardening, or general household tasks that require considerable effort. Commitment to these activities also entails a voluntary pursuit and maintenance of participation in the behaviors. For the purposes of the present study, commitment to physical activity was the focus rather than exercise commitment because it allowed for exploration of a broader and more general construct. As such, the Commitment to Physical Activity scale was used to assess this variable.

**Factors Associated with Physical Activity Commitment**

Trost, Owen, Bauman, Sallis, and Brown (2002) reviewed the literature to summarize the correlates of and factors contributing to participation in physical activity in adults. They were able to designate five major categories in which to place these various correlates: psychological and cognitive factors (i.e., self-efficacy), behavioral attributes and skills (i.e., previous exercise habits and abilities), biological and demographic factors (i.e., sex, socioeconomic status, level of education), social and cultural influences (i.e., peer support, family support), and lastly, environmental and physical activity characteristics (i.e., availability of facilities, safety of area near facilities).
Arguably the most consistent and empirically supported psychological factor associated with commitment to physical activity is self-efficacy, which is a person’s confidence in their ability to exercise and do it regularly (Blanchard, Rodgers, Courneya, & Spence, 2002). Another influential psychological factor is a sense of self-worth or specific value placed on self as it relates to exercise ability (Huberty et al., 2008). Cognitive and emotional correlates also exist, including self-reported improved mood, reduced stress, calmer temperament, and clearer thought processes, among others (Craft & Perna, 2004). The psychological variables are, by their very nature, intrinsic (Trost, et al., 2002). That is, they are regulated internally either by emotions or cognitions.

Behavioral correlates of physical activity and exercise have been researched extensively; these correlates include sleep hygiene, diet, alcohol use, smoking, etc. (e.g., Huberty, et al., 2008; Sallis & Hovell, 1990; Sallis, Prochaska, & Taylor, 2000; Trost, et al., 2002; Yin & Boyd, 2000). There seems to be a consistent positive correlation between healthy diet and exercise participation (McArdle, Katch, & Katch, 2010). Seguin et al. (2010) revealed that regular exercisers typically pursue a higher quality of life than non-exercisers and therefore are more likely to prioritize a certain time in their schedules to be physically active. Similarly, Stephens (1988) indicated that individuals who scored higher in a general well-being inventory are more likely to adhere to exercise. Whaley and Schrider (2005) observed that learning about and obtaining knowledge related to the positive effects of exercise may encourage physical activity. Further, they report that receiving guidance and information from professionals (e.g., personal trainers) also contributes greatly to exercise regimen compliance. There also appear to be some demographic and biological factors to consider. For example, men are significantly more likely to engage in physical activity than
women (Huberty, et al., 2008). Further, in their review of the literature, Trost et al. (2002) found that being overweight and/or being obese, as well as being a smoker and being inflicted with a chronic illness, were negatively correlated with commitment to physical activity.

The last two categories of correlates of exercise commitment are social and cultural support and environmental factors. Trost et al. (2002) reported that several studies have highlighted the importance of social support as a predictor of exercise commitment. For example, Leslie et al. (1999), Sylvia-Bobiak and Caldwell (2006), and Murcia, San Roman, Galindo, Alonso, and Gonzalez-Cutre (2008) all provide support for the importance of peer and family support in relation to exercise commitment. The influence of trainers and reassuring exercise enthusiasts who participate in regular physical activity alongside the respective participants is also associated with exercise commitment (Whaley & Schrider, 2005). This explains why workout classes and camps, small-group training sessions, “boot camps,” etc. all contribute to enhancing commitment to physical exercise. In terms of environmental impact, Trost et al. (2002) found that accessibility to exercise facilities was positively associated with physical activity adherence. However, Humpel, Owen, and Leslie (2002) and Seguin et al. (2010) noted that accessibility of facilities may not be sufficient to promote exercise commitment. Instead, there should be adequate satisfaction with the workout facility, the available equipment, the safe and friendly atmosphere, etc. There also seems to be an association between the expertise of trainers and the exercise adherence of their clients (Seguin, et al., 2010).

While numerous social and environmental variables have been identified above as factors contributing to commitment, this study focused on exploring the relationship and
impact of multiple psychological constructs. There are many psychosocial models of health behavior that seem to operate on the assumption that psychosocial factors are major contributors of overall health (Bandura, 2004). Bandura’s Social-Cognitive Theory (SCT) is one of the most widely utilized models in helping researchers understand the influential role psychosocial variables have in health promotion and maintenance (Anderson E. S., Wojcik, Winett, & Williams, 2006). The goal of research is to better understand a process; in this case, physical activity commitment. And, it is important to either develop or apply theory to establish a framework from which to bring together variables and processes (Heppner, Wampold, & Kivlighan, 2008). As such, the researcher will draw from SCT as the theoretical underpinnings in this exploration of physical activity commitment.

Social Cognitive Theory

Health promotion research indicates that solely having knowledge about a health behavior is rarely enough to change that behavior. Similarly, Bandura (1982) stated, “Indeed, people often do not behave optimally, even though they know full well what to do” (p. 122). SCT may provide the link between knowledge of a health behavior and actual commitment and engagement of that behavior (Bandura, 2004).

SCT posits that human beings are able to govern their thoughts, motivation, and actions. More specifically, by employing a variety self-determining mechanisms, people can affect change in themselves and in their environment (Bandura, 1986). Perhaps the most pervasive of all self-determining mechanisms is the construct of self-efficacy which is defined as the degree to which an individual believes they are capable of performing a specific task (Bandura, 1986). This individual belief appears to be developed and nurtured through an integration of internalized motivation, affective, and cognitive processes
Beyond self-efficacy, another prevalent self-determining construct woven into SCT is self-regulation. This variable has been used in and defined by several theories of motivation and achievement, all with the overarching theme that self-regulation involves the practice and management of goal-related tasks while effectively unifying internal and external sources of motivation (Maes & Karoly, 2005).

SCT has been applied to understanding and promoting physical activity behavior among a variety of populations including college students and young adults (Rovniak et al., 2002). The core element of self-efficacy has been shown to be an important factor in physical activity behavior adoption and maintenance for the college student population (Buckworth & Nigg, 2004; Conn, Minor, Burks, Rantz, & Pomeroy, 2003). Some evidence also suggests that self-regulation is another crucial factor in the relationship between physical activity and self-efficacy in younger adults (Baranowski, Perry, & Parcel, 2002; Rovniak et al. 2002).

While the environment is an important element impacting behavior change for SCT, the research will focus on intrapersonal, psychological factors of the theory in this study. The combination of self-efficacy and self-regulation have contributed significantly to better explaining health behavior processes. However, a concern that these two variables could be limited in their impact on behavior change inspired the inclusion of the third self-psychology variable in this study, self-compassion. The researcher will frequently refer to these constructs as self-psychology variables as they operate through an intrapersonal process. The concern mentioned is that self-efficacy and self-regulation both involve a self-evaluative process. Self-evaluation is not inherently a negative process—it has numerous benefits and is often seen as crucial for goal attainment (Cetinkalp & Turksoy, 2011; Koo & Fishbach,
Nevertheless, self-evaluation has the potential to provoke a wide range of emotions leading to a negative intrapersonal experience which could range from self-doubt and impaired self-concept to general angst and feelings of depression (Neff, 2003a). As such, self-compassion is a construct that could contribute to the pursuit of a goal or behavior along with the self-evaluative process within the self-determining mechanisms of SCT. Moreover, there is evidence to suggest that self-compassion itself may lead to an increase in self-improvement motivation (Brienes & Chen, 2012). In the subsequent three sections, the researcher discusses these identified self-psychology variables in greater detail.

**Exercise Self-Efficacy**

Albert Bandura (1977) suggests that confidence in the ability to perform a behavior is positively correlated with the actual performance of that behavior. Exercise self-efficacy refers to an individual's belief in his/her ability to engage in exercise as a regular course of action (Bandura, 2005). Exercise self-efficacy has been positively associated with the capability to overcome barriers that may interfere with regular exercise (Leenders, Silver, White, Buckworth, & Sherman, 2002). Additionally, high levels of exercise self-efficacy support the maintenance of activity over time (Ashford, Edmunds, & French, 2010). Most exercise self-efficacy scales being used today include probable barriers an individual may face that could potentially deter them from their attempt to exercise regularly. McAuley (1992) utilized a sample of previously sedentary middle-aged adults in a group exercise environment and found that perceptions of exercise self-efficacy predicted the number of exercise sessions and the intensity of those sessions. In a follow-up study, McAuley (1993) investigated the relationship between exercise participation and exercise self-efficacy and found that exercise self-efficacy was the single significant predictor for the continuation of
exercise post-study; demonstrating, once again, the link between exercise self-efficacy and adherence to an exercise routine. Marcus, Eaton, Rossi, and Harlow (1994) and Marcus et al. (2000) found that exercise self-efficacy may have the strongest relationship to habitual physical activity. Exercise self-efficacy, which includes people’s belief systems surrounding successfully engaging in physical activity, has been shown to affect the intensity, duration, and consistency with which an individual engages in exercise (Marcus et al, 1994).

Exercise self-efficacy has been identified and explored as both one-dimensional and multidimensional constructs. That is, much of the earlier research on exercise self-efficacy (e.g., Desharnais, Bouillon, & Godin, 1986; Marcus, Selby, Niaura, & Rossi, 1992; McAuley, 1992) explored the construct in terms of beliefs in an individual’s ability to overcome barriers to maintain exercise participation. More recently, investigators of exercise self-efficacy (e.g., Rodgers & Sullivan, 2001; Rodgers, Hall, Blanchard, McAuley, & Munroe, 2002; Rodgers, Wilson, Hall, Fraser, Murray, 2008; Sniehotta, Scholz, & Schwarzer, 2005) suggest that exercise-related self-efficacy consists of multiple factors including task self-efficacy (i.e., confidence in performing elemental aspects of exercise), coping self-efficacy (i.e., confidence in exercising under challenging circumstances), and scheduling self-efficacy (i.e., confidence in exercising regularly despite other demands).

Netz, Wu, Becker, and TenenBaum (2005) posited that exercise self-efficacy is associated with a sense of mastery surrounding the exercise experience. Consequently, exercise self-efficacy may be the most salient variable supporting well-being in an exercise experience. Similarly, Dionigi (2007) reported that exercise self-efficacy and social interaction were the most prominent mediators between exercise and psychological well-being. While self-efficacy in health behavior research is already well-established, the
researcher utilized the multidimensional nature of exercise self-efficacy for the current study to explore its relation to the other self-psychology variables as well as physical activity commitment. This should add to existing literature in that it confirms self-efficacy’s important role while also highlighting the significance of observing the multidimensional nature of the construct.

Self-Regulation

Self-regulation, as defined by Bandura (1986), is the personal regulation of goal-directed behavior or performance. Bandura explains that self-regulation manifests itself in several different dimensions including goal setting, reinforcements (i.e. rewarding or punishing), self-monitoring (i.e., self-observation), corrective self-reactions (i.e., engaging in behaviors that produce positive outcomes), and preparation to reach or avoid individual outcome expectations associated with a particular behavior (e.g., prepare to increase physical activity because it will make me healthier) (Bandura, 1991). Other researchers have identified self-regulation to be the process of an individual altering his/her responses or inner states (Baumeister, Schmeichel, & Vohs, 2007); for example, denying urges and delaying gratification. Baumeister et al. (2007) clarified a possible misnomer in the literature as the concept of self-regulation is often considered to be part of impulse control. However, they explained that most impulses are automatic responses and cannot be prevented through behavioral regulation. Therefore, self-regulation involves choice. An individual does not control an impulse or desire—he/she experiences it. After experiencing it, an individual decides on a course of action.

Perhaps one of the most vital components of self-regulation as it relates to physical activity and exercise commitment is the ability to set and keep productive goals. Mann,
Ridder, and Fujita (2013) highlight this by defining self-regulation as the various processes by which people pursue and attain goals. They theorize that developing self-regulation leads to more successful, realistic, and appropriate selection of desired goals (i.e., goal setting) and increased or improved engagement in behaviors and strategies needed to produce the desired outcome (i.e., goal striving).

In physical activity and exercise research, the construct of self-regulation has been investigated; however, this has been done most extensively in populations of older adults (e.g., McAuley et al., 2011; Schuz, Wurm, Warner, Wolff, & Schwarzer, 2014; Umstattd, Wilcox, & Saunders 2008). After controlling for self-efficacy and socio-demographic variables, Umstattd et al. (2008) found that using self-regulatory strategies (e.g., self-monitoring, goal setting, etc.) significantly related to higher engagement in physical activity in a population of older adults. Similarly, McAuley and his colleagues (2011) discovered that the use of self-regulatory strategies at the start of an exercise program enhanced beliefs in exercise capabilities and led to improved adherence to exercise regimens. While developing self-regulation has been associated with improved goal-directed health behaviors (e.g., smoking cessation, alcohol consumption control, diet, and exercise behavior), there does not appear to be any research exploring self-regulation and its function related to physical activity commitment among college students. This only adds to the interest and importance of inclusion in this study.

Self-Compassion

Self-compassion is defined as “being touched by and open to one’s own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one’s own suffering and to heal oneself with kindness…offering nonjudgmental understanding to one’s pain,
inadequacies and failures, so that one’s experience is seen as part of the larger human experience” (Neff, 2003a; p. 224). Neff (2003a & 2003b) theorized six aspects of self-compassion including self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. Self-kindness refers to being warm and understanding toward ourselves when we face adversity; the opposite of which is identified as self-judgment. Common humanity is acknowledgment that all humans suffer and facing adversity is simply part of the human experience. Frustration with this suffering and failing to grasp the common humanity perspective often results in more feelings of isolation. Mindfulness refers to being able to approach our negative life experiences with a balanced perspective. This includes embracing a willingness to observe adversity with openness and awareness. When mindfulness is not achieved, one could be at risk for over-identifying with the negative experience or thoughts. These six components come together to create three self-compassion continua (self-kindness versus self-judgment, common humanity versus isolation, and mindfulness versus over-identification).

To date, only a few researchers have published their research of self-compassion in relation to exercise and/or physical activity, all of which focus on either women in general or female athletes (e.g., Magnus, Kowalski, & McHugh, 2010; Mosewich, Kowalski, Sabiston, Sedgwick, & Tracy, 2011). While these researchers did examine exercisers and athletes, they focused primarily on self-conscious emotions (i.e., guilt and shame) and unhealthy self-evaluative thoughts (i.e., fear of failure, negative self-image, and self-criticism) in relation to self-compassion. Being compassionate towards oneself has been negatively associated with depression, anxiety, and neurotic perfectionism while positively associated with life satisfaction and social connectedness (Neff, 2003a).
A research team at Oklahoma State University has also investigated self-compassion as it relates to exercise motivation, entity and incremental beliefs, self-efficacy, and exercise behavior among a college-aged population. Murrell, Gilbertson, Loche, Jacobs, and Miller (2014) presented findings that suggest two of the constructive self-compassion components (common humanity and self-kindness) were positively related to exercise motivation, self-efficacy, and incremental beliefs (i.e., abilities are malleable and can be learned, changed, and/or improved). In a similar sample of data, Gilbertson, Murrell, Loche, Miller, and Miller (2014) presented that common humanity and self-kindness were not only significantly related to exercise behaviors, but exercise persistence (i.e., long-term maintenance of an exercise regimen or routine) as well. Although these findings have not yet been published, they are important to note because these are the only projects known to the researcher that explore self-compassion and exercise with a college-aged population of men and women.

Developing self-compassion appears to be an excellent coping resource, creating a more positive experience for those engaged in physical activity, be it competitive sports or regular exercise (Magnus, Kowalski, & McHugh 2010; Mosewich et al., 2011; Mosewich, Crocker, Kowalski, DeLongis, 2013). The idea that a more positive exercise experience could occur through the adoption or development of a self-compassionate orientation comes from findings which suggest that self-compassion contributes to improved body image and less social physique anxiety, fewer feelings of exercise-related guilt and shame, as well as reduced endorsement of obligatory exercise (Magnus et al., 2010; Mosewich et al., 2011). Further, Breines and Chen (2012) explored self-compassion as it relates to self-improvement motivation and found that when individuals were accepting of personal failure, they may be more motivated to improve themselves.
In summary, self-compassion is a psychological construct that has just recently been explored in relation to participation in exercise and physical activity. However, the populations focused on have been females and female athletes. Additionally, no researchers to date have explored self-compassion in relation to commitment to physical activity for college men and women. The positive correlations of self-compassion that previous researchers have identified contribute to the inclusion of self-compassion in the current study. That is, self-compassion may minimize the any critical self-evaluation processes of self-efficacy and self-regulation while offering “an alternative conceptualization of a healthy attitude towards oneself” (Neff, 2003a, p. 85). The researcher aimed to explore the relationship of these self-psychology variables and further establish self-compassion as a resource for health promotion.

**Research Questions and Hypotheses**

The research questions and hypotheses for this study are as follows:

R1: What are the relationships between task, coping, and scheduling exercise self-efficacy and commitment to physical activity?

H1: All three subscales of exercise self-efficacy (task, coping, and scheduling exercise) will be positively related to commitment to physical activity.

R2: What are the relationships between the six subscales of self-compassion (i.e., self-kindness, self-judgment, common humanity, mindfulness, isolation, over-identification) and commitment to physical activity?

H2: The self-compassion subscales of self-kindness, common humanity, and mindfulness will be positively related to commitment to physical activity. The self-compassion subscales of
self-judgment, isolation, and over-identification subscales will be negatively related to commitment to physical activity.

R3: What is the relationship between self-regulation with commitment to physical activity?

H3: Self-regulation will be positively related to commitment to physical activity.

R4: Does self-compassion account for a significant proportion of the variance in commitment to physical activity, after accounting for self-efficacy and self-regulation?

H4: Self-compassion will account for a significant proportion of the variance in commitment to physical activity, after accounting for self-efficacy and self-regulation.

R5: How much variability in commitment to physical activity can be accounted for by self-efficacy, self-regulation, and self-compassion?

H5: Self-efficacy, self-regulation, and self-compassion will account for a significant portion of variance in commitment to physical activity.

R6: Does commitment to physical activity predict physical activity behaviors?

H6: Commitment to physical activity will positively predict physical activity behaviors.
METHODS

Participants

427 undergraduate and graduate students participated in the study; recruitment details are outlined in the subsequent procedure section. Before conducting the analyses, the researcher removed 86 cases from the dataset; 23 cases were missing a significant amount of data (more than 1/3 of the items were unanswered), 17 participants endorsed Yes when they were asked, “Is there any reason why the survey you have completed should NOT be used by the researcher when analyzing that data?” and another 46 answered reported being Unsure. The researcher examined each of the 46 “unsure” cases and noted that more than fifty percent of them completed the set of questionnaires in less than seven minutes with nearly another 20% completing the surveys in less than ten minutes. Based on the number of items presented to each participant, it is unlikely anyone would have been able to complete the questionnaire items that quickly while also providing reliable, deliberate, and valid data. As such, the researcher elected to discard all 46 cases who endorsed being unsure about the validity of their data. This left 339 respondents who indicated that their responses were representative of their beliefs and behaviors. In addition, 1 case was removed due to missing data on the Self-Compassion scale. Therefore, the final dataset included responses from 338 participants. Characteristics of these participants are displayed in the Table 1 which can be found in Appendix B.
Significant characteristics to note include that the over 83% of participants were undergraduate college students and information reported on age indicated that the sample was comprised primarily of “traditional” students. While this is beneficial for making conclusions about the sample and the data they provided, it weakens any arguments made about differences found among undergraduate and graduate students. A second notable characteristic of this sample is that there are significantly more females than males (male=38.2%, female=61.8%). Additionally, in relation to race and sexual orientation, the sample appeared to be relatively consistent with the population of the university. Finally, a wide range of socio-economic statuses were reported.

**Procedure**

Recruitment was accomplished through convenience sampling methods utilizing the Oklahoma State University College of Education SONA system participant pool. Traditionally, students in College of Education (COE) courses such as Total Wellness, Developmental Psychology, and World of Work are expected to participate in research as part of their course requirement. After accessing the SONA system using their assigned login credentials, a list research of studies was presented to them. Those who chose this study were directed to the study’s invitation page which provided them with a summary of the purpose. Students who elected to click “continue” were directed to the Qualtrics survey page. Qualtrics is a private research software company. The researcher’s affiliation with Oklahoma State University allowed him to utilize the Qualtrics survey platform. Once participants accessed the survey page, they were able to read the electronic informed consent and clicked on either “Yes, I want to take the survey” or “No, I don’t want to take the survey.” Those who selected the “no” option were
redirected out of the survey. By clicking the “yes” option participants provided informed consent and were directed to an online survey which included a demographic sheet and questionnaires regarding their exercise commitment, their self-regulation, their exercise self-efficacy, and their self-compassion experiences as well as their current level of physical activity.

Participants were informed that their participation in the study was voluntary and they were able to choose to not participate or withdraw at any time. Additionally, participants’ survey responses were anonymous; they did not write their names or any identifying information on the surveys so that there would be no way to connect their identity with their survey responses. Furthermore, their instructors did not have access to their survey responses, rather they were provided with a list of who participated in this study. This list of participants was collected separately from the survey responses (through the COE SONA system).

Once participants reviewed the informed consent page, they were directed to the online survey which included the demographic page, the Commitment to Physical Activity scale (CPA; Corbin, Nielsen, Borsdorf, & Laurie, 1987), the Self-Compassion Scale (SCS; Neff, 2003), the Short Self-Regulation Questionnaire (SSRQ; Carey, Neal, & Collins, 2004), the Multidimensional Self-efficacy for Exercise Scale (MSES; Rodgers, Wilson, Hall, Fraser, & Murray, 2008), and the International Physical Activity Questionnaire-short form (IPAQ-SF; Craig et al., 2003). It should be noted that the Exercise Commitment Scale (ECS; Wilson, et al., 2004) was also administered but not used in the present study. The CPA measure was the questionnaire used to measure the outcome variable in this study. Scales were presented in random order through the
Qualtrics block randomization feature. On average, it took approximately 30 to 45 minutes to complete this survey. Students received one credit to be applied toward any College of Education courses they were enrolled in that was using the SONA system that semester for their participation in this research project.

**Measures**

**Demographic Form.** Participants completed a demographic questionnaire, which included questions regarding participant sex, gender, age, race/ethnicity, sexual/affectional orientation, relationship status, college year classification (i.e. freshman, sophomore, etc.), status as collegiate student-athlete or non-athlete, socioeconomic status, and type(s) of exercise currently engaged in (e.g., aerobics, martial arts, weight training, swimming, sports, etc.).

**Commitment to Physical Activity Scale** (CPA; Corbin, Nielsen, Bordsdorf, & Laurie, 1987). The CPA is an adaptation of Carmack and Martens’ (1979) Commitment to Running Scale which assessed differences in motives for starting to run, as well as continuing to run, in both high and low committed runners. Similarly, the CPA is a 12-item questionnaire that measures an individual’s commitment to physical activity. Participants were asked to read each item and rate how strongly they identify with the item using a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Examples of items include, “Physical activity is vitally important to me,” “I have to force myself to participate in physical activity,” and “Physical activity is the high point of my day.” Scores on the CPA range from 12 to 60. Higher scores indicate more commitment to physical activity; lower scores reflect lower commitment to physical activity.
In terms of reliability, split-half reliabilities for the CPA were .88 (n = 238 males) and .91 (n = 212 females) in the scale development sample. Test-retest reliability coefficients of .76 and .85 were reported for the aforementioned participants, respectively, across a one-week interval (Corbin et al., 1987). The Flanagan Item Analysis was used to assess item discrimination; results revealed that CPA items met the cut-off value for acceptability of items to discriminate between groups with high and low scores (Corbin et al., 1987). In the current sample, the CPA demonstrated excellent internal consistency (α = .94).

The CPA was successful in distinguishing between subjects (n = 450) who reported varying levels of physical activity (Corbin et al., 1987). That is, those who reported being more physically active scored higher on the CPA versus subjects who reported lower levels of physical activity. Thus, the CPA has demonstrated a degree of discriminant validity suggesting that the scale may be used to assess commitment to physical activity (Corbin et al., 1987). No convergent validity statistics have been reported.

**Self-Compassion Scale** (SCS; Neff, 2003). The SES is a 26-item self-report measure consisting of six subscales: the 5-item self-kindness subscale (e.g., “I’m kind to myself when I experience suffering.”), the 5-item self-judgment subscale (e.g., “I’m disapproving and judgmental about my own flaws and inadequacies”), the 4-item common humanity subscale (e.g., “I try to see my failings as part of the human condition”), the 4-item isolation subscale (e.g., “When I think about my inadequacies it tends to make me feel more separate and cut off from the rest of the world”), the 4-item mindfulness subscale (e.g., “When something painful happens I try to take a balanced
view of the situation”), and the 4-item over-identification subscale (e.g., “When I’m feeling down I tend to obsess and fixate on everything that’s wrong.”). The six subscales represent three theoretical continua: self-kindness vs. self-judgment, common humanity vs. isolation, and mindfulness vs. over-identification.

Items are rated on a 5-point Likert-type scale from 1 (almost never) to 5 (almost always). The subscales of self-kindness, common humanity, and mindfulness are scored such that higher scores reflect greater levels of self-compassion. The subscales of self-judgment, isolation, and over-identified are scored such that higher scores reflect lower levels of self-compassion. A total SCS score can be calculated by reverse scoring the latter three subscales and summing all six subscales.

During the creation of the original scale, confirmatory factor analyses determined that a single higher-order factor of self-compassion could explain the inter-correlations between the six subscales (Non-Normed Fit Index=.90; Comparative Fit Index=.92; Rindskopt & Rose, 1988). The significance of this is that one can examine the six subscales separately or as an overall score (Neff, 2003a). Neff (2003a) reported acceptable internal consistency reliability for all of the subscales: self-kindness ($\alpha = .78$), self-judgment ($\alpha = .77$), common humanity ($\alpha = .80$), isolation ($\alpha = .79$), mindfulness ($\alpha = .75$), and overidentification ($\alpha = .81$). Each subscale also showed adequate internal consistency in the current sample: self-kindness ($\alpha = .83$), self-judgment ($\alpha = .79$), common humanity ($\alpha = .74$), isolation ($\alpha = .79$), mindfulness ($\alpha = .75$), and overidentification ($\alpha = .79$).

Neff, Kirkpatrick, and Rude (2007) verified that the SCS demonstrates concurrent validity (e.g., correlates negatively with self-criticism), convergent validity (i.e., SCS
scores of clients are significantly correlated with therapist ratings of self-compassion),
discriminant validity (e.g., no correlation with social desirability or narcissism), and test-
retest reliability.

**Short Version of the Self-Regulation Questionnaire** (SSRQ; Carey, Neal, & Collins, 2004). The SSRQ is a 31-item measure of people’s generalized ability to
regulate goal-directed behavior. Participants rate each item using 5-point Likert-type
ranging from strongly disagree (1) to strongly agree (5). All 31 items of the SRQ are
totaled to obtain an overall score regarding self-reported regulation ability. Higher scores
indicate better self-regulation whereas lower scores represent less effective self-
regulation.

The original 63-item measure of self-regulation (SRQ; Brown, Miller, &
Lawendowski, 1999) was initially developed to assess Miller and Brown’s (1991) seven
components of self-regulation which include attention to informational input, self-
evaluation by comparison to a standard, willingness to consider change, engagement in
search for alternatives to meet the change goal, devising a clear plan, implementing and
maintaining the plan, and subsequent evaluation of the plan. Although the SRQ’s seven-
factor structure was confirmed through factor analyses (Brown et al., 1999), there has not
been much empirical support for the long version of the SRQ.

Most researchers now use the 31-item SSRQ instead of the original SRQ. Carey,
Neal, and Collins (2004) conducted a factor analytic study of the SSRQ and found that
the SSRQ was significantly correlated with the SRQ (r = .96). Their findings also
revealed strong internal consistency reliability, with a Cronbach’s alpha estimate of .92
for the overall score of the SSRQ. In the current sample, the SSRQ also had excellent
internal consistency, with an alpha of .94. Factor analyses revealed that the SSRQ consists of two correlated factors: Goal-setting and Impulse control (Neal & Carey, 2005). This two-factor solution has also demonstrated strong internal consistency (Goal-setting: alpha = .86, Impulse control: alpha = .84; Neal & Carey, 2005). Neal and Carey (2005) also found the SSRQ to possess adequate convergent validity which was demonstrated by a positive correlation with another measure of general self-control and a negative correlation with measures of general impulsivity and impaired control. Discriminant validity was also demonstrated by a lack of relation to demographic variables.

**Multidimensional Self-Efficacy for Exercise Scale** (MSES; Rodgers, Wilson, Hall, Fraser, & Murray, 2008). The MSES is a 9-item measure of exercise self-efficacy. Participants rate each item using a 100% confidence scale that ranges from 0% (no confidence) and 100% (complete confidence). Unlike many other self-efficacy for exercise instruments, the MSES measures self-efficacy across three domains: task, coping, and scheduling. Following the stem “How confident are you that you can,” three items measure task self-efficacy (“complete the exercise using proper technique,” “follow directions to complete exercise,” and “perform all of the required movements”), three items measure coping self-efficacy (“exercise when you lack energy,” “exercise when you feel discomfort,” and “exercise when you don’t feel well”), and the final three items measure scheduling self-efficacy (“arrange your schedule to include regular exercise,” “include exercise in your daily routine,” and “consistently exercise three times per week”). The time required to complete this survey is approximately 3 to 5 minutes.
In a series of studies by Rodgers et al. (2008), exercise self-efficacy was assessed using these 9 items. Cronbach’s alpha estimates were calculated at .81 (task), .95 (coping), and .76 (scheduling) for one study and were found to be .84 (task), .81 (coping), and .85 (scheduling) in a second study, reflecting acceptable internal consistency reliability. Similarly, the MSES had good reliability in the current sample for the task (α = .88), coping (α = .84), and scheduling (α = .86) subscales.

Test-retest reliability has been found to be adequate with Pearson’s r values equaling .78 (task), .83 (coping), and .80 (scheduling). Rodgers et al. (2008) addressed structural and criterion validity by conducting three studies with samples from three different populations. Through both exploratory and confirmatory factor analysis, the MSES has been found to have sound construct validity (Rodgers et al., 2008). Subsequently, the generalizability of the factor structure was confirmed with a random sample of 470 adults, and discriminate validity was demonstrated in this sample through the ability of the MSES to distinguish between exercisers and non-exercisers (Rodgers et al., 2008).

**International Physical Activity Questionnaire—short form (IPAQ; 2005).** It was anticipated that physical activity and exercise levels would be measured with the short form (7 items) of the IPAQ. The IPAQ was initially designed and piloted as a way to effectively assess and compare physical activity levels of individuals aged 18-69 spanning the globe. Developed by researchers from the Centers for Disease Control and Prevention and the World Health Organization, two versions of the activity questionnaires were derived in 1998 (Craig et al., 2003). The instrument has been translated into at least 14 languages and modified to accommodate culturally appropriate
definitions of vigorous and moderate physical activity. There are two different versions of the IPAQ; a short version usually administered by telephone interview or self-administration and a longer more detailed version (Craig et al., 2003) utilized when researchers are interviewing independently. The IPAQ-short version was used because the purpose of this study was to estimate participants' overall level of physical activity. The shorter version summarizes the five domains (obligatory physical activity, leisure time physical activity, domestic and gardening activities, work-related physical activity, and transport-related physical activity) and both versions have been shown to yield similar results (Craig et al., 2003).

The short form IPAQ is a 7-item scale assessing the total minutes spent in vigorous physical activity (VPA), moderate intensity physical activity (MPA) and walking during the last 7 days (3 items). The days spent doing each level of activity are assessed (3 items). Sidney and Blumchen (1990) define Metabolic Equivalents (METs) as the resting metabolic rate or amount of oxygen consumed while sitting. Thus, work or activity at 2 METs necessitates twice the resting metabolism; three METs require three times the resting metabolism, and so on. The IPAQ utilizes the MET concept to measure physical activity because it represents a practical and easily understood procedure for expressing energy expenditure. METs-minutes are calculated by multiplying the number of minutes by six for vigorous physical activity, four for moderate physical activity, 3.3 for walking (three items). A total score is calculated for the IPAQ to represent overall energy expenditure from physical activity.

The IPAQ has acceptable measurement properties, comparable to other established self-report instruments (IPAQ, 2005). Craig et al. (2003) argue that the IPAQ
possesses strong content validity because frequency, intensity, and duration of physical activity are all assessed. Results from a study of the reliability and validity of the IPAQ in 12 countries yielded significant support for the use of the instrument (Craig et al., 2003). Craig et al. (2003) reported reliability correlations ranging from .34 to .89 with a median of .80. Concurrent validity coefficients between the short and long forms showed reasonable agreement (.67). Criterion validity of the short form was obtained by comparing IPAQ data against CSA accelerometers (Swartz, Strath, & Bassett, O’Brien, Kings, & Ainsworth, 2000); moderate agreement between the measures was observed with correlations ranging from .14 to .53 (median of .30).

Due to unforeseen difficulties with collecting accurate and reliable IPAQ data from a significant number of respondents, the IPAQ was not used for final analysis in this study. Instead a composite score was created based on information gathered on the demographics questionnaire to establish participants’ physical activity behaviors. The researcher addresses this in more detail near the end of the following results section.
Prior to conducting the statistical analyses, the researcher screened data to ensure that the underlying assumptions of each analysis were met. An alpha level of .05 was used for all analyses. Relationships between participant demographic factors and commitment to physical activity were also examined, so that factors with a significant effect could be included as covariates in the subsequent analyses. Results suggest that undergraduate students scored higher on commitment to physical activity ($M = 43.40, SD = 9.94$) than college graduates or current graduate students ($M = 38.28, SD = 8.69$), $t(334) = 3.33, p = .001, d = 0.37$. Participants’ age did not significantly correlate with commitment to physical activity after age outliers (e.g., 13 participants with ages greater than three standard deviations from the mean) were excluded from the analysis. Commitment to physical activity also did not differ according to participants’ family income or race/ethnicity ($p > .05$). Therefore, only education level was included as a covariate in subsequent analyses.

Between the four main variables (self-compassion, -efficacy, -regulation, and commitment to physical activity), there were a total of 11 scales/subscales analyzed. The ranges, means, medians, modes, and standard deviations of each are presented below in Table 2 which can be found in Appendix B.
The first three hypotheses pertained to the relationships between exercise self-efficacy and commitment to physical activity, self-compassion and commitment to physical activity, and self-regulation and physical activity. To test these hypotheses, the researcher conducted several Pearson product-moment correlations, partialling out the effects of education level on commitment to physical activity. Before the first three hypotheses were tested, the researcher removed univariate outliers with scores greater than three standard deviations from the mean. The researcher excluded one case from the correlation analyses due to an extreme value on the SSRQ, and excluded another seven cases due to extreme outlier values on the task subscale of the MSES.

Bivariate scatterplots indicated linear relationships between the variables. Scores on each subscale of the SCS, the SSRQ, the coping and scheduling subscales of the MSES, and the CPA were approximately normally distributed. However, scores on the task subscale of the MSES were negatively skewed, with skewness of -1.41 ($SE = 1.33$) and kurtosis of 2.17 ($SE = 0.27$). Although Warner (2012) indicated that modest departures from normality are not usually a significant issue, the researcher utilized a bootstrapping procedure with 1000 resamples to produce the significance levels reported in the study. Bootstrapping is a non-parametric technique that estimates the population distribution of a statistic by resampling cases from the dataset (Efron & Tibshirani, 1993). It may provide more robust parameter estimates, especially when traditional parametric assumptions are violated (Erceg-Hurn & Mirosevich, 2008).

In research question 1, the researcher sought to examine the relationship between exercise self-efficacy, measured using three subscales (task, coping, and scheduling), and commitment to physical activity. The results of the correlation analyses indicate that task
self-efficacy \[ r(333) = .58, p < .001 \], coping self-efficacy \[ r(333) = .69, p < .001 \], and scheduling exercise self-efficacy \[ r(333) = .68, p < .001 \] were all positively related to commitment to physical activity. This suggests that participants who reported greater exercise self-efficacy also reported greater commitment to physical activity. Therefore, the first hypothesis was supported.

With research question 2, the researcher sought to examine the relationship between the six subscales of self-compassion (self-kindness, self-judgment, common humanity, mindfulness, isolation, and over-identification) and commitment to physical activity. As expected, the self-kindness \[ r(333) = .13, p = .019 \] and mindfulness \[ r(333) = .17, p = .002 \] subscales of the SCS were positively associated with commitment to physical activity, while the self-judgment \[ r(333) = -.14, p = .010 \], isolation \[ r(333) = -.22, p < .001 \], and over-identification \[ r(333) = -.21, p < .001 \] subscales were negatively related to commitment to physical activity. The common humanity subscale was not related to commitment to physical activity \[ r(333) = .06, p = .276 \]. This suggests that the second hypothesis was mostly supported. The researcher evaluated the relationship between self-regulation and commitment to physical activity with research question 3. The results indicate that self-regulation was positively related to commitment to physical activity \[ r(333) = .37, p < .001 \]. That is, participants who reported greater self-regulation tended to report more commitment to physical activity which supports hypothesis three.

The researcher used hierarchical multiple regression analysis to evaluate the amount of variance in commitment to physical activity explained by differences in self-compassion (research question 4) and self-efficacy, self-regulation, and self-compassion (research question 5). A plot of the standardized residuals suggested that the
homoscedasticity assumption was met and the residuals were approximately normally distributed. The researcher identified four cases with standardized residuals greater than three standard deviations from the mean as outliers and removed these cases from subsequent analyses. Descriptive statistics and a correlation matrix including each variable used in the regression models for Hypotheses 4 and 5 are presented in Table 3. The results of the three-step hierarchical multiple regression analysis are shown in Table 4 (found in Appendix B).

Participants’ education level (0 = undergraduate, 1 = college graduate or graduate student) was entered in the first step to control for the effect of education level on commitment to physical activity. This variable significantly contributed to the model and explained approximately three percent of the variability in commitment to physical activity $[\Delta R^2 = .03, \Delta F (1, 330) = 10.16, p = .002]$. In the second step, participants’ scores on the SSRQ, and the task, coping, and scheduling subscales of the MSES were entered. These predictors collectively contributed to the model and explained an additional 55% of the variance in commitment to physical activity $[\Delta R^2 = .55, \Delta F (4, 326) = 104.82, p = < .001]$. In the third step, participants’ scores on the six subscales of the SCS were entered. The results suggest that adding the self-compassion subscales did not contribute to the predictive power of the model, after controlling for participants’ education level, their self-regulation scores, and their exercise self-efficacy scores $[\Delta R^2 = .00, \Delta F (6, 320) = 0.58, p = .746]$. Therefore, the fourth hypothesis was not supported.

The results suggest that the linear combination of predictors in the full model explained approximately 58% of the variability in commitment to physical activity $[R^2 = .58, F(11, 320) = 40.21, p < .001]$. Participants’ education level ($\beta = -.10, p = .013$) was
predictive of their commitment to physical activity, such that undergraduate students reported more commitment to physical activity than college graduates or graduate students. Participants who reported higher self-regulation scores ($\beta = .13, p = .013$) also reported greater commitment to physical activity. Furthermore, higher coping self-efficacy ($\beta = .29, p = .010$), and scheduling self-efficacy ($\beta = .31, p = .009$) was also associated with greater commitment to physical activity. Task self-efficacy ($\beta = .12, p = .053$) was marginally associated with commitment in the full model. The results suggest that the self-compassion subscales were not significant. Hypothesis 5 was mostly supported.

The purpose of the final research question was to evaluate the impact of commitment to physical activity on self-reported physical activity behaviors. Two simultaneous multiple regression analyses were conducted to examine the direct effect of commitment to physical activity on physical activity behaviors, as well as the direct and indirect effects of participant’s education level, self-regulation, and exercise self-efficacy on physical activity behaviors. The self-compassion subscales were not included because they were not found to be significant predictors of commitment to physical activity in the previous analysis. Table 5, which represents the Zero-order correlation matrix for hypothesis 6, can be found in appendix B.

The International Physical Activity Questionnaire-Short Form (IPAQ) is designed to measure physical activity levels. However, 79 participants completed the measure incorrectly (e.g., reporting that they exercised 0 days per week, then also indicating that they exercised for a period of time on those days), and removing these cases would result in an approximately 24% reduction in sample size. Furthermore, the distribution of
IPAQ scores was severely non-normal, with skewness of 2.67 \( (SE = .15) \) and kurtosis of 10.56 \( (SE = .30) \).

To address this issue, the researcher created a composite measure of physical activity behaviors based on items included in the research survey. To do so, participants’ coded responses to the item “On average, how many days per week do you exercise?” (range, 0-7) was multiplied by their coded responses to the item “On average, how long do you usually exercise?” \( (1 = \text{less than 30 minutes}, 6 = \text{more than 151 minutes}) \). Therefore, scores on this compromise measure could range from 0 to 42, with higher values representing higher levels of physical activity. While this is not the most ideal method of obtaining a self-report of physical activity behavior (as it does not allow for the measurement of intensity through the calculation of METs), it has been shown to be an acceptable alternative (Sallis & Saelens, 2000).

The researcher removed four additional cases with standardized residuals greater than three standard deviations from the mean. In the first model, participants’ level of education, self-regulation, task self-efficacy, coping self-efficacy, and scheduling self-efficacy scores were used to predict commitment to physical activity. The predictors explained approximately 58% of the variance in commitment to physical activity \( [R^2 = .58, F(5, 322) = 87.23, p < .001] \). In the second model, these predictors, as well as commitment to physical activity, were used to predict physical activity behaviors. The predictors in the second model explained approximately 43% of the variance in physical activity behaviors \( [R^2 = .43, F(6, 321) = 39.81, p < .001] \).

As shown in Figure 1 (Appendix B), commitment to physical activity \( (\beta = .32, p = .001) \) and coping self-efficacy \( (\beta = .31, p = .001) \) had direct positive effects on physical
activity behaviors. Therefore, the results support the sixth hypothesis that commitment to
physical activity positively predicts physical activity behaviors. Participants’ education
level had a direct negative effect on behaviors ($\beta = -.10$, $p = .002$), such that
undergraduates engaged in more physical activity behaviors than college graduates or
graduate students. Self-regulation had a significant positive indirect effect on physical
activity behaviors through commitment to physical activities; however, the direct effect
of self-regulation on physical activity behaviors was marginally significant and negative
($\beta = -.09$, $p = .05$). Scheduling self-efficacy had a significant positive indirect effect on
physical activity behaviors through commitment to physical activity, and task self-
efficacy had a marginally significant positive indirect effect.
DISCUSSION

Addressing the Hypothesis

The primary objective of this study was to explore multiple psychological variables that could be contributing to college students’ commitment to physical activity as well as their self-reported physical activity behaviors. An overview of study results indicates that within this population, hypotheses were partially supported. Self-compassion was expected to make unique contributions after accounting for the other constructs. The rationale being that self-compassion minimizes the self-evaluation process of self-efficacy and self-regulation which could offer a potential alternative conceptualization of a healthy attitude towards self (Neff, 2003a). While self-efficacy, self-compassion, and self-regulation were all positively related to physical activity commitment, self-compassion did not explain variance for physical activity commitment beyond self-efficacy and self-regulation. However, it should be noted that two of the three constructive subscales of self-compassion (i.e., self-kindness and mindfulness) were significantly positively related to commitment while all three adverse components (i.e., self-judgment, isolation, and over-identification) were negatively related to physical activity commitment. These findings suggest potential for the construct as means to promoting health and well-being. Still, the results of this study revealed that self-compassion does not predict commitment to physical activity above and beyond the
social-cognitive variables of self-efficacy and self-regulation among a college-aged population. The researcher will briefly discuss the implications of self-compassion in this area of study, but first highlight and address the variables that were found to be significant predictors of physical activity commitment and behavior.

Self-efficacy and self-regulation were found to account for a significant proportion of variance in physical activity commitment and behavior. Keeping in mind that Social Cognitive Theory has been applied to exploring and promoting physical activity behavior among a variety of populations including college students and young adults (Rovniak et al., 2002), it is essential to report that this study adds confirmation to an already impressive body of research (e.g., Baranowski, Perry, & Parcel, 2002; Buckworth & Nigg, 2004; Conn, Minor, Burks, Rantz, & Pomeroy, 2003). However, there are nuances of the current study that provide unique contributions as well. For example, using the multidimensional construct of self-efficacy revealed that while task, coping, and scheduling efficacy all contribute physical activity commitment and behavior, it is the scheduling and coping efficacy that account for the most variance. In other words, when it comes to developing commitment, it is important that an individual believe in their ability to accomplish a behavior (in this case physical activity); however, it is even more important for that individual believe in their ability to perform the activity regardless of barriers (i.e., coping) and to preemptively organize time and space to complete their desired task (i.e., scheduling).

Similarly, findings related to self-regulation in this study are primarily confirmatory. That is, researchers have previously identified self-regulation as an important element impacting behavior change and the data gathered in this study revealed

37
that self-regulation not only correlates highly with the other psychological variables including commitment, but also is a strong predictor of physical activity behaviors. While these constructs provided an excellent framework for the current study, Anderson et al. (2006 & 2007) noted that self-efficacy may serve an important precursor to self-regulation and that these constructs may be interdependent. With this in mind, one direction for future research could be to more clearly identify the interaction of these social-cognitive determinants in regard to their prediction of health behaviors, specifically commitment to health behaviors.

Findings also revealed that participants’ education level may contribute to their level of physical activity commitment and behavior with undergraduate students displaying higher levels of both. However, it is important to note that the sample was comprised of 83% undergraduate students, making it difficult to express any decisive assumptions. Additionally, from a speculative and anecdotal perspective, differences found among level of education might be explained by time commitments and social practices. In other words, going to the gym or engaging in physical activity may likely be more of a “social experience” for undergraduate students than their graduate counterparts. If this is the case, graduate students’ rigorous academic demands may create challenges in allotting time for physical activity when the motivation is socially-based rather than grounded in health promotion. Regardless, this may be an area worth exploring in future research.

As noted before, self-compassion was not a predictor of physical activity commitment in this sample. It is likely the case that self-compassion is not an important variable in the lives of college students, especially in relation to their physical health.
Still, the study of self-compassion (as a testable construct) remains limited in general, but it is even more rare in health and exercise psychology research. Additionally, in this study, self-compassion and self-efficacy were found to be strongly correlated. This finding was not necessarily unexpected as they both reflect healthy perspectives of the self; however, it raises the question that perhaps some of the benefits attributed to self-efficacy could be accounted for by self-compassion as well. Differences and similarities in these constructs may be difficult to detect because the psychological construct of self-compassion is still in its infancy. Exploring and discovering the unique and complimentary roles of self-compassion and self-efficacy in health and exercise research might be a valuable direction for future research.

The researcher had hypothesized that self-compassion could contribute to the pursuit of a goal or behavior by adding an alternative (and more positive) view of self than one that could potentially be created from the self-evaluative process within the self-determining mechanisms of SCT. The findings of this study would suggest that this is not the case. However, it may be worth re-conceptualizing the relationship among these variables. Perhaps self-compassion does not add a unique contribution, but rather acts as a buffer to inherent self-evaluative process. This means including self-compassion as a moderating variable in future analyses which could support Brienes & Chen (2012) who suggest that self-compassion may increase self-improvement motivation.

Limitations and Strengths

Although this project yielded a great deal of information and potential inspiration for future research, there are several limitations to note. After completing data interpretation, it appears that some of the collection methods may have inhibited a
thorough analysis of the data. To start, while Neff’s Self-Compassion Scale is the most widely used tool for assessing self-compassion in the field, its innate ability to measure self-compassion by means of three continua, provides a major limitation. That is, due to the normal distribution of any continuum-based measure, it is challenging to yield stark results that display either high or low levels of the construct, in this case self-compassion. Based on the nature of normal distribution, the majority of participants identified with moderate levels of self-compassion which may be one reason why analysis of the hypothesis yielded insignificant conclusions. Similarly, it should be noted that the Self-Compassion Scale was designed to measure the construct on a five-point scale. This limited range may have contributed to the lack of significant predications.

Second, physical activity behavior was intended to be measured by the IPAQ. While the IPAQ is designed to provide a wealth of information related to physical activity measured in a discipline appropriate unit (Metabolic Equivalent of Task—i.e., METs), its comprehensive nature makes it susceptible to problems if any of the individual questions are misinterpreted or answered incorrectly. Additionally, the 7-item short form that was used in this study is often administered in person or over the phone. Self-report/administration is also acceptable; however, this makes it difficult to ensure quality and accuracy of responses since there is no way to check for clarification. Thus, when it was discovered that nearly a quarter of the cases would need to be removed because of issues with participant responses, a decision was made to create a composite score instead based on physical activity data gathered in the demographics section. While this composite score does not evaluate differences in the intensity of physical activity, it does provide information related to the amount of time spent being physical
active which has been used in previous research (Sallis & Saelens, 2000). Use of the new composite measure of physical activity did not affect any of the first five research questions and hypotheses. It may have had some impact on the outcome of the final analysis. One such effect could be the difference found in level of education. As mentioned above, undergraduate students may be spending more time at the gym than graduate students; however this could be for a variety of reasons including socialization or lack of other time commitments which the composite score would not be sensitive to. Therefore, it is unlikely that the utilization of the composite score measuring physical activity behavior created any significant limitations or had any negative impact on the study’s findings.

Third, the use of convenience sampling is often considered a limitation because of the inability to generalize results. However, the aim in this study was to look specifically at a college student population and convenience sampling is a widely accepted method in these types of exploratory studies (Peterson & Merunka, 2014). In order to address the limited generalizability of the current results it would require replication at other colleges/universities in the country to support and confirm findings. Fourth, the self-reported nature of the data is also a limitation. Self-report data is often criticized because it cannot be independently verified and may contain several potential sources of bias including attribution, exaggeration, telescoping, and/or selective memory. Still, self-report data collection is currently the only method available to assess intrapersonal psychological constructs (i.e., self-psychology variables and commitment). There are more objective measures of physical activity including direct observation, or utilization
of pedometers and accelerometers. However, given the cost and time-intensive nature of these methods, they were not viable options for this study.

Finally, there is an inherent challenge in measuring several unique psychological variables that are different but still interrelated. As it was explained, there is significant overlap in the self-psychology constructs included in the study (self-compassion, self-efficacy, and self-regulation). Moreover, there are likely other potentially influential factors that were not included in the analysis as they did not fit into the theoretical framework of the study. Regardless, self-esteem, locus of control, intrinsic and extrinsic motivation, social physique anxiety, body image/perception, etc. are all examples that could have been serving as mediating or moderating factors. Exploring their role in relation to the impact of self-compassion, self-efficacy, and self-regulation on physical activity commitment may be an important role for future research.

An identified strength of the study is the inclusion of a validity item in the data collection. Close to 100 cases were thrown out after endorsing the validity item, stating that the information they provided was invalid. In addition to the respondents’ self-proclamation of invalid data, the researcher’s spot check of these cases revealed that respondents were completing questionnaires at unlikely speeds and also either lacked a significant amount of data or seemed to answer thoughtlessly (e.g., every response was coded 1). While this may seem like a significant loss of data, there were still more than enough cases to meet the power analysis’ recommended number of cases. Further, it afforded the opportunity to not assume that all 425 original cases collected contained were valid data. The validity of self-report data collection will always yield some
uncertainty; however, this process likely reduced the analysis of poor responses exponentially.

A second identified strength could be the unique application of self-compassion. While this construct is relatively new to psychological study in general, it has rarely been investigated in relation to physical activity and this is the first study to explore its relationship to physical activity commitment. While results did not show that it contributed to commitment beyond what was already accounted for by self-efficacy and self-regulation, it helped to establish a foundation for further examination in the area of physical and psychological health promotion.

**Implications**

In this section, the researcher will attempt to outline practical implications for health and exercise psychology as well as for the field of applied counseling psychology. For one, it is important to highlight the answer found to research question six, which is that higher levels of commitment to physical activity do predict more engagement in physical activity. The physiological and psychological benefits of regular engagement in physical activity are overwhelming and well-established in the literature. Higher levels of exercise and health related physical activities are generally associated with some aspect of good physical and psychological health, disease prevention, and longevity of life (Desai, Miller, Staples, & Bravender, 2008; Mack et al., 2012). As such, researchers and clinicians alike should make an effort to enhance commitment to physical activity which will lead to more regular engagement in the health-benefiting behavior. Based on the findings of hypotheses one through three, individuals may be able to improve commitment to physical activity by increasing a number of self-psychology variables.
Although no definite cause-effect conclusions can be made based on this study, the significant positive relationships established between levels of self-compassion, self-efficacy, and self-regulation with commitment to physical activity create a strong argument for importance of nurturing these self-themes.

Health professionals and lay-people can use a variety of widely used psychological techniques to aid in the development of high self-efficacy and self-regulation. Because these social-cognitive determinants are impacted by mastery experience, vicarious experience, social persuasion, and physiological state, it is logical to develop individual and group strategies aimed at increasing self-efficacy through each of these factors. Because mastery is one of the most powerful sources of self-efficacy and self-regulation, proper goal setting is crucial. This will allow an individual to establish specific, measurable, achievable, relevant, and time-based expectations for their health behavior (Hofmann, Schmeichel, & Baddeley, 2012; Kaplan & Maehr, 1999). Achievement of the smaller, initial goals helps the individual build self-efficacy and momentum to achieve the subsequent larger goals (Cetinkalp & Turksoy, 2011). Another strategy for improving commitment by means of increasing self-efficacy, compassion, and regulation is implementing vicarious experience through imagery and modeling. This will allow someone to mentally rehearse their plan or behavior and has been found to be quite helpful in improving beliefs about self (Vealey & Greenleaf, 2001). McAuley et al., (1994) suggest that verbal and social persuasion, be it through positive interpersonal interaction or self-talk, may be another strategy for improving health-related beliefs of self.
Counseling Psychology

A question could be posed as to why this study is relevant and important to the field of counseling psychology and other applied psychology fields (i.e., clinical, school, etc.). The answer is quite simple. From a mental health perspective, there are numerous psychological benefits to maintaining regular activity and disadvantages for inactivity. The strongest evidence for the positive relationship between exercise and mental health is in the prevention and treatment of depression. In addition to depression, growing research addresses the role of physical activity in relationship to anxiety disorders, attention deficit disorders, eating disorders, psychosis, and cognitive functioning (Ellis, Crone, Davey & Grogan, 2007; Holley, Crone, Tyson, & Lovell, 2011; Otto & Smits, 2011; Richardson et al., 2005; Stathopoulou, Powers, Berry, Smits, & Otto 2006; Watson & Bulik, 2013; Erickson & Kramer, 2009). Research is also growing that ties the positive effects of physical activity and exercise to special populations including trauma survivors and individuals suffering from PTSD (Kendall-Tackett, 2009).

The American Psychological Association (APA) has recently made an effort to acknowledge the role of psychologists in addressing physical activity and mental health through their APA Mind and Body Health Campaign (2011) and in APA Monitor in Psychology articles that highlight a variety of topics including cognitive benefits of exercise, the effect of exercise on mental health, and the application and utilization of exercise in therapy (Blair, Sallis, Hutber, & Archer, 2012; Schmitz, Kruse, & Kugler, 2004; Vina, Sanchis-Gomar, Martinez-Bello, & Gomez-Cabrera, 2012; Walsh, 2011; Weir, 2011). Incorporating exercise into more traditional therapies for mental health
problems serves several purposes. First, physical activity may create a distraction from stressful input. Exercise is also a form of mastery or control; this allows a person the perspective to regain control over their body and (when paired with cognitive behavioral or other traditional therapies) their life. Lastly, psychological benefits can be gained from the social interaction that is inherent in most physical activity. As such, it should be clear why this research is relevant to mental health providers.

Still, simply prescribing physical activity does not ensure that consumers will engage in the activity recommended by their providers. Similarly, it is important to remember the nuanced difference between adherence and commitment. Mental health providers should aim to foster commitment as this is the voluntary sustainability of behavior whereas adherence refers to the engagement and maintenance of a behavioral prescription. This is when the self-psychology variables presented in the current study come into consideration. With physical activity engagement in mind, let us assume that by increasing one’s beliefs in their ability to complete tasks and control their behaviors then they will be more likely to participate in the physical activity assigned to them by a mental health provider. Further, if individuals can learn to unconditionally embrace themselves in the face of adversity, then they will create far fewer psychological barriers to change.

While literature dedicated to improving self-efficacy and enhancing self-regulation has been well-established, there is emerging literature that examines the potential ability of various interventions to raise self-compassion or its components, including mindfulness. Additionally, it appears self-compassion can be increased through relatively easy to administer exercises and training (e.g., Neff and Germer,
The use of self-compassionate imagery, loving-kindness meditation, writing a compassionate letter-to-self, and affectionate breathing scripts are some of the different ways that self-compassionate thinking can be fostered either through self-initiated exercises or through more formal training programs (Germer and Neff, 2013; Smeets et al., 2014). To date, self-compassion interventions have focused mainly on reducing risky health behaviors such as overeating (Adams and Leary, 2007), and smoking (Kelly et al., 2010), rather than increasing positive health behaviors. This point should be stressed as there are two very different processes at work. While reducing negative health behaviors (e.g., smoking) is tremendously beneficial in reducing health risks, it does not require the same motivation and vigilance required to adopt and sustain positive health behaviors. In other words, introducing and maintaining a health promoting behavior is very different than ceasing a negative or risk behavior.

**Conclusion**

Overall, the self-determining intrapersonal mechanisms identified in Bandura’s SCT were shown to be important predictors of commitment to physical activity. However, the maintenance of health behaviors is not solely a personal matter which is why SCT acknowledges the existence of impediments to health behavior (e.g., physical activity) that are grounded in situational and environmental systems. Exploring the sociocultural factors within SCT and how they relate to self-compassion and commitment could be a future step in this area. Bandura (2005b) argued that the scope, productivity, and social utility of health promotion must be enhanced through integration and development of newly informed models. SCT has served as a model of health promotion
for decades and it has thrived in doing so; however, developing an alternative perspective to self-evaluation could be one resource for the “enhancement” Bandura recommended.

In general, there is a growing body of research that asserts that self-compassion is a construct distinct from other self-beliefs/themes and is associated with psychological health and possibly physical health. As research on self-compassion and interventions for self-compassion are at early stages of development, more research is needed to develop the construct validity of self-compassion, its component elements, how these are associated with various aspects of distress and well-being, and how self-compassion can be fostered in treatment. If these aspirations for future study can be realized, it would be interesting to replicate this study or utilize different analyses where self-compassion operates as a moderating variable between social-cognitive determinants and the target health behavior. Lastly, a follow-up study may want to investigate interventions aimed at increasing self-efficacy and -regulation skills as a means for increasing commitment to health behaviors.
REFERENCES


doi:10.1136/bjsm.2008.052498


Giles-Corti, B., & Donovan, R. (2002). The relative influence of individual, social and physical environment determinants of physical activity. Social Science and Medicine, 54, 1793-1812.


complete a structured exercise program. *Research Quarterly for Exercise and


Kendall-Tackett, K. (2009). Psychological trauma and physical health: A psychoneuroimmunology approach to etiology of negative health effects and


on physical activity among black and white adults: a structural equation analysis.

Annals of Behavior Medicine, 31(1), 36-44.


APPENDIX A: REVIEW OF LITERATURE

A literature search using Oklahoma State University’s electronic databases including PsycINFO, PsycArticles, SPORTDiscus, ProQuest, and Health Source (Nursing/Academic Edition), was conducted. Specific terms that were used for the literature search included physical activity, exercise behaviors, leisure-time exercise, college students, university students, social cognitive theory, self-compassion and exercise, exercise self-efficacy, self-regulation and physical activity, self-compassion and self-efficacy, self-compassion and self-regulation, commitment to exercise, commitment to physical activity, benefits of exercise, barriers to exercise, determinants of physical activity, antecedents of physical activity, and correlates of physical activity. Electronic as well as print versions of Journal articles were secured for reviewing the current literature. In addition, several books and supplementary electronic government information provided the necessary tools for examination of interrelated research.

Physical Activity and Exercise

Caspersen, Powell, and Christenson (1985) defined physical activity as body movements produced by skeletal muscle actions that increase energy expenditure. The International Physical Activity Questionnaire (IPAQ; Craig et al., 2003) is the most frequently used instrument in the world to measure physical activity. The IPAQ guidelines suggest three levels of physical activity: 1) inactivity, 2) minimal activity, and 3) health enhancing physical activity. Inactivity is obviously the lowest level of physical activity as it represents a more sedentary lifestyle. Minimal activity is defined as: 3 or
more days of vigorous physical activity for at least 20 minutes per day; 5 or more days of moderate physical activity; walking at least 30 minutes per day; or 5 or more days of any combination of activity achieving at least 600 MET-min per week. Health-enhancing physical activity (HEPA) is defined as vigorous PA for at least three days a week accumulating 1500 MET-min/week or 7 or more days of a combination of any physical activity achieving a minimum of 3000 MET-min/week. Individuals who do not meet the criteria for minimal activity and HEPA are considered inactive. The IPAQ has established median MET values for each activity (walking=3.3 METs, moderate activity=4.0 METs, and vigorous activity=8.0 METs). Hence, MET-min/week is computed by multiplying the medium MET level for a specified activity by the minutes and days in a week that PA took place (medium MET value*minutes*days). Forms of physical activity can include walking, cycling, gardening, swimming, dancing, playing, skating, cleaning house, and climbing stairs (Craig et al., 2003).

Exercise is defined as a subset of physical activity that is planned, structured, repetitive, and purposeful in the sense that improvement or maintenance of physical fitness is the objective (Caspersen, Powell, & Christenson, 1985). Physical fitness includes cardio-respiratory fitness, muscle strength, body composition, and flexibility comprising a set of attributes that people have or achieve that relates to the ability to perform physical activity (Thompson et al., 2003). However, for the purpose of this study, exercise and physical activity will be used interchangeably.

Higher levels of exercise and health related physical activities are generally associated with some aspect of good physical and psychological health, disease prevention, and longevity of life (Desai, Miller, Staples, & Bravender, 2008; Mack et al.,
2012). Still, many people throughout the United States do not participate in regular physical activity despite the well-researched benefits associated with maintaining an active lifestyle (Abu-Moghli, Khalaf, & Barghoti, 2010; Moore et al., 2010; Fleury & Lee, 2006; McNeill, Wyrwich, Brownson, Clark, & Kreuter, 2006; Weinfeldt & Visek, 2009;). In addition, a rapid decrease in activity levels seems to occur between the ages of 18 and 24 (Stephens, Jacobs, & White, 1985). And, although most campus settings appear to provide a physical environment conducive to physical activity and exercise, reports from national surveys and reviews indicate that more than 50% of college students are insufficiently active (American College Health Association [ACHA], 2005). Due to this disturbing trend, college students and young adults have gained the attention of public health officials and are recognized as an important population for health promotion and physical activity research (ACHA, 2005).

Brown (2005) indicated that regular physical activity benefits all individuals, regardless of gender and age. Anderson and colleagues suggest that the inclusion of moderate physical activity for at least 15 minutes per day on most days of the week would render significant health benefits. The authors also mentioned that the health benefits associated with increased activity may ultimately lead to a longer and a better overall quality of life (Anderson et al., 1999).

The amount of obese children (ages 12-19 – 17.6% obese) has more than doubled over the last 15 years. According to Caprio and Genel (2005), childhood obesity is the most common nutritional disorder in the United States, nearly affecting one of every three individuals. Researchers have maintained that at this rate of incidence, the entire U.S. population will be overweight in a few generations and by the year 2025, more than
75% will be classified as overweight, with a third of these people being obese (Booth, Gordon, Carlson, & Hamilton, 2000). This is noteworthy because the number of children who are overweight and/or obese directly correlates with the numbers of college and university students who are overweight and/or obese. It is important to understand this trend, as universities will soon be faced with a dilemma on how to effectively serve the next generation of students that will seemingly have much worse health profiles than that of the current student population (Mack, Wilson, Lightheart, Oster, & Gunnell, 2009).

The physiological detriments of inactivity have been exhausted in the literature and are often the primary focus of research (Fleury & Lee, 2006; McNeill, Wyrwich, Brownson, Clark, & Kreuter, 2006; Moore et al., 2010; Weinfeldt & Visek, 2009). However, from a mental health perspective, there are numerous psychological benefits to maintaining regular activity and disadvantages for inactivity. The strongest evidence for the positive relationship between exercise and mental health is in the prevention and treatment of depression. In addition to depression, growing research addresses the role of physical activity in relationship to anxiety disorders, attention deficit disorders, eating disorders, psychosis, and cognitive functioning (Ellis et al., 2007; Erickson & Kramer, 2009; Holley et al., 2011; Kendall-Tackett, 2009; Otto & Smits, 2011; Richardson et al., 2005; Stathopoulou et al., 2006; Watson & Bulik, 2013). Research is also growing that ties the positive effects of physical activity and exercise to special populations such as trauma survivors.

The American Psychological Association (APA) has recently made an effort to acknowledge the role of psychologists in addressing physical activity and mental health through their APA Mind/Body Health Campaign (2011) and in APA Monitor in
Psychology articles that highlight a variety of topics including cognitive benefits of exercise, the effect of exercise on mental health, and the application and utilization of exercise in therapy (Blair, Sallis, Hutber, & Archer, 2012; Schmitz, Kruse, & Kugler, 2004; Vina, Sanchis-Gomar, Martinez-Bello, & Gomez-Cabrera, 2012; Walsh, 2011; Weir, 2011).

In 2003, the U.S. National Comorbidity Survey addressed the relationship between physical activity and mental health in a sample of 8,098 adults aged 15-54 (Goodwin, 2003). Results indicated that respondents who reported regular exercise were less likely to meet criteria in the previous year for both Major Depressive Disorder and a range of anxiety disorders. Interestingly though, no relationship was found between regular participation in exercise and other mental health issues including Bipolar Disorder, alcohol and other substance dependence. While the data was collected through self-report, this survey still provides important evidence of the relationship between exercise behaviors and mental health.

Researchers have identified a number of promising variables that may influence levels of physical activity among a variety of samples including demographics (McArthur & Raedeke, 2009; Maglione & Hayman, 2009), intra- and interpersonal factors, cultural environment, and physical environment (Trost et al., 2002). However, this review will focus primarily on correlates of exercise and physical activity for college and university students.

The most consistent demographic correlates of physical activity and exercise have been found to be age and gender; where lower levels of physical activity being present in females and with increasing age (Eyler, 2003; McArthur & Raedeke, 2009). Although
not as consistently represented in research, other frequent demographic correlates are lower socioeconomic status (Maglione & Hayman, 2009), lower educational attainment (Day, 2006), and those who are overweight or obese being found to be more likely to be inactive (Sallis et al., 2000; Trost et al., 2002). Being non-White has also been identified as a relatively consistent predictor of lower physical activity participation (Eyler, 2003; Sallis, Prochaska, & Taylor, 2000; Keller, Fleury, Gregor-Holt & Thompson, 1999). For example, Seo and Torabi (2007) found that out of a pool of demographic variables, only race/ethnicity was a predictor of meeting vigorous physical activity guidelines.

In addition to demographic correlates, many studies have identified psychological correlates of physical activity. Trost and his colleagues (2002) found that self-efficacy was the most consistent psychological correlate. Other psychological correlates that have received some support are perceived barriers and the constructs of intentions, attitudes, normative beliefs, and perceived behavioral control (Brown, 2005). For interpersonal correlates, only social support has emerged as a consistent predictor of future physical activity. When examining social support, each study included in the Trost et al. (2002) review that included this construct found it to be a consistent predictor of physical activity. People who report low levels of social support have been found to report lower levels of physical activity.

The results of studies linking environmental correlates with physical activity have produced varying results. However, there is preliminary evidence that suggests that physical activity is more likely in cases of greater actual access to physical activity facilities, less cost to use facilities, observing others exercise in the environment, perceptions of lower crime rates and higher general safety, less vehicular traffic and more
sidewalks, and being in an urban environment (Leslie, et al., 1999; Trost et al., 2002; Reed & Phillips, 2005). Leslie, Sparling, and Owen (2001) suggest that recreational facilities and exercise programs found on many campuses may only be relevant for individuals who are already active. Still, little is known about aspects of the university physical environment that might influence the proportion of the student body that is insufficiently active. There does appear to be some evidence that the physical activity behaviors of students differ depending on their living arrangements (Behrens & Dinger, 2003; Brevard & Rickets, 1996; Jones, Harel, & Levinson, 1992; Reed & Phillips, 2005). That is, students who live in residents’ halls are less likely to be inactive and tend to engage in group physical activities more than students living off-campus (Dinger, 1999; Behrens & Dinger, 2003).

Other researchers have indicated that the transition from students’ home environment to a new social and physical environment in college may negatively impact students’ patterns of exercise (Butler, Black, Blue, & Gretebeck, 2004; Dinger, 1999). The increased use of computers and other technological devices used in college seems to contribute to an environment that does not foster recreational or leisure-time exercise (Buckworth & Nigg, 2004). Previous studies have demonstrated that accessibility and proximity to workout facilities or gyms are associated with being physically active in undergraduate populations.

It has been suggested that the simultaneous examination of demographic, behavioral, and psychosocial, and environmental correlates of physical activity may offer a clearer understanding of individual variation in exercise behavior (Saelens, Sallis, &
Frank, 2003). Although extensive demographic data will be collected, the current study will focus primarily on the contribution of self-psychological variables.

**Exercise and Physical Activity Commitment**

Commitment has been defined in previous research as a global psychological construct reflecting an individual’s pledge or obligation to involvement in a particular behavior (Martin & Hausenblaus, 1998). In relation to exercise and physical activity, commitment is a construct that has been researched intermittently over the past several decades. The constructs of exercise adherence and maintenance appear to be more frequently researched than physical activity or exercise commitment. And, while there appears to be a great deal of overlap in defining the variables, adherence refers more to the extent in which an individual acts in accordance with an advised exercise regimen (Courneya & McAuley, 1995); whereas physical activity commitment focuses more on voluntary pursuit and maintenance of participation in physical activities and exercise behaviors.

Some of the first research on commitment to exercise was done by Carmack and Martens (1979). Their study examined the relationship between running commitment and different factors including average length of runs, frequency of runs, perceived discomfort felt when missing a run, and perceived addiction to running among 250 male and 65 female runners between the ages of 13 and 60 ($M = 28.8$) with varying levels of ability and experience. To measure running commitment, they developed the Commitment to Running Scale (Carmack & Martens, 1979). This scale assessed differences in motives for starting to run, as well as continuing to run, in both high and low committed runners. Their results showed that high committed and low committed
runners differed significantly on length of runs, discomfort experience when a run is missed and perceived addiction to running.

Carmack and Martens’ (1979) initial research was later extended and broadened by Corbin, Nielson, Borsdorf, and Laurie (1987). Corbin et al. (1987) analyzed commitment more broadly by looking at general commitment to physical activity as opposed to a specific type of activity (i.e., running). Four hundred fifty college students in physical education classes (238 males, 212 females) participated in this study. To assess commitment in their research, they created the Commitment to Physical Activity Scale, which was based entirely off of Carmack and Martens’ (1979) Commitment to Running Scale. Not surprisingly, their study found that more frequent exercise was reported more by people with higher levels of commitment than those with lower levels of commitment.

The surveys used by Carmack and Martens (1979) and Corbin et al. (1987) to analyze exercise commitment have been criticized for not accurately representing commitment as defined by Becker (1966). The Commitment to Running scale and the Commitment to Physical Activity scale include items such as “I do not enjoy running/physical activity,” and “Running/Physical activity is pleasant.” Use of these questions in the surveys would not lead to an idea of commitment according to Becker (1966) where it demonstrates a consistent activity or behavior that persists over time.

A major contributor to more recent research and operationalization of exercise and physical activity commitment comes from the Sport Commitment Model (Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993) designed to account for persistence behavior in youth sports primarily. Scanlan and colleagues (1993) define the term sport
commitment as “a psychological construct representing the desire and resolve to continue sport participation” (p. 7). They determined that one’s level of commitment was impacted by enjoyment, personal investment, social constraints, fewer involvement alternatives, and personal investment of time and energy.

Wilson et al. (2004) took a new route towards examining commitment in exercise. Their views stemmed from a combination of Scanlan’s Sport Commitment Model and Johnson’s (1982) notions of two types of commitment: having to (obligatory actions) and wanting to (voluntary actions). To examine this multidimensional aspect of commitment, Wilson et al. (2004) looked to see whether the determinants of the Sport Commitment Model could predict the types (i.e., “want” to and “have” to) of exercise commitment.

The product of this work is the Exercise Commitment Scale (ECS). The ECS was measures different determinants of exercise commitment including satisfaction (i.e., “I find exercising to be very rewarding”), social constraints (i.e., “I feel pressure from other people to exercise”), involvement alternatives (i.e., “I would be happier doing something else instead of exercising”), personal investments (i.e., “I have invested a lot of energy into exercising”), involvement opportunities (i.e., “Exercising gives me the opportunity to improve my health and fitness”), and social support (i.e., “People important to me encourage me to exercise”). Two dimensions of exercise commitment (i.e., “want to” commit and “have to” commit) were also incorporated as vital components to the measure. The “want” to dimension reveals respondents voluntary desire to participate in exercise. This tends to correlate highly with enjoyment in the activity. The “have” to dimension examines respondents’ obligatory feelings and attitudes toward exercise behavior.
Wilson et al. (2004) gave the Exercise Commitment Scale along with the Godin Leisure Time Exercise Questionnaire to university students and staff enrolled in group-based exercise classes (N=428) and found that satisfaction and personal investment were the strongest predictors of exercise commitment. It was also found that investment alternatives and social constraints were only predictive of “have to” (obligatory) commitment. These results suggest that like enjoyment in sport commitment, satisfaction appears to be a strong predictor of exercise commitment. The fact that investment alternatives and social constraints were only predictive of “have to” commitment is not surprising considering that these are the factors that would force an athlete to participate or make him or her feel obligated to participate. For example, an athlete with low investment alternatives and high social constraints, will not have many choices other than to participate in sport, thus, his or her commitment would probably be one of obligation rather than one of a voluntary desire. Overall, the analysis of exercise commitment in this multidimensional method is an important issue to consider when examining sport commitment. While exploring various constructs that potentially impact exercise commitment and physical activity behavior is essential for health promotion, doing so without any theoretical guidance would make it challenging to interpret or make sense of the findings.

Theoretical Influence

Theory serves as a framework and guides the interpretation of relationships among the study variables. Heppner, Wampold, Kivlighan (2008) state that the goal of research is to understand a process and that theory provides the underpinnings or framework necessary to bring together multiple variables and processes. Albert Bandura's
Social Cognitive Theory (SCT) has provided the framework for better understanding the relationships of the variables in this study. SCT posits that human beings are able to determine their thoughts, motivation, and actions and by self-determining mechanisms (i.e., self-efficacy and self-regulation), people can affect change in themselves and in their environment (Bandura, 1986). Bandura also indicates that SCT is a learning theory that incorporates observation of others, behavior, cognition, and the environment into the learning process.

Central to SCT is the self-determined concept of self-efficacy which is defined as the degree to which an individual believes they are capable of performing a specific task (Bandura, 1986). Beliefs related to self-efficacy serve as determinants of human cognition, motivation, and behavior. As such, individuals derive self-efficacy through an integration of motivation, affective, and cognitive processes within themselves. Bandura (1982) establishes a critical relationship between self-efficacy and knowledge. Health research indicates that solely having knowledge about a health behavior is not enough to change that behavior. “Indeed, people often do not behave optimally, even though they know full well what to do” (Bandura, 1982, p. 122). Bandura (1982) purports that self-efficacy may be the key link between knowledge and behavior change. He highlights avenues for behavior change, such as one of the four conditions of self-efficacy plus a challenging task. This well-established theory is suited for explaining exercise commitment’s relationship with perceptions of exercise-related self-efficacy, self-regulation, and self-compassion because it is one of the most commonly used behavior theories in explaining patterns of physical activity and exercise (Bandura, 2001; Petosa, Suminski, & Hertz, 2003; Rovniak, Anderson, Richard, Winett, & Stephens, 2002).
SCT has been widely applied to understanding and promoting physical activity behavior among a variety of populations including college students and young adults (Rovniak et al., 2002). Among some of the core elements to SCT are self-efficacy and self-regulatory capabilities (Bandura, 1986). Self-efficacy has been shown to be one of the most vital factors in physical activity behavior adoption and maintenance for the college student population (Conn, Minor, Burks, Rantz, & Pomeroy, 2003; Buckworth & Nigg, 2004). However, some evidence exists to suggest that self-regulation is also an important factor in the relationship between physical activity and self-efficacy in younger adults (Baranowski, Perry, & Parcel, 2002; Rovniak et al. 2002).

One study that tested the relationship of the social cognitive variables of Bandura’s model was conducted by Rovniak and her colleagues (2002). Self-efficacy, social support, outcome expectations, and self-regulation with physical activity were studied in a sample of 277 university students. Results of structural equation modeling revealed self-efficacy had the greatest total effect on physical activity. Social support had a moderate effect on physical activity, mediated entirely by self-efficacy. Outcome expectations did not have a significant total effect on physical activity. A strength of this study is the use of a prospective design and structural equation analysis to provide greater understanding of the influence the study variables have on physical activity. Limitations include self-report measures, limited ethnic diversity of the sample, and the use of a measure developed for this study that requires further testing for reliability.

**Exercise Self-Efficacy**

Self-efficacy is the belief in one's capabilities to organize and execute the courses of action required to produce given attainments and self-efficacy theory suggests that
confidence in the ability to perform a behavior is positively correlated with the actual performance of that behavior (Bandura, 1977).

Self-efficacy is based on four principle sources of information: performance attainment, vicarious experiences of observing the performances of others, verbal persuasion and allied types of social influences, and physiological states from which people partly judge their capableness (Bandura, 1986).

Performance attainment is the most influential source of self-efficacy. Through mastery experiences, people learn that they are capable of performing specific behaviors under specific conditions. Successes raise efficacy appraisals; repeated failures lower them, especially if the failures early in the course of events and do not reflect lack of effort or adverse external circumstances (Bandura, 1986).

Vicarious experiences of observing the performances of others is a source of efficacy in that people persuade themselves that if others can perform the behavior, they should be able to achieve at least some improvement in performance (Bandura, 1986). That is, by watching others, people develop rules for behavior. Armed with these rules, and seeing successful capabilities of others’ behavior, people then feel they can behave similarly in similar situations.

Verbal persuasion is widely used to try to talk people into believing they possess capabilities that will enable them to achieve what they seek (Bandura, 1986). People who are persuaded that they have the capabilities to perform a behavior are more likely to try harder to perform the behavior and are more likely to persevere in the face of obstacles in performing a behavior.
The final source of self-efficacy is physiological states. People rely partly on information from their physiological state in judging their capabilities (Bandura, 1986). People will often read their physiological states as either an indicator of efficacy or inefficacy.

According to Bandura (2004):

“Self-efficacy beliefs shape the outcomes people expect their efforts to produce. Those of high efficacy expect to realize favorable outcomes. Those of low efficacy expect their efforts to bring poor outcomes. Self-efficacy beliefs also determine how obstacles and impediments are viewed. People of low efficacy are easily convinced of the futility of effort in the face of difficulties. They quickly give up trying. Those of high efficacy view impediments as surmountable by improvement of self-management skills and perseverant effort.” (p. 145)

This notion that strong belief in one's efficacy heightens perseverance in difficult pursuits is corroborated by evidence across diverse task and activity domains (including exercise) throughout most of the lifespan (Bandura & Cervone, 1986). Strong exercise self-efficacy is associated with the capability to overcome barriers that may interfere with regular exercise; high levels of exercise self-efficacy support the maintenance of activity over time. More specifically, exercise self-efficacy refers to an individual's belief in their ability to engage in exercise as a regular course of action (Bandura, 2005a).

There are several research studies supporting the theory that self-efficacy is a cognitive factor that plays an influential role in general health practices (particularly exercise) in regards to both motivation and performance. Moreover, exercise self-efficacy
has been shown to affect the intensity, duration, and consistency with which an individual engages in exercise (Marcus, et al., 1994). Several examples of those studies (primarily ones with college student populations) will now be reviewed.

McAuley (1992) explored the relationship of exercise self-efficacy, exercise adherence, and exercise intensity in a sample of 103 sedentary middle-aged individuals between the ages of 45-64 years who were introduced to a group exercise environment. Four exercise classes were offered per week, with the expectation that the participants would attend at least three times a week. The classes incorporated cardiovascular activity in incrementally longer durations up to a total of 40 minutes by the 10th week. Exercise self-efficacy was assessed at week 12 and week 20, attendance was also taken throughout the study. McAuley (1992) found that perceptions of exercise self-efficacy predicted the number of exercise sessions and the intensity of these sessions. In McAuley's exercise adherence research, he emphasizes the need to study the process of exercise adherence throughout the adoption and continuation stages of exercise compliance.

In a follow-up study, McAuley (1993) investigated the relationship of exercise participation with exercise self-efficacy as well as physiological (e.g., sex and body composition) and behavioral (e.g., past exercise frequency and intensity) parameters among the same older adults four months after the termination of the original study. McAuley found that exercise self-efficacy was the only significant predictor for the continuation of exercise following the original study, demonstrating once again the link between exercise self-efficacy and exercise adherence. Individuals with a history of sedentary behavior may have a number of real and perceived barriers preventing them from beginning an exercise program.
Continuing the research on the role of self-efficacy in exercise adherence, Marcus et al. (1994) found that exercise self-efficacy may have the strongest relationship to habitual physical activity. They investigated the stages of readiness to exercise using the Transtheoretical model; this model has been used extensively in the study of behavior change research in areas such as smoking cessation and weight-loss. The participants in the study were drawn from four Rhode Island worksites, including 698 male and female adults. The participants were surveyed pertaining to their exercise stage of change behavior, their exercise self-efficacy, and were also given a decisional balance measure survey that presented questions involving the perceived pros and the cons associated with exercise. The three constructs (pros, cons, and exercise self-efficacy) were examined a second time six months after the first analysis to determine each construct's independent ability to predict physical activity participation. The data revealed that exercise self-efficacy was a strong predictor of the performance of physical activity over a six month period of time. The relationship between exercise self-efficacy and exercise adherence is critically linked to the fight against physical inactivity.

Sharpe and Connell (1992) also found that the relationship of self-efficacy to maintenance of an exercise regimen may be different than the relationship of self-efficacy to beginning an exercise regimen. In an investigation of 250 adult employees of a large university, self-efficacy, outcome expectancy, and perceived difficulty of engaging in exercise (barriers) were significantly related to intention to exercise. However, baseline exercise frequency was the only predictor of exercise behavior 1 year later.

utilizing a street-based survey. This method of data collection involves researchers standing on the street approaching potential study participants either randomly or at a certain interval (e.g. every 5 minutes). Findings indicated that a large proportion (n=351, 38%) of the student sample was not meeting nationally recognized exercise guidelines and that exercise self-efficacy scores were significantly different based on the exercise stage of change that student reported being in. That is, levels of self-efficacy were recorded lowest for individuals in the pre-contemplation stage of exercise and were highest for individuals maintaining regular exercise practices.

In an effort to address the importance of studying the combination of self-efficacy and social support to understand physical activity, Wallace, Buckworth, Kirby, and Sherman (2000) used a random sample of 937 undergraduate students and applied constructs from Bandura’s Social Cognitive Theory (SCT) to determine personal, behavioral, and environmental characteristics associated with exercise behavior and intentions. Exercise self-efficacy and physical activity history were found to be significant predictors of engagement in exercise behaviors for both males and females.

In attempting to understand the relationship of self-efficacy and perceived benefits and barriers of physical activity, Brown’s (2005) study of physical activity levels among a sample of 398 college students found fairly high levels of physical activity in the study sample. Results indicated that 81.8% (n=242) of participants involved in a subgroup sampling of physical activity levels met the current recommended guidelines and that both benefits and barriers were moderately correlated with self-efficacy (r = .35 and r = -.39 respectively). Self-efficacy was also moderately correlated with physical activity (r = .29, p<.05).
Broadening the lens of psychosocial correlates used to view physical activity, Petosa, Suminski, and Hertz (2003) used a convenience sample of 350 college students to test Social Cognitive Theory constructs to predict vigorous physical activity. Specific constructs the authors examined over the 4 week study were: self-efficacy, social support for exercise from friends and family, self-regulation, outcome expectancy value, exercise role identity, and positive exercise experience. Exercise self-efficacy and social support from friends were moderately correlated while social support from family was weakly correlated with physical activity (r = .40; r = .28; r = .16 respectively). Only 22% (n = 77) of the sample reported meeting or exceeding the recommendation of vigorous physical activity (defined as continuous activity for at least 20 minutes where the heart beats rapidly, breathing is rapid and deep, and the inability to hold conversation while exercising) 3 to 5 days a week. The majority of the participants reported low use of self-regulation skills and low positive outcome expectancy value for exercise. Further, they did not perceive vigorous activity in positive terms and did not see vigorous physical activity as part of their personal identity. The SCT constructs studied explained 27.2% of the variance in physical activity.

Limitations of the study include self-report measures and a cross-sectional design. The non-random sample of students enrolled in a health requirement course also contributes to the inability to generalize the findings to other college student populations. Strengths of the study included the use of a theoretical foundation to guide the research and the considerable effort taken to establish and report on the psychometric data of the instruments to avoid error (Petosa et al., 2003).
A study that further considered psychosocial influences on a variety of health behaviors was conducted by Von Ah, Ebert, Ngamvitroj, Park, and Kang (2004). In a sample of 161 college students, the direct effects of perceived stress, perceived availability of social support, satisfaction with social support, and self-efficacy, as well as the intermediate roles of perceived threat, benefits, and barriers on several health behaviors including physical activity and nutrition (which were grouped together) were examined. Hierarchical multiple regression analysis and structural equation modeling findings indicated that self-efficacy was the only significant predictor for each of the five health behaviors studied. Physical activity and nutritional behaviors were significantly and positively influenced by self-efficacy. Moreover, the higher the self-efficacy and the lower the perceived barriers to physical activity and nutrition protective behaviors, the more likely individuals were to exercise at least three times a week for 20 minutes and/or eat a balanced diet. Social support did not significantly predict any of the health behaviors, including physical activity. This study extended the research that examines health behaviors of college students; however, the lengthy series of self-report questionnaires (230 items) imposed some burden on the participants, and need for additional psychometric testing as acknowledged by the researchers, along with the small sample size for the path analysis warrants caution when interpreting the results of this study.

So far, the studies reviewed have considered the concept of exercise self-efficacy to be relatively one-dimensional. However, emerging research in the fields of exercise, sport, and health psychology suggest that self-efficacy related to physical activity is more effectively examined as a multidimensional construct.
Gyurcsik, Bray, and Brittain (2004) examined barriers, coping self-efficacy, and task self-efficacy and their ability to predict vigorous physical activity and explain the dramatic decline in physical activity that occurs from adolescence to young adulthood. The authors defined coping self-efficacy as confidence in one’s skills and abilities to overcome barriers to physical activity and task self-efficacy as confidence in one’s skills and abilities to engage in incrementally progressive bouts of physical activity. Results indicated that coping self-efficacy predicted task self-efficacy which predicted vigorous physical activity. This study builds on previous research that identifies self-efficacy as an important predictor of physical activity. Findings indicated that 47% of the sample (n=53) failed to meet the national recommendation of three weekly vigorous physical activity sessions. The study is limited by its exclusive examination of vigorous physical activity because moderate physical activity can have significant positive effects on health (e.g., Craft & Perna, 2004; Russell, Zigmond, Dimatelis, Daniels, & Mabandla 2014) and would also be important to study in transitioning students.

Recognizing the different dimensions of self-efficacy, Rodgers, Hall, Blanchard, McAuley, and Munroe (2002) explored the relationship of task self-efficacy and scheduling self-efficacy on exercise intentions and exercise behaviors in a prospective study. In a sample of 589 active persons attending exercise classes at two large universities, results confirmed a conceptual distinction between the two types of self-efficacy. Scheduling self-efficacy was considered a subtype of coping self-efficacy and was defined as the ability to manage and organize one’s schedule to exercise. Although
this study focused on already active individuals, the validation of these constructs of self-efficacy expands what is theoretically inferred about self-efficacy and exercise behavior.

*Exercise Commitment and Self-efficacy*

Exercise self-efficacy has been researched extensively as it relates to attitudes toward exercise and physical activity behaviors. However, research is quite limited in the area of commitment and only a few studies to date have investigated the relationship between these variables. This is an important aspect to consider because more than half of all individuals who begin exercise programs drop out within 6 months (Annesi, 2004; Dishman, Sallis, & Orenstein, 1985). Sullum, Clark, and King (2000) found that undergraduate students (n = 52) who exercised at least three times per week but who experienced frequent relapses of inactivity scored lower on self-efficacy at baseline compared with exercise maintainers. Although this prospective study examined factors that might predict exercise maintenance and relapse over eight weeks using a theoretical model, it was limited in sample size and failed to control for participation in an organized sport.

Another study that attempted to explain exercise commitment behavior in relation to self-efficacy was conducted by Wallace and Buckworth (2003). Their sample included 165 college students from whom they collected data on exercise self-efficacy, social support, sedentary behavior, and shifts in exercise behavior. Uncommitted exercisers reported significant decreases in self-efficacy and social support from peers over time.

In summary, although the amount of variance explained varies across studies, findings consistently indicate that self-efficacy can significantly predict the physical activity behavior of college students (Brown, 2005; Gyurcsik et al., 2004; Leenders et al.,
2002; Petosa et al., 2003; Rovniak et al., 2002; Von Ah et al., 2004; Wakui et al., 2002; Wallace et al., 2000). These findings support previously published studies that indicate self-efficacy is the most consistent correlate of physical activity behavior (Netz et al., 2005; Trost et al, 2002; Clark, 1996; Sallis, Hovell, Hofstetter, Faucher, et al., 1989). Still, McAuley (1992) suggested that "self-efficacy might be more beneficially understood by studying it in concert with other supposedly potent influences on exercise behavior such as goal orientations, coping strategies, goal-setting, motivational climate, and social support mechanisms" (p.127). This suggestion contributed to the rationale for including other psychological variables in this study as potential correlates and predictors of exercise commitment. In addition to exercise self-efficacy, the psychological constructs of self-regulation and self-compassion will be explored in relation to exercise commitment. Self-regulation is often studied alongside physical activity and exercise self-efficacy. This construct will be introduced next along with a review of literature related to self-regulation.

**Self-Regulation**

According to Bandura (1986), self-regulation takes into account behavior is motivated and regulated by internal standards and self-evaluative responses to personal actions or performance. Monitoring one’s pattern of behavior and the cognitive and environmental conditions under which it occurs is the first step towards doing something to affect it (Bandura, 2001). Developing this construct allows individuals to monitor progress towards anticipated outcomes and goals. It also provides constant feedback and motivation for continued behavioral adjustment (Bandura, 1986). In essence, people
create ways, in their environment and through cognitive processes, to monitor and regulate behavior and to set incentives for the outcomes of behavior.

Self-regulation allows people to set goals, to track their progress towards goals, and to evaluate their capabilities to perform behaviors in given situations. Self-regulation, as outlined by Bandura’s (1991) *Social Cognitive Theory of Self-Regulation*, has three sub-functions: self-monitoring, judgmental influence, and self-reactive influence.

Success in self-regulation partly depends on the validity, reliability, and timing of self-monitoring. Bandura (1991) posits that people cannot influence their own motivation and actions very well if they do not pay adequate attention to their own performances, the conditions under which they occur, and the immediate and long-term effects they produce. Self-monitoring largely occurs through self-observation which provides information needed for setting realistic goals and for evaluating one’s own progress towards those goals. Goal setting enlists evaluative self-reactions that mobilize efforts towards goal attainment (Bandura, 1991). Being able to set goals and monitor progress towards goals can become a motivating force for behavior in and of itself. Self-monitoring appears to be most effective in motivating behavior when the goals for the behavior are focused on when the behavioral effect is clear and direct rather than ambiguous, when the person is motivated to change behavior, and when the behavioral domain is valued so that the behavior change produces self-satisfaction (Bandura, 1991).

Whether a given performance is regarded favorably or negatively will depend upon the personal standards against which the person is being evaluated; the judgmental influence sub-function accounts for the personal standards against which one monitors behavior (Bandura, 1986). Judgment standards seem to be the result of the development
of personal standards. These personal standards are created through several processes, including social comparisons, reactions to one’s behavior by people within the social network, and personal experiences (Bandura, 1986; Bandura, 1991).

Additionally, Bandura posits that self-reactions to performance judgments will vary depending on how people perceive the determinants of their behavior. Bandura (1991) suggests that people are more likely to take pride in their accomplishments when they ascribe their successes to their own abilities and efforts. Self-reaction influences provide the mechanism by which standards regulate courses of action (Bandura, 1991). That is, people are motivated by behavior that they feel either produces positive tangible outcomes or positive self-reflections. As part of this sub-function, people who provide themselves with incentives or who reward themselves as a consequence of monitoring their own behavior and meeting goals are more likely to continue the behavior. One of the factors that differentiate people who succeed in regulating their motivation and behavior to achieve what they seek from those who are unsuccessful in their self-regulatory efforts is the effective use of self-incentives (Bandura, 1991).

Some researchers have attempted to define self-regulation more simplistically and identified the construct as the process of an individual altering their responses or inner states (Baumeister, Schmeichel, & Vohs, 2007). For example, early research in the area of self-regulated behavior (e.g., Bandura, 1986) explored smoking cessation. Anytime a dedicated smoker denies an urge to light a cigarette, they self-regulate their behavior. Another component of self-regulation is the ability to delay gratification. An example of this concept is the “Stanford Marshmallow Experiment” conducted by Mischel and Ebbesen (1970) where children were presented with a marshmallow and told that they
could either eat the one marshmallow or wait until the research returns, at which point they could have two marshmallows. The one-third of children who were able to resist temptation and wait the entire fifteen-minutes exercised this element of self-regulatory behavior. For some, these components are sufficient in operationalizing self-regulation.

Researchers have indicated that self-regulation skills are necessary for negotiating emotionally related tasks, directing actions toward achieving specific goals, complying with rules, problem-solving, and behaving appropriately within the guidelines of a situation (Brock, Rimm-Kaufman, Nathanson, & Grimm, 2009; Garon, Bryson, & Smith, 2008; McClelland, Acock, & Morrison, 2006; McClelland, Morrison & Holmes, 2000). These researchers have been focused primarily on education-related goals among children. As it relates to physical activity and health behaviors, self-regulation may be best understood through its goal-directing ability as well (Latham & Locke, 1991; Rovniak et al., 2002; Schuz et al., 2014; Wing at al., 2006).

Latham and Locke (1991) define self-regulation as a process similar to self-control and state that it is implicit in goal setting. They explain that once a goal is established, successful pursuit of that goal requires effort, persistence, and direction. And, in order for this to be achieved, one must overcome aversive social and internal cues (e.g., not giving into a craving and eating certain foods when on a diet; or skipping out on a workout because muscles are a bit sore). Similarly, Mann, Ridder, and Fujita (2013) suggest that developing self-regulation leads to more successful, realistic, and appropriate selection of desired goals (i.e., goal setting) and increased or improved engagement in behaviors and strategies needed to produce the desired outcome (i.e., goal striving).
Self-regulation has been researched in several health-related areas including smoking cessation (e.g., Kelly, Zurdoff, Foa, & Gilbert, 2010), diet (e.g., Johnson, Pratt, & Wardle, 2012), weight control (e.g., Burke, Wang, & Sevick, 2011), and alcohol consumption (e.g., Hustad, Carey, Carey, & Maisto, 2009). The research overwhelmingly indicates that utilization of self-regulative strategies (e.g., self-monitoring and goal-setting) leads to more desirable outcomes in health behavior pursuits. Bandura (2004) stated that health habits are not simply changed by an act of will rather they require motivational and self-regulatory skills. In physical activity and exercise research, the construct of self-regulation has been investigated extensively, but almost always in the context of social cognitive theory and rarely as an independent predictive variable. Additionally, when self-regulation has been explored more independently and in relation to exercise, it was in populations of older adults (e.g., Schneider, 1997; Schuz, Wurm, Wolff, & Schwarzer, 2014; Umstattd, Wilcox, & Saunders 2008) or athletes (Cleary & Zimmerman, 2010). For this reason, investigation of self-regulation is of great interest to the current study. Similarly, the next construct to be discussed, self-compassion, has not been extensively examined in exercise and physical activity literature either.

**Self-Compassion**

Self-compassion is defined as “being touched by and open to one’s own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one’s own suffering and to heal oneself with kindness…offering nonjudgmental understanding to one’s pain, inadequacies and failures, so that one’s experience is seen as part of the larger human experience” (Neff, 2003, p. 224). Neff theorized a six-factor model of self-compassion that represent three continua including kindness toward self rather than harsh
judgment toward self, perceptions of one’s struggles as part of common human experience rather than as isolating, and maintaining a balanced awareness for one’s painful thoughts and feelings rather than over-identifying with the negativity. Based on these theoretical constructs, she developed the Self-Compassion Scale (Neff, 2003).

Neff (2003) explained that exploration of self-compassion would significantly contribute to the growing field known as positive psychology. Seligman and Csikzentmihalyi (2000) suggest that the positive psychology movement focuses strengths and positive human potentials such as happiness, love, forgiveness, and overall well-being as opposed to maladaptive functioning and psychopathology. Moreover, positive psychology research should contribute to understanding the actions and attitudes that help people experience more satisfaction in their lives (Diener, 2000). Neff (2003) maintains that the study of self-compassion aligns well with principles of positive psychology.

While research on self-compassion continues to grow at an exponential rate, it has been quite limited in relation to physical activity and exercise. To date, only a few researchers have explored this relationship, all of which focus on either women in general or female athletes (e.g., Magnus & Kowalski, 2010; Mosewich, Crocker, Kowalski, DeLongis, 2013). Being compassionate towards oneself has been associated with emotional maturity and secure attachment (Neff, 2009), adaptive psychological functioning (Neff, Kirkpatrick, & Rude 2007), wisdom, curiosity, and low levels of neuroticism (Neff, Rude, & Kirkpatrick, 2007), and self-esteem, self-worth, and subjective well-being (Neff, 2011).

Breines and Chen (2012) explored self-compassion as it relates to self-improvement motivation and found that when individuals were accepting of personal
failure, they may be more motivated to improve themselves. Therefore, developing self-compassion appears to be an excellent coping resource, creating a more positive experience for those engaged in health promoting activities, for example, physical activity, be it competitive sports or regular exercise (Magnus, Kowalski, & McHugh, 2010; Mosewich, Crocker, Kowalski, DeLongis, 2013).

Magnus, Kowalski, and McHugh (2010) explored how self-compassion relates to women’s motivations to exercise beyond what exercise-related outcomes could be explained by self-esteem alone. Their sample included 252 female exercisers who completed the Self-Compassion Scale (SCS; Neff, 2003), the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), the Behavioral Regulations in Exercise Questionnaire (BREQ; Mullan, Markland, & Ingledew, 19970, the Goal Orientations in Exercise Measure (GOEM; Petherick & Markland, 2008), the Social Physique Anxiety Scale (SPAS; Martin et al., 1997), and the Obligatory Exercise Questionnaire (OEQ; Pasman & Thompson, 1988). Hierarchical regression results revealed that self-compassion contributed unique variance (beyond what self-esteem explained) to the understanding of “intrinsic motivation, ego goal orientation, social physique anxiety, and obligatory exercise” (p. 363)

Mosewich, Kowalski, Sabiston, Sedgwick, and Tracy (2011) explored how self-compassion could be a potential resource to protect against proneness to self-conscious emotions and potentially unhealthy self-evaluative thoughts and behaviors for young female athletes. A total of 151 adolescent female athletes completed the SCS, the RSES, the Test of Self-Conscious Affect for Adolescents (TOSCA-A; Tangney, Wagner, Gavlas, & Gramzow, 1991), the original Social Physique Anxiety Scale (SPAS; Hart et
al., 1989), the Obligatory Exercise Questionnaire (OEQ; Pasman & Thompson, 1988),
the Objectified Body Consciousness Scale for Youth (OBC-Youth; Lindberg et al.,
2006), the Performance Failure Appraisal Inventory (PFAI-S; Conroy, Willow, &
Metzler, 2002), and the Fear of Negative Evaluation Scale (FNE; Leary, 1983). Their
findings revealed that self-compassion is negatively related to shame proneness, shame-
free guilt proneness, social physique anxiety, objectified body consciousness, fear of
negative evaluation, and fear of failure.

In a related study, Mosewich, Crocker, Kowalski, and DeLongis (2013) explored
the effects of a self-compassion intervention on negative cognitive states among a group
of self-identified self-critical female athletes. The intervention consisted of a
psychoeducation session and a series of writing assignments that were completed over a
period of seven days. The data collected suggested that the self-compassion intervention
was effective in helping female student athletes manage self-criticism, rumination of
negative thoughts, and exacerbated concern over mistakes. Thus, in addition to self-
estee promotion, self-compassion may be beneficial in developing a positive sport
experience for young women.

As mentioned above, the research exploring self-compassion and exercise and/or
physical activity is lacking. The current field of research seems to focus almost
exclusively on various psychological or psychosocial variables that self-compassion is
related to and there have been no studies investigating how self-compassion impacts the
actual engagement in physical activity, exercise participation, or commitment to these
health promoting behaviors, which is one of the foci of the present study. Neff (2009)
argues that while high self-esteem is theoretically desirable and positive, it may not
ensure psychological health as it Western culture had once suggested. In fact, Baumeister et al. (2003) reported that self-esteem does not appear to improve academic or job performance or leadership skills. They suggest it does little to prevent children from smoking, drinking, taking drugs, or engaging in early sex. Although these findings do not relate directly to engagement in physical activity, Neff (2009) maintains that self-compassion can be an alternative attitude toward self that minimizes the negative consequences of self-evaluation and social comparison. Because both self-efficacy and self-regulation involve inherent self-evaluate components, adding self-compassion to the equation could provide individuals with a new way to view themselves. Could this have a positive impact on an individual’s commitment to health and consequently physical activity? The researcher hypothesizes that it will.
References for Extended Literature


Table 1. Demographic Characteristics of Participants (N = 338)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>Highest level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>129</td>
<td>38.2</td>
<td>HS graduate or GED</td>
<td>9</td>
<td>2.7</td>
</tr>
<tr>
<td>Female</td>
<td>209</td>
<td>61.8</td>
<td>College freshman</td>
<td>33</td>
<td>9.8</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0.0</td>
<td>College sophomore</td>
<td>79</td>
<td>23.4</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>College junior</td>
<td>90</td>
<td>26.6</td>
</tr>
<tr>
<td>17-19</td>
<td>82</td>
<td>24.3</td>
<td>College senior</td>
<td>80</td>
<td>23.7</td>
</tr>
<tr>
<td>20-21</td>
<td>133</td>
<td>39.3</td>
<td>College graduate</td>
<td>6</td>
<td>1.8</td>
</tr>
<tr>
<td>22-23</td>
<td>65</td>
<td>19.2</td>
<td>Currently pursuing master’s degree</td>
<td>31</td>
<td>9.2</td>
</tr>
<tr>
<td>24-25</td>
<td>17</td>
<td>5.0</td>
<td>Earned master’s degree</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>26-27</td>
<td>10</td>
<td>3.0</td>
<td>Currently pursuing PhD</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>28-29</td>
<td>5</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 &amp; above</td>
<td>26</td>
<td>7.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td>Sexual Orientation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/European American</td>
<td>244</td>
<td>72.2</td>
<td>Heterosexual</td>
<td>321</td>
<td>95.0</td>
</tr>
<tr>
<td>Black/African American</td>
<td>29</td>
<td>8.6</td>
<td>Gay</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>12</td>
<td>3.6</td>
<td>Lesbian</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>4</td>
<td>1.2</td>
<td>Bisexual</td>
<td>10</td>
<td>3.0</td>
</tr>
<tr>
<td>Native American</td>
<td>16</td>
<td>4.7</td>
<td>Other</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Middle Eastern/Southeast Asian</td>
<td>2</td>
<td>0.6</td>
<td>Preferred Type(s) of Exercise*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian Bi/Multiracial</td>
<td>31</td>
<td>9.2</td>
<td>Aerobic or group exercise class</td>
<td>68</td>
<td>20.1</td>
</tr>
<tr>
<td>Family’s estimated income</td>
<td></td>
<td></td>
<td>Martial arts/boxing</td>
<td>8</td>
<td>2.4</td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>12</td>
<td>3.6</td>
<td>Weight/resistance training</td>
<td>154</td>
<td>45.6</td>
</tr>
<tr>
<td>$10,001 to $15,000</td>
<td>12</td>
<td>3.6</td>
<td>Mind-body exercise</td>
<td>68</td>
<td>20.1</td>
</tr>
<tr>
<td>$15,001 to $20,000</td>
<td>9</td>
<td>2.7</td>
<td>Spinning/indoor cycling</td>
<td>29</td>
<td>8.6</td>
</tr>
<tr>
<td>$20,001 to $25,000</td>
<td>16</td>
<td>4.7</td>
<td>Indoor cardio equipment</td>
<td>128</td>
<td>37.9</td>
</tr>
<tr>
<td>$25,001 to $30,000</td>
<td>10</td>
<td>3.0</td>
<td>Running/jogging</td>
<td>175</td>
<td>51.8</td>
</tr>
<tr>
<td>$30,001 to $40,000</td>
<td>26</td>
<td>7.7</td>
<td>Hiking or other outdoor activities</td>
<td>63</td>
<td>18.6</td>
</tr>
<tr>
<td>$40,001 to $50,000</td>
<td>24</td>
<td>7.1</td>
<td>Biking/cycling outside</td>
<td>52</td>
<td>15.4</td>
</tr>
<tr>
<td>$50,001 to $60,000</td>
<td>20</td>
<td>5.9</td>
<td>Aerobic walking</td>
<td>38</td>
<td>11.2</td>
</tr>
<tr>
<td>$60,001 to $70,000</td>
<td>29</td>
<td>8.6</td>
<td>Swimming</td>
<td>45</td>
<td>13.3</td>
</tr>
<tr>
<td>$70,001 to $80,000</td>
<td>41</td>
<td>12.1</td>
<td>Rowing</td>
<td>9</td>
<td>2.7</td>
</tr>
<tr>
<td>$80,001 to $100,000</td>
<td>54</td>
<td>16.0</td>
<td>Sports</td>
<td>174</td>
<td>51.5</td>
</tr>
<tr>
<td>$100,001 or more</td>
<td>84</td>
<td>24.9</td>
<td>Other</td>
<td>14</td>
<td>4.1</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Percentage adds up to more than 100%, because participants could select more than one option
Table 2. *Variable Data*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Raw Score Range</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-Compassion Scale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-kindness</td>
<td>1-5</td>
<td>3.04</td>
<td>3.0</td>
<td>3.0</td>
<td>.85</td>
</tr>
<tr>
<td>Self-judgment</td>
<td>1-5</td>
<td>3.32</td>
<td>3.4</td>
<td>3.0</td>
<td>.87</td>
</tr>
<tr>
<td>Common humanity</td>
<td>1-5</td>
<td>3.30</td>
<td>3.25</td>
<td>3.0</td>
<td>.82</td>
</tr>
<tr>
<td>Isolation</td>
<td>1-5</td>
<td>3.07</td>
<td>3.0</td>
<td>3.0</td>
<td>.96</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>1-5</td>
<td>3.43</td>
<td>3.5</td>
<td>3.25</td>
<td>.81</td>
</tr>
<tr>
<td>Over-identification</td>
<td>1-5</td>
<td>3.07</td>
<td>3.0</td>
<td>3.0</td>
<td>.96</td>
</tr>
<tr>
<td><strong>Self-Regulation Questionnaire</strong></td>
<td>55-155</td>
<td>114.66</td>
<td>115.5</td>
<td>113.0</td>
<td>17.95</td>
</tr>
<tr>
<td><strong>Exercise Self-Efficacy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>0-30</td>
<td>24.26</td>
<td>26.0</td>
<td>30</td>
<td>5.88</td>
</tr>
<tr>
<td>Coping</td>
<td>0-30</td>
<td>20.90</td>
<td>22.5</td>
<td>30</td>
<td>7.16</td>
</tr>
<tr>
<td>Scheduling</td>
<td>0-30</td>
<td>19.55</td>
<td>20.0</td>
<td>30</td>
<td>7.58</td>
</tr>
<tr>
<td><strong>Commitment to Physical Activity</strong></td>
<td>12-60</td>
<td>42.68</td>
<td>43.0</td>
<td>36</td>
<td>9.92</td>
</tr>
</tbody>
</table>
Table 3. *Zero-Order Correlation Matrix for Regression Analyses – Hypotheses 4 and 5 (n = 332)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Education</td>
<td>0.14</td>
<td>0.35</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Self-Kindness</td>
<td>3.04</td>
<td>0.84</td>
<td>-.11*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Common Humanity</td>
<td>3.30</td>
<td>0.82</td>
<td>.00</td>
<td>.54***</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mindfulness</td>
<td>3.44</td>
<td>0.80</td>
<td>-.02</td>
<td>.69***</td>
<td>.66***</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Self-Judgment</td>
<td>3.32</td>
<td>0.87</td>
<td>.14**</td>
<td>-.54***</td>
<td>-.14**</td>
<td>-.34***</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6. Isolation</td>
<td>3.07</td>
<td>0.95</td>
<td>.14**</td>
<td>-.48***</td>
<td>-.21***</td>
<td>-.38***</td>
<td>.73***</td>
<td>-</td>
</tr>
<tr>
<td>7. Over-identification</td>
<td>3.07</td>
<td>0.95</td>
<td>.13**</td>
<td>-.49***</td>
<td>-.16**</td>
<td>-.39***</td>
<td>.71***</td>
<td>.71***</td>
</tr>
<tr>
<td>8. SSRQ</td>
<td>114.62</td>
<td>17.78</td>
<td>-.04</td>
<td>.35***</td>
<td>.30***</td>
<td>.42***</td>
<td>-.35***</td>
<td>-.46***</td>
</tr>
<tr>
<td>9. MSES (Task)</td>
<td>24.25</td>
<td>5.90</td>
<td>-.03</td>
<td>.16**</td>
<td>.14**</td>
<td>.25***</td>
<td>-.17**</td>
<td>-.23**</td>
</tr>
<tr>
<td>10. MSES (Coping)</td>
<td>20.89</td>
<td>7.17</td>
<td>-.10*</td>
<td>.18***</td>
<td>.07</td>
<td>.20***</td>
<td>-.22***</td>
<td>-.25***</td>
</tr>
<tr>
<td>11. MSES (Scheduling)</td>
<td>19.56</td>
<td>7.61</td>
<td>-.12*</td>
<td>.17**</td>
<td>.07</td>
<td>.17**</td>
<td>-.22***</td>
<td>-.27***</td>
</tr>
<tr>
<td>12. CPA</td>
<td>42.82</td>
<td>9.74</td>
<td>-.17**</td>
<td>.17**</td>
<td>.08</td>
<td>.20***</td>
<td>-.19***</td>
<td>-.28***</td>
</tr>
</tbody>
</table>

*Note. Education = Participants’ education level (0 = undergraduate, 1 = college graduate or graduate student), Self-Kindness = Self-Compassion Scale (Self-Kindness), Common Humanity = Self-Compassion Scale (Common Humanity), Mindfulness = Self-Compassion Scale (Mindfulness), Self-Judgment = Self-Compassion Scale (Self-Judgment), Isolation = Self-Compassion Scale (Isolation), Over-identification = Self-Compassion Scale (Over-identification), SSRQ = Short Version of the Self-Regulation Questionnaire, MSES (Task) = Multidimensional Self-Efficacy for Exercise Scale-Task subscale, MSES (Coping) = Multidimensional Self-Efficacy for Exercise Scale-Coping subscale, MSES (Scheduling) = Multidimensional Self-Efficacy for Exercise Scale-Scheduling subscale, CPA = Commitment to Physical Activity Scale, Physical = Physical Activity Behaviors.*** p < .001, ** p < .01, * p < .05*
Table 4. Predictors of Commitment to Physical Activity

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictor</th>
<th>CPA</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>95% BCa CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Constant)</td>
<td>43.50</td>
<td>0.58</td>
<td>-</td>
<td>76.56</td>
<td>.001</td>
<td>[42.26, 44.72]</td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>-4.87</td>
<td>1.34</td>
<td>-.17</td>
<td>-3.19</td>
<td>.001</td>
<td>[-7.38, -2.46]</td>
</tr>
<tr>
<td></td>
<td>ΔR² = .03, ΔF (1, 330) = 10.16, p = .002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R² = .03, F(1, 330) = 10.16, p = .002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>(Constant)</td>
<td>13.58</td>
<td>2.37</td>
<td>-</td>
<td>5.73</td>
<td>.001</td>
<td>[8.45, 18.21]</td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>-2.79</td>
<td>1.08</td>
<td>-.09</td>
<td>-2.68</td>
<td>.011</td>
<td>[-4.82, -0.83]</td>
</tr>
<tr>
<td></td>
<td>SSQR</td>
<td>0.08</td>
<td>0.03</td>
<td>.14</td>
<td>3.41</td>
<td>.005</td>
<td>[0.03, 0.13]</td>
</tr>
<tr>
<td></td>
<td>MSES (Task)</td>
<td>0.21</td>
<td>0.10</td>
<td>.13</td>
<td>2.33</td>
<td>.044</td>
<td>[-0.02, 0.43]</td>
</tr>
<tr>
<td></td>
<td>MSES (Coping)</td>
<td>0.38</td>
<td>0.14</td>
<td>.28</td>
<td>3.13</td>
<td>.009</td>
<td>[0.12, 0.64]</td>
</tr>
<tr>
<td></td>
<td>MSES (Scheduling)</td>
<td>0.41</td>
<td>0.14</td>
<td>.32</td>
<td>3.85</td>
<td>.005</td>
<td>[0.16, 0.66]</td>
</tr>
<tr>
<td></td>
<td>ΔR² = .55, ΔF (4, 326) = 104.82, p &lt; .001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R² = .58, F(5, 326) = 88.45, p &lt; .001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>(Constant)</td>
<td>14.06</td>
<td>3.97</td>
<td>-</td>
<td>3.43</td>
<td>.001</td>
<td>[5.32, 21.12]</td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>-2.79</td>
<td>1.08</td>
<td>-.10</td>
<td>-2.68</td>
<td>.013</td>
<td>[-4.94, -0.68]</td>
</tr>
<tr>
<td></td>
<td>SSQR</td>
<td>0.07</td>
<td>0.03</td>
<td>.13</td>
<td>2.81</td>
<td>.013</td>
<td>[0.02, 0.14]</td>
</tr>
<tr>
<td></td>
<td>MSES (Task)</td>
<td>0.20</td>
<td>0.10</td>
<td>.12</td>
<td>2.27</td>
<td>.053</td>
<td>[-0.03, 0.43]</td>
</tr>
<tr>
<td></td>
<td>MSES (Coping)</td>
<td>0.39</td>
<td>0.14</td>
<td>.29</td>
<td>3.16</td>
<td>.010</td>
<td>[0.12, 0.68]</td>
</tr>
<tr>
<td></td>
<td>MSES (Scheduling)</td>
<td>0.39</td>
<td>0.14</td>
<td>.31</td>
<td>3.60</td>
<td>.009</td>
<td>[0.14, 0.64]</td>
</tr>
<tr>
<td></td>
<td>Self-Kindness</td>
<td>0.07</td>
<td>0.64</td>
<td>.00</td>
<td>0.11</td>
<td>.916</td>
<td>[-1.19, 1.37]</td>
</tr>
<tr>
<td></td>
<td>Common Humanity</td>
<td>-0.49</td>
<td>0.62</td>
<td>-.04</td>
<td>-0.82</td>
<td>.428</td>
<td>[-1.62, 0.76]</td>
</tr>
<tr>
<td></td>
<td>Mindfulness</td>
<td>0.27</td>
<td>0.84</td>
<td>.02</td>
<td>0.37</td>
<td>.748</td>
<td>[-1.22, 1.89]</td>
</tr>
<tr>
<td></td>
<td>Self-Judgment</td>
<td>1.09</td>
<td>0.71</td>
<td>.10</td>
<td>1.55</td>
<td>.128</td>
<td>[-0.26, 2.44]</td>
</tr>
<tr>
<td></td>
<td>Isolation</td>
<td>-0.66</td>
<td>0.65</td>
<td>-.07</td>
<td>-1.09</td>
<td>.300</td>
<td>[-2.10, 0.83]</td>
</tr>
<tr>
<td></td>
<td>Over-identification</td>
<td>-0.33</td>
<td>0.62</td>
<td>-.03</td>
<td>-0.54</td>
<td>.586</td>
<td>[-1.52, 0.95]</td>
</tr>
<tr>
<td></td>
<td>ΔR² = .00, ΔF (6, 320) = 0.58, p = .746</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R² = 0.58, F(11, 320) = 40.21, p &lt; .001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Standard errors, significance levels, and 95% bias-corrected and accelerated confidence intervals (BCa CI) are estimated using bootstrapping with 1000 resamples. Education = Participants’ education level (0 = undergraduate, 1 = college graduate or graduate student), Self-Kindness = Self-Compassion Scale (Self-Kindness), Common Humanity = Self-Compassion Scale (Common Humanity), Mindfulness = Self-Compassion Scale (Mindfulness), Self-Judgment = Self-Compassion Scale (Self-Judgment), Isolation = Self-Compassion Scale (Isolation), Over-identification = Self-Compassion Scale (Over-identification), SSQR = Short Version of the Self-Regulation Questionnaire, MSES (Task) = Multidimensional Self-Efficacy for Exercise Scale-Task subscale, MSES (Coping) = Multidimensional Self-Efficacy for Exercise Scale-Coping subscale, MSES (Scheduling) = Multidimensional Self-Efficacy for Exercise Scale-Scheduling subscale, CPA = Commitment to Physical Activity Scale, Physical = Physical Activity Behaviors

***p < .001, **p < .01, *p < .05
Table 5. Zero-Order Correlation Matrix for Regression Analyses – Hypothesis 6 (n = 328)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Education</td>
<td>0.14</td>
<td>0.35</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. SSRQ</td>
<td>114.44</td>
<td>17.61</td>
<td>-.03</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. MSES (Task)</td>
<td>24.23</td>
<td>5.91</td>
<td>-.03</td>
<td>.44***</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. MSES (Coping)</td>
<td>20.83</td>
<td>7.17</td>
<td>-.10*</td>
<td>.40***</td>
<td>.71***</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. MSES (Scheduling)</td>
<td>19.50</td>
<td>7.62</td>
<td>-.11*</td>
<td>.32***</td>
<td>.66***</td>
<td>.90***</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CPA</td>
<td>42.80</td>
<td>9.77</td>
<td>-.17**</td>
<td>.41***</td>
<td>.60***</td>
<td>.72***</td>
<td>.71***</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7. Activity</td>
<td>8.87</td>
<td>6.49</td>
<td>-.19***</td>
<td>.44***</td>
<td>.44***</td>
<td>.60***</td>
<td>.58***</td>
<td>.59***</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. Education = Participants’ education level (0 = undergraduate, 1 = college graduate or graduate student), SSRQ = Short Version of the Self-Regulation Questionnaire, MSES (Task) = Multidimensional Self-Efficacy for Exercise Scale-Task subscale, MSES (Coping) = Multidimensional Self-Efficacy for Exercise Scale-Coping subscale, MSES (Scheduling) = Multidimensional Self-Efficacy for Exercise Scale-Scheduling subscale, CPA = Commitment to Physical Activity Scale, Activity = Physical Activity Behaviors.

*** p < .001, ** p < .01, * p < .05
Figure 1. Direct and indirect effects of education, self-regulation, self-efficacy, and commitment to physical activity on physical activity behaviors

Standardized beta coefficients are shown. Education = Participants’ education level (0 = undergraduate, 1 = college graduate or graduate student), SSRQ = Short Version of the Self-Regulation Questionnaire, MSES (Task) = Multidimensional Self-Efficacy for Exercise Scale-Task subscale, MSES (Coping) = Multidimensional Self-Efficacy for Exercise Scale-Coping subscale, MSES (Scheduling) = Multidimensional Self-Efficacy for Exercise Scale-Scheduling subscale, CPA = Commitment to Physical Activity Scale, Activity = Physical Activity Behaviors.

*** p < .001, ** p < .01, * p < .05, † p < .06
APPENDIX C

INFORMED CONSENT FORM AND SURVEYS
INFORMED CONSENT

We would like to invite you to participate in a survey study exploring factors associated with commitment to physical activity. In particular, we want to explore how the psychological variables of self-compassion, self-regulation, and self-efficacy impact your commitment to physical activity and exercise routines.

Participation will involve completing a survey which should take no more than 45 minutes to complete. Your responses will be anonymous. We will not ask you to write your name anywhere on the survey so there is no way to connect your responses to your identity. When you select your survey response, they will go directly to a data file and a summary of the group findings may be reported in a research manuscript in a publication Journal as well as in professional research presentations. No individual participants will be identified in the summary of the findings. Note that Qualtrics has specific privacy policies of their own. If you have concerns you should consult this service directly. Qualtrics’ privacy statement is provided at: http://qualtrics.com/privacy-statement.

If you are participating in this survey and are receiving credit for a class, you will be guided to a separate website to provide your name and contact information for your instructors purposes only to know that you participated in this study for class credit. Your instructor will not have access to your survey responses.

The benefits of participating are many. We hope that the results of this study will help us better understand the psychological factors related to and impacting exercise commitment.

There are no foreseeable risks in participating in the study. However, you may view some of the questions as personal or sensitive.

By selecting “submit” below and filling out the survey, you are agreeing to participate in the study.

If you have any questions or concerns about this research project at Oklahoma State University, please contact Joshua Gilbertson, M.S. at josh.gilbertson@okstate.edu or Carrie Winterowd, Ph.D. at (405)744-6040 or at carrie.winterowd@okstate.edu. This study has been approved by the Oklahoma State University Institutional Review Board to ensure the ethical nature of this study as well as your human rights as a research participant. If you have questions about your rights as a participant in this study, you may also contact Dr. Hugh Crethar, Chair of the Institutional Review Board at OSU at 405-744-9442 or irb@okstate.edu. Thank you for your willingness to assist us with this very important research project.

If you agree to participate, please click the submit option below to begin the survey. You can choose to end your participation at any time, however if you end your participation credit will not be granted.
DEMOGRAPHICS

What is your gender?  ____Male  ____Female  ____Transgender

What is your age?  ______

What is your highest educational attainment?
  ____Less than high school graduate
  ____High school graduate or GED
  ____Current College freshman
  ____Current College sophomore
  ____Current College junior
  ____Current College senior
  ____College graduate
  ____Currently pursuing a master’s degree
  ____Earned a master’s degree
  ____Currently pursuing a PhD or professional degree (MD, JD, etc.)
  ____Earned a PhD or professional degree

What is your race/ethnicity? (Check all that apply)
  Caucasian/White/European American
  African American
  Hispanic/Latino
  Asian/Pacific Islander
  Native American
  Other (please specify)______________

What is your sexual/affectional orientation? (check one box)
  Heterosexual/straight
  Gay
  Lesbian
  Bisexual
  Questioning
  Other

What is your family’s estimated annual income level?
  ____Less than $10,000
  ____$10,001 to $15,000
  ____$15,001 to $20,000
  ____$20,001 to $25,000
  ____$25,001 to $30,000
  ____$30,001 to $40,000
What types of exercise do you currently engage in? (check all that apply)

___Aerobics or group exercise class
___Martial Arts/boxing
___Weight/resistance training
___Mind-body exercise (yoga, pilates, tai chi, etc.)
___Spinning/indoor cycling
___Indoor cardio equipment (elliptical trainer, stationary bike, stair-master, etc.)
___Hiking or other outdoor activities
___Running/jogging
___Biking/cycling outside
___Aerobic walking
___Swimming
___Rowing
___Sports (basketball, tennis, football, volleyball, etc.)
___Other _________________________
___None

On average, how many days per week do you exercise? _____

On average, how long do you usually exercise? (minutes per work-out session)

___less than 30 minutes
___31 to 60 minutes
___61 to 90 minutes
___91 to 120 minutes
___121 to 150 minutes
___more than 150 minutes

How long have you been exercising at this level?

___3 weeks or less
___1 – 3 months
___4 – 6 months
___6 – 12 months
___1 – 5 years
___more than 5 years
Commitment to Physical Activity (CPA)

The following statements may or may not describe your feelings about PA. Read each statement and then circle the appropriate number to indicate how well the statement describes your feelings most of the time. There are no right or wrong answers. Do not spend too much time on any one item, but give the answers which seem to describe how you generally feel about physical activity.

<table>
<thead>
<tr>
<th>Strong Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I look forward to physical activity.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. I wish there were a more enjoyable way to stay fit.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. Physical activity is drudgery.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. I do not enjoy physical activity.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5. Physical activity is vitally important to me.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6. Life is so much richer as a result of physical activity.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7. Physical activity is pleasant.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8. I dread the thought of physical activity.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9. I would arrange or change my schedule to participate in physical activity</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>10. I have to force myself to participate in physical Activity</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>11. To miss a day of physical activity is sheer relief.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12. Physical activity is the high point of my day.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Self-Compassion Scale (SCS)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never  1  2  3  4  Almost always 5

_____ 1. I’m disapproving and judgmental about my own flaws and inadequacies.
_____ 2. When I’m feeling down I tend to obsess and fixate on everything that’s wrong.
_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
_____ 5. I try to be loving towards myself when I’m feeling emotional pain.
_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.
_____ 7. When I’m down and out, I remind myself that there are lots of other people in the world feeling like I am.
_____ 8. When times are really difficult, I tend to be tough on myself.
_____ 9. When something upsets me I try to keep my emotions in balance.
_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
_____ 11. I’m intolerant and impatient towards those aspects of my personality I don't like.
_____ 12. When I’m going through a very hard time, I give myself the caring and tenderness I need.
_____ 13. When I’m feeling down, I tend to feel like most other people are probably happier than I am.
_____ 14. When something painful happens I try to take a balanced view of the situation.
_____ 15. I try to see my failings as part of the human condition.
16. When I see aspects of myself that I don’t like, I get down on myself.
17. When I fail at something important to me I try to keep things in perspective.
18. When I’m really struggling, I tend to feel like other people must be having an easier time of it.
19. I’m kind to myself when I’m experiencing suffering.
20. When something upsets me I get carried away with my feelings.
21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
22. When I'm feeling down I try to approach my feelings with curiosity and openness.
23. I'm tolerant of my own flaws and inadequacies.
24. When something painful happens I tend to blow the incident out of proportion.
25. When I fail at something that's important to me, I tend to feel alone in my failure.
26. I try to be understanding and patient towards those aspects of my personality I don't like.
## Short Self-Regulation Questionnaire (SSRQ)

Please respond to the following questions by circling the response that best describes how you are. If you STRONGLY DISAGREE with the statement, circle 1. If you DISAGREE, circle 2. If you are UNCERTAIN or UNSURE, circle 3. If you AGREE, circle 4. If you STRONGLY AGREE, circle 5.

There are no right or wrong answers. Work quickly and don’t think too long about your answers.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain or Unsure</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I usually keep track of my progress toward my goals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>I have trouble making up my mind about things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>I get easily distracted from my plans.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>I don’t notice the effects of my actions until it’s too late.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>I am able to accomplish goals I set for myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>I put off making decisions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>It’s hard for me to notice when I’ve “had enough” (alcohol, food, sweets).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>If I wanted to change, I am confident that I could do it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>When it comes to deciding about a change, I feel overwhelmed by the choices.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>I have trouble following through with things once I’ve made up my mind to do something.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>I don’t seem to learn from my mistakes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>I can stick to a plan that’s working well.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>13.</td>
<td>I usually only have to make a mistake one time in order to learn from it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14.</td>
<td>I have personal standards, and try to live up to them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15.</td>
<td>As soon as I see a problem or challenge, I start looking for possible solutions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16.</td>
<td>I have a hard time setting goals for myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17.</td>
<td>I have a lot of willpower.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18.</td>
<td>When I’m trying to change something, I pay a lot of attention to how I’m doing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19.</td>
<td>I have trouble making plans to help me reach my goals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20.</td>
<td>I am able to resist temptation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21.</td>
<td>I set goals for myself and keep track of my progress.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22.</td>
<td>Most of the time I don’t pay attention to what I’m doing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23.</td>
<td>I tend to keep doing the same thing, even when it doesn’t work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24.</td>
<td>I can usually find several different possibilities when I want to change something.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25.</td>
<td>Once I have a goal, I can usually plan how to reach it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26.</td>
<td>If I make a resolution to change something, I pay a lot of attention to how I’m doing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>27.</td>
<td>Often I don’t notice what I’m doing until someone calls it to my attention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>28.</td>
<td>I usually think before I act.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>29.</td>
<td>I learn from my mistakes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>30.</td>
<td>I know how I want to be.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>31.</td>
<td>I give up quickly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Multidimensional Self-efficacy for Exercise Scale (MSES)

Respond to each item on a scale of 0 to 100 (where 0 = Not confident at all and 100 = Completely confident).

<table>
<thead>
<tr>
<th>How confident are you that you can…</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. complete your exercise using proper technique?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>2. exercise when you feel discomfort?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>3. include exercise in your daily routine?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>4. follow directions to complete exercise?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>5. exercise when you lack energy?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>6. consistently exercise three times per week?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>7. perform all of the required movements?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>8. exercise when you don't feel well?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>9. arrange schedule to include regular exercise?</td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
</tbody>
</table>
International Physical Activity Questionnaire (IPAQ)

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

   _____ days per week

   □ No vigorous physical activities  

   → Skip to question 3

2. How much time did you usually spend doing vigorous physical activities on one of those days?

   _____ hours per day
   _____ minutes per day

   □ Don’t know/Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

   _____ days per week

   □ No moderate physical activities  

   → Skip to question 5
4. How much time did you usually spend doing **moderate** physical activities on one of those days?

   ___ hours per day
   ___ minutes per day

☐ Don’t know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

   ___ days per week

☐ No walking → **Skip to question 7**

6. How much time did you usually spend **walking** on one of those days?

   ___ hours per day
   ___ minutes per day

☐ Don’t know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

   ___ hours per day
   ___ minutes per day

☐ Don’t know/Not sure
Validity Item

NOTE: Regardless of your answer to the question below, you will still receive credit for participating and completing the survey.

Is there any reason (e.g., rushed through the questions without carefully answering, randomly clicked on answers without reading each item, etc.) why the survey you have completed should NOT be used by the researcher when analyzing the data?

_____ Yes, researcher should NOT use my data
_____ No, my responses are representative of my beliefs and behaviors
_____ Unsure
CURRICULUM VITA

Joshua Tod Gilbertson

Candidate for the Degree of

Doctor of Philosophy

Dissertation: THE RELATIONSHIP OF SELF-REGULATION, EXERCISE SELF-EFFICACY, AND SELF-COMPASSION WITH COMMITMENT TO PHYSICAL ACTIVITY IN COLLEGE STUDENTS

Major Field: Counseling Psychology

Education:

Expected to complete the requirements for the Doctor of Philosophy in Educational Psychology (option: Counseling Psychology) at Oklahoma State University, Stillwater, Oklahoma in August, 2016.

Completed the requirements for the Master of Science in Clinical Psychology at Emporia State University, Emporia, Kansas in 2012.

Completed the requirements for the Bachelor of Science in Psychology at Newman University, Wichita, Kansas in 2010.