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Effects of Interrelated Goals, Anxiety, and Mindfulness on Somatic Symptoms

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THE EFFECTS OF INTERRELATED GOALS, ANXIETY, AND MINDFULNESS ON SOMATIC SYMPTONS

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ABSTRACT

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The present study investigated the interrelationships between interrelated goals, anxiety, somatic symptoms, and mindfulness among a sample of undergraduate college students (n = 454). Structural equation modeling was used to develop a well-fitting model based on collected data. Results showed that goal conflict was positively associated with higher levels of anxiety and somatic symptoms. Anxiety was found to mediate the relationship between goal conflict and somatic symptoms. Goal facilitation was found to be unrelated to anxiety and somatic symptoms. Mindfulness was not found to moderate the relationship between anxiety and somatic symptoms, but was found to be negatively related to lower levels of goal conflict, anxiety, and somatic symptoms. Mindfulness was also correlated with goal facilitation. This study serves as further evidence in support of Reinforcement Sensitivity Theory. Results of the study also serve to illuminate the importance of goal conflict and its role in explaining anxiety and somatic symptoms, as well as the role of mindfulness as being associated with lower levels of these constructs that are demonstrated in literature to have a negative impact on psychological and physiological health and well-being.

Keywords: goal conflict, goal facilitation, anxiety, somatic symptoms, Reinforcement Sensitivity Theory

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CHAPTER I

INTRODUCTION

Goals are considered essential to behavior change, formation, and maintenance (Aarts, 2007). A goal (defined as a "future valued [outcome])" (Locke & Latham, 2006, p. 265) is as diverse as the individual setting it, ranging from a desire for internal consequences (e.g., happiness, self-confidence) to environmental consequences (e.g., fulfilling expectations or roles; Wiese & Salmela-Aro, 2008). There is an abundance of evidence linking goals to overall well-being as goals have been found to provide structure, meaning, identity, and an overall sense of purpose (e.g., Cantor & Sanderson, 1999; Deci & Ryan, 2000; Delle Fave, Brdar, Wissing, & Vella-Brodrick, 2013; Emmons, 1986; Muraven, 2017; Ryff & Singer, 2008; Steger, Oishi, & Kashdan, 2009). However, "the process underlying how goals influence behavior and well-being in everyday life . . . are not yet well understood," (Riediger & Freund, 2004, p. 1511). While goals and goal setting are becoming increasingly prominent in many settings in which psychologists work, including health-care and college settings, there is a growing need to better understand how goals relate to psychological and physical well-being (Boudreaux & Ozer, 2013).

Goals, and particularly multiple goals, have the potential to impact individuals in a wide range of ways. Goals can interact by conflicting with one another, or by facilitating one another. Goal conflict is said to occur "when the pursuit of one goal undermines the pursuit of another" (Boudreaux & Ozer, 2013, p. 433), and goal

facilitation occurs when the pursuit of one goal simultaneously increases success in reaching another goal (Boudreaux & Ozer, 2013; Riediger & Freund, 2004). Psychologically, situations of goal conflict have been associated with shame, guilt, and self-criticism (Bailis, Thacher, Aird, & Lipschitz, 2011), depression, anxiety, stress, and rumination, as well as low levels of life satisfaction, self-esteem, and self-efficacy, and overall well-being (Bongers, Dijksterhuis, & Spears, 2009; Boudreaux & Ozer, 2013; Emmons & King, 1988; Gray, Ozer, & Rosenthal, 2017; Li & Chan, 2008; Nash, McGregor, & Prentice, 2011; Presseau, Sniehotta, Francis, & Campbell, 2009; Slocum, Cron, & Brown, 2002). Goal facilitation has instead been associated with positive affect, life satisfaction, and pursuit of the goals that have been set (Boudreaux & Ozer, 2013; Presseau, Sniehotta, Francis, & Gebhardt, 2010; Riediger, 2008). Physiologically, goals that conflict with one other have been associated with symptoms such as high blood pressure, headaches, chest pains, dizziness, nausea, immune system weakening, increased pain levels, poor physical health and somatic symptoms in general, in addition to higher rates of health center visits (Boudreaux & Ozer, 2013; Emmons & King, 1988; Goossens et al., 2010; Hardy, Crofford, & Segerstrom, 2011; Karoly, Okun, Ruehlman, & Pugliese, 2008; McClelland, Floor, Davidson, & Saron, 1980; Riediger & Freund, 2004). Goals that facilitate each other, on the other hand, have been associated with fewer psychosomatic symptoms (Freund, Knecht, & Wiese, 2014).

Goal-Setting Theoretical Framework

Goal-setting theory, initially developed by Locke and Latham (1990; 2002), provides a backdrop for understanding the integral role that goals play in everyday life, including their impact on behavior and affect. The theory purports that more difficult,

specific goals encourage an increase in productivity, whereas more abstract goals (e.g., "be successful"), are less motivating. In order to be effective and to encourage behavior change, an individual is ideally committed to a goal, has the ability and resources to attain it, and notably, does not hold goals that conflict with one another (Locke & Latham, 2006).

Goals in general are related to affect in many different ways from the goal-setting theoretical perspective. They have been associated with the ability to assist in self-regulation, help set personal standards for self-satisfaction, self-efficacy, and are viewed as pathways to feelings of overall success and well-being (Bandura, 1988; Delle Fave et al., 2013; Locke & Latham, 2006; McIntosh, Martin, & Jones, 1997; Wiese & Freund, 2005). The process of goal-setting, however, is naturally fraught with situations of ambiguity, inconsistency, and choice, innately tied to affective experiences. According to goal-setting theory, the process of setting goals "implies discontent with one's present condition and the desire to attain an object or outcome" (Locke & Latham, 2006, p. 265). As a result, particularly when goals are not able to be achieved - or are perceived to be unobtainable - uncertainty and threats to personal meaning can ensue, prompting distress similar to anxiety (Locke & Latham, 2006; Proulx & Heine, 2010).

Reinforcement Sensitivity Theoretical Framework

Gray's (1976) behavioral inhibition system (BIS) theory of anxiety "has stood well the test of time" (Pickering & Corr, 2008). The theory purports that personality factors account for variation in behavioral differences, particularly when it comes to the resolution of the ambiguity and choice involved in the process of goal-setting and pursuit (Pickering & Corr, 2008). Gray modified Eysenck's (1967) arousal theory, initially

defining impulsive individuals as being sensitive to signals of reward, and anxious individuals as being sensitive to signals of punishment. Gray named the BIS as being the neurological mechanism that accounts "for the generation of the negative emotional state that characterizes neurosis" (Pickering & Corr, 2008, p. 242). Gray identified goal conflict as the source of anxiety following intensive animal research (Gray & McNaughton, 2000; Nash et al., 2011; Pickering & Corr, 2008), and BIS theory was revised to expand and update descriptions of these underlying neural systems and their functions. Their theory evolved into what is now Reinforcement Sensitivity Theory (RST; Gray & McNaughton, 2000), which provides a potential framework for understanding the way that goals, specifically interrelated goals, influence behavior and affect.

According to RST, there are three systems that underlie behavior and affect. First, the Fight Flight Freeze System (FFFS), which is responsible for avoidance and escape reactions in the face of threat, mediating the emotion of fear, and is considered to be related to somatic manifestations of anxiety and panic (Gray & McNaughton, 1996). Second, the Behavioral Inhibition System (BIS), is sensitive to conditions of punishment, and is responsible for the resolution of goal conflict by generating anxiety and scanning memory and the environment for risks and possible resolutions for conflict. Finally, the Behavioral Approach System (BAS), is sensitive to rewards, and is responsible for movement toward goals and the generation of optimism and hope (Pickering & Corr, 2008; see Table 1).

Table 1

Reinforcement Sensitivity Theory Systems and Associated Traits

Reinforcement Sensitivity Theory Systems	Associated Traits
Fight-Flight-Freeze System (FFFS)	Fear-proneness, avoidance; phobia, panic.
Behavioral Activation System (BAS)	Optimism, hope, reward-orientation, increased impulsivity.
Behavioral Inhibition System (BIS)	Worry, anxious rumination, punishment-orientation; generalized anxiety.

Note. Adapted from Pickering & Corr (2008)

The BIS resolves goal conflicts "by increasing . . . the negative valence of stimuli" (Pickering & Corr, 2008, p. 244). In other words, worry and rumination increase as a way to motivate behavior, until the conflict is resolved, making the BIS associated with the tendency to examine the environment for potential threats under non-clinical circumstances, and with conditions such as generalized anxiety in clinical cases (Pickering & Corr, 2008). According to Becerra-Garcia and Robles Jurado (2014), RST appears to be associated with somatic symptoms (medically unexplained symptoms, or those attributed to an underlying mental health condition; Kroenke, 2003). They found that individuals with somatic symptoms and fibromyalgia had lower levels of BAS activity, and therefore fewer feelings of hope, optimism, and reward response, leading to increased experiences of pain and negative affect. It is hypothesized that due to the evidence in literature of the high comorbidity of anxiety and somatic symptoms (Kroenke, Spitzer, Williams, & Lowe, 2010; Simms, Prisciandaro, Krueger, & Goldberg, 2012), that when anxiety is increased due to BIS activation, that risk for somatic symptoms increases as well.

Regarding goal facilitation, there is evidence that when an individual experiences goals that facilitate one another, they are more likely to engage in goal-pursuit behaviors (Boudreaux & Ozer, 2013; Riediger & Freund, 2004), which corresponds with the function of the BAS. According to RST, when the BAS is activated by either external or internal cues (a desired goal or an expectation of attaining a goal), the individual is motivated to move toward attaining that goal, and begins planning and experiencing increases in self-efficacy and hope (Alloy et al., 2009; Gray, 1994; see Table 1). The BAS has also been called the Behavioral Facilitation System, responsible for approach behavior, motivation, and the generation of positive affect such as happiness (Carver & White, 1994; Harmon-Jones, 2003), and individuals experiencing goal facilitation also are shown to engage in more goal-pursuit behaviors (Boudreaux & Ozer, 2013; Riediger & Freund, 2004), and experience larger increases in happiness (Carver & White, 1994), and lower symptoms of anxiety in a sample of college students (Markarian, Pickett, Deveson, & Kariona, 2013).

Using RST as a backdrop, the intention of the current study was to expand our understanding of the effects of goal conflict and goal facilitation by further examining their relationship with somatic symptoms and the role mindfulness may play in moderating these relationships in a sample of college students, who likely frequently face conflicting goals (Cantor, Brower, & Korn, 1985).

The Effects of Goal Conflict

On a daily basis, human beings attempt to work toward multiple goals (Riediger, 2008). While goal conflict has been included in research for many years, according to Boudreaux and Ozer (2013), “the empirical foundation documenting the effects of goal

conflict is surprisingly thin" (p. 433). Goal conflict has been defined as occurring when the pursuit of one goal undermines the pursuit of another valued goal (Riediger & Freund, 2004). For example, an individual may pursue a goal of being confident and trying new things, which conflicts with an alternative goal of avoiding social situations to reduce anxiety. A student may be pursuing a goal of finishing a degree, which conflicts with an alternative goal of starting a family and settling down, which may also conflict with a goal of traveling more. For working adults, an individual may have a goal to make a large income or achieving high status in their company, which may conflict with their goal of prioritizing personal health by managing stress, or fostering family relationships. These are only brief examples of the wide range of goals that may influence our daily life.

Research on the impact of goal conflict has increased in recent years, particularly its impact on psychological and physical well-being. Kobasa (1985) pointed out that if conflict is at the core of somatization, then conflict must be examined in order to gain a better understanding of the relationship between the two. According to Segerstrom and Solberg Nes (2006), "Because not all goals can be actively pursued at once, some goals must be engaged at the cost of other goals, so that any time a person holds multiple goals (i.e., virtually all the time), those goals can conflict with each other," (p. 675) thus undermining our well-being. In 1988, Emmons and King pointed out that "although theoretical speculation abounds, empirical work on the causes, assessment, and consequences of conflict for cognition, emotion, and behavior is lacking," (p. 1040), which encouraged an increase in literature concerning the psychological and physiological effects of goal conflict. More recently, Fisher and Palermo (2016) saliently

pointed out that “research investigating goal conflict is important in order to understand the tipping balance between engagement and avoidance of goals” (p. 7).

While research has increased in an attempt to understand the mechanisms and impact of goal conflict, there remains much to understand, particularly in how goal conflict influences health and well-being. Through the lens of RST (Gray & McNaughton, 2000), it may be that in the face of goal conflict, the systems associated with anxiety and fear (the BIS and FFFS systems) are activated, which in turn elevate symptoms such as worry, rumination, and various somatic symptoms (Becerra-Garcia & Robles Jurado, 2014; Pickering & Corr, 2008).

Though there has been much theoretical speculation and empirical research on the negative impact of goal conflict on physical and psychological well-being (e.g., Alexander, 1950; Bongers et al., 2009; Boudreaux & Ozer, 2013; Emmons & King, 1988; Gray & McNaughton, 2000; Gray et al., 2017; Maes & Gebhardt, 2000; Presseau et al., 2009; Riediger & Freund, 2004), interestingly “not all empirical studies actually show a negative relationship between goal conflicts and well-being; goal conflicts apparently differ in their effects” (Gorges, Esdar, & Wild, 2014, p. 475). For example, inconsistent or no associations were found between goal conflict and well-being in some studies (King, Richards, & Stemmerich, 1998; Sheldon & Kasser, 1995). However, this may depend on how both goal conflict and goal facilitation are measured. Riediger (2007) argued that conflict and facilitation are not bipolar opposites (using response options ranging from strong facilitation to strong interference), and are better measured using separate unipolar scales (using response options ranging from no conflict to pervasive conflict). The two constructs have been shown to be independent of each other according

to factor-analytic findings (Riediger & Freund, 2004), and when goal conflict and goal facilitation are measured independently from one another, research results more consistently show that goal conflict is associated with lower well-being, and that goal facilitation is associated with positive functioning (Boudreaux & Ozer, 2013; Riediger & Freund, 2004; Riediger, Freund, & Baltes, 2005). Riediger and Freund (2004) explained that goals do not necessarily exist independently, and therefore may be either facilitative or interfering:

> A person might have the goals to be an excellent student, to enjoy life, to spend more time with family, and to exercise regularly. Exercising regularly and enjoying life might facilitate each other as exercising might help one relax and open up to the enjoyable sides of life [goal facilitation]. Being an excellent student and spending more time with family, in contrast might interfere with each other as both goals draw on the same limited resource, time [goal conflict]. (p. 1511)

The Effects of Goal Facilitation

Compared with goal conflict, less research has focused on the construct of goal facilitation (Presseau, Tait, Johnston, Francis, & Sniehotta, 2013). It may be important to examine goal facilitation further, in order to determine how individuals who experience higher levels of goal facilitation differ from those who experience higher levels of goal conflict. Boudreaux and Ozer (2013) provided examples of goal facilitation in a sample of college students, which included, "Get good grades . . . Manage my time better," and "Volunteer for community service . . . Become a better person" (p. 438). Goal facilitation has been shown to be independent of goal conflict, and the literature on the impact of goal facilitation on well-being appears to be mixed. Generally, it appears that "interference among personal goals might have a stronger effect on well-being than intergoal facilitation" (Riediger & Freund, 2004, p. 1512).

Research has found that individuals who perceive experiencing more goal facilitation report higher levels of life satisfaction and positive affect, in addition to having more success in attaining their goals (Boudreaux & Ozer, 2013). Presseau et al. (2010) found that when college students perceived higher levels of goal facilitation, it predicted follow-through on exercise-related goals. Other studies have found that goal facilitation did not necessarily predict well-being, but was significantly associated with increased pursuit of goals (Riediger & Freund, 2004). Interestingly, older individuals have been shown in recent research to report higher levels of goal facilitation than younger individuals, perhaps due to increase in available resources, such as money (Riediger et al., 2005). Regarding anxiety and somatic symptoms specifically, higher levels of goal facilitation have been associated with fewer psychosomatic symptoms (Freund et al., 2014), and reduced levels of goal facilitation have been associated with anxious symptoms (Dickson & Moberly, 2010). Overall, the theme in the literature surrounding goal conflict is that "the more facilitative a person's goals are, the more this person tends to work on the realization of these goals" (Riediger, 2008, p. 38). It is unclear as to the relationship between the BAS and anxiety, and further research is needed to understand the relationship between goal facilitation and overall well-being. Through the lens of RST, it is hypothesized in this study that the BAS may be activated in the context of higher levels of perceived goal facilitation, and therefore more positive affective experiences may result, such as hope and optimism, as well as reduced incidences of negative affect, such as stress, anxiety, and associated somatic symptoms.

Mindfulness

For this study, the definition of mindfulness was drawn from Bishop et al.'s (2004) conceptualization, and defined as "the self-regulation of attention so that it is maintained on immediate experience, [while] adopting a particular orientation towards one's experiences in the present moment . . . characterized by curiosity, openness, and acceptance" (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007, p. 177-178). Recently, Boudreaux and Ozer (2013) suggested that regardless of goal content, person-level variables appear to buffer against the potential effects of conflicting goals, including anxiety, depression, and somatic symptoms, and that exploring these individual differences would be a helpful research pursuit. Such variables, according to the authors, could include factors such as the ability to plan ahead, delay gratification, manage stress, and/or the ability to tolerate cognitive complexities (Boudreaux & Ozer, 2013). Emmons and King (1988) proposed that a pessimistic orientation and cognitive inflexibility may contribute to an individual experiencing goal conflict more frequently. Considering these qualities, the traits associated with mindfulness come to mind as potential factors to build upon in order to build upon factors that may improve one's ability to tolerate the negative effects of goal conflict. It may be that individuals with greater positive affect, cognitive, attentional, and behavioral flexibility, emotion regulation, problem analysis, and lower levels of avoidance, anxiety, worry, rumination--qualities found in individuals with higher levels of mindfulness--may be able to manage the effects of goal conflict to a more successful degree (Bishop et al., 2004; Brown & Ryan, 2003; Carlson & Brown, 2005; Carmody & Baer, 2008; Feldman et al., 2007; Roemer & Orsillo 2003; Schmertz, Anderson, & Robins, 2009).

Mindfulness meditation and mindfulness-based therapies have been found to reduce symptoms of anxiety and improve positive affect throughout the literature (e.g., Beauchamp-Turner & Levinson, 1992; Chen, Yang, Wang, & Zhang, 2013; Evans et al., 2008; Hoge et al., 2013). In a recent meta-analysis, Mindfulness-Based Therapy (MBT) was shown to be "especially effective" for decreased anxiety and stress (Khoury et al., 2013, p. 763). In college students, mindfulness has been shown improve mood and academic performance, and demonstrated to reduce symptoms of anxiety and stress as well (Bajaj, Robins, & Pande, 2016; Franco, Mañas, Cangas, & Gallego, 2010; Mrazek, Franklin, Phillips, Baird, & Schooler, 2013; Oman, Shapiro, Thoresen, Plante, & Flinders, 2008; Warnecke, Quinn, Ogden, Towle, & Nelson, 2011). In adult medical patients, mindfulness therapy has been demonstrated to improve physical health (Fjorback et al., 2013), improve mental functioning, improve awareness and acceptance of painful symptoms and emotions, improve self-care, and increase behavioral change (van Ravesteijn, Lucassen, Bor, van Weel, & Speckens, 2013; van Ravesteijn et al., 2014), as well as improve daily pain in adults with chronic pain (M. C. Davis, Zautra, Wolf, Tennen, & Young, 2015). Mindfulness has been studied in relation to RST as well. For example, Sauer, Walach, and Kohls (2011) found "that a reduction in BIS accounts for parts of the effect that mindfulness exhibits on well-being" (p. 510). In effect, mindfulness may be a potential tool to use in order to assist individuals in reducing BIS-related symptoms, such as anxiety.

It was hypothesized in this study that mindfulness may serve as a moderator between anxiety that is generated by goal conflict, and the associated somatic symptoms that may result. Because mindfulness has been shown to assist individuals in managing

symptoms of anxiety and somatic symptoms, and has been linked in the literature to reducing negative affect associated in the BIS, it may be that mindfulness serves as a way to focus attention more on facilitating goals, and reduce incidences of negative affect, such as stress, anxiety, and associated somatic symptoms.

Study Rationale and Purpose

Goal conflict has been found to negatively impact both psychological and physical well-being. Not only are goals a common aspect of daily life, they are also often the focus of psychological work in a variety of settings, including community mental health, college, and medical settings. Emmons and King (1988) reported associations between goal conflict and increased levels of negative affect and psychosomatic complaints. Boudreaux and Ozer (2013) found goal conflict to be a significant predictor of future levels of psychological distress including depression, anxiety, and somatization. Due to the focus on goal-setting in a variety of treatment settings, understanding its influence on health and well-being is essential to ensuring the appropriate and effective implementation of programs and treatment plans. While the benefits of goal-setting have been well documented (e.g., Delle Fave et al., 2013; Ryff & Singer, 2008), there is also evidence of potentially detrimental effects when goals conflict, including higher anxiety, greater pain, and poorer self-rated physical health in college students (Boudreaux & Ozer, 2013; Karoly & Ruehlman, 1996). Without a better understanding the impact of clients and their goals, there is the potential for exacerbation of physical symptoms and negative impact to well-being. Additionally, if goals are conflicting and negatively impacting an individual's health and well-being, understanding potential beneficial interventions such as mindfulness could assist practitioners in helping to manage such conflicts.

Understanding goal conflict and goal facilitation and how they relate to anxiety, somatic symptoms, and mindfulness has many potential implications. For students, having conflicting goals could either help or hinder study habits, persistence, and school success. For mental health professionals, understanding the potential impact of having multiple treatment goals can shed light on the potential ways certain goals may not only help (goal facilitation) or hinder (goal conflict) treatment progress, but also how they may affect anxiety and reported physical symptoms of clients. It is also important for clients to understand the potential impact that their goals have on their behavior and emotions in order to assist them in experiencing success. To further investigate the applicability of the study of interrelated goals, an examination into how mindfulness impacts the direction of the relationships between goal conflict, goal facilitation, and physical and psychological constructs may provide a potential tool to assist individuals in managing their influences.

According to Keng, Smoski, and Robins (2011), higher scores in mindfulness have been associated with cognitive flexibility, emotional regulation, attentional functioning, and lower levels of perceived stress--similar to the person-level variables suggested by Boudreaux and Ozer (2013) that may moderate the negative impact of goal conflict. Lau et al. (2006) also found that mindfulness leads to reductions in chronic pain. It has also been shown in biofeedback research to reduce somatic conditions of symptoms of illness (Brown & Ryan, 2003), and Hoge et al. (2017) recently found that individuals diagnosed with Generalized Anxiety Disorder who received mindfulness meditation training displayed a significantly greater reduction in the biomarkers of anxiety when compared to a control group. Sauer et al. (2011) found that mindfulness had a relieving influence on BIS-related symptoms and emotions, based on Gray and McNaughton's

(2000) RST. While mindfulness-based interventions have been shown in research to potentially reduce somatic conditions or symptoms of illness (Khoury et al., 2013; van Ravesteijn et al., 2014), it is unknown whether its benefits will have an impact on somatic symptoms that may arise in the face of goal conflicts.

The current study used Gray and McNaughton's (2000) RST as a framework for understanding how the constructs of goal conflict and goal facilitation relate to anxiety, somatic symptoms, and mindfulness, to shed light not only on how they may influence both physical and psychological well-being, but also on how mindfulness may play a role in moderating the relationship between goal conflict-generated anxiety and any corresponding somatic symptoms. The results of this study will aid in developing a better understanding of the relationships between these constructs by examining a population of college students who likely frequently face conflicting goals (Cantor et al., 1985). The results of the current study may assist clients, students, and practitioners not only in gaining a better understanding of the potential impact of the goal-setting process, but also in improving the understanding of potential qualities, such as those associated with mindfulness, that may assist individuals in managing the potential negative effects of goal conflict. Therefore, the goal of the present study was to examine a hypothesized model in which anxiety mediates the relationship between interrelated goals (goal conflict and goal facilitation) and somatic symptoms in a sample of college students, based on RST (see Figure 1). An alternative model was also tested in which mindfulness indirectly moderates the potential effect of goal conflict on somatic symptoms found in a review of literature (see Figure 2).

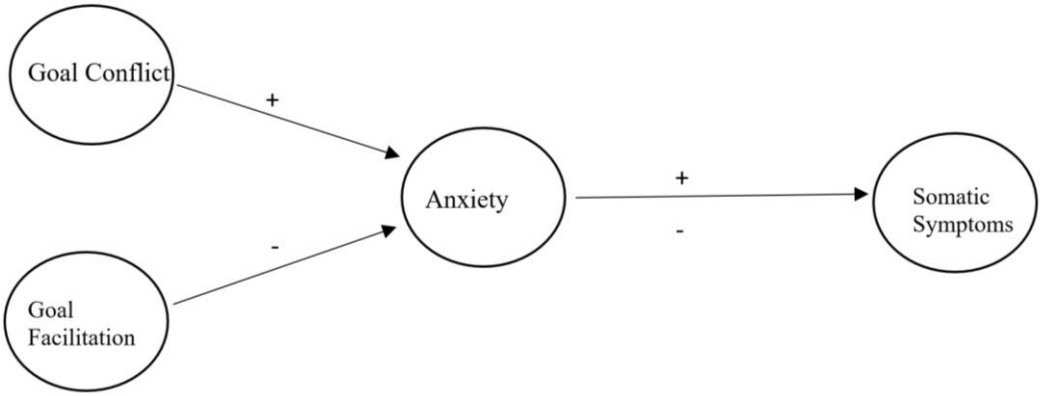

Figure 1. Predicted relationships between goal conflict, goal facilitation, and somatic symptoms, without mindfulness as moderator.

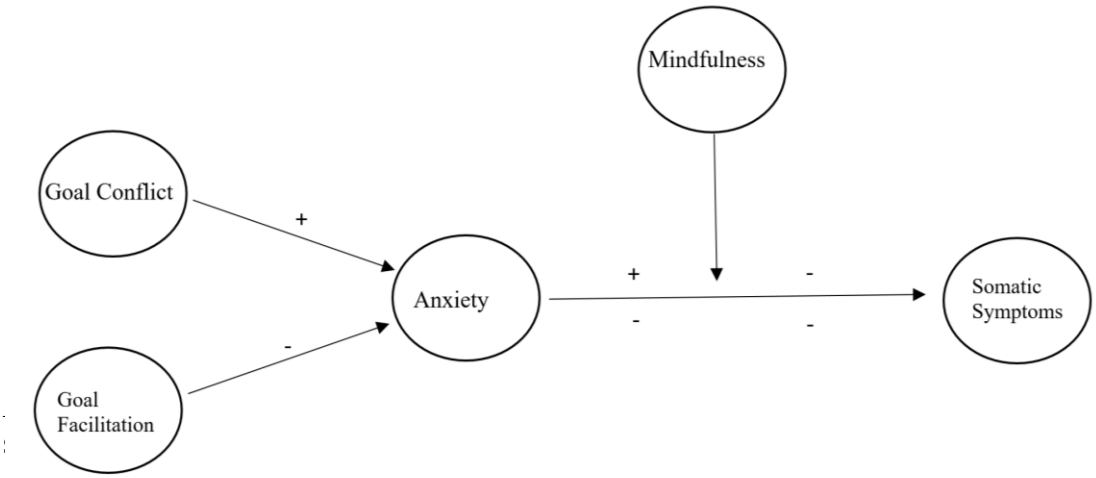

Figure 2. Predicted relationships between goal conflict, goal facilitation, and somatic symptoms, with mindfulness as moderator.

After reviewing the literature, no research has been pursued on the interrelationships among goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness. There is clear theoretical support for goal conflict directly and positively impacting anxiety and indirectly positively impacting somatic symptoms with anxiety as a mediator (e.g., those scoring higher in goal conflict will also display increased anxiety and somatic symptoms; Boudreaux & Ozer, 2013; Gray & McNaughton, 2000; Pickering & Corr, 2008; Riediger & Freund, 2004), and for goal facilitation to negatively impact anxiety and somatic symptoms (e.g., those scoring higher in goal facilitation will also display lower levels of anxiety and somatic symptoms; Dickson & Moberly, 2010; Freund et al., 2014; Gray & McNaughton, 2000; Pickering & Corr, 2008). Additionally, there was clear support in the research for the exploration of the role that mindfulness may play in moderating the indirect relationship between goal conflict and somatic symptoms found in the literature, as there is evidence of mindfulness being successful in the treatment of anxiety and somatic symptoms (M. C. Davis et al., 2014; Franco et al., 2010; Khoury et al., 2013; van Ravesteijn et al., 2014).

Research Questions

As a result of the prior research, the following research questions were created to examine a proposed theoretical model that explains the interrelationships among goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness:

Q1 Does a primary theoretical explanatory model (see Figure 1) adequately fit the observed relationships in the data, conceptualized with goal conflict directly and positively affecting anxiety, and indirectly positively affecting somatic symptoms through the mediating variable of anxiety, and with goal facilitation directly and negatively affecting anxiety, which indirectly and negatively affects somatic symptoms through the mediating variable of anxiety?

Q2 Does an alternate model (see Figure 2) also adequately fit the observed interrelationships between these constructs in the data, which includes mindfulness as a moderator between goal conflict-induced anxiety and somatic symptoms?

Limitations

The generalization of the results the current study will find is limited by important factors. First, the sample included a convenience sample of college students and may not be diverse in regards to the inclusion of racial/ethnic minorities, so generalizing the findings to populations outside of this type of sample will need to be done cautiously.

Second, Wiese and Salmela-Aro (2008) and Riediger and Freund (2006) have identified variables that may influence the constructs of goal conflict and goal facilitation, including gender and age. Recent research has pointed out that North American adults, women in particular, have limited available time, and therefore could experience goal conflict occurring as a result of holding multiple roles (Pearson, 2008; Williams, Guerin, & Fortier, 2014). Goal facilitation has been found to increase with age, particularly in individuals over the age of 60 (Riediger & Freund, 2006), perhaps because abilities such as mental and attentional control tend to improve with age (Rothbart, Ellis, & Posner, 2004). Regarding somatic symptoms, Kocalevent, Hinz, and Brahler (2013) found that somatic symptom scores tend to increase by gender and age, with women reporting more symptoms than men, and older individuals reporting more symptoms than younger individuals. Additionally, a review of research found that Latin Americans tend to report higher levels of somatic symptoms (Tofoli, Andrade, & Fortes, 2011). It appeared that no prior research has examined whether mindfulness can play a role in moderating the effects of interrelated goals, specifically somatic symptoms. While the current study attempted to incorporate and control for these variables that have been

shown to influence interrelated goals and somatic symptoms, this study may not have accounted for potentially influencing demographic variables that have not yet been identified. Because prior research on goal conflict, goal facilitation, and somatic symptoms has most often incorporated gender, age, and race/ethnicity, and sometimes socio-economic status into their designs (e.g., Kocalevent et al., 2013; Wiese & Salmela-Aro, 2008), the current study attempted to control for age, race/ethnicity, and gender.

Finally, since only one scale was used to represent each construct within the hypothesized models, this leads to potential measurement error and bias in fully capturing the constructs being explored in this study. In particular, the measurement and definition of mindfulness currently in the literature varies to a large degree, which indicates disagreement surrounding this construct (Keng et al., 2011).

Definition of Terms

Anxiety. A collection of symptoms at varying severity levels, ranging from having trouble relaxing, to feeling afraid as if something awful might happen or worrying too much about different things (American Psychiatric Association [APA], 1994; Spitzer, Kroenke, Williams, & Löwe, 2006).

Behavioral Approach System (BAS). Sensitive to rewards, responsible for movement toward goals and the generation of optimism and hope (Gray & McNaughton, 2000; Pickering & Corr, 2008; see Table 1).

Behavioral Inhibition System (BIS). Sensitive to conditions of punishment, and responsible for the resolution of goal conflict by generating anxiety and scanning memory and the environment for risks and possible resolutions for conflict (Gray & McNaughton, 2000; Pickering & Corr, 2008).

Fight Flight Freeze System (FFFS). Responsible for avoidance and escape reactions in the face of threat, mediating the emotion of fear, and is considered to be related to somatic manifestations of anxiety and panic (Gray & McNaughton, 1996).

Goal conflict. **"**Occurs when the pursuit of one goal undermines the pursuit of another" (Boudreaux & Ozer, 2013, p. 433). Also referred to in the literature as inter-goal interference (Riediger & Freund, 2004).

Goal facilitation. Occurs when the pursuit of one goal simultaneously increases success in reaching another goal, also referred to in the literature as intergoal facilitation (Boudreaux & Ozer, 2013; Riediger & Freund, 2004).

Goals. "Future valued outcomes" (Locke & Latham, 2006, p. 265).

Mindfulness. "The self-regulation of attention so that it is maintained on immediate experience, [while] adopting a particular orientation towards one's experiences in the present moment . . . characterized by curiosity, openness, and acceptance" (Feldman et al., 2007, pp. 177-178). The construct is, therefore, made up of four components: The ability to regulate attention; an orientation to present/immediate experience; awareness of experience; an attitude of acceptance or nonjudgment towards the experience (Bishop et al., 2004; Feldman et al., 2007).

Reinforcement Sensitivity Theory (RST). Gray and McNaughton's (2000) theory of personality developed out of Gray's Behavioral Inhibition System theory of anxiety 1976) which purports that there are three systems that underlie behavior and affect, including Behavioral Inhibition, Behavioral Activation, and Fight Flight Freeze.

Somatic Symptoms. Medically unexplained symptoms, or those attributed to an underlying mental health condition, such as headaches, stomach, or back pain (Kroenke, 2003).

Summary

Interrelated goals have been examined in the literature on a limited basis, particularly in regards to the individual differences that may contribute to the effects of goal conflict (Boudreaux & Ozer, 2013). It remains unknown if individuals with higher levels of mindfulness experience fewer somatic symptoms as a result of goal conflict. The current study aids in developing a better understanding of interrelated goals and their potential effects by examining a population of college students, who have been reasonably assumed to face multiple goals (Cantor et al., 1985), and set multiple goals to aid in their success (e.g., Fryer & Elliot 2007; Van Yperen 2006). By examining the interrelationships between goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness, this study sought to understand the role that mindfulness may play in moderating the effects of interrelated goals on somatic symptoms in a sample of college students, through the lens of Gray and McNaughton's (2000) Reinforcement Sensitivity Theory. As the relationships among these constructs have not yet been examined in the literature, this study contributes to the field of psychology in a number of ways. It will help clients, students, and practitioners to better understand the potential impact of the goal-setting process, the importance of being intentional in setting goals that facilitate one another, and the potential individual characteristics that may contribute to successfully managing the effects of interrelated goals.

CHAPTER II

REVIEW OF LITERATURE

In the following review of literature, a theoretical and empirical basis for the current study was established. First, the theoretical framework for the study is presented, along with a review of the basic concepts and development of both goal setting and reinforcement sensitivity theories. Next, research on interrelated goals, specifically goal conflict and goal facilitation, is presented and integrated with relevant available literature on anxiety and somatic symptoms. Next, research on mindfulness is presented through the theoretical perspective of RST, along with its role in the treatment of anxiety and somatic symptoms. Finally, empirical support for the construct of somatic symptoms and its measurement is presented to provide support for the importance of understanding this construct and its role in the college student population. The following review of literature will be closed with a summary, including rationale and potential implications for the current study.

Theoretical Frameworks

Goal-Setting

Research on goals has evolved in North America since the 1950s and 60s, when the study of motivation in general was seen as impractical due to the dominance of behaviorism in the field of psychology at the time, and motivation being viewed as existing outside of the individual in the form of reinforcement and punishment (Locke & Latham, 2002). While the concept of conscious, internally constructed goals was being

studied prior to the 1950s (e.g., Lewin, 1935; Lewin, Dembo, Festinger, & Sears, 1944), research on goal-setting largely went unnoticed until Ryan and Smith (1954), authors in industrial psychology, began to produce literature on conscious goals (Locke & Latham, 2002). Locke and Latham (2002) reported that goal-setting theory is predominantly based on the proposition that goals influence behavior. Ryan (1970) stated at the time that "it seems a simple fact that human behavior is affected by conscious purposes, plans, intentions, tasks and the like" (p. 18).

Goal-setting theory purports that conscious motivation affects behavior, regardless of subconscious influence (taking action without full awareness of what is motivating choice; Locke & Latham, 2002). Locke and Latham (2002) recognized that while an insufficient emphasis on subconscious motivation has been considered a limitation of goal-setting theory, they argued that from a self-efficacy perspective (Bandura, 1997):

> People have the power to actively control their lives through purposeful thought; this includes the power to program and reprogram their subconscious, to choose their own goals, to pull out from the subconscious what is relevant to their purpose and to ignore what is not, and to guide their actions based on what they want to accomplish. (Locke & Latham, 2002, p. 714)

Goal setting theory also asserts that more difficult, specific goals encourage an increase in productivity, whereas more abstract goals (e.g., "be successful"), are less motivating. In order to be effective and encourage behavior change, an individual is ideally committed to a goal, has the ability and resources to attain it, and does not hold goals that conflict with one another (Locke & Latham, 2006). With these stipulations in mind goals have the potential to conflict often, with an array of affective consequences, consistently regulating how individuals interact with the environment (Bandura, 1988;

Nuttin, Lorion, & Dumas, 1984). As stated by Boudreaux and Ozer (2013), "in some respects, goal conflict is a part of everyday life" (p. 434).

Goals are related to affect in many different ways. They have been associated with the ability to assist in self-regulation, help set personal standards for self-satisfaction, self-efficacy, and are viewed as pathways to feelings of overall success and well-being (Bandura, 1988; Delle Fave et al., 2013; Locke & Latham, 2006; McIntosh et al., 1997; Wiese & Freund, 2005). The process of goal-setting, however, is naturally fraught with situations of ambiguity, inconsistency, and choice, innately tied to affective experiences. According to goal-setting theory, the process of setting goals "implies discontent with one's present condition and the desire to attain an object or outcome" (Locke & Latham, 2006, p. 265). As a result, particularly when goals are not able to be achieved - or are perceived to be unobtainable - uncertainty and threats to personal meaning can ensue, prompting distress similar to anxiety (Locke & Latham, 2006; Proulx & Heine, 2010).

Reinforcement Sensitivity

Early on, goal conflict was described as existing in situations that lead an individual to act "in two opposite directions at the same time" (Bailis et al., 2011, p. 130), and that negative emotional experiences are impacted by states of conflict versus working toward a single goal. Gray's (1976) behavioral inhibition system (BIS) theory of anxiety was developed as a potential biological explanation for the impact of goal conflict, as well as for individual differences in how it is managed. Gray modified Eysenck's (1967) arousal theory, which delineated a difference between introverts and extroverts, with introverts having "lower response thresholds . . . [being] more arousable when faced with

sensory stimulation" (Corr, 2004, p. 318) than extroverts. Initially defining impulsive individuals as being sensitive to signals of reward, and anxious individuals as sensitive to signals of punishment, Gray named the behavioral inhibition system (BIS) as the neurological mechanism that accounts "for the generation of the negative emotional state that characterizes neurosis" (Pickering & Corr, 2008, p. 242). In 2000, Gray and McNaughton identified goal conflict as the primary cause of anxiety following a review of animal research, and revised BIS theory to expand and update descriptions of these underlying neural systems and their functions. Their theory evolved into what is now Reinforcement Sensitivity Theory (RST; Gray & McNaughton, 2000), which provides a potential framework for understanding the way that interrelated goals influence affective experiences, particularly anxiety and distress.

According to RST, there are three systems that underlie behavior and affect. First, the Fight Flight Freeze System (FFFS), which is responsible for avoidance and escape reactions in the face of threat, mediating the emotion of fear. Second, the Behavioral Inhibition System (BIS), is sensitive to conditions of punishment, and is responsible for the resolution of goal conflict by generating anxiety and scanning memory and the environment for risks and possible resolutions for conflict. Finally, the Behavioral Approach System (BAS), is sensitive to rewards, and is responsible for movement toward goals and the generation of optimism and hope (Pickering & Corr, 2008; see Table 1).

According to RST, the BIS resolves goal conflicts "by increasing . . . the negative valence of stimuli" (Pickering & Corr, 2008, p. 244). In other words, worry and rumination increase until the conflict is resolved, making the BIS associated with the tendency to "look-out for possible signs of danger," as well as with conditions such as

generalized anxiety (Pickering & Corr, 2008). Over time, research has built on RST, and there is evidence in existing literature that BIS "plays a central role in the development of psychopathology, e.g., anxiety" (Sauer et al., 2011, p. 507; see also Harmon-Jones, 2003). In a study of 459 undergraduate students at a large Midwestern university, Markarian et al. (2013) found that higher levels of BIS sensitivity was associated with higher anxiety levels, and higher levels of BAS sensitivity was associated with lower levels of anxiety (as measured by the Depression Anxiety Stress Scale; Lovibond & Lovibond, 1995). Nash et al. (2011) summarized Gray and McNaughton's BIS by explaining that the environment is unpredictable and frequently activates the BIS, leaving individuals with feelings of anxiety and uncertainty.

On the other hand, the BAS is hypothesized to be "a psychobiological system that integrates approach motivation, personality traits, and behavioral tendencies involved in goal-seeking and reward responsiveness" (Alloy & Abramson, 2010, p. 189). According to RST, when the BAS is activated by either external or internal cues (a desired goal or an expectation of attaining a goal), the individual is motivated to move toward attaining that goal, and begins planning and experiencing increases in self-efficacy and hope (Alloy et al., 2009; Gray, 1994). The BAS has also been called the Behavioral Facilitation System, responsible for approach behavior, motivation, and the generation of positive affect such as happiness (Carver & White, 1994; Harmon-Jones, 2003). Individuals experiencing goal facilitation also are shown to engage in more goal-pursuit behaviors (Boudreaux & Ozer, 2013; Riediger & Freund, 2004), and experience larger increases in happiness (Carver & White, 1994). Essentially, activation in the BAS has the potential to lead to goal-oriented behavior, and improved feelings of well-being. Taken to

the extreme, however, individuals with elevated levels of BAS sensitivity have been associated with symptoms of increased impulsivity, mania, and hypomania (Alloy & Abramson, 2010).

Goals are not inherently conflictual. They have the ability to aid in the attainment of other goals, rather than drawing an individual to choose between two conflicting goals. When goals are seen as helpful in the achievement of overall success, positive affect is proposed to occur (Wiese & Salmela-Aro, 2008). Because the BAS is hypothesized in RST to involve motivation and goal-seeking behavior (Alloy & Abramson, 2010), it can be concluded that when an individual experiences higher levels of goal facilitation (versus goal conflict), more BAS-related reactions emerge instead, such as optimism, hope, and goal-directed behavior, driven by reward.

Gray and McNaughton's (2000) RST has been associated in research with pain and somatic symptoms. Becerra-Garcia and Robles Jurado (2014), for example, found adults with somatic symptoms and fibromyalgia had lower levels of BAS activity, and therefore fewer feelings of hope, optimism, and reward response. In adolescents, lower levels of BAS activity has been found to be related significantly to pain catastrophizing (a tendency to focus on pain and view oneself as unable to manage the pain; Muris et al., 2007). Additionally, differential associations between BIS, BAS, and various self-reported somatic symptoms have been found in college students, meaning that lower levels of BAS and higher levels of BIS activity have been associated with increased self-reported somatic symptoms (Becerra-Garcia, Garcia-Leon, Martin-Vazquez, & Reyes-Del-Paso, 2011; see also Becerra-Garcia & Robles Jurado, 2014).

Gray and McNaughton's (2000) RST provides a context for understanding both goal conflict and goal facilitation, having been built upon the reality that conflict exists as an integral part of one's experience, and providing possible explanations for psychological and physiological response patterns via biological systems. It can be concluded in reviewing RST that goal conflict is an integral part of daily experiences to varying degrees, activating the BIS, and increasing anxiety (and its corresponding symptoms) to begin resolution of the conflict at hand. Furthermore, it could also be concluded that when goals facilitate one another, BAS-related reactions emerge, leading to increased goal-directed behavior and more positive emotional reactions such as optimism and hope.

Interrelated Goals

Goal Conflict

Theorists from a variety of perspectives throughout history have referred to goal conflict in their research, and linked it to a negative impact on behavior and emotion. For example, psychoanalysts tend to "view behavior as a compromise between conflicting conscious and unconscious impulses" (Emmons & King, 1988, p. 1040). Freud theorized that personality is troubled by conflict and "vulnerable to the deterioration that chronic conflict implies" (Emmons & King, 1988, p. 1040). From a behaviorist perspective, in 1927, Pavlov found that goal conflict led dogs to display distress and aggression. In 1935, Lewin found that goal conflict led toddlers to become anxious and throw tantrums, and in 1950, Alexander proposed that emotional conflict is central to somatic complaints.

Research on the impact of goal conflict has since increased, particularly its influence on both psychological and physical well-being. Williams et al. (2014)

concluded that feeling required to do one thing (e.g., study for a test) while really wanting to do something else (e.g., spend time with friends) may lead to higher levels of conflict, and thus lower levels of psychological well-being. When examining goal conflict with respect to exercise, studies have found that those experiencing goal conflict display lower levels of psychological well-being and diminished progress toward exercise goals (e.g., Li & Chan, 2008; Presseau et al., 2009). Goal conflict has also been associated with high negative, self-critical feelings, such as shame and guilt (Bailis et al., 2011), as well as lower levels of life-purpose in college students (Berrios, Totterdell, & Kellett, 2017). In their study of 117 physically active university students, Bailis et al. (2011) asked participants how important it was to them to be attending college, and then asked each student to commit to 30 minutes of exercise four times a week. The authors found that students who entered the study reporting that attending college was highly important to them experienced higher levels of shame and distress at the time they committed to the exercise goal.

Conflicting goals have been associated with high levels of depression, anxiety, stress, and rumination, as well as low levels of life satisfaction, well-being, self-esteem, and self-efficacy in samples of adults (Anaby, Backman, & Jarus, 2010; Emmons & King, 1988; Lazarus & Folkman, 1984; Li & Chan, 2008; Nash et al., 2011; Palys & Little, 1983; Presseau et al., 2009; Slocum et al., 2002). In a recent meta-analysis of 54 studies, Gray et al. (2017) concluded that there is evidence of a negative association between goal conflict and psychological well-being. Anaby et al. (2010) found that goal conflict, as measured by the Intergoal Relations Questionnaire (IRQ; Riediger & Freund, 2004), was significantly and negatively associated with well-being in a sample of 24

adults. Bongers et al. (2009) found that failure in goal pursuit was associated with lower levels of self-esteem in a sample of 93 undergraduate students in Amsterdam. In a sample of 170 college students at a public university in Southern California, Boudreaux and Ozer (2013) recently found that when goal conflict persisted over four to six weeks, "significant increases in depression, anxiety, and physical symptoms" (p. 441) were reported by participants, with depression, anxiety, and physical symptoms being measured by the Brief Symptom Inventory (BSI; Derogatis, 2001). Notably, using similar structure to the IRQ (Riediger & Freund, 2004), the authors measured goal conflict using an internet-based survey that asked participants to list eight goals, which were automatically paired with each of the other listed goals. Participants were then asked to judge whether or not working toward one goal supported the attainment of each of the other goals. Nash et al. (2011) also concluded after their study of college students that "goal conflicts specifically cause anxious uncertainty" (p. 1298) when participants were randomly assigned to situations of goal conflict that threatened goals such as achievement and acceptance. Interestingly, Taylor, Lekes, Gagnon, Kwan, and Koestner (2012) recently gathered a sample of 3,248 high school students in a suburban areas of Quebec, Canada, and found that students who perceived more often that school goals conflicted with work goals reported higher levels of intent to drop out of school, with conflict measured by the IRQ (Riediger & Freund, 2004). While not measuring the effects of goal conflict among college students in the United States specifically, this study is noteworthy given the potential impact of goal conflict (particularly between school and work) on school dropout found by the authors. Additionally, Farmer, Farrand, and O'Mahen (2012) found that goal conflict, as measured by both the IRQ and the Striving Instrumentality

Matrix (SIM; Emmons, 1986) via online survey, was correlated with identity conflict, and associated with avoidance of symptoms of depression in a sample of 105 participants recruited via a general university email distribution list and social networking site.

Goal Conflict and Somatic Symptoms

Regarding its potential physiological impact, goal conflict has historically been described as a "precursor to psychosomatic illnesses" (Emmons & King, 1988, p. 1041), with conflicting interests or goals generating or exacerbating somatic conditions (Fridlund, Newman, & Gibson, 1984). Conflict among goals has been associated in the past with high blood pressure, headaches, chest pains, dizziness, nausea, immune system weakening, and higher rates of health center visits (Emmons & King, 1988; McClelland et al., 1980). Conflict among goals has been associated with poor physical health and somatic symptoms in both college students and working adults (Emmons & King, 1998; Hoge, 2009; Karoly & Ruehlman, 1996; Marcinko, 2015). As described previously, Boudreaux and Ozer (2013) recently found goal conflict to be a significant predictor of psychosomatic symptoms in college students. Recent research also suggests that when individuals perceive their goals to be conflicting, it is associated with increased disability, pain, and higher levels of pain-related fear (Goossens et al., 2010; Hardy et al., 2011; Karoly et al., 2008).

While there has been much theoretical speculation and empirical research on the negative impact of goal conflict on physical and psychological well-being (e.g., Alexander, 1950; Bongers et al., 2009; Boudreaux & Ozer, 2013; Emmons & King, 1988; Gray & McNaughton, 2000; Maes & Gebhardt, 2000; Presseau et al., 2009; Riediger & Freund, 2004), interestingly "not all empirical studies actually show a negative

relationship between goal conflicts and well-being; goal conflicts apparently differ in their effects" (Gorges et al., 2014, p. 475). For example, Sheldon and Kasser (1995) did not find an association between goal conflict and negative states, and neither did Kehr (2003) nor Segerstrom and Solberg Nes (2006). Kelly, Mansell, and Wood (2011) found that goal conflict was negatively correlated with depression. However, these inconsistent findings may be due to differences in how goal conflict (and goal facilitation) have been measured and conceptualized (Boudreaux & Ozer, 2013; Riediger & Freund, 2004).

Goal conflict may present in a variety of forms. In defining and measuring goal conflict, Riediger and Freund (2004) delineated that resource limitations (including limited time, money, and energy), as well as incompatible goal-attainment strategies, lead individuals to experience conflicting goals. Resource limitations can lead to conflict among goals when several goals require the same, inadequately available resources. For example, establishing a career may take a lot of time that cannot be spent on other goals. Incompatible goal-attainment strategies occur when goals counteract each other. For example, when an individual has set both a goal to lose weight, and to also spend more time with friends who prefer to go out to restaurants (Riediger & Freund, 2004). Goals must compete for limited resources, which can also include "the allocation of attention to focal goals" (Bailis et al., 2011, p. 129). As recently pointed out by Williams et al., (2014), in cases of limited time resources when goal conflict levels are potentially high, deciding to simply add activities that are normally considered to positively influence well-being "may result in increased conflict . . . and a subsequent decrease in well-being" (p. 166). This concept is particularly relevant for the field of psychology. For example, a client experiencing distress as a result of conflicting goals (increasing study time while

also increasing self-care), may become more distressed due to lack of available resources if a new goal is set to improve their social life.

Goal conflict is a part of everyday life (Boudreaux & Ozer, 2013), as individuals must consistently make decisions regarding how to spend their resources and make decisions that influence emotion and behavior in complex ways. As summed up by Kleiman and Hassin (2013):

> The very nature of goal conflicts is such that people fluctuate between seeing the world through the eyes of one goal, and seeing it from the vantage point of another, conflicting goal. . . . "If I go to the party, I may hang out with John" proclaims happily one goal. "BUT ALSO" warns the conflicting goal, "I may be very tired in the exam tomorrow. (p. 375)

Goal Facilitation

Compared to goal conflict, less research has focused on the construct of goal facilitation (Presseau et al., 2013), and it may be important to examine in order to determine how individuals who perceive higher levels of goal facilitation differ from those who experience higher levels of goal conflict (Riediger, 2008). Recently, McKee and Ntoumanis (2014) pointed out that much of the available research on multiple, interrelated goals has either focused exclusively on goal conflict (e.g., Gebhart et al., 2007; Jung & Brawley, 2010), or neglected to measure goal conflict and goal facilitation as independent from each other (Riediger & Freund, 2004).

It is naturally assumed that goal facilitation will have a positive impact on well-being. This assumption aligns with models and empirical studies that purport that positive emotion and well-being occurs when behaviors and circumstances facilitate the attainment of goals (e.g., Bagozzi & Pieters, 1998; McKee & Ntoumanis, 2014; Wiese, 2007; see also Wiese & Salmela-Aro, 2008). Additionally, research has found that

individuals who more often perceive their goals to be facilitating of one another report higher levels of empathy, life satisfaction, positive functioning, and positive affect, in addition to more success in attaining their goals (Boudreaux & Ozer, 2013; Riediger, 2008; Sheldon & Kasser, 1995; Wiese & Salmela-Aro, 2008). Presseau et al. (2010), for example, found that when a sample of 37 undergraduate students perceived higher levels of goal facilitation (as measured by the Personal Projects Analysis; PPA; Little, 2006), it significantly predicted the frequency of reported physical activity. Recently, McKee and Ntoumanis (2014) found that goal facilitation was related to successful goal attainment, as measured by the IRQ facilitation subscale (Riediger & Freund, 2004), in a sample consisting of 103 college students and 70 young professionals via web-based questionnaire. Riediger and Freund (2004) also found that while goal facilitation did not necessarily predict well-being, it was significantly associated with increased pursuit of goals. In their study of 170 undergraduate students as discussed previously, Boudreaux and Ozer (2013) found that goal facilitation was associated with higher levels of positive affect and life satisfaction (measured similarly to the IRQ via web-based survey). In a psychotherapy setting, there is evidence that clients who report higher levels of goal facilitation tend to be cooperative, willing to self-disclose and try new behaviors (Michalak & Schulte, 2002). Interestingly, older individuals have been shown in recent research to report higher levels of goal facilitation than younger individuals, perhaps due to improvement in available resources, such as money (Riediger et al., 2005). Mutual facilitation among goals may enhance goal-directed activities by allowing an efficient use of one's resources in the interest of one's goals" (Wiese & Salmela-Aro, 2008). For example, an individual may set goals to both increase physical activity and to be more

social, and decide to invite friends to jog with them in order to meet both goals and use time resources efficiently.

Goal Facilitation and Somatic Symptoms

In a review of relevant available literature on goal facilitation and somatic symptoms, there has been very limited research examining the relationship between these two constructs of interest. In a sample of adolescents, Dickson and Moberly (2010), found evidence that symptoms of anxiety and depression are associated with lower levels of goal facilitation. Recently, Freund et al. (2014) conveyed that goal facilitation may lessen the number somatic symptoms experienced, but that "this subject has been largely neglected in the literature" (p. 255). The same authors found, in a study of working adults, a significant positive correlation between the number of somatic symptoms reported and goal conflict, but not between somatic symptoms and goal facilitation. The relationship between goal facilitation and somatic symptoms does not appear to have yet been examined within a college student population.

Overall, the theme in the literature surrounding goal facilitation is that "the more facilitative a person's goals are, the more this person tends to work on the realization of these goals" (Riediger, 2008, p. 38), as well as experience fewer symptoms of anxiety and somatic symptoms (Dickson & Moberly, 2010; Freund et al., 2014). Through the lens of RST, it was hypothesized that the BAS may be accessed in the context of higher levels of perceived goal facilitation, and therefore increased goal-driven behavior, positive affective experiences such as hope and optimism, and reduced incidences of negative affect, such as stress, anxiety, and associated somatic symptoms. The present study tested this relationship.

Measurement of Goal Conflict and Goal Facilitation

Goal conflict and goal facilitation have been measured in the literature both as opposites of a spectrum, as well as mutually exclusive constructs. While intuitively it may make sense to rate goal conflict and facilitation along a continuum, with goal conflict on one side and goal facilitation on the other, this does not prove to be the case in research examining the two constructs. Riediger and Freund (2004) conceptualized and tested goal conflict and facilitation as existing independent of one another, rather than as opposite constructs. The authors explained that goals do not necessarily exist independent from one another, and provide an example of an individual who holds four goals, "to be an excellent student, to enjoy life, to spend more time with family, and to exercise regularly" (Riediger & Freund, 2004, p. 1511). Exercising and enjoying life would facilitate one another, as exercise would promote relaxation and potentially allow the individual to enjoy life a bit more. On the other hand, being a good student and increasing time spent with family would likely be goals that conflict with one another, as both reduce the amount of time available to the person (Riediger & Freund, 2004). "In other words, multiple personal goals may influence each other in positive (facilitative), or negative (interfering) ways" (Riediger & Freund, 2004, p. 1511).

When goal conflict and goal facilitation are measured independently, factor analyses have demonstrated that the two constructs are distinct from one another (Presseau et al., 2010; Riediger & Freund, 2004), leading Riediger and Freund (2004) to conclude that the constructs should be regarded as "distinct characteristics rather than as opposites on one dimension" (p. 1513). Studies that use unidimensional response scales to measure goal conflict (e.g., with options for responses that range from 1 (no conflict) to 5 (pervasive conflict; Perring, Oatley, & Smith, 1988) have found that higher levels of goal conflict were are associated with diminished psychological well-being, and that goal facilitation is associated with positive functioning (e.g., Boudreaux & Ozer, 2013; Palys & Little, 1983; Riediger & Freund, 2004; Riediger et al., 2005). In contrast, studies using multidimensional assessment of goal conflict with scales that range from strong goal conflict to strong goal facilitation have found either no or inconsistent associations with psychological well-being (e.g., Emmons & King, 1988; King et al., 1998; Sheldon & Kasser, 1995; see Table 2 for a summary of measures of goal conflict and goal facilitation).

Table 2

Measures of Goal Conflict and Goal Facilitation

Measure	No. of Items; Scaling	Psychometric Data	Factors Included
Intergoal Relations Questionnaire (IRQ; Riediger & Freund, 2004)	36-item self-report inventory; 5-point Likert-type scale.	Cronbach's ∝ .94 for intergoal interference and .91 for intergoal facilitation; correlated with Striving Instrumentality Matrix (SIM; Emmons, 1986); shown to predict life satisfaction and positive and negative affect.	Intergoal interference (assessed in terms of time, energy, and financial constraints, and incompatible goal-attainment strategies); intergoal facilitation (assessed in terms of instrumental goal relations and overlapping goal-attainment strategies).
Personal Projects Analysis (PPA; Little, 1983)	10 personal projects rated on 17 dimensions, on a scale ranging from 0-10 and defined based on each dimension (e.g., 0, no stress at all to 10, very stressful).	Cronbach's α .53-.77; correlations between Time 1 administration and Time 2 .39-.68.	Personal appraisals of everyday personal projects, rated on dimensions such as Project Importance, Value Congruency, Perceived Control, Time Adequacy, Outcome, Difficulty, and Stress.

Mindfulness

In a recent study on goal conflict, Boudreaux and Ozer (2013) suggested that regardless of goal content, person-level variables appear to buffer against the potential effects of conflicting goals, including anxiety, depression, and somatic symptoms, and that exploring these individual differences would be a helpful research pursuit. Such variables, according to the authors, could include factors such as the ability to plan ahead, delay gratification, manage stress, and the ability to tolerate cognitive complexities (Boudreaux & Ozer, 2013). Emmons and King (1988) proposed that a pessimistic orientation and cognitive inflexibility may contribute to an individual experiencing goal conflict more frequently. Considering these qualities, the traits associated with mindfulness come to attention as potential factors to consider in understanding qualities that may improve one's ability to tolerate the potential negative effects of goal conflict. It may be that individuals higher in positive affect, cognitive, attentional, and behavioral flexibility, emotion regulation, problem analysis, and with lower levels of avoidance, anxiety, worry, and rumination - qualities found in individuals with higher levels of mindfulness - may be able to manage the effects of goal conflict to a more successful degree (Bishop et al., 2004; Brown & Ryan, 2003; Carlson & Brown, 2005; Carmody & Baer, 2008; Feldman et al., 2007; Roemer & Orsillo 2003; Schmertz et al., 2009). Riediger (2008) reported that research suggests, since older adults experience more goal facilitation than younger adults, "focusing the content of one's goals on central and similar goals (but not in the sense of restricting oneself to few goals) is among the mechanisms that underlie high levels of intergoal facilitation" (p. 39). It can be concluded that individuals with high levels of mindfulness may not only experience lower levels of

goal conflict, but may also be able to focus their goals to those that will facilitate each other.

Mindfulness Defined

Defining mindfulness has proven to be challenging throughout the literature. Shapiro (2009) pointed out that, “one of the most salient issues in mindfulness research is how to operationally define it in a meaningful, quantifiable and consensual way” (p. 559). The concept of mindfulness stems from ancient traditions, with Buddhist philosophy as the theoretical foundation (De Silva, 2001). Buddhism is a spiritual tradition that is over 2,000 years old (Keng et al., 2011) which suggests that negative feelings are based on a process called sankhara (De Silva, 2001). Sankhara is explained to be a "dissatisfaction with a present state of affairs” (Sauer et al., 2011, p. 507), which compares nicely with early descriptions of goals as conditions of tension within a person that prompt action (Atkinson, 1964). According to Sauer et al. (2011), “mindfulness is believed to weaken the intensity of the sankhara process, thereby reducing defensive motivation and, ultimately, related aversive emotions” (p. 507).

In both modern and ancient theoretical literature on mindfulness, the construct is depicted to be a method to calm the mind, reduce suffering, and improve life quality (e.g., Chuang Tsu, 1964; Fletcher & Hayes, 2005; Kabat-Zinn, 2003; Lao-tzu, 1988; Siegel, 2007; Tolle, 1999). Traditional Buddhist writings present mindfulness as a way to improve well-being and facilitate the ability to regulate emotions (Kumar, 2002). Meditation practices (focusing on improving awareness and attention to control mental processes in order to foster a sense of calm, clarity, and improve general well-being; Walsh & Shapiro, 2006), are largely the focus of theoretical writings and empirical

research on mindfulness (D. M. Davis & Hayes, 2011). Meditation practices, as well as other methods such as yoga and tai chi, encourage the development of mindfulness through the focused and systematic application of attention to sensations in the body, and to thoughts, emotions, and the environment (Bodhi, 2000; D. M. Davis & Hayes, 2011; Germer, 2005; Gunaratana, 2002). Research on mindfulness-based interventions have also shown that mindfulness can be increased with training and practice, and is not a characteristic that is held constant throughout the lifespan (Carmody & Baer, 2008; Collard, Avny, & Boniwell, 2008).

Developing an operational definition is of critical importance when it comes to the study of mindfulness. For research purposes, a panel was developed that provided a definition of mindfulness that stresses the regulation of attention so it remains in the present moment, and includes a curious, open, and acceptant orientation toward the present (Bishop et al., 2004). The panel also concluded that there are four components common among existing definitions of mindfulness, including: the ability to regulate attention; orientation to the present; awareness; and acceptance and nonjudgment toward what is presently occurring (Bishop et al., 2004; Feldman et al., 2007).

For the current study, the definition of mindfulness was drawn from Bishop et al.'s (2004) conceptualization, and defined as "the self-regulation of attention so that it is maintained on immediate experience, [while] adopting a particular orientation towards one's experiences in the present moment . . . characterized by curiosity, openness, and acceptance" (Feldman et al., 2007, pp. 177-178). For the purposes of the current study, including the ability to regulate attention in the definition of mindfulness is of key importance. When individuals are engaged in the pursuit of one goal, the ability to reach

that goal likely involves being able to focus attention on it, even with alternative goals present, which can be especially challenging when alternative goals are also highly important to the individual (Fishbach, Friedman, & Kruglanski, 2003). As stated by Bailis et al. (2011), "the relevant dynamic here is the contest for limited resources that all of a person's goal pursuits demand, especially the allocation of attention to focal goals" (p. 129). With this in mind, it could be concluded that individuals with higher levels of mindfulness may be able to focus their attention on certain goals – perhaps those that facilitate one another--leading to the ability to better manage the potential effects of those that conflict with one another.

Mindfulness and Reinforcement Sensitivity Theory

From an RST perspective, mindfulness has been associated in the literature with having the ability to alleviate emotions that are associated with BIS, including anxiety (Evans et al., 2008). In a study of adults, Sauer et al. (2011) found that lower levels of BIS accounted in part for the positive effects that mindfulness had on well-being. The authors found a "strong indirect effect of mindfulness on well-being through BIS" (p. 510). In examining subsamples within their study, they reported that individuals who practiced mindfulness regularly displayed higher scores in well-being and mindfulness, in addition to lower BIS scores, compared to individuals who did not practice mindfulness. In considering these results, it can be concluded that mindfulness may be a potential tool to use in order to assist individuals in reducing BIS-related symptoms, such as anxiety.

It was hypothesized in this study that mindfulness may serve as a moderator between anxiety that is generated by goal conflict, and the somatic symptoms that may result. Because mindfulness has been shown to assist individuals in managing symptoms

of anxiety and improve positive affect (e.g., Beauchamp-Turner & Levinson, 1992; Chen et al., 2013; Evans et al., 2008; Hoge et al., 2013), and has been linked in the literature to reducing negative affect produced by the BIS (Sauer et al., 2011), it may be that mindfulness cultivates the ability to quiet the BIS, reducing incidences of negative affect, such as stress, anxiety, and associated somatic symptoms, while at the same time allowing more BAS-related positive emotions and behavior to emerge, such as hope, optimism, and goal-directed behaviors. Additionally, Kabat-Zinn (1990) explained a contradiction that occurs regarding goal-directed behavior and mindfulness activities. The author indicates that while mindfulness training encourages present-moment orientation, this becomes difficult if the mind is not present-focused and engaging in goal-directed activity during mindfulness-based activities such as meditation (e.g., looking forward to a future state of relaxation). In essence, cultivating the ability to set goal-directed behavior aside (Cheon, 2013), may allow for the resolution of the potentially negative effects of conflicting goals.

Mindfulness and Anxiety

Research on mindfulness has increased greatly in recent literature, particularly as it has gained in popularity in a variety of treatment settings (Feldman et al., 2007). Recently, Bajaj et al. (2016) found mindfulness to be negatively related to anxiety and depression in a sample of 417 undergraduate students in a study design using Structural Equation Modeling. Mindfulness meditation and mindfulness-based therapies have been found to reduce symptoms of anxiety and improve positive affect throughout the literature (Beauchamp-Turner & Levinson, 1992; Chen et al., 2013; Evans et al., 2008; Hoge et al., 2013; Kabat-Zinn et al., 1992; J. J. Miller, Fletcher, & Kabat-Zinn, 1995;

Ruffault, Bernier, Thienot, Fournier, & Flahault, 2016). In a recent meta-analysis, Mindfulness-Based Therapy (MBT) was “especially effective” for decreasing anxiety and stress (Khoury et al., 2013, p. 763). In a review of randomized controlled trials, Mindfulness-Based Stress Reduction (MBSR) was found to be useful in improving mental health overall, in addition to reducing symptoms of anxiety and stress (Fjorback et al., 2013).

In a randomized, controlled study, Davidson et al. (2003) found that in a population of healthy adults, participating in an eight-week clinical training program in mindfulness meditation was associated with positive affect, and improved brain and immune function. Greeson et al. (2012) measured mindfulness via online survey in a sample of 279 adults participating in a Mindfulness-Based Stress Reduction (MBSR) program using the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al., 2007). The authors explored the relationship between mindfulness, subjective spiritual experiences, and health-related quality of life, and found that practicing mindfulness increased spiritual experiences, and was associated with improved overall mental health. In college students specifically, mindfulness has been shown improve mood and academic performance, and reduce symptoms of anxiety and stress (Mrazek et al., 2013; Oman et al., 2008; Warnecke et al., 2011). A study of 67 undergraduate students at a northeastern university in the United States found that lower levels of mindfulness, as measured by the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), was associated with generalized anxiety symptoms (measured by the Generalized Anxiety Disorder Questionnaire; GADQ-IV; Newman et al., 2002). In a sample of 167 introductory psychology students, Thompson and Waltz (2008) found that

higher levels of mindfulness (as measured by both the CAMS-R and the Mindful Attention Awareness Scale; MAAS; Brown & Ryan, 2003) was associated with higher levels of self-esteem. In developing the CAMS-R, Feldman et al. (2007) found that higher levels of mindfulness was associated with higher levels of well-being and cognitive flexibility, and lower levels of worry, distress, and rumination in a sample of 212 college students. Additionally, in a randomized controlled trial by Greeson, Juberg, Maytan, James, and Rogers (2014), the authors found that a mindfulness training program increased levels of mindfulness (as measured by the CAMS-R via web-based survey), decreased levels of perceived stress, and improved sleep quality and self-compassion in a sample of 90 students.

Mindfulness and Somatic Symptoms

There has also been an increase in interest and research on the impact of mindfulness in the treatment of somatic symptoms, particularly considering their prevalence in medical settings (Chaturvedi & Desai, 2013), and among college students (Fischer, Gaab, Ehlert, & Nater, 2013). Mindfulness therapy has been demonstrated to improve physical health (Fjorback et al., 2013), mental functioning, awareness and acceptance of painful symptoms and emotions, and self-care, as well as increase behavioral change in patients with medically unexplained symptoms (van Ravesteijn et al., 2013van Ravesteijn et al., 2014). It has also been found to improve daily pain levels in individuals with chronic pain (M. C. Davis et al., 2014). Mindfulness has been associated with fewer reported physical symptoms (Carlson & Brown, 2005), and Mun, Okun, and Karoly (2014) found that individuals who experience extended periods of pain display lower levels of mindfulness, including less nonjudgmental awareness. Increased

somatic symptoms were also found to be significantly correlated with difficulties in mindfulness and emotion regulation in a study of adult patients with functional gastrointestinal disorders (Mazaheri, 2015). In a college student sample, Murphy, Mermelstein, Edwards, and Gidycz (2012) found that students with higher levels of mindfulness, as measured by the MAAS (Brown & Ryan, 2003) engaged in healthier eating, experienced improved sleep quality, and reported improved physical health overall. Masuda, Mandavia, and Tully (2014) found that higher levels of mindfulness, as measured by the MAAS (Brown & Ryan, 2003) via web-based survey, was recently shown to be associated with lower levels of anxiety and somatic symptoms (as measured by the Brief Symptom Inventory; BSI; Derogatis, 2001), as well as depressive symptoms in a surveyed sample of undergraduate students. Notably, when a sample of graduate students participated in a 15-week Mindfulness-Based Stress Reduction (MBSR) program, during which they engaged for 75 minutes each day in yoga and meditation activities, they experienced a significant reduction in anxiety, somatic symptoms, and pain (Shure, Christopher, & Christopher, 2008).

Measurement of Mindfulness

In reviewing relevant literature on the measurement of the construct of mindfulness, it is clear that self-report measures of the construct are highly variable in their approach to the definition, content, and factor structure (Brown, Ryan, & Creswell, 2007; see also Brown & Ryan, 2003; Feldman et al., 2007; Lau & Segal , 2007). Some questionnaires are designed to measure levels of mindfulness in individuals who have previously received training in mindfulness-based activities, or to assess levels of mindfulness following treatment (Buchheld, Grossman, & Walach, 2001; Lau et al.,

2006). Others assess mindfulness levels based on some aspects, but neglect to measure all potential components of the complex construct, particularly acceptance and nonjudgment (Brown & Ryan, 2003), and attention (Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008). Still others are problematic due to their length (e.g., Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; see Table 3). For this study, a measure has been chosen that encompasses as many aspects of mindfulness as possible, including attention, awareness, acceptance, and the ability to be present-focused (Feldman et al., 2007). The authors of the Cognitive and Affective Mindfulness Scale – Revised (CAMS-R; Feldman et al., 2007), created their measure based on the definition provided by Bishop et al. (2004) outlined above, and discuss openly their intention to capture as many aspects of mindfulness as briefly as possible, including acceptance and non-judgment.

Somatic Symptoms

Somatic syndromes occur in approximately 9.3% of the general population (Kocalevent et al., 2013), and have been found to occur at a similar rate among college students, at 9.5% (Fischer et al., 2013). They have been noted as being common complaints in medical settings, accounting for over half of outpatient visits (Kroenke, 2014). Somatization and anxiety are among the frequently presented issues by college students (Kim, Coumar, Lober, & Kim, 2011; Lee, 2010), as well, and Hazlett-Stevens, Craske, Mayer, Chang, and Naliboff (2003) noted that concerns such as irritable bowel syndrome (IBS), generalized anxiety disorder (GAD), and chronic worry existed at high rates among a sample of 905 university students.

Table 3

Major Measures of Mindfulness

Measure	No. of Items; Scaling	Psychometric Data	Factors Included
Striving Instrumentality Matrix (SIM; Emmons, 1986)	15x15 matrix with rows and columns labeled with 15 personal strivings. Each pairing is rated on a scale ranging from -2 (very harmful) to 2 (very helpful).	Internal consistency *rs* = .91; test-retest reliability .58.	Conflict and facilitation among goal strivings.
Cognitive and Affective Mindfulness Scale – Revised (CAMS-R; Feldman et al., 2007)	12-item self-report measure; 4-point Likert scale.	Cronbach's α .76-.85; supported by confirmatory factor analysis; positively correlated with the FMI and MAAS, well-being, adaptive emotion regulation, cognitive flexibility, problem analysis; negatively correlated with symptoms of distress, worry, rumination, experiential avoidance.	Attention; Present Focus; Awareness; Acceptance.

Table 3 (continued)

Measure	No. of Items; Scaling	Psychometric Data	Factors Included
Five-Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006)	39-item questionnaire; 5-point Likert-type scale.	Cronbach's α .75-.91; significantly predicts Psychological Well-Being (except the observing facet); significantly correlated with meditation experience (except the awareness facet; Baer et al., 2008).	Observing; Describing; Acting with Awareness; Nonjudging; Nonreactivity.
Freiburg Mindfulness Inventory (FMI; Buchheld et al., 2001)	30-item self-report inventory; 4-point Likert scale.	Cronbach's α .93; predicts lower psychological distress; intended for use with experienced meditators.	Disidentifying attentional processes of mindfulness; Accepting and open attitudes toward experience; Process oriented understanding; Paying attention without distraction.
Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004)	39-item self-report inventory; 4-point Likert-type scale.	Cronbach's α .76-.91; test-retest reliability .65-.86; Negatively correlated with neuroticism and psychological symptoms.	Observing; Describing; Acting with awareness; Accepting without judgment; Based on elements of Dialectical Behavior Therapy (DBT).

Table 3 (continued)

Measure	No. of Items; Scaling	Psychometric Data	Factors Included
Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003)	15-item self-report inventory; 6-point Likert-type scale.	Cronbach's α .82-.87; positive correlations with openness to experience, emotional intelligence, well-being; negative correlations with rumination, social anxiety.	Attention; Awareness of present-moment experiences; Emphasizes lack of attentiveness, associated with absent mindedness.
Philadelphia Mindfulness Scale (PHLMS; Cardaciotto et al., 2008)	20-items, 5-point Likert scale.	Cronbach's α .75-.82; Correlates positively with awareness/attention, reflection, acceptance/willingness. Correlates negatively with thought suppression and rumination.	Awareness; Acceptance.
Southampton Mindfulness Questionnaire (SMQ; Chadwick et al., 2008)	16-items; 7-point Likert scale.	Cronbach's α .82-.89; significantly correlated with the MAAS (r = 0.57), and with positive mood.	Mindful observation; Non-aversion; Nonjudgment; Letting go.
Toronto Mindfulness Scale (TMS; Lau et al., 2006)	10-item measure; 5-point Likert-type scale.	Cronbach's α .84-.91; Correlates with other mindfulness measures; for use following meditation sessions.	Awareness of bodily sensations thoughts, and feelings; Curiosity; Acceptance; Openness.

Thirty-five years ago, somatoform disorders were introduced in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III; American Psychiatric Association, 1980), and updated to include medically unexplained symptoms as a core facet of the disorders in the DSM-IV (APA, 1994). Somatoform disorders, including somatization disorder, pain disorder, and hypochondriasis, were controversial throughout revisions to the DSM, due to reports that they tend to be difficult to diagnose, are not universally accepted by patients and clients, and that comorbidity with psychiatric and medical disorders were overlooked in the diagnostic criteria (Croicu, Chwastiak, & Katon, 2014). With the release of the DSM-5 (APA, 2013), the diagnosis of somatic symptom disorder replaced somatization disorders, and now acknowledges the influence of thoughts, feelings, and behaviors regarding the somatic symptoms being reported (Croicu et al., 2014).

The etiology of somatic symptoms continues to be examined in research, and is generally considered to be complicated and complex in nature (Zunhammer, Eberle, Eichhammer, & Busch, 2013). Simms et al. (2012) pointed out that examining somatic symptoms when they occur is important due to the possibility that the individual "may also be experiencing a range of other internalizing symptoms" (p. 25). For example, in a random sample of 289 patients reported by Khan, Khan, Harezlak, Tu, and Kroenke (2003), 433 somatic symptoms were recorded, and physician raters classified 48% of them as having either a psychiatric or unknown etiology, with the remaining symptoms being due to physical etiology. Considering the wide variation and possibilities in understanding why somatic symptoms occur, along with their high prevalence, continued

research is valuable in improving our understanding of how, and to what degree, they are influenced by other constructs such as anxiety, mindfulness, and interrelated goals.

Definition and Measurement of Somatic Symptoms

Similarly to mindfulness, the definition of somatic symptoms, particularly which symptoms should be included within the definition, are varied in available empirical research on the construct (Chaturvedi & Desai, 2013). The most frequently reported symptoms in the literature include trouble sleeping, headache, low energy, fatigue, and pain, including abdominal pain, and chest pain (Hanel et al., 2009; Hiller, Rief, & Brahler, 2006). Available self-report measures on somatic symptoms inquire about symptoms in areas spanning cardiopulmonary, gastrointestinal, musculoskeletal, and other general symptoms, such as dizziness, numbness, and memory loss (Zijlema et al., 2013). Somatic symptoms are highly subjective experiences. Zijlema et al. (2013) suggest that "measuring and quantifying something which is subjective, which cannot be seen or felt, which is interpreted differently by health professionals, cannot be easy" (p. 31). In their recent review of somatic symptom questionnaires Zijlema et al. (2013) identified 40 self-report measures that showed wide variation in their purposes and ease of use. Based on the criteria of the review, which included the assessment of such qualities as psychometrics, included symptoms, time-frame, and appropriateness for use among different populations, the authors concluded that the Patient Health-Questionnaire-15 (Kroenke, Spitzer, deGruy, & Swindle, 1998) was among the strongest scales assessed, particularly in the areas of psychometrics, relevant symptoms, length, and availability (Zijlema et al., 2013; see Table 4).

Table 4

Common Somatic Symptom Measures

Measure	No. of Items; Scaling	Psychometric Data	Factors Included
Brief Symptom Inventory (BSI; Derogatis, 2001)	18-item self-report inventory; 5-point Likert-type scale.	Cronbach's α .74 (Somatization); .84 (Depression); .79 (Anxiety); .89 (Global Severity Index; GSI). Test-retest estimates .68-.84 for symptoms dimensions, .90 for GSI. Correlated with SCL-90-R, .91-.96.	Screens for psychological distress and psychiatric disorders, assessing 3 symptom dimensions: Somatization, Depression, Anxiety, and GSI.
Patient Health Questionnaire–15 (PHQ-15; Kroenke et al., 1998)	15-item self-report inventory; 3-point Likert scale.	Cronbach's α .78-.87; Correlated with the Symptom Checklist-90 Somatization Subscale (SCL-90-SOM; Derogatis, Lipman, & Covi, 1973) at .38. Correlated with number of symptoms reported in interview (.63), and number of medically unexplained symptoms assessed by general practitioner (.63).	Cardiopulmonary, Gastrointestinal, and General pain/fatigue symptoms; covers 14 of 15 prevalent somatization disorder symptoms, suggested for use in studies interested in measuring common somatic symptoms (Zijlema et al., 2013).

Table 4 (continued)

Measure	No. of Items; Scaling	Psychometric Data	Factors Included
Psychosomatic Symptom Checklist (PSC-17; Attanasio, Andrasik, Blanchard, & Arena, 1984)	17-item self-report inventory; 5-point Likert-type scale.	Cronbach's α .74-.81; test-retest reliability at 1 week interval *r*=.67; Very little overlap with distress assessed by other measures.	Measures 1 general psychosomatic distress factor; includes 17 symptoms, including headaches, insomnia, dizziness.
Screening for Somatoform Symptoms (SOMS-7; Rief & Hiller, 2003)	53-item instrument; 5-point Likert scale.	Cronbach's α .89; correlation with DSM-IV somatization (.66), SCL-90-SOM (.76); test-retest reliability .71-.76.	For use with primary care patients to evaluate treatment effects in somatoform disorders; includes all somatic symptoms mentioned in the DSM-IV and ICD-10 as occurring in somatization disorder.
Short Form Health Survey-12 (SF-12; Ware, Kosinski, & Keller, 1996)	12-item self-report inventory; 4-point Likert scale.	Cronbach's α .72-.89; Test-retest correlations (2 week) .76-.89; Correlated with the longer SF-36.	2 Components (Physical and Mental) covering 8 domains: physical functioning, role limitations due to physical problems, bodily pain, general health, vitality, social functioning, role limitations due to emotional problems, mental health.

Table 4 (continued)

Measure	No. of Items; Scaling	Psychometric Data	Factors Included
Somatic Symptom Scale-Revised (SSS-R; Sandin, Valiente, & Chorot, 1999)	90 items; 5-point Likert scale.	Cronbach's α .79-.84.	Assesses immunological, coronary, respiratory, stomach, neurosensorial, musculoskeletal, skin allergy, and urinary symptoms.
Symptom Checklist-90 Somatization Subscale (SCL-90-SOM; Derogatis et al., 1973)	12 items; 5-point Likert scale.	Cronbach's α .86; correlation with structured interview (.73), correlation with number of primary care consultations (.27).	Subscale of the SCL-90; includes pain, fatigue, nervousness, dizziness, fear, panic attacks, anxiety, nausea, tension; suggested for use in studies interested in measuring somatization.

Self-report questionnaires on somatic symptoms instruct individuals to rate their experiences across varying time frames that range from throughout the lifetime (e.g., Othmer & DeSouza, 1985; Pennebaker, 1982; Swartz et al., 1986) to the past week (e.g., Derogatis & Melisaratos, 1983; Main, 1983; Terluin et al., 2006). While the ideal time frame for questionnaires assessing certain symptoms has yet to be definitively understood (Zijlema et al., 2013), it has been suggested that recall bias, and therefore threat to reliability, is likely when asking respondents to report on symptoms they have experienced over a long period of time (Leiknes, Finset, Moum, & Sandanger, 2006).

Considering the variability in measurement of somatic symptoms, and the importance of capturing the construct in a reliable and valid manner, the current study defined somatic symptoms as medically unexplained symptoms, or those attributed to an underlying mental health condition, such as headaches, stomach, or back pain (Kroenke, 2003), and were measured by the Patient Health Questionnaire-15 (PHQ-15), which includes somatic symptoms that most commonly occur in primary care settings (Kroenke et al., 1998), in order to capture symptoms relevant to typical presentation.

Somatic Symptoms and Anxiety

Research has also consistently found that mood and anxiety symptoms overlap considerably (Kroenke et al., 2010; Löwe et al., 2008; Mayou, Kirmayer, Simon, Kroenke, & Sharpe, 2005). Historically, the majority of primary care patients (as many as 73%) with depression or anxiety have exhibited solely somatic symptoms (Kirmayer & Robbins, 1991). More recently, individuals with anxiety and depression have a tendency to report more somatic symptoms in the absence of an identifiable disease (McLaughlin, Khandker, Kruzikas, & Tummala, 2006), and higher numbers of somatic symptoms have

been associated with a higher likelihood of depression and anxiety (Katon, Lin, & Kroenke, 2007). In a recent study including a sample of 431 undergraduate students at a Midwestern university, somatic symptoms, as measured by the Patient Health Questionnaire-15 (PHQ-15; Kroenke et al., 1998) via online survey, were related to anxiety sensitivity, especially when paired with health anxiety (Fergus, Valentiner, & Holzman, 2014). According to the DSM 5 (APA, 2013), individuals who worry to an extreme degree and suffer from generalized anxiety disorder (GAD) may be especially susceptible to physical symptoms such as nausea, sweating, muscle aches, tension, and soreness, and gastrointestinal issues. Due to the overlap found in the literature between anxiety and somatic symptoms, for the current study, it was hypothesized that individuals experiencing high levels of anxiety and goal conflict will also report a higher number of somatic symptoms than individuals with lower levels of goal conflict.

Summary of Research Support

A theoretical and empirical basis and rationale for the current study was established through a comprehensive review of literature. The results of the review were integrated using both goal-setting and reinforcement sensitivity theories as the foundational theoretical framework. While the completed literature review has potential limitations (approach to the search, search terms used, and errors integrating available sources), it has attempted to present and synthesize relevant literature related to goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness.

Goal-setting theory (Locke & Latham, 1990; 2002) provides a foundation for understanding the integral role that goals play through their impact on behavior and affect, asserting that in order to be effective and encourage behavior change, an

individual should ideally be committed to a goal, have the ability and resources to attain it, and notably, does not hold goals that conflict with one another (Locke & Latham, 2006). Goals have been associated with the ability to assist in self-regulation, help set personal standards for self-satisfaction and self-efficacy, and are viewed as pathways to feelings of overall success and well-being (Bandura, 1988; Delle Fave et al., 2013; Locke & Latham, 2006; McIntosh et al., 1997; Wiese & Freund, 2005). The process of goal-setting, however, is naturally fraught with situations of ambiguity, inconsistency, and choice, innately tied to affective experiences. As a result, particularly when goals are not able to be achieved, or are perceived to be so, uncertainty and threats to personal meaning can ensue, prompting distress similar to anxiety (Locke & Latham, 2006; Proulx & Heine, 2010).

In 2000, Gray and McNaughton identified goal conflict as the primary cause of anxiety. Their RST provides a potential framework for understanding the way that interrelating goals influence affective experiences, particularly anxiety and distress. Through three systems that underlie behavior and affect (see Table 1), the theory proposes that the BIS resolves goal conflicts by increasing worry and rumination, and potentially somatic symptoms (Becerra-Garcia & Robles Jurado, 2014), in order to motivate behavior until the conflict is resolved, making the BIS associated with the tendency to examine the environment for potential threats under non-clinical circumstances, and with conditions such as generalized anxiety in clinical cases (Pickering & Corr, 2008). Also according to RST, when the BAS is activated by either external or internal cues (a desired goal or an expectation of attaining a goal), the individual is motivated to move toward attaining that goal, and begins planning and

experiencing increases in self-efficacy and hope (Alloy et al., 2009; Gray, 1994; see Table 1). These resulting traits align with available literature on goal facilitation, which indicates that individuals experiencing goal facilitation also are shown to engage in more goal-pursuit behaviors (Boudreaux & Ozer, 2013; Riediger & Freund, 2004), and experience larger increases in happiness (Carver & White, 1994), and lower symptoms of anxiety (Markarian et al., 2013). It was hypothesized that due to the evidence in literature of the high comorbidity of anxiety and somatic symptoms (Kroenke et al., 2010; Simms et al., 2012), that when anxiety is increased due to BIS activation, that risk for somatic symptoms increases, as well. It was also hypothesized that the BAS may be accessed in the context of higher levels of perceived goal facilitation, and therefore increased goal-driven behavior, positive affective experiences such as hope and optimism, and reduced incidences of negative affect, such as stress, anxiety, and associated somatic symptoms will result.

Results of the completed review of literature also showed that goal conflict and goal facilitation both have the potential to impact both psychological and physiological functioning. Psychologically, goal conflict has been associated with shame, guilt, and self-criticism (Bailis et al., 2011), depression, anxiety, stress, and rumination, as well as low levels of life satisfaction, self-esteem, and self-efficacy, and overall well-being (Bongers et al., 2009; Boudreaux & Ozer, 2013; Emmons & King, 1988; Li & Chan, 2008; Nash et al., 2011; Presseau et al., 2009; Slocum et al., 2002). Goal facilitation has instead been associated in the literature with positive affect, life satisfaction, and pursuit of the goals that have been set (Boudreaux & Ozer, 2013; Presseau et al, 2010; Riediger, 2008). Physiologically, goals that conflict with one other have been associated with

symptoms such as high blood pressure, headaches, chest pains, dizziness, nausea, immune system weakening, increased pain levels, poor physical health and somatic symptoms in general, in addition to higher rates of health center visits (Boudreaux & Ozer, 2013; Goossens et al., 2010; Hardy et al., 2011; Karoly et al., 2008; McClelland et al., 1980; Riediger & Freund, 2004). Goals that facilitate each other, on the other hand, have been associated in the literature with fewer somatic symptoms (Freund et al., 2014).

In the review of literature, support was found for the proposed relationships between goal conflict, goal facilitation, anxiety, and somatic symptoms. However, it appears there have not been any studies that examine the relationships between all of these variables through the lens of Gray and McNaughton's (2000) RST. There is clear theoretical support for goal conflict positively impacting anxiety and somatic symptoms (Boudreaux & Ozer, 2013; Gray & McNaughton, 2000; Pickering & Corr, 2008; Riediger & Freund, 2004), and for goal facilitation to negatively impact anxiety and somatic symptoms (Dickson & Moberly, 2010; Freund et al., 2014; Gray & McNaughton, 2000; Pickering & Corr, 2008). Additionally, the construct of mindfulness has not been examined in the literature in relation to the constructs presented, and there is ample research indicating that mindfulness may play a moderating role in the indirect relationship between goal conflict and somatic symptoms found in the literature, as there is evidence of mindfulness being successful in the treatment of anxiety and somatic symptoms (M. C. Davis et al., 2015; Franco et al., 2010; Khoury et al., 2013; van Ravesteijn et al., 2014). Additionally, mindfulness has also been linked with RST, in that it had a relieving influence on BIS-related symptoms and emotions (Sauer et al., 2011). While mindfulness-based interventions have been shown in research to potentially reduce

somatic conditions or symptoms of illness (Khoury et al., 2013; van Ravesteijn et al., 2014), it is unknown whether its benefits will have an impact on somatic symptoms that may arise in the face of goal conflicts.

The current study aids in developing a better understanding of interrelated goals and their potential effects by examining a population of college students, who have been reasonably assumed to face multiple goals, and have been reported to frequently experience somatic symptoms (Cantor et al., 1985; Kim et al., 2011; Lee, 2010). By examining the interrelationships between goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness, this study seeks to understand the role that mindfulness may play in moderating the effects of interrelated goals on somatic symptoms, through the lens of RST. As the relationship among these constructs has not yet been examined in the literature, this study may help clients, students, and practitioners to not only better understand the potential impact of the goal-setting process, but also improve understanding of potential qualities, such as those associated with mindfulness, that may assist clients and students in managing the potential negative effects of goal conflict. In the next chapter, the methodology for this study will be presented along with specific research questions and statistical analyses.

CHAPTER III

METHODS

The current study used a cross-sectional design to examine the relationships between interrelated goals (goal conflict and goal facilitation), anxiety, somatic symptoms, and mindfulness. It was examined how goal conflict and goal facilitation, previously shown to influence affective states such as anxiety, are associated with somatic symptoms. It was also examined whether or not mindfulness may serve as a moderator variable between goal-conflict induced anxiety and somatic symptoms. Undergraduate college student participants were recruited via email to complete a web-based survey comprised of multiple scale measures as described below.

In the current study, the recommended methods were used for preventing multiple submissions, and detecting same-response category inattentiveness, protocol consistency, and patterns of missing data. The measurement scales included were used to operationalize the constructs being examined, as Gray and McNaughton's (2000) RST and other empirical literature (e.g., Boudreaux & Ozer, 2013; Riediger & Freund, 2004) supports the conceptualization of goal conflict and goal facilitation as latent constructs. Also, though the construct of mindfulness is still being defined and conceptualized consistently within the field of psychology, it is based in both modern and ancient theoretical writings that support it as a latent construct able to improve well-being, and encompassing attention, present orientation, awareness, and acceptance or nonjudment (e.g., Bishop et al., 2004; Feldman et al., 2007; Gampopa, 2000; Kabat-Zinn, 2003; Keng

et al., 2011; Mun et al., 2014; Walshe, 1987). Additionally, anxiety and somatic symptoms can be represented by self-identified symptoms, and have been measured as such extensively in the literature (see Rose & Devine, 2014 and Zijlema et al., 2013 for reviews). Therefore, this study examined the relationships between latent constructs in an attempt to contribute to the established literature by creating a model that seeks to explain the plausibility of the relationships between goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness through the lens of Gray and McNaughton's (2000) RST, and based on a review of empirical literature.

Following a review of literature, a primary theoretical model and an alternate model relating goal conflict and goal facilitation to anxiety, somatic symptoms, and mindfulness were hypothesized (see Figures 1 and 2). Structural equation modeling (SEM) procedures were used to test the primary theoretical model, to determine the theorized fit between the specified unobserved, latent variables. Latent variables, as defined by Byrne (2008), are used in the behavioral sciences to study "theoretical constructs that cannot be observed directly" (p. 4), such as the constructs as goal conflict and mindfulness. These constructs, which cannot be directly observed or measured, must be operationally defined and linked to something observable, such as self-report scales (Byrne, 2008). With this in mind, the current study used scale data from the measures described below to indirectly measure the constructs being examined. Because the scales measure the constructs of interest indirectly, they are not perfect measures of the latent variables they represent and are impacted by measurement error. As a result, SEM was used to account for the measurement error inherent in the scales used, as this form of statistical analysis presents an effective way for testing the relationships between latent

constructs while accounting for measurement error inherent in the operationalization of those constructs (Byrne, 2008).

Three strategic frameworks have been summarized by Jöreskog (1993) for the use of SEM, including *strictly confirmatory* (a single theoretical model is presented, tested, and may be rejected without further modifications), *alternative models* (several theoretical models are presented and analyzed, and then one model is selected as most appropriate) and *model-generating* (a theoretical model is presented and tested, then if it is rejected, it is modified and reestimated based on the results of the first model, as well as on research and theory; Byrne, 2008). Byrne (2008) pointed out that the model generating framework is most used in literature, due to the risks and costs associated with testing a model that ends up being rejected entirely, as is likely to occur with the other two frameworks.

For this study, the *model generating* approach was used, in order "to locate misfit in the model and to determine a model that better describes the sample data" (Byrne, 2008, p. 8). First, a model based on theory and literature was tested for fit according to the data collected. Second, an alternate model was tested for fit as appropriate, according to the data collected. If no fit was found, a combination of theory and results were used to re-create and examine new models. Because literature on the relationships between all variables of interest is limited, the model generating approach was be used to create a new theoretical model of the constructs defined. This study used a non-experimental cross-sectional design using SEM to examine the acceptability of two theoretical models specifying the relationships between the latent constructs of goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness.

For the hypothesized models, anxiety was explored as a mediator variable, in order to explain the possible relationships between goal conflict, goal facilitation, and somatic symptoms. Baron and Kenny (1986) clarified that the effects of one variable on behavior are mediated by a variety of internal processes. By their definition, any variable can be considered to function as a mediator "to the extent that it accounts for the relation between the predictor and the criterion" (Baron & Kenny, 1986, p. 1176). Therefore, it was anticipated that those scoring higher in goal conflict will also display higher levels of somatic symptoms, with anxiety explaining this hypothesized positive effect. It was also anticipated that those scoring higher in goal facilitation will also display lower levels of somatic symptoms, with anxiety explaining this hypothesized negative effect.

The alternative hypothesized models will also include mindfulness as a moderator variable. Baron and Kenny (1986) describe moderator variables as those that affect the direction and/or strength of the relationship between an exogenous and an endogenous variable. A moderator effect would be expected to occur if the relationship between anxiety and somatic symptoms is substantially reduced and/or reversed in the presence of the constructs of goal conflict and goal facilitation. In the current study, it was expected that across different levels of mindfulness, the relationship between anxiety and somatic symptoms would be impacted. Those with higher levels of mindfulness would display lower levels of anxiety and somatic symptoms within the model regardless of their perceived levels of goal conflict and goal facilitation, and those with lower levels of mindfulness would tend to display higher levels of anxiety and somatic symptoms, regardless of their perceived levels of goal conflict and goal facilitation.

Participants

5,103 undergraduate students from a Rocky Mountain region university consisting of approximately 12,000 students. Students age 18 and older were recruited for participation via their university email addresses. All data were collected via the internet using a web-based survey developed through Qualtrics (2015). Potential participants were sent an email inviting them to participate in the study, along with a hyperlink to the study website where they were presented with the University's Internal Review Board (IRB)-approved informed consent form (see Appendix A for a copy of the approved consent form). Participants provided voluntary informed consent by clicking an "I Agree to Participate" button, and an "I Agree I am at Least Age 18" button, which then linked to the study survey. The survey was made up of the measures explained below. Data were collected from each participant's responses to the survey items and stored on Qualtrics' (2015) secure servers. Data were then downloaded and imported into a statistical software package and stored on the researcher's password-protected computer.

Low response rate has been consistently found to be a drawback to web-based survey research (Fan & Yan, 2010). In order to improve response rate in the current study, certain precautions were employed. First, meta-analyses have demonstrated that the number of contacts made to participants is an important factor in the prediction of response rates, particularly for both mail and web surveys (e.g., Cook, Heath, Thompson, 2000; Fox, Schwartz, & Hart, 2006). There is also evidence that sending reminder notices to participants, especially when the initial reminder is sent following two days, is helpful in generating a more positive response rate (Crawford, Couper, & Lamias, 2001). As a result, reminder emails were sent to participants following two days of initial deployment

of the survey, and then at two-week intervals following, with the survey being sent out a total of three times to each participant. Second, monetary incentives have been shown to improve response rate for surveys as well (Shih & Fan, 2008). With this in mind, each participant in the current study was provided with a link to a free download through iTunes. A link was provided at the end of each survey to a web page requesting their email address, which was separate from the survey itself in order to maintain anonymity. Cost per download ranged from $0.99 to $1.37, with an average cost of $1.18 per participant. A similar incentive design was recently used by Holland, Ritchie, and DuBois (2015) with success in recruiting an online sample in a study using a survey of 160 items, taking participants an estimated 20 to 30 minutes to complete. The authors reported a recruitment rate of 108.7 participants a month, with a total of "489 valid participants recruited over 4.5 months" (p. 1916). The authors also suggested that this method be used for recruiting other populations of participants due to their reported rate of success.

Instrumentation

Demographics

Five items asked participants to input their age (specific number), gender, and their race/ethnicity. The current study attempted to control for these variables (age, race/ethnicity, gender) due to evidence of their influence on the constructs being measured, particularly goal conflict, goal facilitation, and somatic symptoms (e.g., Kocalevent et al., 2013; Wiese & Salmela-Aro, 2008). The demographics questionnaire also included an item asking whether or not the individual experiences chronic pain, and another item asking whether or not they consider themselves to be first-generation

college students, in order to explore potential variations in results for these populations and possible directions for future research (see Appendix B).

Goal Conflict and Goal Facilitation Measure

Goal conflict and goal facilitation were measured using the Intergoal Relations Questionnaire (IRQ; Riediger, 2001). The IRQ conceptualizes goal conflict (intergoal interference) and goal facilitation (intergoal facilitation) as two independent factors, measured on two separate subscales. Riediger and Freund (2004) found that a two-factor solution (eigenvalues > 1) was yielded following an exploratory factor analysis on the subscale scores.

The IRQ requests participants to pair three of their most important goals with each of the other ones (Goals A, B, and C). For each goal combination, participants are asked to respond to several items assessing conflict among goals in terms of resource limitations and incompatible attainment strategies on one hand, and assessing facilitation among goals in terms of instrumental goal relations and overlapping goal attainment strategies on the other. The IRQ measures intergoal interference in terms of time, energy, and financial constraints as well as incompatible goal-attainment strategies. Intergoal facilitation is assessed in terms of instrumental goal relations and overlapping goal-attainment strategies (Riediger & Freund, 2004).

In all, participants responded to 36 items, rating their level of agreement or disagreement with each question on a 5-point Likert-type rating scales ranging from 1 (*Never/Very Rarely*) to 5 (*Very Often*). The intergoal interference subscale is composed of 24 items, and the intergoal facilitation subscale is composed of 12 items. Sample items for intergoal interference include: “How often can it happen that because of the pursuit of

goal A, you do not invest as much time into goal B as you would like to?," and "How often can it happen that you do something in the pursuit of goal A that is incompatible with goal B?" Sample items for intergoal facilitation include: "How often can it happen that you do something in the pursuit of goal A that is simultaneously beneficial for goal B?," and "The pursuit of goal A sets the stage for the realization of goal B" (see Appendix C).

Recent work supports the scale's construct validity and use with adults ages 18 and over, including college students (Riediger et al., 2005). The IRQ has demonstrated good psychometric properties and a stable structure of two unrelated factors (interference and facilitation) in several independent samples (Riediger, 2007; Riediger & Freund, 2004; Riediger et al., 2005). Riediger and Freund (2004) found support for its discriminant and predictive validity, and the scale has demonstrated adequate internal consistency estimates in samples including college students (Cronbach's $\propto$ estimates of .94 for intergoal interference and .91 for intergoal facilitation; Riediger et al., 2005). Participants receive a total composite score for goal conflict by averaging the total of all subscale items, with higher scores indicating higher perceived levels of goal interference. They also receive a separate score for goal facilitation by averaging all respective subscale items, with higher scores indicating higher perceived levels of goal facilitation. Permission to use this measure was granted by Dr. M. Riediger (personal communication, October 8, 2015).

Anxiety Measure

Anxiety was measured using the Generalized Anxiety Disorder–7 Questionnaire (GAD-7; Spitzer et al., 2006). The GAD-7 is a self-report measure developed to assess

anxiety symptom severity based on the diagnostic criteria in the DSM-IV for Generalized AnxietyDisorder (APA, 1994). The GAD-7 discriminates between clinical and nonclinical anxious samples (Spitzer et al., 2006; Swinson, 2006), and factor analysis has demonstrated a one-factor structure for the GAD-7 (Dear et al., 2011). Participants respond to seven items describing symptoms such as "feeling nervous, anxious, or on edge," and "feeling afraid as if something awful might happen" (see Appendix D). Participants rate how much each symptom bothered them in the past two weeks on a 4-point Likert-type scale ranging from 0 (*not at all*) to 3 (*nearly every day*), with a maximum score of 21. The GAD-7 has been demonstrated to be a valid measure of anxiety in the general population (Löwe et al., 2008), with support found for its construct validity when compared with measures of constructs such as depression and self-esteem. Spitzer et al. (2006) demonstrated the GAD-7 to be a reliable and valid measure in primary care patients, demonstrating construct, factorial, and criterion validity, with 89% sensitivity in diagnosing Generalized Anxiety Disorder. Adequate internal consistency estimates have recently been achieved among undergraduate samples, as well (Cronbach's $\propto$ estimate of .94; Stein et al., 2012). Total scores can be classified into categories, including mild anxiety (scores ranging from 0 to 5), moderate anxiety (scores ranging from 6 to 10) and severe anxiety (scores ranging from 11 to 21; Spitzer et al., 2006). No permission is required to reproduce, translate, display, or distribute this measure.

Somatic Symptoms Measure

Somatic symptoms were measured using the Patient Health Questionnaire-15 (PHQ-15; Kroenke et al., 1998). The PHQ-15 assesses the severity level of 15 somatic

symptoms over the past four weeks, such as “headaches,” and “stomach pain” (see Appendix E). The PHQ-15 was derived from the Patient Health Questionnaire (Spitzer, Kroenke, & Williams, 1999), which was developed using DSM-IV criteria to assess symptoms of mental disorders, and separated into modules, in order to cut down on administration time. Factor analysis has revealed three underlying dimensions measured by the PHQ-15, including cardiopulmonary, gastrointestinal, and general pain/fatigue symptoms (Zijlema et al., 2013). Recent work supports the scale’s construct validity and use with adults ages 18 and over in the general population (Kocalevent et al., 2013). Participants rate how much each symptom bothered them in the past week on a 3-point Likert scale ranging from 0 (*Not bothered at all*) to 2 (*Bothered a lot*), with maximum score of 30. Kocalevent et al. (2013) also found support for its convergent and discriminant validity. Adequate internal consistency estimates have been achieved among adult general population samples in recent research (Cronbach’s $\propto$ estimate of .82; Kocalevent et al., 2013). Total scores can be classified into categories, including low somatic symptom severity (scores ranging from 0 to 9), medium somatic symptom severity (scores ranging from 10 to 14) and high somatic symptom severity (scores ranging from 15 to 30; Kroenke, Spitzer, & Williams, 2002). The PHQ-15 is recommended for use when compared with other somatic symptom measures (Zijlema et al., 2013). No permission is required to reproduce, translate, display, or distribute this measure.

Mindfulness Measure

Mindfulness was measured using the 12-item Revised Cognitive & Affective Mindfulness Scale (CAMS-R; Feldman et al., 2007). The CAMS-R measures

mindfulness as a unitary construct composed of four factors (attention, present focus, awareness, and acceptance), based on theoretical discussions of mindfulness (Bishop et al., 2004). Participants respond to items following the prompt, "People have a variety of ways of relating to their thoughts and feelings. For each of the items below, rate how much each of these ways applies to *you"* (Feldman et al., 2007, p. 180). Participants then rate their responses on a 4-point Likert-type scale ranging from 1 (*Rarely/Not at all*) to 4 (*Almost always*), with items 2, 6, and 7 being reverse-scored, with higher scores indicating higher levels of mindfulness. Total scores can range from 12 to 48. Sample items include: "It's easy for me to keep track of my thoughts and feelings," and "I am able to accept the thoughts and feelings I have" (see Appendix F). Scores on the scale are summed along for subscale dimensions. The four subscales are Attention (items 1, 6, and 12), Present Focus (items 2, 7, and 11), Awareness (items 5, 8, and 9) and Acceptance (items 3, 4, and 10). Adequate internal consistency estimates have been found, with Cronbach's $\propto$ estimates of .78 to .84 in a student samples; Greeson, Toohey, & Pearce, 2015). Feldman et al. (2007) found evidence for the measure's convergent and discriminant validity with concurrent measures of mindfulness, problem-solving, emotion regulation, and distress in three samples of university students.

The CAMS-R includes measurement of Acceptance and Nonjudgment, which are not included in other mindfulness measures, such as the Mindful Attention Awareness Scale (MAAS; Baer, 2003; Feldman et al., 2007). The CAMS-R measures mindfulness as a trait-like quality that manifests as a general tendency to be mindful in daily life. The measure reflects the assumption that mindfulness can be conceptualized as a response tendency that tends to be stable across situation, yet is modifiable by life experience

(including mindfulness training). Permission to use this measure was granted by Dr. G. Feldman (personal communication, October 9, 2015).

Procedures

Participant Recruitment

Before collecting data, an application for approval to perform the study was obtained from the university's IRB in the Office of Sponsored Programs (see Appendix G). Undergraduate student participants were recruited using a list of randomly selected emails provided through the Office of University Assessment Survey Research Program at the university where the research was conducted, which required IRB approval prior to submitting an application for conducting a survey at the university. Next, an invitation to participate in the study (see Appendix H) was emailed to the students, including a link to the Qualtrics (2015) web-based survey. When potential participants clicked on this link, they were sent to the study's online survey introduction page, where they reviewed the informed consent form before participating (see Appendix A).

Informed Consent Process

The informed consent process was also completed online. After the introduction page was viewed, the participant clicked on a "Continue" button. The next page held the informed consent form (see Appendix A), which listed the details of the study, what is involved in participation, compensation, researcher contact information, and any risks involved. After reading the informed consent form, the participant was able to decide whether or not to participate, and needed to click an "I Agree to Participate" button, and an "I Agree I am at Least Age 18" button to begin the survey. They were also given an option to exit the survey, thus declining participation. On the final screen, the participant

was able to read a debriefing document, describing the purpose of the study and providing resources and contact information for organizations that provide counseling and emergency services, should the participant have experienced any adverse effects as a result of participating in the study (see Appendix I). After the survey was completed, the participant was sent to a separate survey to type their email address, and were sent a link to the free iTunes download of their choice as incentive for participation.

Study Survey

The survey for this study was located online and created via Qualtrics (2015). The study's measures (see Appendix C) were adapted into web-based format, by typing in each scale item and creating a Likert-type scale response option format. A web address for the study survey through the Qualtrics (2015) program was then created and the address was copied into the invitation email that was sent to all potential study participants (see Appendix H). Once a potential participant clicked on the link and completed the informed consent form process, the survey was presented on the following screen. Participants indicated their responses on the Likert-type scales by clicking check boxes on the corresponding Likert scale numbers, which matched the paper-and-pencil versions of the scales that were used.

Individual questionnaires were presented in their entirety, and in random order for each participant. For example, one participant initially received the IRQ, while another participant initially received the CAMS-R. Varying the order of administration mitigated the potential effects of response order, as there is evidence that the order in which questions are presented "may be critical in determining which options are likely to be chosen" (Couper, Tourangeau, Conrad, & Crawford, 2004, p. 125), meaning that items

presented up front may impact items presented later in the survey. The exception to this randomization process was the demographics questionnaire, which was presented at the end of the survey for each participant. While opinions differ as to where demographics questionnaires should ideally be placed during survey administration, there are reported advantages to placing them last (e.g., survey questions are answered prior to less interesting demographic questions), particularly for self-administered surveys that are not sensitive in nature (Babbie, 2008; Colton & Covert, 2007; Stoutenbourgh, 2008). After the survey was completed, which was estimated to take between 15 and 20 minutes for all measures combined, the participant clicked on a link to a separate survey and entered their email address in order to receive a free iTunes download as incentive for participation. By linking to a separate survey, participant email addresses were not able to be traced back to their survey responses.

Study Sample Size

The procedure of SEM generally requires a fairly large sample size ($N > 200$; Kline, 2011). Jackson (2003) provided empirically supported, conservative guidelines for finding a sufficient sample size. The author suggested an $N{:}q$ ratio of 10:1 to be considered sufficient, with N representing the number of participants and q representing the number of parameters to be estimated in the proposed SEM model. For the current study, 44 parameters were estimated in the alternate theoretical model, which means that a sample size of 440 participants would have been ideal. As this sample size may not realistically have been met, Kline (2011) has recognized that a minimum sample size of 200 for most SEM analyses is practical and reasonably sufficient. The current study

obtained a recruitment sample of 454 undergraduate students randomly selected by the Office of University Assessment Survey Research Program, with a response rate of 13%

Review of Research Questions

The following research questions were formulated in order to examine a proposed theoretical model that explains the interrelationships among goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness:

Q1 Does a primary theoretical explanatory model (see Figure 1) adequately fit the observed relationships in the data, conceptualized with goal conflict directly and positively affecting anxiety, and indirectly positively affecting somatic symptoms through the mediating variable of anxiety, and with goal facilitation directly and negatively affecting anxiety, which indirectly and negatively affects somatic symptoms through the mediating variable of anxiety?

Q2 Does an alternate model (see Figure 2) also adequately fit the observed interrelationships between these constructs in the data, which includes mindfulness as a moderator between goal conflict-induced anxiety and somatic symptoms?

Data Analysis

After the data collection stage of this study, data were cleaned, initial analyses were completed in SPSS, and then input into the statistical software package, EQS Structural Equation Modeling Software, Version 6.2 (Multivariate Software, 1995) using Byrne's (2008) instructions for building an input file for EQS. SEM analyses were then conducted following Byrne's (2008) guidelines for the appropriate steps in an SEM analysis using EQS: (a) specify and estimate the models, (b) assess for goodness of fit, (c) identify misspecified parameters if the models exhibit poor fit to the data, (d) re-specify and

re-estimate the model, (e) reassess model fit, and (f) report results of model fit, interpret parameter estimates, consider equivalent or alternative models, and repeat as needed.

The primary theoretical model detailed in Figure 1 was created based on a comprehensive literature review. Support was found for the proposed relationships between goal conflict, goal facilitation, anxiety, and somatic symptoms. However, it appears there have not been any studies that examined the relationships between all of these variables through the lens of Gray and McNaughton's (2000) RST. Additionally, the construct of mindfulness has not been examined in the literature in relation to the constructs presented in the primary model. Kline (2011) recommends creating an alternative model, and so the model pictured in Figure 2 reflects changes to the original model that are also theoretically and empirically based, considering the literature that has been reviewed.

For the primary theoretical model, the pattern of relationships between goal conflict, goal facilitation, anxiety, and somatic symptoms were hypothesized. The primary model suggested that goal conflict is an exogenous variable that directly and positively impacts anxiety and indirectly positively impacts somatic symptoms, with anxiety as a mediator (e.g., those scoring higher in goal conflict will also display increased anxiety and somatic symptoms; Boudreaux & Ozer, 2013; Gray & McNaughton, 2000; Pickering & Corr, 2008; Riediger & Freund, 2004), and that goal facilitation is also an exogenous variable that directly negatively impacts anxiety and somatic symptoms (e.g., those scoring higher in goal facilitation will also display lower levels of anxiety and somatic symptoms; Dickson & Moberly, 2010; Freund et al., 2014; Gray & McNaughton, 2000; Pickering & Corr, 2008). Additionally, there is ample research support for the alternative model, which suggests that mindfulness may play a moderating role in the indirect relationship between goal conflict and somatic symptoms

found in the literature, as there is evidence of mindfulness being successful in the treatment of anxiety and somatic symptoms (M. C. Davis et al., 2015; Franco et al., 2010; Khoury et al., 2013; van Ravesteijn et al., 2014).

Both models have been evaluated for their identification status. A model is deemed to be identified if "it is theoretically possible for the computer to derive a unique estimate of every model parameter" (Kline, 2011, p. 93). Kline's (2011) guidelines indicate that models must have at least 0 degrees of freedom, and that each latent variable must be assigned a metric. The models created for this study can all be considered over-identified, which is the ideal condition (Byrne, 2008), because they contain less free parameters to be estimated than observations. A unit loading identification constraint on one of each latent variable's direct effect for one of its indicators was also used to set the metric, which is often done in SEM analyses (Byrne, 2008; Kline, 2011).

Psychometrically strong measurement scales for each construct were selected and adapted for web-based survey format. To operationalize and measure the variables in this study, ordinal Likert-type scales were used as observable indicators. Scales were selected for this study that have support for their validity and internal consistency for data collected in samples similar to the one that will be used. In the next chapter, analyses of the data will be presented.

CHAPTER IV

RESULTS

This chapter will first provide a description of the participants, including demographic information and procedures for handling missing data, followed by a description of the preliminary data screening processes that were completed. The results of the confirmatory factor analysis of the measurement model will then be presented, immediately followed by results of the structural model analyses for the primary and proposed structural models, and the impact of the control variables that were included in data analysis. The chapter will close with the results of alternative structural models that were tested following initial data analysis, and an overall interpretation of the models analyzed in this study.

Participants

Of the 663 participants who completed the study informed consent process, resulting in a response rate of 13%. 184 participants were removed due to attrition from participants deciding to exit the web-based survey before completing it by closing their web browser. Seven percent of those who exited the survey did so when asked to list three of their goals at the beginning of the Intergoal Relations Questionnaire (IRQ), which was the most frequent point of discontinuation. Another 25 participants were removed using listwise deletion following missing data analysis, which demonstrated that the data were missing completely at random (i.e., there were no patterns in the missing data; the missing values were not related to any variables under final analysis), and there

was not a loss of statistical power overall (Schlomer, Bauman, & Card, 2010). Data from 454 participants were ultimately included for all study variables, which resulted in a completion rate of 68%.

Based on this final sample, 351 reported being female (77.3%), 101 reported being male (22.2%), and two reported their gender as Other (0.4%). The mean age of the sample was 22.84 (SD = 6.96; range of 18 to 63). Regarding ethnicity, 70.9% identified as White, 15.9% Hispanic or Latino, 5.1% Black or African American, 0.9% as Native American or American Indian, 4.2% as Asian or Pacific Islander, and 2.9% as Other. Ethnicity was not reported for one participant. Additionally, 67 (14.8%) reported that they suffer from chronic pain, and 184 (40.5%) reported that they consider themselves to be a first generation college student. See Table 5 for a summary of the frequencies and percentages for the demographic variables.

Table 5

Frequencies and Percentages for Participant Demographic Variables

Variables	*N*	%
Gender		
Male	101	22.2
Female	351	77.3
Other	2	4.0
Ethnicity		
White	322	70.9
Hispanic/Latino	72	15.9
Black/African American	23	5.1
Native American/American Indian	4	0.9
Asian/Pacific Islander	19	4.2
Other	13	2.9
Chronic Pain Suffers		
Yes	67	14.5
No	270	59.5

n = 454

Preliminary Data Screening Procedures

Both univariate and multivariate normality and outliers were checked. Per Kline (2011), a variable is normally distributed if its skewness index is less than 3.0 and if its kurtosis index is less than 10. Results demonstrated that responses related to somatic symptoms, specifically the cardiopulmonary symptoms (skewness of 11.33, kurtosis of 7.79) and gastrointestinal symptoms factors (skewness of 7.02 and kurtosis of 2.18) were

considered skewed, with cardiopulmonary symptoms being moderately kurtotic. As such, these factors were transformed using a natural log function (Tabachnick & Fidell, 2012). The skewness index of the transformed variables then fell below three (cardiopulmonary symptom factors = skewness of 2.14, kurtosis of 5.34; gastrointestinal symptom factors = skewness of .417, kurtosis of 5.40). As such, these transformed variables were used in subsequent procedures.

Multivariate normality was assessed via Mardia's (1970) kappa generated by EQS Structural Equation Modeling Software, Version 6.2 (Multivariate Software, 1995). The normalized estimate of Mardia's kappa was 9.96. Per Bentler and Wu (2002), normalized kappa values above 3.0 lead to biased chi-square and standard error estimates. Accordingly, robust χ^2 values and standard errors were requested and reported in subsequent analyses (Satorra & Bentler, 1994).

To detect univariate outliers, the variables were standardized, and cases with standardized values above the absolute value of 3.29 were deemed to be outliers (Tabachnick & Fidell, 2012). Results demonstrated that no cases met this criterion, indicating that there were no univariate outliers. Regarding multivariate outliers, the EQS output generates five cases that contribute most to multivariate kurtosis. To determine whether or not these cases were affecting model fit, they were removed from the data set and model fit was examined both with and without the specified cases. Given that the fit indices with and without these cases were not significantly different, the cases were retained (with outliers: *CFI* = .946, *RMSEA* = .067, *SRMR* = .049; without outliers: *CFI* = .943, *RMSEA* = .069, *SRMR* = .050; see Measurement Model Confirmatory Factor Analysis Section below for fit index descriptions and guidelines used in this study).

Descriptive statistics and intercorrelations for each scale used in this study are displayed in Table 6. A measure is considered reliable if its Cronbach's alpha value (α) is .70 or higher (Nunnally & Bernstein, 1994). As shown in Table 6, all measures for this study are considered reliable.

The findings in Table 6 indicate that significant relationships existed between all scores, with the exception of goal facilitation (GF), which was only positively correlated with the total mindfulness (MF) score (r = .152, p < .01). The total somatic symptoms (SS) score was positively correlated with goal conflict (GC; r = .144, p = <.01) and anxiety (ANX; r = .558, p < .001), and was negatively correlated with MF (r = -.298, p < .001). The total GC score was positively correlated with ANX (r = .190, p < .001), and negatively correlated with MF (r = -.146, p < .05). Finally, the total ANX score was negatively correlated with MF (r = -.496, p < .001).

Table 6

Pearson Correlations and Descriptive Statistics for All Measures

	Parameter							
Parameter	1	2	3	4	5	*Mean*	*SD*	*α*
1. SS	-					9.15	5.10	.807
2. GC	.144**					59.90	16.86	.906
3. GF	-.038	.005				39.26	10.36	.857
4. ANX	.558***	.190***	-.023			8.13	5.36	.893
5. MF	-.298***	-.146**	.152**	-.496***	-	31.29	5.66	.791

Note. ANX = Generalized Anxiety Disorder-7 scale, GAD-7; GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; GF = Intergoal Relations Questionnaire (IRQ), Goal Facilitation subscale; MF = Cognitive and Affective Mindfulness Scale-Revised, CAMS-R' SS = Patient Health Questionnaire-15 (PHQ-15)
n= 454
* $p < .05$, ** $p < .01$, *** $p < .001$

Measurement Model Confirmatory Factor Analysis

Byrne's (2008) guidelines for conducting confirmatory factor analyses (CFA) were used to evaluate the fit of the observed indicators to the data for the measurement model for the identified latent constructs, with anxiety mediating goal conflict and somatic symptoms. The CFA was conducted using robust methods maximum likelihood estimation (ML), while treating the data as continuous. Both measurement and structural model fit was assessed using ideal, conservative guidelines established by Hu and Bentler (1999) for the comparative fit index (*CFI* > .95), standardized root mean square residual (*SRMR* < .08), and root mean square error of approximation (*RMSEA* close to .06) fit indices. The less rigorous guidelines suggested by Weston and Gore (2006; CFI > .90) were also considered in the analyses. Of note, the $\chi 2$ statistic tends to be sensitive to sample size, and other fit indices serve as essential additions to model fit assessment (Byrne, 2008; Schumacker & Lomax, 1998).

Using the available data from 454 participants, measurement models for three latent constructs of the primary proposed model (see Figure 3) were submitted for CFA (goal conflict, anxiety, and somatic symptoms), as each variable had at least three indicators and thus were considered to be identified (Little, Ehemtulla, Gibson, & Schoemann, 2013; Matsunaga, 2008). The Goal Facilitation construct was not subjected to a CFA due to the model being under-identified. However, this subscale and its associated indicators have previously been used successfully in structural models to measure this latent construct (Riediger & Freund, 2006) and this measure has previously demonstrated sound psychometrics when used with samples of college-aged adults (McKee & Ntoumanis, 2014; Riediger & Freund, 2004; Riediger et al., 2005).

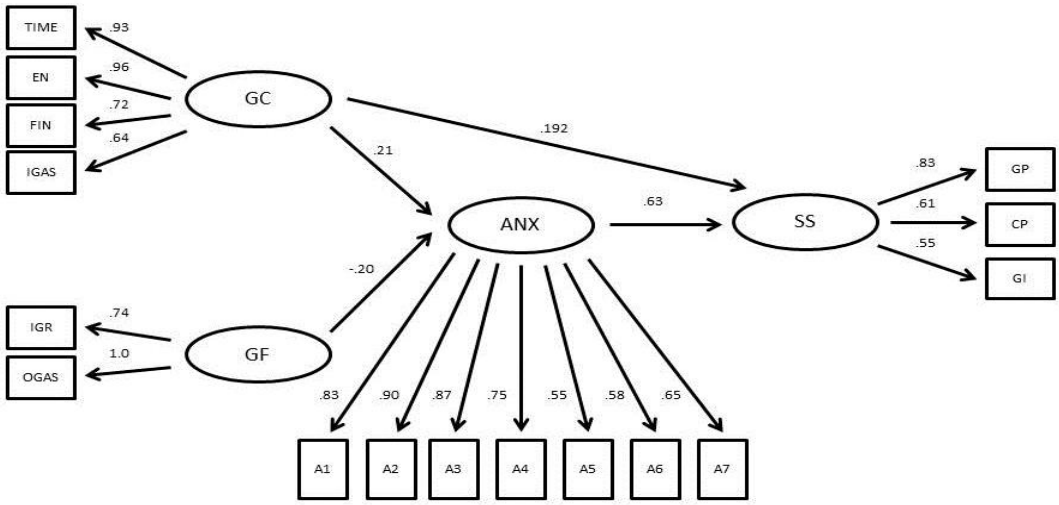

Figure 3. Primary proposed structural model. Estimates are reported as standardized parameters. GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; TIME = Intergoal interference in terms of Time; EN = Intergoal interference in terms of Energy; FIN = Intergoal interference in terms of Financial Constraints; IGAS = Intergoal interference in terms of Incompatible Goal-Attainment Strategies; GF = Intergoal Relations Questionnaire, Goal Facilitation subscale; IGR = Intergoal facilitation in terms of Instrumental Goal Relations; OGAS = Intergoal facilitation in terms of Overlapping Goal-Attainment Strategies; SS = Patient Health Questionnaire-15, PHQ-15; CP = Cardiopulmonary symptoms factor; GI = Gastrointestinal symptoms factor; GPF = General Pain/Fatigue symptoms factor; ANX = Generalized Anxiety Disorder-7 scale, GAD-7; A1-A7 = GAD-7 items

The measurement model fit the data well. As shown in Table 7, all acceptable thresholds were met (*CFI* = .946, *RMSEA* = .067, *SRMR* = .049). All indicator variables also loaded significantly onto their respective constructs (see Table 8).

Table 7

Robust χ^2 and Fit Indices for the Primary Measurement and Structural Models

Index	Measurement	Structural
Satorra-Bentler χ^2	294.44	296.73
Degrees of freedom	98	100
Comparative Fit Index (CFI)	.946	.946
Root Mean Square Error of Approximation (RMSEA)	.067	.066
Lower bound 90% confidence interval	.058	.057
Upper bound 90% confidence interval	.075	.074
Standardized root mean square residual (SRMR)	.049	.050

Table 8

Factor Loadings for the Proposed Primary Measurement Model

Parameter	Unstandardized Coefficient	*SE*	Standardized Coefficient	*t*-value
Goal conflict to:				
Time	.701	.380	.925	25.15***
Energy	.767	.275	.961	28.95***
Financial Constraints	.602	.697	.717	17.72***
Incompatible Goal Attainment Strategies	.563	.765	.644	15.26***
Anxiety to:				
Item 1	.811	.555	.832	26.59***
Item 2	.910	.432	.902	29.76***
Item 3	.868	.489	.872	30.52***
Item 4	.727	.667	.745	19.88***
Item 5	.548	.833	.553	12.48***
Item 6	.537	.818	.575	12.96***
Item 7	.674	.757	.654	15.62***
Somatic symptoms to:				
General Pain/Fatigue	2.39	.547	.837	19.12***
Cardiopulmonary	.409	.792	.611	14.14***
Gastrointestinal	.337	.838	.546	11.87***

Note. Robust standard errors, *t*-values, and significance levels are reported.
* $p < .05$, ** $p < .01$, *** $p < .001$

Structural Model Analysis: Anxiety as a Mediator

After conducting a CFA of the full measurement model and determining an adequate fit for the data, the primary structural model (see Figure 3) was subjected to SEM analysis using robust ML and treating the data as continuous. Data from all 454 participants were used, which exceeded the minimum requirement of 200 (Kline, 2011), and surpassed the ideal sample size of 440 for the alternative theoretical model (Jackson, 2003).

Model fit was again assessed using ideal, conservative guidelines (*CFI* > .95, *SRMR* < .08, *RMSEA* close to .06), and the less rigorous CFI guidelines (> .90, Weston & Gore, 2006). The proposed primary structural model (see Figure 3) also fit the data well. As shown in Table 7, all acceptable thresholds were met (*CFI* = .946, *RMSEA* = .066, *SRMR* = .050). The findings in Table 9 reveal that three out of the five parameter estimates were statistically significant.

Table 9

Parameter Estimates for the Proposed Primary Structural Model

Parameter	Unstandardized Coefficient	*SE*	Standardized Coefficient	*t*-value
GC to ANX	.171	.040	.211	4.32***
GF to ANX	-.016	.039	-.020	-.416
ANX to SS	1.84	.144	.778	12.83***
GC to SS (direct effect)	.152	.115	.192	1.329
GC to SS (indirect effect)	.306	.076	.128	4.01***

Note. Robust standard errors, *t*-values, and significance levels are reported; ANX = Generalized Anxiety Disorder-7 Scale (GAD-7); GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; GF = Intergoal Relations Questionnaire (IRQ), Goal Facilitation subscale; SS = Patient Health Questionnaire-15 (PHQ-15)
* $p < .05$, ** $p < .01$, *** $p < .001$

According to Kline (2011), a variable is deemed a mediator when the following criteria are met: (a) the independent variable significantly predicts the mediator, (b) the mediator significantly predicts the dependent variable, and (c) and the indirect effect is statistically significant but the direct effect is not statistically significant (i.e., full mediation) or statistically significant (i.e., partial mediation). As demonstrated in Table 9, these criteria were met to indicate that ANX mediated the relationship between GC and SS. GC significantly predicted ANX, meeting the first criterion for mediation. ANX also significantly predicted SS, fulfilling the second criterion for mediation. Finally, the indirect effect of GC on SS was statistically significant, and the direct effect was not significant, meeting the third criterion. Given that all criteria were fulfilled, ANX significantly and fully mediated the relationship between GC and SS.

Because GF did not significantly predict ANX and the first criterion for mediation was not fulfilled, ANX did not significantly mediate the relationship between GF and SS. Due to the perfect path coefficient of 1.00 between GF and its associated OGAS factor (see Figure 3), an exploratory factor analysis (EFA) was completed for GF, which revealed a three-factor solution (see Table 10). However, since a three-factor solution was not supported in prior scale development literature and did not significantly impact the outcome of the overall structural model, a two-factor solution was maintained (two-factor solution: *CFI* = .946, *RMSEA* = .066, *SRMR* = .050; three-factor solution: *CFI* = .947, *RMSEA* = .061, *SRMR* = .047).

Table 10

Exploratory Factor Analysis for Intergoal Relations Questionnaire Goal Facilitation Subscale: Pattern Matrix for 3-Factor Solution

Item	Component 1: Goals 2 & 3	Component 2: Goals 1 & 2	Component 3: Goals 1 & 3
OGAS Item 1/Goals 1 & 2	-.090	.877	-.012
OGAS Item 2/Goals 1 & 2	-.010	.858	.062
IGR Item 1/Goals 1 & 2	.000	.657	-.093
IGR Item 2/Goals 1 & 2	.116	.647	.021
OGAS Item 3/Goals 1 & 3	-.,057	-.037	-.938
OGAS item 4/Goals 1 & 3	-.001	.073	-.839
IGR Item 3/Goals 1 & 3	-.026	.008	-.822
IGR Item 4/Goals 1 & 3	.209	-.008	-.606
OGAS Item 5/Goals 2 & 3	.880	.040	.046
OGAS Item 6/Goals 2 &	.850	.015	-.002
IGR Item 5/Goals 2 & 3	.829	-.037	.007
IGR Item 6/Goals 2 & 3	.738	.015	-.112

Note. OGAS = Overlapping Goal-Attainment Strategies, Goal Facilitation subscale; IGR = Instrumental Goal Relations, Goal Facilitation subscale

Structural Model Analysis: Mindfulness as Moderator

To examine the alternative hypothesized model with MF as a moderator of the relationship between ANX and SS, the median of the total MF score (*Md* = 31) was used to create two groups, which has been done in prior research (e.g., Epstein & Preston, 2003; Rouquette et al., 2015), and using the CAMS-R specifically (e.g., Carter, 2015). CAMS-R scores range between 12 and 48, with 31 being the normative mean value (Kemper, Mo, & Khayat, 2015). Individuals scoring at the normative mean value can be

described as possessing mindful qualities at a level found on average among norm populations (Feldman et al., 2007; Kemper et al., 2015). Participants scoring below the median were assigned to the low MF group, and those scoring at or above the median were categorized into the high MF group. To determine whether MF moderated the relationship between anxiety and somatic symptoms, a simultaneous group analysis was conducted (Byrne, 1998). The path between ANX and SS was constrained to be equal, and χ^2 was used to determine whether the path coefficient differed significantly across the two groups. As shown in Table 11, MF did not significantly moderate the relationship between ANX and SS ($\chi^2 = .791$).

Table 11

Parameter Estimates for First Generation Student Status, Proposal Primary Model

Parameter	Low Mindfulness Standardized Coefficient	High Mindfulness Standardized Coefficient	χ^2
GC to ANX	.166	.173	.408
GF to ANX	.029	.030	.654
ANX to SS	.595	.579	.791

Note. ANX = Generalized Anxiety Disorder-7 Scale (GAD-7); GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; GF = Intergoal Relations Questionnaire (IRQ), Goal Facilitation subscale; SS = Patient Health Questionnaire-15 (PHQ-15)
$n = 454$
* $p < .05$, ** $p < .01$, *** $p < .001$

A regression analysis was also completed to examine MF as a moderator between ANX and SS, which again demonstrated that MF did not serve as moderator for this sample (B = -.00, t = -.16, p = .87; change in R^2 = .00).

Control Variables

To determine whether there was a difference in the relationships proposed in the structural model for both first generation student status and age, a simultaneous group analysis was conducted for both (Byrne, 1998). Ethnicity, gender, and chronic pain variables were not tested, due to the minimum criteria of about 200 not being met for each group (Kline, 2011; see Table 5).

For first-generation student status, the paths were constrained to be equal, and χ^2 was used to determine whether the parameter estimate differed significantly across the groups. The findings in Table 12 reveal that none of the paths differed across first-generation and non-first-generation student statuses. Accordingly, there were no significant difference in the relationships posited in the structural model based on first-generation student status.

Table 12

Parameter Estimates for First Generation Student Status, Proposal Primary Model

Parameter	First Generation Standardized Coefficient	Non First-Generation Standardized Coefficient	χ^2
GC to ANX	.208	.212	1.44
GF to ANX	-.020	-.020	1.22
ANX to SS	.673	.603	.075

Note. ANX = Generalized Anxiety Disorder-7 Scale (GAD-7); GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; GF = Intergoal Relations Questionnaire (IRQ), Goal Facilitation subscale; SS = Patient Health Questionnaire-15 (PHQ-15)
* $p < .05$, ** $p < .01$, *** $p < .001$

To examine whether there was a difference in model results among age groups, the median of the age variable (*Md* = 21) was used to create two groups. Participants scoring below the median were assigned to the 18 to 20 age group, and those scoring above the median were categorized into the 21 and older group. To determine whether there was a difference in the relationships posited in the structural model for age, a simultaneous group analysis was conducted (Byrne, 1998). The paths were constrained to be equal, and χ^2 was again used to determine whether the path coefficients differed significantly across the groups. The findings in Table 13 reveal that none of the paths differed across age groups. Accordingly, there was no significant different in the relationships posited in the structural model based on age.

Table 13

Path Estimates for Age Groups, Proposed Primary Model

Parameter	Age 18-20 Standardized Coefficient	Age 21+ Standardized Coefficient	χ^2
CG to ANX	.205	.215	3.34
GF to ANX	.027	.029	1.24
ANX to SS	.621	.635	.002

Note. ANX = Generalized Anxiety Disorder-7 Scale (GAD-7); GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; GF = Intergoal Relations Questionnaire (IRQ), Goal Facilitation subscale; SS = Patient Health Questionnaire-15 (PHQ-15)
* $p < .05$, ** $p < .01$, *** $p < .001$

Testing Alternative Structural Models

In accordance with Byrne's (2008) model-generating approach to SEM, while the primary model demonstrated acceptable fit and no statistical improvements were indicated, alternative structural models were examined based on the results of parameter estimates, theory, and literature.

Goal Facilitation

Given that GF did not significantly predict ANX and thus did not mediate the relationship between GF and SS, an alternative structural model was examined without GF (Alternative Model A; see Figure 4). The alternative structural model without GF demonstrated ideal fit, an improvement over the acceptable fit of the primary hypothesized model (see Figure 3). As shown in Table 14, all ideal thresholds were met (*CFI* = .954, *RMSEA* = .067, *SRMR* = .046). The findings in Table 15 reveal that three out of the four parameter estimates were statistically significant, and that all criteria for

mediation were again fulfilled indicating that ANX significantly and fully mediated the relationship between GC and SS.

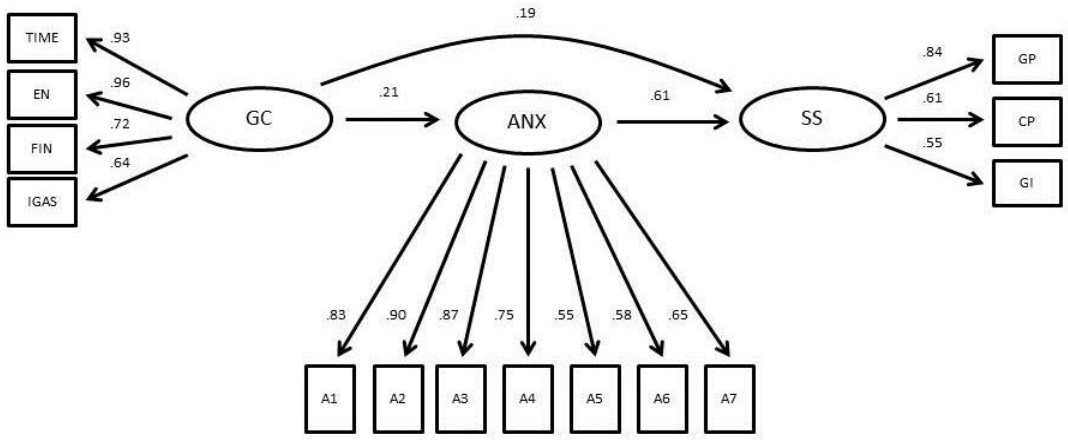

Figure 4. Alternative structural model A, without goal facilitation. Estimates are reported as standardized parameters. GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; TIME = Intergoal interference in terms of Time; EN = Intergoal interference in terms of Energy; FIN = Intergoal interference in terms of Financial Constraints; IGAS = Intergoal interference in terms of Incompatible Goal-Attainment Strategies; SS = Patient Health Questionnaire-15, PHQ-15; CP = Cardiopulmonary symptoms factor; GI = Gastrointestinal symptoms factor; GPF = General Pain/Fatigue symptoms factor; ANX = Generalized Anxiety Disorder-7 scale, GAD-7; A1-A7 = GAD-7 items.

Table 14

Robust χ^2 and Fit Indices for Alternative Structural Model A, Without Goal Facilitation

Index	Alternative Structural Model A
Satorra-Bentler χ^2	224.68
Degrees of freedom	74
Comparative fit Index (CFI)	.954
Root Mean Square Error of Approximation (RMSEA)	.067
Lower bound 90% confidence interval	.057
Upper bound 90% confidence interval	.077
Standardized root mean square residual (SRMR)	.046

Table 15

Parameter Estimates for Alternative Structural Model A, without Goal Facilitation

Parameter	Unstandardized Coefficient	*SE*	Standardized Coefficient	*t*-value
CG to ANX	.169	.040	.209	4.25***
ANX to SS	1.804	.150	.613	12.04***
GC to SS (direct effect)	1.52	.115	.192	1.329
CG to SS (indirect effect)	.306	.076	.128	4.01***

Note. Robust standard errors, *t*-values, and significance levels are reported; ANX = Generalized Anxiety Disorder-7 Scale (GAD-7); GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; SS = Patient Health Questionnaire-15 (PHQ-15)
* $p < .05$, ** $p < .01$, *** $p < .001$

Mindfulness

Given that MF was not demonstrated to moderate the relationship between ANX and SS in initial analysis procedures, an alternative use of the MF construct was considered after reviewing theory and literature, in accordance with the model generating approach used in this study. According to Byrne (2008), the model generating approach within SEM involves presenting and testing a theoretical model, and reestimating and testing a new model using a combination of results, research, and theory. Cosme and Wiens (2015) stated that the "effects of mindfulness may differ depending on how it is conceptualized" (p. 3), and prior literature indicates that mindfulness can be conceptualized as either a state or a trait construct (Medvedev, Krageloh, Narayanan, & Siegert, 2017). Given that participants were not taught mindfulness techniques prior to taking the survey in this study, and that mindfulness was measured as a trait-like quality via the CAMS-R, an alternative model was created with MF in the role of an exogenous variable (trait) rather than a moderator variable (state; see Figure 5).

A CFA was first conducted including MF, using robust methods maximum likelihood estimation (ML), while treating the data as continuous. The measurement model fit the data (see Table 16), with all acceptable thresholds being met (*CFI* = .940, *RMSEA* = .063, *SRMR* = .050). As demonstrated in Table 17, all indicator variables loaded significantly onto their respective constructs. While the ATT subscale of the CAMS-R loaded at a level significantly less than ideal compared to other measure subscales at .483 (.60 being the ideal standard according to Field, 2005), this discrepancy is commensurate with existing scale development literature (Feldman et al., 2007), and is considered to be in the fair fit range according to Comrey and Lee (1992).

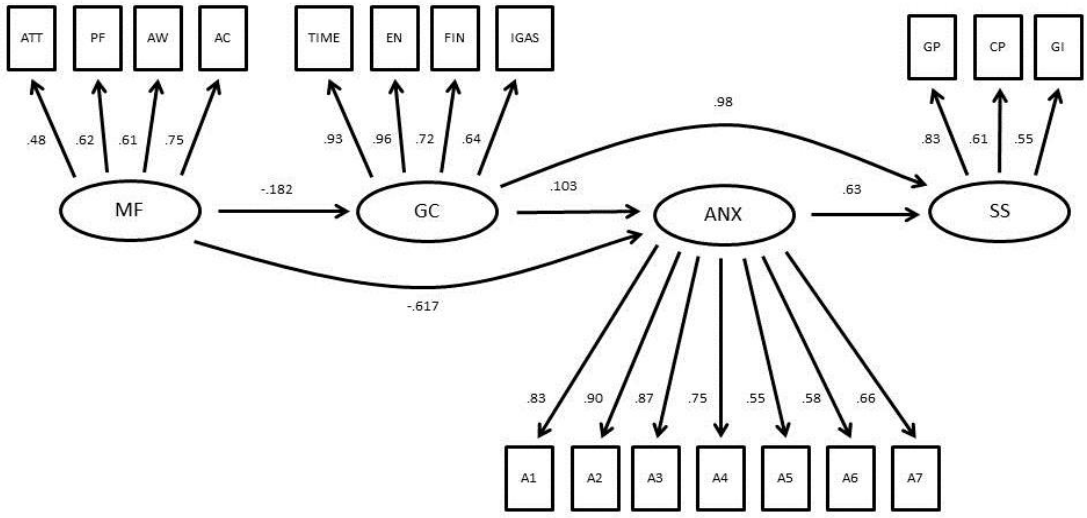

Figure 5. Alternative structural model B, with mindfulness as exogenous variable. Estimates are reported as standardized parameters. MF = Cognitive and Affective Mindfulness Scale – Revised (CAMS-R); ATT = Attention subscale; PF = Present Focus subscale; AW = Awareness subscale; AC = Acceptance subscale; GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; TIME = Intergoal interference in terms of Time; EN = Intergoal interference in terms of Energy; FIN = Intergoal interference in terms of Financial Constraints; IGAS = Intergoal interference in terms of Incompatible Goal-Attainment Strategies; SS = Patient Health Questionnaire-15, PHQ-15; CP = Cardiopulmonary symptoms factor; GI = Gastrointestinal symptoms factor; GPF = General Pain/Fatigue symptoms factor; ANX = Generalized Anxiety Disorder-7 scale, GAD-7; A1-A7 = GAD-7 items.

Table 16

Robust χ2 and Fit Indices for Alternative Model B with Mindfulness as Exogenous Variable, Primary Measurement and Structural Models

Index	Measurement	Structural
Satorra-Bentler χ^2	357.39	359.54
Degrees of freedom	129	131
Comparative Fit Index (CFI)	.940	.940
Root Mean Square Error of Approximation (RMSEA)	.063	.062
Lower bound 90% confidence interval	.055	.054
Upper bound 90% confidence interval	.070	.070
Standardized root mean square residual (SRMR)	.052	.053

Table 17

Factor Loadings for Alternative Measurement Model B, Mindfulness as Exogenous Variable

Parameter	Unstandardized Coefficient	*SE*	Standardized Coefficient	*t*-value
Goal conflict to:				
Time	.701	.028	.925	25.18***
Energy	.767	.026	.961	28.93***
Financial Constraints	.602	.034	.717	17.74***
Incompatible Goal	.563	.037	.644	15.25***
Attainment Strategies				
Anxiety to:				
Item 1	.812	.031	.832	26.60***
Item 2	.909	.031	.901	29.73***
Item 3	.865	.029	.869	30.26***
Item 4	.728	.036	.746	19.98***
Item 5	.549	.044	.555	12.53***
Item 6	.541	.041	.580	13.12***
Item 7	.678	.043	.658	15.80***
Somatic symptoms to:				
General Pain/Fatigue	2.39	.125	.834	19.08***
Cardiopulmonary	.410	.029	.612	14.19***
Gastrointestinal	.338	.028	.548	11.90***
Mindfulness to:				
Present Focus	1.06	.085	.622	12.58***
Awareness	1.27	.105	.610	12.06***
Acceptance	1.46	.089	.745	16.46***
Attention	.951	.099	.483	9.60***

Note. Robust standard errors, *t*-values, and significance levels are reported.
* $p < .05$, ** $p < .01$, *** $p < .001$

Following completion of the CFA for the newly constructed model, the structural model was subjected to SEM analysis. The structural model including MF as an exogenous variable fit the data well. As displayed in Table 16, all acceptable thresholds were met (*CFI* = .940, *RMSEA* = .062, *SRMR* = .053). Table 18 demonstrates that four of the five path coefficients were statistically significant. These results held true across control variables of first generation student status and age (see Tables 19 and 20). While MF significantly predicted GC and GC significantly predicted ANX, the indirect effect between MF and ANX was not significant, which means that GC did not mediate the relationship between MF and ANX.

Table 18

Parameter Estimates for Alternative Structural Model B with Mindfulness as an Exogenous Variable

Parameter	Unstandardized Coefficient	*SE*	Standardized Coefficient	*t*-value
MF to GC	-.128	.040	-.182	-3.20**
GC to ANX	.119	.052	.103	2.26**
ANX to SS	1.85	.143	.630	12.91***
MF to ANX (direct effect)	-.501	.041	-.617	-12.31***
MF to ANX (indirect effect)	-.015	.009	-.019	-1.68

Note. Robust standard errors, *t*-values, and significance levels are reported; ANX = Generalized Anxiety Disorder-7 Scale (GAD-7); GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; MF = Cognitive and Affective Mindfulness Scale-Revised (CAMS-R); SS = Patient Health Questionnaire-15 (PHQ-15)
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 19

Path Coefficients for First and Non-first Generation Student Status: Alternative Structural Model B

Parameter	First Generation Standardized Coefficient	Non First-Generation Standardized Coefficient	χ^2
MF to GC	-.168	-1.68	1.42
GC to ANX	.213	.216	1.15
ANX to SS	.673	.602	.646

Note. ANX = Generalized anxiety Disorder-7 Scale (GAD-7); GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; MF = Cognitive and Affective Mindfulness Scale-Revised (CAMS-R); SS = Patient Health Questionnaire-15 (PHQ-15)
n = 454
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 20

Path Coefficients for Age Groups, Alternative Model B

Parameter	Age 18-20 Standardized Coefficient	Age 21+ Standardized Coefficient	χ^2
MF to GC	-.180	-.154	1.64
GC to ANX	.198	.214	.293
ANX to SS	.625	.624	.009

Note. ANX = Generalized Anxiety Disorder-7 Scale (GAD-7); GC = Intergoal Relations Questionnaire (IRQ), Goal Conflict subscale; MF = Cognitive and Affective Mindfulness Scale-Revised (CAMS-R); SS = Patient Health Questionnaire-15 (PHQ-15)
n = 454
* $p < .05$, ** $p < .01$, *** $p < .001$

Interpretation of Structural Models

The primary proposed model (see Figure 3) showed good overall fit to the data. Fit indices all fell within acceptable ranges (*CFI* = .946, *RMSEA* = .066, *SRMR* = .050). Using Cohen's (1992) guidelines (< .10 = small effect size, .30 = medium effect size, > .50 = large effect size), parameter estimates for the model can be interpreted. Results demonstrated that GC had a significant positive medium direct effect on ANX (.211), and a positive small indirect effect on SS through the mediating variable of ANX (.128). ANX also demonstrated a significant positive large direct effect on SS (.778). The parameter estimate for the path between GF scores and ANX scores was not significant (-.020). These results held the same across age groups (18 to 20, 21 and over), and across first-generation student status.

The alternative primary proposed model, which tested MF as a moderator variable between ANX and SS using a simultaneous group analysis, demonstrated no significant change in path coefficients between high and low MF groups (χ^2 = .791).

Correlations were significant between all variables in the model, except for the relationships between GF and GC (.005), SS (-.038), and ANX (-.023). Correlations between both GC and ANX (.190) and SS (.144) were positive and medium in size. The correlation was large between ANX and SS (.558). The correlation between MF and GC (-.146) was negative and small (-.146), and the correlation between MF and GF was positive and small (.152). Correlations between MF and ANX (-.496) and SS (-.298) were negative and medium in size.

An alternative model was created following initial model analysis, excluding GF (Alternative Structural Model A; see Figure 4). Fit indices for the alternative model

removing GF demonstrated excellent overall fit to the data, and all fell within ideal ranges (*CFI* = .954, *RMSEA* = .067, *SRMR* = .046). Interpretation of parameter estimates again revealed that GC had a significant positive medium direct effect on ANX (.209), and a positive small indirect effect on SS through the mediating variable of ANX (.128). ANX also again demonstrated a significant positive large direct effect on SS (.613).

A second alternative model (Alternative Structural Model B; see Figure 5) was created following initial model analysis, again excluding GF, and including MF as an exogenous variable given its lack of significance as a moderator. Fit indices fell within acceptable ranges (*CFI* = .940, *RMSEA* = .062, *SRMR* = .053). Parameter estimates demonstrated that MF had a significant negative small direct effect on GC (-.182). While MF had a significant negative large direct effect on ANX (-.617), its indirect effect on ANX through the mediating variable of GC was not significant (-.019). The results between GC, ANX, and SS held consistent, with GC having a significant positive small direct effect on ANX (.103), and ANX having a significant positive large direct effect on SS (.630). These results also held the same across age groups (18 to 20, 21 and over), and across first-generation student status.

In sum, the primary theoretical explanatory model adequately fit the observed relationships in the data, conceptualized with GC directly and positively affecting ANX, and indirectly positively affecting SS through the mediating variable of ANX. However, GF was neither found to directly negatively affect ANX, nor indirectly negatively affect SS through the mediating variable of ANX (see Figure 1). In fact, when GF was removed, the model demonstrated excellent fit. Two alternative hypothesized models were also tested, following removal of the GF construct. While MF was not shown to

moderate the relationship between ANX and SS, it was demonstrated to be an independent variable for both GC and ANX with adequate model fit. In the final chapter that follows, implications of these results for theory, research, and practice will be discussed.

CHAPTER V

DISCUSSION

This final chapter will first provide a review of the study rationale, purpose, and research questions. Discussion of the results of the data will then be presented, along with resultant implications for future research, theory, and practice. The chapter will close by explaining limitations of the study, and conclusions that can be drawn from its results.

Given the evidence of potentially detrimental effects that can occur when goals conflict, including higher anxiety, higher levels of pain, and reduced self-rated physical health (e.g., Becerra-Garcia & Robles Jurado, 2014; Boudreaux & Ozer, 2013; Gray et al., 2017; Karoly & Ruehlman, 1996; Marcinko, 2015; Pickering & Corr, 2008), new research must seek to understand how interrelated goals relate to anxiety and somatic symptoms, and to their potential impact of goal conflict on health and well-being. If goals are conflicting and negatively impacting an individual's health and well-being, understanding potential beneficial interventions, such as mindfulness, could assist counseling psychologists in helping to better manage such conflicts.

As goal-setting has become increasingly used in a variety of treatment settings, researchers are drawing attention to the importance of examining how goal and goal-setting process impact overall health and well-being (e.g., Boudreaux & Ozer, 2013; Fisher & Palermo, 2016; Riediger & Freund, 2004). Boudreaux and Ozer (2013) encouraged further research on person-level variables that may moderate the negative

impact of goal conflict, and more recently it was stated that "more complex and complete models of goal conflict are necessary" (Muraven, 2017, p. 8). Additionally, with evidence that conflicting goals are related to higher levels of somatic symptoms with a negative association with psychological well-being (e.g., Boudreaux & Ozer, 2013; Gray et al., 2017; Marcinko, 2015), and that college students may frequently experience goal conflict and somatic symptoms (e.g., Cantor et al., 1985; Kim et al., 2011; Lee, 2010), examining interrelated goals, their relationships with constructs like anxiety and somatic symptoms, and the potential role that mindfulness may play in symptom management becomes highly important.

The current study aided in developing a better understanding of interrelated goals and their potential effects by examining a convenience sample of college students, who have been reasonably assumed to face multiple goals, and have been reported to frequently experience somatic symptoms (Cantor et al., 1985; Kim et al., 2011; Lee, 2010). By examining the interrelationships between goal conflict, goal facilitation, anxiety, somatic symptoms, and mindfulness, this study sought to understand the role that mindfulness may play in the relationship between interrelated goals and somatic symptoms through the lens of Gray and McNaughton's (2000) well-established Reinforcement Sensitivity Theory (RST). As the relationships among these constructs have yet to be examined in the literature, this study may help clients and counseling psychologists to better understand the potential impact of the goal-setting process. Additionally, it may also improve understanding of potential qualities, such as those associated with mindfulness, that may assist clients and students in managing the potential negative effects of goal conflict.

Study Rationale and Purpose

The goal of this study was to develop a model that explains the interrelationships among interrelated goals (goal conflict and goal facilitation), anxiety, somatic symptoms, and mindfulness. This study investigated the possible mediating role anxiety may play between interrelated goals and somatic symptoms, and the role that mindfulness may play in moderating the effect of goal conflict on somatic symptoms. Based on a review of literature, it appears that no research has been completed on the interrelationships among these constructs.

As evidenced by the comprehensive literature review, there was clear theoretical support for goal conflict directly and positively affecting anxiety and indirectly positively impacting somatic symptoms with anxiety as a mediator (e.g., Boudreaux & Ozer, 2013; Gray & McNaughton, 2000; Pickering & Corr, 2008; Riediger & Freund, 2004). There was also support for goal facilitation to negatively impact anxiety and somatic symptoms (e.g., Dickson & Moberly, 2010; Freund et al., 2014; Gray & McNaughton, 2000; Pickering & Corr, 2008). In addition, there was clear support in the literature for the exploration of the role that mindfulness may play in moderating the indirect relationship between goal conflict and somatic symptoms, based on evidence showing mindfulness as being successful in the treatment of anxiety and somatic symptoms (M. C. Davis et al., 2015; Franco et al., 2010; Hoge et al., 2017; Khoury et al., 2013; van Ravesteijn et al., 2014). Thus, the following research questions were created to evaluate two theoretical models that explained the interrelationships among interrelated goals, anxiety, somatic symptoms, and mindfulness:

Q1 Does a primary theoretical explanatory model (see Figure 1) adequately fit the observed relationships in the data, conceptualized with goal conflict directly and positively affecting anxiety, and indirectly positively affecting somatic symptoms through the mediating variable of anxiety, and with goal facilitation directly and negatively affecting anxiety, which indirectly and negatively affects somatic symptoms through the mediating variable of anxiety?

Q2 Does an alternate model (see Figure 2) also adequately fit the observed interrelationships between these constructs in the data, which includes mindfulness as a moderator between goal conflict-induced anxiety and somatic symptoms?

Goal Conflict, Anxiety, and Somatic Symptoms

In evaluating the primary and alternative models (see Figures 3 and 4), the results from these data supported the research-based theoretical links between goal conflict, anxiety, and somatic symptoms. Like prior literature showing similar results (e.g., Boudreaux & Ozer, 2013; Gray & McNaughton, 2000; Pickering & Corr, 2008; Riediger & Freund, 2004), in addition to theoretical writings and research by Gray and McNaughton (2000), the current study found significant effects between goal conflict, anxiety, and somatic symptoms. Specifically, the results indicated that goal conflict was positively impacted both anxiety and somatic symptoms to approximately the same degree. Additionally, results displayed indirect effects of goal conflict on somatic symptoms through anxiety as a mediating variable, confirming that anxiety was shown to explain the effect of goal conflict on somatic symptoms. These relationships held constant across model testing scenarios, and across age groups and first-generation student status. This means that as individuals reported a higher number of goals that conflict with one another, they also reported more somatic symptoms, and that this is explained by having higher levels of anxiety in the face of goal conflict. These results

were the same, regardless of age, or whether or not the individual was a first-generation student.

These results are consistent with prior research and theory linking goal conflict with anxiety, and explains the relationship between goal conflict and somatic symptoms found in prior studies (e.g., Becerra-Garcia & Robles Jurado, 2014; Boudreaux & Ozer, 2013; Gray et al., 2017; Karoly & Ruehlman, 1996; Marcinko, 2015; Pickering & Corr, 2008). It is also consistent with literature demonstrating the comorbidity of anxiety and somatic symptoms (Kroenke et al., 2010; Simms et al., 2012), and offers strong support for RST--that in the face of goal conflict, the Behavioral Inhibition System (BIS) is triggered and anxiety is increased. For example, a client sets a goal to complete a homework assignment by the end of the week, and also sets a goal to exercise three times over the week. As the daily decision is made as to how their time is spent, this client may experience heightened anxiety, and thus elevated somatic symptoms, as these goals conflict with each other from day to day.

Goal Facilitation

The results also indicated that goal facilitation did not impact anxiety or somatic symptoms (see Figure 3). However, as expected following a review of prior research on scale development (Riediger & Freund, 2004), goal facilitation and goal conflict were mutually exclusive variables. In alternate models examined in the current study, goal facilitation was removed due to its lack of effect on the endogenous variables, specifically anxiety and somatic symptoms. While it was expected that individuals with higher levels of goal facilitation would experience lower levels of anxiety and somatic symptoms, this hypothesis did not fit the data. This suggested that while goal facilitation

did not impact anxiety and somatic symptoms, it may be associated with other constructs outside of those examined in this study, such as goal pursuit (Boudreaux & Ozer, 2013; Riediger & Freund, 2004), optimism, hope, or even impulsivity (Pickering & Corr, 2008). Although there was empirical support for the negative effect of goal facilitation on anxiety (e.g., Dickson & Moberly, 2010; Freund et al., 2014; Gray & McNaughton, 2000; Pickering & Corr, 2008), further research is needed in the area of goal facilitation to examine its relationship to other factors, and investigate its role and impact.

Mindfulness

Results also suggested that mindfulness did not serve to moderate the relationship between anxiety and somatic symptoms established in the SEM models (see Table 10). However, when an alternative model was created with mindfulness as an exogenous variable (see Figure 5) rather than as moderating the effect of anxiety on somatic symptoms, results emerged supporting negative effects on mindfulness on both goal conflict and anxiety. Thus, while results did not support goal conflict as mediating the strong effect of mindfulness on anxiety, model data did support mindfulness as an independent variable and having a negative effect on both goal conflict and anxiety. These results were again consistent across age groups and whether or not an individual identified as a first-generation student. Mindfulness was also demonstrated to have a medium negative effect on somatic symptoms, and a small positive effect on goal facilitation. This means that individuals with more mindfulness traits reported less goal conflict, and fewer anxiety and somatic symptoms. They also reported higher levels of goal facilitation. For example, a client who regularly practices mindfulness and has developed mindful qualities (e.g., the ability to engage in focused attention and be

present, aware, and accepting) may have the capacity to be more intentional in their goal-setting processes, set more goals that facilitation one another, or perceive goal conflict scenarios with more acceptance, than a client who has not yet developed these qualities.

Results suggested that individuals with more trait-based mindfulness, or the "dispositional tendency toward mindfulness" (Mesmer-Magnus, Manapragada, Visesvaran, & Allen, 2017) experience less goal conflict, anxiety, and somatic symptoms, as well as higher levels of goal facilitation. This is consistent with research examining the impact of mindfulness on both anxiety and somatic symptoms (e.g., M. C. Davis et al., 2015; Franco et al., 2010; Hoge et al., 2017; Khoury et al., 2013; van Ravesteijn et al., 2014). These results also suggest that individuals with more mindfulness traits may have the ability to set goals more intentionally and optimistically. For example, encouraging a present-moment orientation, rather than one engaged in goal-directed activity, may allow for resolution of negative effects of conflicting goals (Cheon, 2013; Kabat-Zinn, 1990). In addition, mindfulness has recently been associated in literature with greater clarity of goals and flexibility in goal pursuit (Crane, Barnhofer, Hargus, Amarasinghe, & Winder, 2010; Crane, Winder, Hargus, Amarasinghe, & Barnhofer, 2012; Morris, Mansell, & McEvoy, 2016).

Results also suggested that the way mindfulness is measured must be considered in model development and its relationship to other constructs. While trait-based mindfulness did not change the degree or direction of its effect on existing anxiety and somatic symptoms specifically, results did demonstrate trait-based mindfulness as directly affecting one's overall level of anxiety. In other words, in situations where mindfulness is not directly taught and measured immediately following, those with pre-

existing mindfulness traits may experience fewer symptoms of anxiety and somatic symptoms compared with those who do not hold as many mindfulness traits. This supports prior literature on trait versus state-based mindfulness, which indicates that individuals with trait-based mindfulness may have better awareness of their behavior and behavioral antecedents (Black, Sussman, Anderson Johnson, & Milam, 2012; Brown & Ryan, 2003), with less reactivity, and less subjective distress (Brown, Weinstein, & Creswell, 2012).

Overall Model Interpretation

Based on the results of the final primary and alternative models, results of the current study suggested that higher levels of goal conflict had a causal effect on higher levels of anxiety and somatic symptoms, with anxiety serving to mediate the effect of goal conflict on somatic symptoms. This means that one outcome of goal conflict is somatic symptoms (e.g., nausea, fatigue, headaches, difficulty sleeping), and that when anxiety increases due to goal conflict (e.g., feeling nervous and worrying too much), more somatic symptoms are likely to be present. In addition, higher levels of trait-based mindfulness had a causal effect on lower levels of goal conflict and fewer symptoms of anxiety. Higher levels of mindfulness also had a causal effect on lower levels of somatic symptoms and higher levels of goal facilitation. This means that individuals with more mindful traits (e.g., being present-focused, accepting, aware, attentive) may have fewer goals that conflict with one another, and fewer symptoms of anxiety and somatic symptoms. They also likely have more goals that complemented one another rather than conflict, such as goals that help with progress toward their other goals. Interestingly, and in contrast with prior research, goal facilitation did not demonstrate an effect on anxiety.

That is, the path between goal facilitation and anxiety was not significant, indicating that anxiety did not mediate the relationship between goal facilitation and somatic symptoms. This means that there was no there was no effect on anxiety, whether or not an individual reported their goals as facilitating one another. This finding may be explained by other factors associated with goal facilitation, such as goal pursuit, optimism, hope, or even impulsivity (Boudreaux & Ozer, 2013; Pickering & Corr, 2008).

Research Implications

The results of this research provide strong support for goal conflict having a causal effect on higher somatic symptoms, and that this relationship being explained by heightened anxiety in the face of goal conflict. Results also provide strong support for lower levels of goal conflict, anxiety, and somatic symptoms being likely outcomes of higher mindfulness traits. Boudreaux and Ozer (2013) suggested that future research seek to differentiate between goal-level factors and person-level factors that influence goal processes. Since the type of goal was not explored in this study, this leads to the conclusion that mindfulness and associated traits may be person-level variables that influence differences in goal conflict experiences.

Future research on goals, particularly interrelated goals, could build on this research in multiple ways. Exploring additional individual differences, such as cognitive flexibility or self-compassion, and how they relate to goal conflict, would further our understanding of how individuals experience their goals. Using a similar design and measuring state mindfulness in individuals who have just completed mindfulness training or mindfulness-based treatment would be beneficial in order to gain a better understanding of the difference in trait versus state mindfulness, and how it differs in

association with other constructs. Future research could also continue to examine how trait-based mindfulness is developed, and how long it takes to do so, in order to inform counseling psychologists in helping individuals improve their ability to be mindful over the long-term. There appears to be mixed findings regarding how much mindfulness training is necessary and sufficient to bring about measurable changes (e.g., Christopher & Christopher, 2008; Gotink et al., 2015). As a result, further research is suggested in order to understand how much training is needed and in what format, to improve individual trait-based mindfulness most efficiently. Future research could also continue to examine the ability of mindfulness-based interventions to reliably improve trait-based mindfulness, an area of research also recently suggested by Witkiewitz, Roos, Colgan, and Bowen (2017). Another possible future research strategy would be to measure trait mindfulness in clients prior to goal-setting and treatment planning, and teach mindfulness interventions to only a sample of them. Then, goal conflict and mindfulness could be measured in both groups periodically and over time, in order to explore the impact of mindfulness interventions on both goal conflict and mindfulness in the long term.

The current results lead to the conclusion that being intentional in reaching a definition of mindfulness and its corresponding factors, as well as delineating each existing measure's reason for its use (state or trait measurement) is essential for the ongoing research of this important construct. For example, study designs involving mindfulness training sessions could indicate the use of a state-based measure (e.g., the Toronto Mindfulness Scale; TMS), and study designs measuring mindfulness without a formal training component could indicate a trait-based measure (Cognitive and Affective Mindfulness Scale – Revised; CAMS-R). It could also be important, depending on the

results of further research, to pair other constructs accordingly, measuring state-based constructs when state-based mindfulness is being researched, and measuring trait-based constructs when trait-based mindfulness is being researched.

While the current study did not find mindfulness to moderate the effect of anxiety on somatic symptoms and instead found it to have a direct effect on the two constructs, further research is necessary to test these findings and explore further how mindfulness can be implemented into treatment. It will be important to continue to examine the construct of mindfulness and explore its relation to RST. The findings of the current study indicate that mindfulness may play a role in Gray and McNaughton's theory, which is also supported by prior research by Sauer et al. (2011). These authors found that lower activation of the BIS accounted in part for the positive effects that mindfulness had on well-being, and a "strong indirect effect of mindfulness on well-being through BIS" (p. 510). Future research could examine how mindfulness training influences the BIS system, to identify underlying mechanisms and clinical techniques that help reduce anxiety and rumination that is associated with BIS activation (Pickering & Corr, 2008). Due to the contribution of this study to research demonstrating the effect of mindfulness on reduced anxiety and somatic symptoms, continued research on mindfulness and its impact on anxiety and somatic symptoms, particularly using randomized controlled trials, will help further the evidence that including mindfulness interventions in anxiety treatment can be beneficial. Additionally, it is important to note that while trait-based mindfulness was measured in this study, the measure used for anxiety was state-based in contrast, measuring symptom severity within the past two weeks. It may be possible that while trait-based mindfulness did not moderate the effects between state-based anxiety

and somatic symptoms, that use of a state-based mindfulness measure could have yielded different results. It would be a fruitful focus of future research to investigate the interactions between state and trait-based mindfulness versus state and trait-based anxiety to better understand the relationship between these constructs and their nuances.

While the IRQ provides a psychometrically sound method of measuring both goal conflict and goal facilitation, there are limited options for measuring interrelated goals, and further research on measures for goals is indicated. Another important research implication resulting from the current study is that goal conflict and goal facilitation were unrelated to each other. This parallels findings by Riediger and Freund (2004), illuminating that the two constructs should be measured and considered as independent from one another.

This study's results did not support goal facilitation as having an effect on anxiety or somatic symptoms. Including goal facilitation in further research would serve to develop a better understanding of its relationship to other variables, particularly with the results of this study indicating no effect of goal facilitation on anxiety. Research appears thus far to have focused less on goal facilitation than on goal conflict (Presseau et al., 2013). Additionally, results of this study demonstrate that mindfulness had a small, positive effect on goal facilitation, which supports prior research indicating that the construct may be associated with psychological states frequently desired by clients, including life satisfaction, positive functioning, positive affect, and increased success in goal attainment (Boudreaux & Ozer, 2013; Riediger, 2008; Sheldon & Kasser, 1995; Wiese & Salmela-Aro, 2008). Further research examining the relationship between goal facilitation and mindfulness is warranted, along with the association between goal

facilitation and other theoretically relevant constructs such as goal pursuit, motivation, optimism, or impulsivity (Pickering & Corr, 2008; Riediger & Freund, 2004).

Furthermore, additional research is needed to confirm the results of the current study, suggesting that goal facilitation is not related to anxiety or somatic symptoms. A possible explanation for this finding is the way in which goal facilitation was measured within the model. First, the goal facilitation subscale of the Intergoal Relations Questionnaire (IRQ) contains fewer items than the goal conflict subscale (two questions based on each goal pairing, compared with four), and has been developed and researched with only two indicators (overlapping goal-attainment strategies and instrumental goal relations). Because three indicators are suggested in the use of structural equation modeling (SEM; Bollen, 1989), and the subscale includes only two questions asked about multiple goal pairings, the goal facilitation construct could have been subject to measurement error (Chin, Marcolin, & Newsted, 2003). Second, through exploratory factor analysis, the goal-facilitation subscale was found in this study to measure three factors that appeared to be related to each specific goal pairing, rather than the expected two-factor solution, measuring overlapping goal-attainment strategies and instrumental goal relations. As a result, further research is needed to measure goal facilitation more robustly, as well as to explore whether or not a three-factor solution is replicated using the IRQ specifically.

Considering that the ability to engage in the resolution of conflict is said to be important for the overall well-being of an individual (Boudreaux & Ozer, 2013), researchers could include other relevant constructs and their impacts on goal conflict, anxiety, and somatic symptoms, such as stress management and planning (Boudreaux &

Ozer, 2013), cognitive flexibility, emotion-regulation, self-compassion, attention shifting, and motivation.

Previous research has shown that a number of demographic variables may be associated with the variables involved in this study, and the current research either did not, or was unable to, incorporate multiple demographic variables into the analyses. Future research could continue to clarify which variables are associated with goal conflict, anxiety, somatic symptoms, and mindfulness. It may help to refine the study design and analyses and perhaps lead to more generalizable results. For example, future research could investigate differences in relationships between the constructs at hand for different ethnicities, chronic illness groups, genders, and other populations outside of undergraduate students. Further research could also again explore potential differences in age and student status to see if results of the current study are replicated.

Theoretical Implications

Using Gray and McNaughton's (2000) RST as a framework for model-building and analysis, the results of the current study supported the basic tenants of the theory. Results suggested a causal effect of goal conflict on anxiety, a relationship purported by RST. Specifically, individuals with more frequent goal conflict had a higher number of somatic symptoms, which were explained by higher anxiety symptoms. These results fit well with the theory's explanation and evidence of goal conflict being the source of anxiety (Gray & McNaughton, 2000; Nash et al., 2011). According to the theory, the BIS is associated with worry, rumination, and anxiety, triggered as a way to motivate behavior until a goal conflict is resolved (Pickering & Corr, 2008). As recently stated, while conflict between goals can be detrimental, the rise in negative affect should be in

place to signal that reorganization of plans and behaviors in order to resolve the conflict that is threatening to the individual (Boudreaux & Ozer, 2013; Muraven, 2017). Results also suggested that anxiety predicted somatic symptoms found with higher levels of goal conflict in prior literature, which also parallels results of research tying RST to medically unexplained symptoms and somatic symptoms attributed to underlying mental health conditions (Becerra-Garcia & Robles Jurado, 2014; Kroenke, 2003) and evidence in prior research linking anxiety and somatic symptoms (Kroenke et al., 2010; Simms et al., 2012).

From an RST framework linking the Behavioral Activation System (BAS) to more positive feelings (Carver & White, 1994; Harmon-Jones, 2003) and lower symptoms of anxiety in college students (Markarian et al., 2013), it was hypothesized that higher levels of goal facilitation would be associated with lower symptoms of anxiety, and thus fewer somatic symptoms. Results did not support this proposition, as lower anxiety levels were not demonstrated to be an outcome of higher goal facilitation. Theoretically, the BAS is activated by rewards, or the expectation of goal-attainment, rather than conflict resolution or punishment. While goal facilitation did not impact anxiety in the current research, it could be that it is more directly predictive of BAS-related constructs such as happiness, self-efficacy, hope, goal-pursuit behaviors, and other approach-related behaviors (Alloy et al., 2009; Carver & White, 1994; Gray, 1994; Pickering & Corr, 2008), rather than the anxiety formed and driven to resolve conflict.

While mindfulness was not demonstrated to moderate anxiety and somatic symptoms in this study as originally purported, this study demonstrated that the outcome of an individual having more mindfulness traits is that they are likely to have lower levels

of goal conflict and anxiety. Goal conflict was not shown to explain why less anxiety was present in those with more mindfulness traits. However, there are multiple reasons why anxiety may be impacted, outside of having lower levels of goal conflict, that were not established in the models (e.g., lower state anxiety, temperament, subjective well-being). Mindfulness was also found to have a positive effect on goal facilitation and a negative effect on somatic symptoms. From a theory and research-based perspective, mindfulness has been associated with the ability to alleviate emotions that correspond with the BIS, including anxiety (Evans et al., 2008), and lower BIS levels have been shown to partially account for the positive effects of mindfulness (Sauer et al., 2011). Research has also associated mindfulness with the management of anxiety symptoms (e.g., Chen et al., 2013; Hoge et al., 2013). The current research thus provides further evidence for existing RST and mindfulness research.

Overall, the current research contributes to Gray and McNaughton's (2000) RST, by providing further evidence of goal conflict impacting anxiety, specifically that goal conflict activates the BIS and increases associated anxiety symptoms. The current literature also supports previous findings that one outcome of goal conflict is somatic symptoms, and offers anxiety (and thus activation of the BIS) as a possible explanation for this relationship, meaning that when anxiety increases due to goal conflict, more somatic symptoms are likely to be present. It also supports mindfulness, specifically trait-based mindfulness, as having a causal effect on lower goal conflict and BIS-related emotional states such as anxiety. While further research is needed to clarify the effects found between constructs in this study across populations, particularly between state and trait-based mindfulness on the BIS and the possible role of goal facilitation in relation to

RST, results based on this data support the overall theoretical links suggested by and researched among Gray and McNaughton's (2000) theory.

Practice Implications

Considering the results of the current study, there are a variety of implications for counseling psychologists in practice. With the significant role of goal conflict and its demonstrated impacts on anxiety and somatic symptoms, it is suggested that counseling psychologists incorporate the potential influence of goal conflict on anxiety into their work with clients, as well as the effect of both goal conflict and anxiety on somatic symptoms. This would require not only an understanding of the theoretical foundation that anxiety can be a product of goal conflict (Gray & McNaughton, 2000), but also the potential detriment of setting goals that may conflict with one another. Counseling psychologists could add a psychoeducational element to the treatment planning and goal-setting process, discussing with clients the different ways that goals relate to each other, and the possible anxiety that could result from setting goals that conflict with one another, so they are better prepared for what may occur in the future, depending on how their goals interact with each other. Education about the effect of anxiety on somatic symptoms would also be appropriate to incorporate. For clients already presenting with significant anxiety and somatic symptoms, exploration of their goals and aspirations may be important to incorporate early into sessions, in order to discover and discuss how their goals interact with each other up front, as well as how any goal conflict experiences could be contributing to their symptoms. Further, it may be desired to begin incorporating a measure of interrelated goals at the beginning of the treatment, in order to establish what goals the client already holds and how they relate to each other. The field has increased in

its focus on goal-setting, particularly as psychologists have become more visible in integrated care settings, and engage more in the treatment of physical conditions with underlying mental health issues (Lambert & Donovan, 2016; Romano & Hage, 2000; Tucker et al., 2007). Thus, being intentional in the administration of goal-setting processes and behavioral goal-setting techniques becomes an important implication of the current research. In this way, clinicians may be able to help identify goals that conflict with each other, help to explain and validate negative emotions associated with them, and either assist clients in revising and restructuring their goals, or provide interventions, such as mindfulness, to help manage goal conflict scenarios, anxiety, associated somatic symptoms.

The results of the current study also suggest that trait-based mindfulness, which has been demonstrated in prior literature to be able to be fostered by mindfulness training (Carmody & Baer, 2008; Collard et al., 2008), may be one possible tool to not only help manage anxiety and somatic symptoms, but also decrease overall levels of goal conflict. The current research also suggested that, to a small degree, higher levels of goal facilitation are likely to be present in individuals with more mindfulness traits, a construct linked in prior literature with higher levels of life satisfaction, positive affect, and greater success in goal-attainment (Boudreaux & Ozer, 2013). It may be that fostering mindfulness in goal-setting processes could be beneficial to the improvement of overall symptoms and well-being, and intentionality in goal setting processes. The current study indicates that the benefits of helping clients develop and maintain qualities of mindfulness may be reduced goal conflict, and thus reduced symptoms of anxiety and somatic symptoms. It also indicates that helping clients foster mindfulness traits may also

assist them in setting more goals that facilitate one another rather than conflict, perhaps leading to preferred states such as life satisfaction, positive affect, and success in attaining their goals (Boudreaux & Ozer, 2013). This can be included in therapeutic settings in a variety of ways, as current therapies use many techniques to "shift and sustain awareness on sources of goal conflict" (Morris et al., 2016, p. 7). For example, motivational interviewing encourages awareness of goals that compete with one another (W. Miller & Rose, 2009; Morris et al., 2016). Acceptance and Commitment Therapy (ACT), which incorporates mindfulness work and values exploration, may be an approach supported by the current research as well, as it encourages clients to foster an awareness of their values in goal-setting, fosters mindful approaches to symptom management, and helps to facilitate more effective responding to difficult experiences (Hayes, Strosahl, & Wilson, 2012; Pielech, Vowles, & Wicksell, 2017).

In addition to current therapies that incorporate mindfulness work, counseling psychologists could also begin to implement the results of this study in their measurement processes, and as a way to track overall progress towards developing mindfulness traits and effectiveness of treatment planning. For example, a client could be given the CAMS-R and IRQ at the beginning of treatment. This would provide a snapshot of which mindfulness traits the client already holds, and which traits may need to be fostered before revising their goals to be more effective. By having an understanding of mindfulness traits up front, early treatment planning can begin incorporating mindfulness interventions right away that are customized to what the client may need (e.g., mindful movement, body scanning, sitting meditation, breath awareness; Vollestad, Sivertsen, & Hostmark Nielsen, 2011), and assist them in approaching the

goal-setting process more mindfully. In combination with psychoeducation on the potential effects of goal conflict (increased anxiety and somatic symptoms), explaining to clients that mindfulness traits may prevent goal conflict scenarios could also be highly effective in gaining client buy-in regarding the goal-setting process. Should the client already hold a higher number of mindfulness traits, then educating them on using mindfulness to intentionally set goals that facilitate one another would be a suggested next step. Psychoeducation could be administered either with individual clients, or in a group setting prior to treatment. Using the CAMS-R and IRQ periodically as treatment progresses could serve to track the long-term development of mindfulness traits, as well as how the client is perceiving their goals. This would then allow for treatment goals to be updated accordingly, and lead to a potential better understanding of existing anxiety and somatic symptoms.

Across settings there has been a demonstrated concern for the prevalence of anxiety and somatic symptoms (Kim et al., 2011; Kroenke, 2014; Lee, 2010). Given the direct negative impact of mindfulness on anxiety and somatic symptoms in the current study that is also supported by prior research, counseling psychologists may be further interested in the use of mindfulness strategies to potentially reduce these symptoms, in addition to reducing higher healthcare costs. Mindfulness-Based Stress Reduction (MBSR) and Mindfulness Based Cognitive Therapy (MBCT) are mindfulness-based approaches that have been predominantly studied in prior literature, both with evidence supporting their use in the treatment of anxiety and chronic somatic diseases, and improvement of trait-based mindfulness (e.g., Gotink et al., 2015; Keune, Bostanov, Hautzinger, & Kotchoubey, 2011; Vollestad et al., 2011). Both are brief in nature

(approximately eight sessions) and delivered in group settings. MBSR focuses on stress-reduction and improvement in overall well-being, while MBCT combines MBSR with cognitive therapy (Strauss, Cavanagh, Oliver, & Pettman, 2014). A recent meta-analysis by Gotink et al. (2015) reviewed randomized controlled trials on mindfulness-based interventions, and found that both "MBSR and MBCT significantly improved" anxiety symptoms (pp. 1-2), and alleviated both mental and physical symptoms in illnesses such as cardiovascular disease and chronic pain, in both adult and child populations. Shure et al. (2008) found that a 15-week MBSR program led to a significant reduction in anxiety, somatic symptoms, and pain in a sample of graduate students. Importantly, Vollestad et al. (2011) measured trait mindfulness in participants both after an MBSR course, and at six-month follow-up. Trait mindfulness was found to increase significantly when compared with wait-list control, with gains maintained after six months, and 84% of participants reporting continued mindfulness practice at follow up. Of note, in a meta-analysis of randomized controlled trials in 2014, while Strauss et al. pointed out that "neither MBSR nor MBCT were developed for people experiencing an acute episode of depression or anxiety" (p. 1), and that eight sessions may not be enough for individuals who currently meet criteria for an anxiety disorder. Along with evidence of MBSR and MBCT being effective in the treatment of both anxiety and somatic symptoms, as well as trait-based mindfulness being negatively related to anxiety (Mesmer-Magnus et al., 2017), there are also multiple benefits of incorporating these treatments, including easy implementation, low cost due to group administration, and low risk (Gotink et al., 2015).

In light of the results of the current research demonstrating the impact of trait-based mindfulness on anxiety and somatic symptoms, counseling psychologists may be

particularly interested in the incorporation of mindfulness-based interventions into their work due to their focus on prevention of mental health disorders with less severe populations. By improving trait-based mindfulness in individuals, this research, along with prior findings, demonstrates the possibility of preventing goal conflict scenarios, anxiety, and somatic symptoms through teaching and implementation of mindfulness skills early on. Research thus far not only supports the use of group-based modalities such as MBSR and MBCT on the treatment of anxiety disorders and somatic symptoms, and overall stress management in healthy populations (Chiesa & Serretti, 2009), but there is also support for the effectiveness of individual acceptance-based interventions such as Acceptance-Based Behavior Therapy (Morgan, Graham, Hayes-Skelton, Orsillo, & Roemer, 2014) and ACT (A-Tjak et al., 2015).

Limitations

Psychology literature displays a shortage of research on the relationships between interrelated goals, their potential effects on anxiety and somatic symptoms, and the person-level variables influencing their interactions. Further research is needed, from the perspective of counseling psychologists in particular, to better understand practice implications for these constructs, particularly given the rise of counseling psychology in settings concerned with somatic symptoms and goal-setting processes, such as medical settings, counseling centers, and community mental health centers (Lambert & Donovan, 2016; Romano & Hage, 2000; Tucker et al., 2007). In addition, research on the measurement of constructs such as mindfulness, interrelated goals, and somatic symptoms is continuously emerging, and the results of this study were limited to the findings based on available measurement scales for constructs still being defined and

explored. Generalizing the results of this study are also limited to the distinctive demographic characteristics of the sample used, as the sample was limited to undergraduate students, and predominately female-identified, White, and from one geographical location (a Rocky Mountain region university consisting of approximately 12,000 students). The study sample was also considered nonrandom, as students voluntarily chose to participate in the survey sent out via their student email accounts. The current study did attempt to examine variables shown to potentially influence the constructs in the study, including gender, ethnicity, age, and chronic pain status. However, the minimum sample size needed for SEM limited the demographic variables that could be split into two groups for examination (specifically race/ethnicity, chronic pain status, and gender), and the current design may have also neglected to account for variables unidentified so far in research that may impact the research design.

The current study may also have been impacted by mono-method bias, as only single scale data were used to denote each construct involved. Future research can use multiple measures per construct to help control for measurement error and any potential bias characteristic of the use of a single measure to depict each construct.

Finally, this study tested the moderation of mindfulness by categorizing the scale into two groups. While a multiple-group approach using categorization of scales is considered valuable (Tomarken & Waller, 2005), and has frequently been used in psychiatric and social sciences settings (Taylor, West, & Aiken, 2006) with a median split method being the most popular (Irwin & McClelland, 2003), this process has its limitations. These include the reduction of statistical power and efficiency, in that information regarding points outside of the dichotomized categories may be lost (Altman,

Armitage, & Colton, 1998; Irwin & McClelland, 2003). For the purposes of the current study, categorization was done for a number of reasons. First, the sample size in the current study provided for sufficient power to drive model analysis (Kline, 2011), and the process has been used in previous studies using SEM (Epstein & Preston, 2003; Rouquette et al., 2015) and the CAMS-R (Carter, 2015). Categorization of the mindfulness variable allowed for the reporting of results in meaningful terms. In addition, SEM uses latent variables to account for measurement error, which can require categorization in order to test moderation within a structural model rather than a path model, thus requiring categorization of mindfulness to interpret moderating effects (Rouquette et al., 2015). Tomarken and Waller (2005) also pointed out that some promising approaches to the testing of interactions in SEM have not been easily available in common SEM software, and are in need of ongoing research. Finally, the moderation of mindfulness was also tested via regression as a continuous variable in this study with the same results (no moderation of mindfulness on the relationship between anxiety and somatic symptoms). While categorization was necessary in the case of the current study, future research should explore potential cutoff scores or statistical techniques to allow for the exploration of subtle change in the data from level to level.

Conclusions

In spite of these limitations, the current study succeeded in establishing a well-fitting model explaining the interrelationships among goal conflict, anxiety, somatic symptoms, and mindfulness. Specifically, somatic symptoms were found to be an outcome of goal conflict, mediated by anxiety. Goal conflict, anxiety, and somatic symptoms were present in individuals with trait mindfulness, though trait mindfulness

was not found to moderate the relationship between anxiety and somatic symptoms. All results held constant across age groups and first generation student status. Interestingly, goal facilitation did not appear to have a significant effect on anxiety or somatic symptoms. However, goal facilitation was demonstrated to be an outcome of mindfulness. This study serves to illuminate the importance of goal conflict and its role in explaining anxiety and somatic symptoms, as well as the impact of mindfulness on these constructs that have been demonstrated in literature to have a negative impact on overall health and well-being. In line with Gray and McNaughton's (2000) RST, these results suggest that goal conflict is a source of anxiety, and provide evidence that the BIS may serve to increase difficult emotions such as anxiety and to activate an individual to pursue behaviors toward the resolution of goal conflict. These results also suggest that mindfulness may serve as a tool to manage symptoms associated with BIS activation. These results are especially relevant for counseling psychologists, and future research may investigate whether these interrelationships hold true for other groups.

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APPENDIX A

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH

UNIVERSITY of
NORTHERN COLORADO

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH
UNIVERSITY OF NORTHERN COLORADO

Project Title:	The Effects of Interrelated Goals
Researcher:	Liesel Christoe-Frazier, MA, Counseling Psychology Department
Phone:	(xxx) xxx-xxxx
E-mail:	chri0034@bears.unco.edu
Faculty Sponsor:	Brian Johnson, PhD; (970) 351-2209; brian.johnson@unco.edu

Purpose and Description: The researcher is interested in the goal-setting processes, and physical and emotional well-being of undergraduate students. As a participant in this research, you will be asked to complete an anonymous web-based questionnaire. The items will consist of an opportunity to list some of your most salient personal goals, along with a variety of rating scales that will assess how you feel about your goals and general well-being. The questionnaire will provide you with the opportunity to assess your perceptions of your goals, and various thoughts, feelings, and behaviors that you experience on a daily basis. The questionnaire will take approximately 15 to 20 minutes to complete.

For the questionnaire, you will not provide your name, but will be asked to provide your age, gender, and race/ethnicity. You must be age 18 and older to participate, and only the researcher will examine individual responses. Questionnaire responses will be submitted and stored via a web-based survey program called Qualtrics. Results will then be downloaded to an Excel document and randomly assigned a participant number. Data will then be imported into statistical software packages, all completed on the researcher's password protected computer. While confidentiality cannot be guaranteed due to the electronic nature of data collection in this study, the researcher will strive to protect the anonymity and confidentiality of your responses throughout the process.

Potential risks in this project are minimal. In fact, there are no foreseeable risks outside the time it takes to complete the survey. However, as with any questionnaire, mild discomfort may be experienced in responding to questions regarding your perceptions of your personal goals, and your physical and emotional well-being. This process is not expected to expose you to any other risk than what might occur during any survey of your perceptions. To minimize potential risks, you will be provided with a button on each screen of the survey to decline participation at any time without consequence. At the end of the survey, you will also be provided with contact information for psychological and emergency services, should you experience any emotional discomfort as a result of

participating. You will also be provided with a separate link to submit your email address in order to be provided with a free iTunes download as incentive for participation in this study. There are no other direct benefits to you as a participant. However, the field of psychology is likely to benefit from this study, as it will assist us in better understanding the goal-setting process, and how it relates to physical and emotional well-being in a student population. Therefore, the benefits of this study are expected to far outweigh the risks.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please communicate your consent by clicking "I Agree to Participate" if you would like to participate in this research. You may keep this form for future reference. If you have any concerns about your selection or treatment as a research participant, please contact Sherry May, IRB Administrator, in the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

APPENDIX B

DEMOGRAPHICS QUESTIONNAIRE

DEMOGRAPHICS QUESTIONNAIRE

1. What is your age? _____

2. Please specify your ethnicity (or race):

- ☐ White
- ☐ Hispanic or Latino
- ☐ Black or African American
- ☐ Native American or American Indian
- ☐ Asian/Pacific Islander
- ☐ Other

3. What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other (please specify): _____

4. Do you suffer from Chronic Pain (physical pain persisting for 3-6 months; Apkarian, Hashmi, & Baliki, 2011)?

- ☐ Yes
- ☐ No

5. Do you consider yourself to be a first generation college student?

- ☐ Yes
- ☐ No

APPENDIX C

INTERGOAL RELATIONS QUESTIONNAIRE

INTERGOAL RELATIONS QUESTIONNAIRE
(IRQ; Riediger & Freund, 2004)

Your personal goals...

People typically have ideas of how they want to live their life, of what they want to attain or to avoid. Below, we refer to such ideas as "goals." Everybody has his or her unique set of personal goals. Such goals can pertain to different life domains--for example, finances, travel, health, politics, family, leisure, friends, education, partnership, profession, and so forth. Examples are *"To extend my part-time job as tourist guide," "To keep in touch with old friends,"* or *"To help my partner cope with unemployment."*

Please take a moment to think about which goals you currently have. How do you want to shape your life in the future? What do you want to attain or realize? What do you want to avoid?

We are interested in those of your goals...
... that you have for the **near** future (i.e., the coming months or years),
... the realization of which is already **currently** important and relevant for you, and
... that you expect will still be relevant for you **in a couple of months**.

In the spaces below, please list your three **most important** goals of that kind. (You will later answer a couple of questions concerning these goals). Please describe your goals with a few words or in short sentences, but with sufficient detail for us to understand what they are about.

Your most important goal
A.
Your second most important goal
B.
Your third most important goal
C.

Relations between your goals...

Below, we are interested in the nature of relations among your goals. For instance, two goals might be related insofar as progress towards one goal might facilitate the realization of the other goal. For example, the pursuit of the goal "to lose weight" might have a positive impact on the goal "to improve my physical fitness". Two goals, however, might also conflict each other. The pursuit of the goal "to find a job abroad," for example, might interfere with the realization of the goal "to spend more time with my family." Of course, two goals might also be independent of each other, that is, have neither positive nor negative effects on each other, as might be the case, for example, for the two goals "to read the newspaper every day" and "to lose weight." Below, you will find a number of questions concerning the relations among **your** personal goals. Each of these questions will address a specific pair of **two** of your goals.

Example:
Assume a person listed "professional success" and "family" as Goals A and B, respectively:

Goal A: professional success
Goal B: family

The questions below address both the impact of pursuing goal A ("professional success") on goal B ("family") as well as the impact of pursuing goal B ("family") on goal A ("professional success").

For example, one question is:
How often can it happen that, **because of the pursuit of Goal A ("professional success"),** you do not invest as much time into **Goal B ("family")** as you would like to?

In the other direction, the question reads:
How often can it happen that, **because of the pursuit of Goal B ("family"),** you do not invest as much time into **Goal A ("professional success")** as you would like to?

When answering the questions that begin on the next screen, please think of *your* personal goals A, B, and C as you have summarized them previously.

Please respond to the following questions with respect to your goals. The following questions refer to your Goals A and B. You have the following response options:

Never/Very rarely	Rarely	Sometimes	Often	Very often
1	2	3	4	5

Goal A: _____

Goal B: _____

How often can it happen that, **because of the pursuit of Goal A** ...

…	you do not invest as much *time* into Goal B as you would like to?	1	2	3	4	5
…	you do not invest as much *money* into Goal B as you would like to?	1	2	3	4	5
…	you do not invest as much *energy* into Goal B as you would like to?	1	2	3	4	5

How often can it happen that ... … you do something in the pursuit of **Goal A** that is *simultaneously* beneficial for Goal B?	1	2	3	4	5
How often can it happen that ... … you do something in the pursuit of **Goal A** that is *simultaneously* beneficial for Goal B?	1	2	3	4	5
… you do something in the pursuit of **Goal A** that is *incompatible* with Goal B?	1	2	3	4	5

How much do the following statements apply to your Goals A and B?

The pursuit of **Goal A** sets the stage for the realization of Goal B	1	2	3	4	5

Notes: Participants respond to these items for each possible combination of two of the three goals (i.e., 6 goal pairs). Each item will explicitly specify the two to-be-compared goals; questionnaire is from Riediger and Freund (2004). Permission to use this measure granted by Dr. Michaela Riediger.

APPENDIX D

GENERALIZED ANXIETY DISORDER-7 QUESTIONNAIRE

GENERALIZED ANXIETY DISORDER-7 QUESTIONNAIRE
(GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006)

Over the <u>last 2 weeks,</u> how often have you been bothered by the following problems?	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Note: Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. No permission required to reproduce, translate, display or distribute.

APPENDIX E

PATIENT HEALTH QUESTIONNAIRE-15

PATIENT HEALTH QUESTIONNAIRE-15
(PHQ-15; Kroenke, Spitzer, deGruy, & Swindle, 1998)

During the <u>past 4 weeks</u>, how much have you been bothered by any of the following problems?

	Not bothered at all (0)	**Bothered a little (1)**	**Bothered a lot (2)**
a. Stomach pain	☐	☐	☐
b. Back pain	☐	☐	☐
c. Pain in your arms, legs, or joints (knees, hips, etc.)	☐	☐	☐
d. Menstrual cramps or other problems with your periods	☐	☐	☐
WOMEN ONLY			
e. Headaches	☐	☐	☐
f. Chest pain	☐	☐	☐
g. Dizziness	☐	☐	☐
h. Fainting spells	☐	☐	☐
i. Feeling your heart pound or race	☐	☐	☐
j. Shortness of breath	☐	☐	☐
k. Pain or problems during sexual intercourse	☐	☐	☐
l. Constipation, loose bowels, or diarrhea	☐	☐	☐
m. Nausea, gas, or indigestion	☐	☐	☐
n. Feeling tired or having low energy	☐	☐	☐
o. Trouble sleeping	☐	☐	☐

Note: Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. No permission required to reproduce, translate, display or distribute.

APPENDIX F

COGNITIVE AND AFFECTIVE MINDFULNESS SCALE-REVISED

COGNITIVE AND AFFECTIVE MINDFULNESS SCALE-REVISED
(CAMS-R; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007)

People have a variety of ways of relating to their thoughts and feelings. For each of the items below, rate how much each of these ways applies to *you*.	**Rarely/Not at all**	**Sometimes**	**Often**	**Almost Always**
1, It is easy for me to concentrate on what I am doing.	1	2	3	4
2. I am preoccupied by the future.	1	2	3	4
3. I can tolerate emotional pain.	1	2	3	4
4. I can accept things I cannot change.	1	2	3	4
5. I can usually describe how I feel at the moment in considerable detail.	1	2	3	4
6. I am easily distracted.	1	2	3	4
7. I am preoccupied by the past.	1	2	3	4
8. It's easy for me to keep track of my thoughts and feelings.	1	2	3	4
9. I try to notice my thoughts without judging them.	1	2	3	4
10. I am able to accept the thoughts and feelings I have.	1	2	3	4
11. I am able to focus on the present moment.	1	2	3	4
12. I am able to pay close attention to one thing for a long period of time.	1	2	3	4

Note: 2, 6, and 7 are reverse scored. Sum of all values reflect greater mindful qualities. Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Permission to use this measure granted by Dr. Greg Feldman.

APPENDIX G

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

DATE:	November 30, 2015
TO:	Liesel Christoe-Frazier, MA
FROM:	University of Northern Colorado (UNCO) IRB
PROJECT TITLE:	[837444-1] The effects of interrelated goals, anxiety, and mindfulness on somatic symptoms
SUBMISSION TYPE:	New Project
ACTION:	APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE:	November 28, 2015

Thank you for your submission of New Project materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

Liesel -

Thank you for an exceptionally well-prepared and thorough IRB application for an interesting study.

There are no modifications that require submission of materials for subsequent review. However, please delete the participant and research signature lines and spaces for dates in your consent form as these are not relevant to your online data collection and your use of a 'no signature' consent form.

Best wishes with your research and don't hesitate to contact me with any IRB-related questions or concerns.

Sincerely,

Dr. Megan Stellino, UNC IRB Co-Chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Sherry May at 970-351-1910 or Sherry.May@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

APPENDIX H

PARTICIPANT INVITATION EMAIL

Dear Student,

Hello! I am contacting you regarding an IRB-approved online survey I am conducting with undergraduate students at the University of Northern Colorado. I am interested in goal-setting processes, and the physical and emotional well-being of the college population. It is my hope that the results of this study will provide the field of psychology with a better understanding of the goal-setting process and how it relates to physical and emotional well-being. I would greatly appreciate your help with this study!

If you are age 18 and older and would like to participate, just click on the link below to be taken to the survey, which is anticipated to take between 15 to 20 minutes to complete.

As a thank you for participating, you will be provided with the option of submitting your email address via a separate link at the end of the survey, to receive a free iTunes download! You are not required to participate in any way, and can exit the survey at any time, should you decide not to continue.

Thank you very much for your time and effort!

Liesel Christoe-Frazier, MA
Doctoral Student
Counseling Psychology
University of Northern Colorado
chri0034@bears.unco.edu

APPENDIX I

PARTICIPANT DEBRIEFING FORM

UNIVERSITY of
NORTHERN COLORADO

DEBRIEFING FORM FOR HUMAN PARTICIPANTS IN RESEARCH
UNIVERSITY OF NORTHERN COLORADO

Project Title:	The Effects of Interrelated Goals
Researcher:	Liesel Christoe-Frazier, MA, Counseling Psychology Department
Phone:	(xxx) xxx-xxxx
E-mail:	chri0034@bears.unco.edu
Faculty Sponsor:	Brian Johnson, PhD; (970) 351-2209; brian.johnson@unco.edu

Thank you for participating! I am primarily interested in your experiences with goal-setting, and how it relates to your physical and emotional well-being. Specifically, how different goal relationships are related to anxiety levels and physical symptoms. Additionally, I am curious about whether or not the ability to be mindful may help to manage these physical symptoms. The information you shared may help the field of psychology better understand the goal-setting process, and how it relates to the physical and emotional well-being of college students.

For further reading on goal-setting, mindfulness, and physical and emotional well-being, see:

Boudreaux, M. J. & Ozer, D.J. (2013). Goal conflict, goal striving, and psychological well-being. *Motivation and Emotion, 37*, 433-443.

Davis, D.M. & Hayes, J.A. (2011). What are the benefits of mindfulness? A practice review of psychotherapy-related research. *American Psychological Association, 48*(2), 198-208. doi: 10.1037/a002206

If you have any questions or concerns about this project, or if you want to know how the results turn out, please contact Liesel Christoe-Frazier at chri0034@bears.unco.edu. You can also contact the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-2161. If after participating you feel as though you have been impacted emotionally or psychologically, please contact the University of Northern Colorado's Psychological Services Clinic at 970-351-1645, where the first session is free and the cost for a semester of services is $60. In the case of an emergency please call 911.