Striving for Wellness: An Exploration of Motivation, Goal Pursuits, and Well-being in an Online Educational Environment

Dissertation

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By

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Abstract

Colleges and universities have been tasked with instilling a comprehensive range of healthy behaviors among student populations. Educational interventions that promote health-oriented knowledge, awareness, and behavioral change have thus become desirable options for institutions of higher education. This study examined an online course that was designed to promote health and wellness by engaging students in a process of striving toward self-selected goals. Students created three personal goals to enhance their well-being based upon a holistic wellness model, and reported progress toward these goals over a nine-week period. The purpose of this study was to determine the motivational constructs that facilitated student engagement with goal pursuits, and the resultant well-being associated with these efforts. The Self-Concordance Model (SCM; Sheldon & Elliot, 1999) was employed as an empirically validated model of motivational influences related to goal attainment and well-being. Data generated by students was used to replicate prior studies using the SCM. Analysis of the data involved regression analyses, bootstrapping procedures for mediation analyses, and the development of a structural equation model to test fit of the SCM as one theorized explanatory framework for course outcomes. Findings indicated that the data from the current study did not align with hypotheses and findings from prior studies using the SCM. Respecifications were necessary to achieve an adequate fit of the structural model to the data from the
These results suggest that self-concordance may not possess the same utility for explaining goal attainment and well-being in the context of an online educational environment. Instead, reported engagement with goal pursuance and the satisfaction of the psychological need for competence were found to be the most significant determinants of goal attainment and well-being. Implications from this study suggest that online educational interventions can effectively enhance participant engagement with health and wellness behaviors, but further exploration is necessary to identify the specific motivational elements that facilitate positive outcomes.
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Chapter 1: Introduction

Wellness is a multidimensional, holistic construct that refers to individual or organizational movement toward actualizing inherent potentialities for health and growth (Dunn, 1961; Hettler, 1980; Myers & Sweeney, 2005a; Roscoe, 2009). On an individual level, wellness represents an emerging paradigm for healthcare that differs from the traditional Western focus on the diagnosis and treatment of acute disease or injury, commonly referred to as the medical model. By contrast, wellness emphasizes health promotion and self-endorsed lifestyle change, which work in combination to promote prevention of chronic disease (Granello & Witmer, 2012a). As such, wellness-guided approaches to healthcare provide a more expansive vision for human functioning, including prevention of illness, enhancement of individual well-being, and maximization of health-oriented lifestyles (Witmer, 2012).

As the wellness paradigm gains traction for reasons related to cost-effectiveness and responsiveness to changing health demographics, the promotion of individual motivation to maintain personal health and wellness has become a critical factor for effective healthcare (Granello & Witmer, 2012a). Therefore, it is necessary for health professionals to gain an understanding of the motivational influences that promote the types of growth-oriented change associated with the wellness paradigm. This study will investigate motivational factors related to the goals of students enrolled in an online wellness course.
Background

Health promotion on college campuses has been identified as a critical factor for overall prevention efforts among the U.S. population (American College Health Association [ACHA], 2012). The number of young adults enrolled in institutions of higher education has risen steadily in both diversity and total number over the past two decades. As of 2012, more than half of all 18- and 19-year olds in the U.S. were enrolled in college. This is the highest enrollment percentage in the history of the U.S. (Freudenberg et al., 2013). Additionally, the population of students who identify as racial and ethnic minorities has doubled over the past four decades, and now represents about one third of the overall student population. The number of students from low income backgrounds has also increased, creating greater socioeconomic diversity on college campuses. Students enrolled in college are therefore now representative of a broader cross-section of the U.S. population, suggesting that institutions of higher education have become a critical setting for addressing gaps in health equality (Freudenberg et al., 2013).

Many colleges and universities have responded to this opportunity by supporting the design of programs intended to enhance the health and wellness of students, faculty, and staff. Healthy Campus 2020 (ACHA, 2012) provides an overarching framework for college personnel to promote healthy student development across many domains including academic achievement, mental and physical health, reduction of harmful behaviors, promotion of supportive social relationships, and overall self-care. The comprehensive range of behaviors addressed within this framework aligns closely with the wellness paradigm for healthcare. Both approaches are concerned with fostering the
ability of the individual to enhance his or her well-being while encouraging the adoption of health-oriented lifestyles across multiple dimensions of human functioning. Therefore, approaches to health promotion on college campuses grounded in the wellness paradigm of healthcare can also support the desired outcomes associated with recommended prevention efforts.

Although the utilization of holistic wellness models and approaches has become prominent in the health promotion efforts of many institutions of higher education, very few empirical studies have been conducted related to the outcomes of these efforts. A bulk of the studies detailed in the research literature that have employed a holistic framework for wellness were undertaken to describe overall wellness levels for particular population demographics (Myers & Sweeney, 2008). For instance, LaFountaine, Neisen, and Parsons (2006) distributed a holistic wellness assessment to newly enrolled college students (N=1007) to contrast the overall functioning of first year students with normative scores for the overall undergraduate population. Similarly, Myers and Mobley (2004) collected data from wellness assessments distributed to undergraduate students (N=1567) to explore differences in scores between traditional and non-traditional students. Findings from these types of studies suggest that targeted interventions and wellness education could promote the adoption of healthy behaviors. However, few outcome studies have been conducted to determine the effects of holistic wellness interventions.

One of the approaches to promoting health-oriented behaviors among student populations that has been implemented and studied is the provision of academic courses
that emphasize wellness education (Choate & Smith, 2003; Conley, Travers, & Bryant, 2013; Myers & Sweeney, 2008). Choate and Smith (2003) conducted a study that involved the integration of wellness education into the course curriculum of first year survey classes. Participants (N=59) demonstrated increased scores on a wellness assessment that they completed at the beginning and end of the semester. Similarly, Conley, Travers, and Bryant (2013) used a quasi-experimental design to study the effect of student engagement in an eight week wellness seminar for first year students. Students in the seminar (N=29) showed no differences from participants in the control group (N=22) at the beginning of the study, but reported greater capacities for stress management and psychosocial adjustment by the end of the educational intervention. Although these two isolated studies show promise for the potential effect of wellness education, the lack of broad evidence suggests that it would be beneficial to gain a better understanding of the effects and outcomes of educational interventions intended to promote college student health. Of particular interest are the motivational processes that facilitate or undermine the initiation and adoption of healthy behaviors, as the ultimate goal of health promotion among college students is the incorporation of health enhancing practices into students’ ongoing lifestyles.

Self-Determination Theory (SDT; Deci & Ryan, 1985, 2000) is a theory of motivation that offers an empirical basis for exploring human functioning. SDT has been extensively applied to the study of educational processes and outcomes, with a particular interest in how educational settings support or forestall development and growth (Ryan & Deci, 2000, 2009). SDT hypothesizes that different contexts support or undermine
satisfaction of basic psychological needs. Need satisfaction, in turn, facilitates a process of internalization, through which external values are integrated into more autonomous, or self-determined forms of motivation for identified activities (Niemiec & Ryan, 2009). Autonomous forms of motivation, as opposed to controlled forms of motivation, have been linked with adaptive learning outcomes and improved adherence to new behaviors (Vansteenkiste, Lens, & Deci, 2006; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). Therefore, SDT is proposed as a theory that has utility for identifying the processes that facilitate the adoption of healthy behaviors in educational settings.

The Self-Concordance Model (SCM; Sheldon & Elliot, 1999) is grounded in SDT, with a particular focus on goal striving, motivation, and psychological well-being (Smith, Ntoumanis, & Duda, 2007). The central premise of the SCM is that for each individual, some goals are better than others for enhancing mental health and well-being (Ryan, Sheldon, Kasser, & Deci, 1996), because they align more fully with the underlying interests, values, and needs of the individual (Sheldon, 2014; Sheldon & Elliott, 1999). The model is comprised of two stages, the first of which represents the theorized relationship between self-concordance and goal attainment (see Figure 1).

The first component of this stage of the model is the construct of goal self-concordance, which represents the degree to which individuals perceive selected goals as representative of internal values and interests. Organismically congruent (i.e. self-concordant) goals are defined as those pursued more for autonomous reasons than controlled reasons, and more oriented toward intrinsic outcomes than extrinsic outcomes (Sheldon & Elliot, 1998; Sheldon & Kasser, 1998). Goals based upon external or
introjected values are considered to be premised on controlled motives, whereas goals based upon identified or intrinsic values are experienced as autonomous, and more self-concordant. According to the propositions of the SCM, goal self-concordance is predictive of the likelihood that individuals may achieve the goals that they have selected. This achievement is termed goal attainment, the third component of the model. However, in the studies that led to the creation of the SCM, Sheldon and Elliot (1998) found that the presence of persistent sustained effort toward achieving goals over time mediates the relationship between goal self-concordance and goal attainment. Therefore, the primary hypothesis for the first stage of the model is that self-concordant goals are more likely to be achieved than less self-concordant goals, due to the presence of sustained effort toward goal attainment (Sheldon & Elliot, 1999).

The second stage of the model represents the theorized relationship between goal self-concordance and well-being. Need satisfying experiences, the fourth component of the model, is a construct used to bridge the components that make up the first stage of the model with changes in well-being, the final component of the model. Multiple motivational theories have identified goal attainment as a determinant of well-being. For instance, cognitive-behavioral theories of motivation (Bandura, 1989; Locke & Latham,
1990) propose that efficacy beliefs predict progress toward goal attainment, and state that both progress toward and attainment of goals result in improved well-being. By contrast, organismic perspectives toward motivation like Self-Determination Theory suggest that it is the experience of the satisfaction of psychological needs (i.e. autonomy, competence and relatedness) that results in well-being, and that both the quality of one’s progress toward goal attainment along with the efficacy of progress are important determinants of need satisfaction.

Research involving the SCM has identified two constructs that are predictive of need satisfying experiences. Goal attainment is a significant predictor of need satisfaction in and of itself. Additionally, goal self-concordance interacts with progress toward and evaluation of goal attainment. The attainment of goals based upon controlled reasons is less likely to enhance well-being than the attainment of goals pursued for autonomous reasons, as autonomous goals are more closely linked with valued personal growth and development (Smith, Ntoumanis, & Duda, 2007). Stated differently, goal self-
concordance has been shown to moderate the effect of goal attainment on need satisfaction (Sheldon & Kasser, 1998). Therefore, the interaction of goal self-concordance and goal attainment (i.e. goal self-concordance x goal attainment) is included in the SCM as a significant predictor of need satisfying experiences. Taken as a whole, the second stage of the SCM hypothesizes that the interaction between goal self-concordance and goal attainment, along with goal attainment as an isolated construct are both predictive of need satisfying experiences. In turn, need satisfying experiences are considered to be predictive of changes in well-being, the final component of the SCM (Sheldon, 2014; Sheldon & Elliot, 1999).

Self-determination theory in general, and the self-concordance model more specifically may be useful sources for understanding the circumstances through which individuals are most likely to achieve wellness-related goals that produce a greater sense of well-being. The human capacity to create and pursue personal goals is an essential component of wellness philosophy that is often utilized in practice settings including individual consultations, group work, and educational environments (Granello & Witmer, 2012a). One example of an exercise in the utilization of goals to enhance personal wellness is found in an online course for undergraduate and graduate students at a large, Midwestern research university. In this class, titled “Wellness: Achieving a Healthy Lifestyle,” students complete modules that explore the different component areas of a holistic wellness model. Learning objectives for the class include increasing student knowledge about wellness and promoting the adoption of healthy behaviors. As a course assignment, students complete a wellness assessment and create three goals and
associated behavioral objectives for wellness domains that are self-identified as areas of potential growth. Over the duration of the semester, students complete surveys to report their engagement, persistence, and affective responses and outcomes to the goals that they have created. An understanding of the motivational processes that accompany this process of goal striving and its associated outcomes could help to generate and clarify best practices in the utilization of online education for the promotion of healthy behaviors.

Very few studies have used SDT as an organizing framework for research related to online learning environments. Chen and Jang (2010) tested a model for learner motivation in online teaching certificate programs. Their model explored interrelationships between contextual support, need satisfaction, autonomous motivation, and learning outcomes. Findings from this study indicated that students who reported need satisfaction (perceived autonomy, competence, and relatedness) also showed higher levels of autonomous motivation and improved learning outcomes. However, when need satisfaction was not present, autonomous motivation was no longer associated with learning outcomes. This finding counters the results of other studies that have explored SDT in more traditional educational settings (e.g. Black & Deci, 2000) and may be based upon the fact that controlled forms of motivation can also sustain behavioral change as long as the external stimulus that reinforces the behavior is present (e.g. Ryan & Deci, 2007). As an example, for the duration of a course, the external stimulus of grading may prompt student engagement in new behaviors and temporary knowledge acquisition. However, SDT suggests that students must internalize and integrate these behaviors in a
manner that produces more autonomous forms of motivation in order for them to be sustained beyond completion of the course. Further exploration is needed to understand whether and how the SCM, which is grounded in SDT, is representative of the processes of goal striving and goal outcomes in the domain of online education.

Statement of the Problem

Colleges and universities are tasked with the promotion of healthy behaviors, and are increasingly utilizing wellness-based approaches to health promotion. Different strategies have been utilized to promote student wellness, including the integration of wellness principles and practices into course curricula. Modalities for these courses include online educational settings with a specific focus on wellness education. However, few studies have been conducted regarding outcomes related to these educational interventions. Moreover, the studies that have been conducted have examined direct outcomes, rather than seeking to identify the underlying motivational mechanisms that facilitate internalization of new behaviors and values.

Several additional studies have explored student motivation related to communication and collaborative learning assignments in online environments (Giesbers, Rienties, Tempelaar, & Gijselaers, 2013, 2014; Rienties, Tempelaar, Van den Bossche, Gijselaers, & Segers, 2009). Although findings from these studies have been largely inconclusive, they are referenced here because they represent almost all of the literature regarding utilization of SDT in online learning environments. This gap in the literature suggests that future studies could contribute to a greater understanding of motivation in online coursework. Therefore, this study proposes to examine the utility of the Self-
Concordance Model for understanding the adoption and maintenance of health-enhancing behaviors in an online college course and the outcomes linked with those goals.

**Purpose of the Study**

The study will utilize a quantitative design to test the proposals of the self-concordance model in an online education setting that makes explicit use of goal striving to achieve wellness-oriented outcomes. Participants will be students enrolled in an online wellness course at a large, Midwestern university. It is anticipated that the sample for the study will primarily identify within a traditional undergraduate age range of 18-22 years old, although some graduate, professional, and non-traditionally aged undergraduate students may also be included in the sample based upon course enrollment. Measures will include goal self-concordance, sustained effort, goal attainment, satisfaction of basic psychological needs (autonomy, competence, and relatedness), and psychological well-being.

Goal self-concordance will be considered to examine the associations of goal motives with other variables in the model. Goals that are endorsed as more autonomous are hypothesized to be positively associated with sustained effort toward goal attainment, whereas goals that are based more upon controlled motives are hypothesized to be negatively associated with sustained effort toward goal attainment. Because it is expected that sustained effort will be predictive of goal attainment, the association of goal self-concordance with goal attainment is hypothesized to be mediated by effort. Both goal attainment and goal self-concordance have been positively linked with psychological need satisfaction, which in turn is hypothesized to be positively associated with well-being.
being. Therefore, the association between goal self-concordance, goal attainment, and well-being is hypothesized to be mediated by need satisfaction (Sheldon & Elliot, 1999; Smith, Ntoumanis, & Duda, 2007). Sheldon and Elliot (1999) suggest that the SCM may require modification as goal attainment may positively impact well-being, independent of goal motive or need satisfaction. This study proposes to apply the model to data derived in an online course setting to determine the stability of previously observed relationships among these variables for this particular context.

**Significance of the Study**

Colleges and universities have been tasked with instilling healthy behaviors among student populations. Despite many organizational efforts to promote lifestyle changes, there is little empirical evidence to guide best practices regarding holistic development of wellness-oriented behaviors. Several studies have suggested that wellness curricula can support growth in knowledge and behavioral change (Choate & Smith, 2003; Conley, Travers, & Bryant, 2013) although this subject has not been explored in online educational settings. Because online courses can be scaled to reach very large populations, they may provide an effective educational intervention for initiating health-enhancing change processes among broad audiences. However, there has only been minimal empirical exploration regarding the motivational mechanisms that support student learning in online education courses. Increased understanding of the motivational influences that impact outcomes related to online learning formats can therefore provide valuable knowledge for shaping effective online educational interventions.
As the course in question for this study relies upon a central task of asking students to set and work toward wellness-oriented goals, it is particularly important to examine motivational influences related to goal striving and outcomes associated with greater well-being. It is fitting to use goals to work toward health and wellness-oriented outcomes as the pursuit of personal goals has been linked with a wide variety of positive lifestyle changes (Austin & Vancouver, 1996; Emmons, 1989). Additionally, goals are closely linked to motivational theory, as they help to articulate and shape behavior, direct energy to particular activities, and can encourage persistence and self-regulation (Sheldon, 2014). Utilization of the self-concordance model to explore course outcome data offers an opportunity to test the fit of an empirically supported model that may help to explain students’ ability to attain goals and experience greater well-being. This in turn may contribute to refining course design to promote greater goal striving that will ultimately yield health and wellness outcomes in a format that can be employed with large populations. Findings from this study may therefore generate multiple educational interventions that more effectively promote healthy lifestyle behaviors across broad population segments while simultaneously addressing the gap in knowledge related to the motivational influences present in online course delivery systems.

**Primary Research Questions**

The research questions that this study will assess the fit of the self-concordance model (SCM; Sheldon & Elliot, 1999) to students’ reported experience of setting and working toward wellness-oriented goals in an online university course. Goal self-concordance, sustained effort, goal attainment, psychological need satisfaction, and well-
being will be considered as they represent the core components of the SCM. The research questions incorporate these elements in order to align with the propositions of the SCM, as follows:

1) Is goal self-concordance predictive of goal attainment for wellness-oriented goals selected by students in an online course?

2) Does sustained effort toward goals mediate the relationship between goal self-concordance and the goal attainment for students in an online course?

3) Are goal self-concordance and goal attainment predictive of changes in well-being for students in an online course?

4) Does the self-concordance model provide a good fit for the data generated by students completing a goal oriented assignment in an online wellness course?

**Hypotheses**

The hypotheses for this study are based upon the SCM and the research questions articulated above. The first stage of the model is concerned with the relationship between goal motives, effort expended in goal striving, and goal attainment. It is hypothesized that the degree to which goal motives are self-concordant is predictive of sustained effort, which results in a greater likelihood of goal attainment. More autonomous goal motives (i.e. self-concordant goals) are hypothesized to positively predict effort toward goal attainment, while more controlled goal motives are hypothesized to result in diminished effort over time, resulting in decreased likelihood of goal attainment. In prior iterations of the course in question for this study, students have reported high levels of goal attainment. Differences in goal attainment based upon goal motives may therefore be
difficult to observe. This may be due to the fact that the context of the course is both time-sensitive and evaluative, so even controlled goal regulations may be sufficient to sustain effort over the period of enrollment. However, it is necessary to test this hypothesis as a clear understanding of the influence of goal motives will enhance future practices in framing goal-oriented assignments in online coursework.

The second stage of the SCM is concerned with the relationship between variables of goal self-concordance, goal attainment, psychological need satisfaction (i.e. needs for autonomy, competence, and relatedness), and well-being outcomes. Goal motives are hypothesized to moderate outcomes related to goal attainment, such that the attainment of autonomous, or self-concordant goals is hypothesized to be positively associated with the satisfaction of psychological needs. By contrast, the attainment of goals associated with controlled goal motives is hypothesized to be unrelated to psychological need satisfaction. Need satisfaction, in turn, is hypothesized to be positively associated with outcomes related to well-being.

Prior research with the SCM (Sheldon & Elliot, 1999) has indicated that goal attainment may be independently predictive of well-being, although no conclusions have been drawn based upon this finding. It may be worthwhile to explore the influence of goal attainment on each of the various components of psychological need satisfaction, rather than using an aggregate variable for need satisfaction. The three basic psychological needs that SDT proposes as universally essential for human development and flourishing are competence, relatedness, and autonomy (Ryan, 1995). Competence refers to the ability to feel effective when exploring or interacting with one’s
environment, and leads to actively seeking challenges that promote increased functioning (Deci & Ryan, 2000). The need for competence is fulfilled through experiences where individuals are able to realize their desired outcomes (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Relatedness concerns the experience of giving and receiving care and love with significant others and feeling a sense of belonging (Ryan & Deci, 2000). The need for relatedness is satisfied by the experience of feeling interconnected with others (Reis et al., 2000). Autonomy refers to the ability to choose and commit to a particular course of action in a manner that aligns with one’s character and values (Deci & Ryan, 2000). Each of these needs is considered to contribute independently to an individual’s capacity to thrive (Filak & Sheldon, 2003). Conversely, when these needs are neglected, well-being is diminished, and when undermined, the likelihood of pathology and negative outcomes increases. Therefore, the satisfaction or absence of psychological needs can be predictive of either thriving or pathology (Vansteenkiste & Ryan, 2013).

Goal attainment has the potential to satisfy the psychological need for competence independent of goal motives. In other words, individuals may feel more competent upon attaining a goal, regardless of whether the goal was selected for autonomous or controlled reasons. Satisfaction of the need for competence may promote psychological well-being even in the absence of enhanced autonomy or relatedness. Thus, it may be beneficial to explore the relationship between goal attainment and each of the psychological needs, while also examining the independent contribution of each of the need variables to well-being. It is hypothesized that goal attainment will be positively associated with satisfaction of the need for competence, independent of goal self-concordance. This
association may help to explain the direct relationship between goal attainment and psychological well-being that has been observed in prior studies (Sheldon & Elliot, 1999; Smith, Ntoumanis, & Duda, 2007).

Null hypotheses for the first stage of the model are that goal motives are not predictive of sustained effort or goal attainment. Alternative hypotheses for the first stage of the model are that more autonomous goal motives will negatively predict student effort and goal attainment, and that more controlled goal motives will positively predict student effort and goal attainment. Null hypotheses for the second stage of the model are that there is no association between goal attainment, goal motives, and need satisfaction, and that there is no association between need satisfaction and well-being. Alternative hypotheses for the second stage of the model are that there is a negative association between goal attainment and need satisfaction, or a negative association between need satisfaction and well-being. The null hypothesis for the final assertion is that goal attainment is not associated with satisfaction of the need for competence, and the alternative hypothesis is that goal attainment is negatively associated with perceived competence.

Research Design

The study will utilize structural equation modeling, a quantitative statistical procedure intended to test the relationships between the hypothesized variables and constructs of a theoretical model (Schumacker & Lomax, 2010). More specifically, the study will use structural equation modeling to explore the fit of the self-concordance model to data generated by participants in an online wellness course to determine if prior
assumptions regarding goal self-concordance, effort, goal attainment, need satisfaction, and psychological well-being hold true in an online educational setting.

Participants

The participants for this study will be recruited from students enrolled in an online elective course titled *Wellness: Achieving a Healthy Lifestyle* at a large, Midwestern public research university. Because this course is offered as a general elective, no field of study is particularly associated with enrollment, so students should be generally representative of the campus population. Participants will be at least 18 years of age, will give their consent to participate in this study, and will be enrolled as a student at the university. Undergraduate, graduate, and professional students are eligible to enroll in the course. However, the percentage of graduate and professional students enrolled in the course is much smaller than the undergraduate enrollment, so the participant population is likely to be primarily comprised of undergraduate students. In three recent course offerings, enrollment numbers were 200 (Spring semester 2013), 95 (Autumn semester 2013), and 250 (Spring semester 2014). The course is projected to increase in enrollment as the staff who coordinate the course have actively promoted the course to academic advisors at the university, and additional graduate associates have been allocated to facilitate future course offerings. The population proposed for this study will be recruited from this course offering. Basic demographic information will be gathered, including sex, year in school, race, age, and citizenship.
Measures

**Goal Self-Concordance.** Participants will complete a goal setting assignment for the course that requires each student to select three particular wellness dimensions and write one goal and associated objectives for each area. As an example, a participant may select the dimension of physical wellness, write a goal for this area (e.g. “I will lose 5 pounds this semester”) and then create three specific and measurable objectives to track progress toward goal attainment (e.g. “I will work out for 45 minutes at least three times each week,” “I will eat at least one fruit or vegetable serving with each meal,” “I will drink at least 8 cups of water per day for the semester”). Once students have selected three goals, goal self-concordance will be measured using idiographic goal methodology that has been established for use with self-concordance research (Ryan & Connell, 1989; Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001; Sheldon & Kasser, 1998). Participants will be asked to rate each of their goals using a Likert-type scale from 1 (**not at all for this reason**) to 7 (**completely for this reason**) to rate statements representative of external (e.g. “You are pursuing this goal because someone else wants you to or the situation demands it”), introjected (e.g. “You are pursuing this goal because you would feel ashamed, guilty, or anxious if you didn’t”), identified (e.g. “You are pursuing this goal because you really believe it’s an important goal to attain”), or intrinsic (e.g. “You are pursuing this goal because of the fun and enjoyment that it provides you”) regulations (Sheldon & Elliot, 1999). Identified and intrinsic scores for all three goals will be summed to produce an overall autonomous goal motive score, and external and introjected scores will be summed to produce a controlled goal motive score. An
aggregate self-concordance score for each participant will be computed by subtracting the controlled goal motive score from the autonomous goal motive score.

**Effort and Goal Attainment.** Participants will be asked to complete a brief biweekly survey five times between goal selection and the end of the course to assess their progress and effort toward their goals. As per Sheldon and Elliot (1999) items will include prompts for effort (e.g. “How hard are you trying to work toward this goal?”) and attainment (e.g. “How well are you doing in making progress toward this goal?”).

Aggregate variables for both effort and attainment will be created by averaging the self-reported scores for all three goals.

**Need Satisfaction.** Satisfaction of the three basic psychological needs articulated by self-determination theory will be measured using items from instruments that have demonstrated adequate reliability and validity in prior studies. Autonomy will be measured using six items from Standage, Duda, and Ntoumanis (2005). Competence will be measured using six items from the perceived competence subscale of the Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989). Relatedness will be measured using five items from the acceptance subscale of the Need for Relatedness Scale (Richer & Vallerand, 1998).

**Psychological Well-Being.** Well-being outcomes will be measured at two separate times during the course using the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Tellegen, & Clark, 1988). The first implementation will occur concurrent with the goal setting assignment in week 6, and the second implementation will occur concurrent with the final course survey in week 15, creating a T1 and a T2
variable for well-being. This instrument was selected as it has been utilized in prior studies exploring the self-concordance model (Sheldon & Elliot, 1999; Smith, Ntoumanis, & Duda, 2007).

**Procedure**

All students enrolled in the course “*Wellness: Achieving a Healthy Lifestyle*” will be invited to participate in this study. Participants will complete an initial survey that contains demographic items and a form for informed consent at the beginning of the semester. All other measures associated with the study will be included in standard course surveys and assignments, so no additional requirements will be placed upon students who choose to participate in this research study. Data will be obtained through the distribution of electronic surveys. Students will complete items that measure goal self-concordance and well-being upon completion of the goal setting assignment. Items that assess effort and goal attainment will be administered through the goal tracking survey that students submit biweekly between the completion of the goal setting assignment and the end of the course. Items related to need satisfaction and well-being will be included on the final course survey. The measures will be analyzed through computing frequencies and running regression analyses prior to testing all hypothesized constructs and paths in a structural equation model using LISREL 9.2 (Jöreskog & Sörbom, 2015).

Each of the research questions for the study will be addressed by specific analytic procedures in a manner that replicates prior studies using the SCM in educational environments. The first research question for this study explores whether goal self-
concordance is linked with goal attainment. Bivariate correlations will be generated for all of the major study variables, with particular attention given to the relationship between goal self-concordance and goal attainment for all participants. It is hypothesized that there will be a positive relationship between the two variables. The second research question asks whether effort mediates the relationship between goal self-concordance and goal attainment. A bootstrapping approach to mediation analysis will be conducted using PROCESS (Hayes, 2013) to explore the relationship between these three variables. It is hypothesized that effort will mediate the relationship between self-concordance and goal attainment.

The third research question explores the relationship between goal self-concordance, goal attainment, and well-being. Regression and mediation analyses will be conducted to explore the relationship among these variables. The first analysis will involve $T_2$ Well-being as the dependent variable and $T_1$ Well-being, goal attainment, self-concordance, and the interaction of goal attainment and self-concordance as independent variables. It is hypothesized that goal attainment will be predictive of well-being, that self-concordance will not be a significant predictor, and that the interaction between self-concordance and goal attainment will be a significant predictor indicating that the association between attainment and changes in well-being is stronger for participants with more self-concordant goals. A second analysis will be conducted to explore the proposed bridge of need satisfaction between the first and second stages of the SCM. The analysis will regress the variable for global need satisfaction on variables of self-concordance, goal attainment, and the interaction variable of self-concordance and goal
attainment. It is hypothesized that goal attainment, self-concordance, and the interaction between goal attainment and self-concordance will all be significant predictors of need satisfying experiences.

Additional regression analyses will explore the relationship of need satisfying variables with well-being. The current study will expand upon prior studies (e.g. Sheldon & Elliot, 1999) by conducting two distinct analyses of these variables. The first will regress T2 Well-being on T1 Well-being and an aggregate variable for global need satisfaction. The second will separate the need satisfaction variable into components of autonomy, competence, and relatedness to explore the individual contributions of each measure of need satisfaction. It is hypothesized that all need satisfying variables will be predictive of well-being. A final bootstrapping mediation analysis will be conducted using PROCESS (Hayes, 2013) to determine whether need satisfaction mediates the relationship between goal attainment and well-being. It is hypothesized that need satisfying variables will mediate the influence of goal attainment on well-being.

Each of the preceding analyses will be conducted to establish all of the component parts of the self-concordance model in preparation for the fourth research question, which explores whether the SCM provides a good fit for the data generated by participants who have completed a goal oriented assignment in an online wellness course. A structural equation model (SEM) will be constructed to validate the entire model simultaneously. The initial model will specify paths between the variables as per the SCM as represented in Figure 2 (please refer to page 7). It is hypothesized that the SCM will provide a good fit for the data, indicating that the theoretical assumptions of the
model supported by prior investigations will similarly hold true in online educational environments.

**Limitations**

This study has several limitations. Students in this online course have self-selected to participate in a general elective on wellness. Therefore, the sample for this study may not be representative of general undergraduate and graduate student populations. Findings related to this study should therefore be balanced with an awareness that the students sampled may already possess intrinsic motivation to initiate healthy behaviors, or dispositions to maintain these behaviors over time. Future studies could address this limitation by exploring the role of motivational processes in goal-related behaviors when all students are required to participate (e.g. first year survey courses that incorporate wellness education).

Additionally, there are only limited studies that have applied the tenets of self-determination theory in online learning environments. Findings from these studies have not always aligned with results in more traditional face-to-face educational settings. It does not appear that the self-concordance model has ever been tested in an online setting. Therefore, this study is proposed to further understand how these theoretical propositions function in online educational settings. Future studies can build upon this findings from this study for greater clarity regarding motivational principles in online environments.

Finally, although structural equation modeling provides a quantitative analysis of theoretical models, the research design does not meet the standards of an experimental study. Therefore, it is not advised to interpret findings from this study as evidence of
causal relationships that promote healthy behaviors, but rather as a means of exploring the application of a particular theoretical model for online learning environments. Future experimental studies could be conducted that utilize findings from this study. For instance, outcomes for goal attainment and well-being could be compared between two class sections after manipulating factors within one of the sections to augment the presence of motivational constructs identified as significant predictors by the current proposed study. This would provide a logical extension of this study that could produce generalizable findings which could inform the promotion of healthy behaviors suggested by Healthy Campus 2020 (ACHA, 2012) in a manner facilitates the establishment of healthy lifestyles among college students.

**Definition of Key Terms**

Several terms related to motivational theory, wellness, and goal setting will be utilized frequently for this study. The following terms are defined here for the sake of clarity, and to address how they should be understood in the context of this study:

*Autonomy*. Autonomy refers to the basic psychological need for choice or self-determination in one’s actions (Smith, Ntoumanis, & Duda, 2007).

*Competence*. Competence refers to the basic psychological need to experience mastery and produce valued results (Smith, Ntoumanis, & Duda, 2007).

*Goal motives*. Goal motives refer to individual reasons for selecting various goals. Autonomous goal motives refer to goals that are pursued based upon identification, interest, or enjoyment. Controlled goal motives refer to goals that are pursued based upon external pressures to comply or introjected notions (Sheldon & Elliot, 1999).
Goal striving. The proactive efforts of individuals to attain desired outcomes and meet their needs (Emmons, 1989).

Motivational regulations. Qualities of motivation that can be conceptualized along a continuum reflecting the extent to which resultant behaviors are self-determined. Regulations include controlled (e.g. external, introjected) and autonomous (e.g. identified, intrinsic) types of motivation (Smith, Ntoumanis, & Duda, 2007).

Relatedness. Relatedness refers to the basic psychological need to feel a sense of belonging within one’s social environment (Smith, Ntoumanis, & Duda, 2007).

Self-Concordance. The degree to which one’s stated goals align with and express one’s enduring interests and values (Sheldon & Elliot, 1999).

Well-being. An individual’s cognitive and affective evaluations of his or her life. Subjective well-being involves the experience of positive emotions, low levels of negative moods, and life satisfaction (Diener, 1994).

Wellness. A multidimensional, holistic construct that refers to individual or organizational movement toward actualizing inherent potentialities for health and growth (Myers & Sweeney, 2005a).

Summary

Many colleges and universities desire the capacity to support the development of health and wellness-oriented behaviors among student populations. However, little empirical evidence is available to guide best practices that may produce these outcomes. There is evidence to suggest that wellness curricula can support growth in knowledge and behavioral change (Choate & Smith, 2003; Conley, Travers, & Bryant, 2013). Because
online courses represent an educational modality that can be scaled to large populations, they may provide an ideal delivery format to promote the initiation and adoption of health and wellness behaviors among broad audiences. Only minimal empirical evidence exists regarding the motivational mechanisms that support student learning in online education courses. Therefore, increased understanding of the motivational influences that impact outcomes related to online learning formats can provide valuable knowledge for shaping effective online learning environments.

The context for this study will be one particular online course that has been designed to promote knowledge about wellness while encouraging students to engage with growth-oriented behavioral change. Given that the core assignment for this course is an exercise in setting and striving toward self-selected goals, this study proposes to examine the motivational influences related to goal striving and its associated outcomes. The Self-Concordance Model (SCM; Sheldon & Elliot, 1999) will be employed as an empirically validated model of motivational influences related to goals. Utilization of the SCM may help to understand the motivational constructs that contribute to students’ abilities for attaining goals and enhancing personal well-being. The knowledge generated by this study will contribute future course offerings by allowing instructors to refine the course design to promote greater goal striving, with a goal of producing health and wellness outcomes. Additionally, these findings may have broader implications as the class represents a potentially viable public health intervention that can be readily reproduced and implemented in multiple settings with large populations.
Chapter 2: Review of the Literature

Motivation is central to the study of human behavior. However, the word motivation is also used in conversational language with enough frequency that its true value and utility for understanding behavior may be masked. A more formal articulation of motivation refers to the universal, internal state that generates and drives action and determines its direction and maintenance (Hagger & Chatzisarantis, 2007). Motivation lies at the core of many theories within education, psychology, counseling, and the social sciences, including Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000). SDT is a theory of human motivation, development, and wellness that has generated a broad base of empirical support. Unlike many motivational theories, SDT is more concerned with quality than quantity, defining motivation by varying types, rather than relative amounts of motivation within a single category. Thus, SDT describes a typology of motivation, based primarily on the degree to which behaviors are autonomous, or self-determined (Hagger & Chatzisarantis, 2007). Each of the various types of motivation identified by SDT has been studied extensively, including the relationship of each with associated outcomes related to human well-being (Deci & Ryan, 2008). Therefore, SDT may be a particularly useful theory for exploring the psychological processes that support or undermine progress toward goals for holistic wellness.
Types of Motivation

The broadest categories of motivation within SDT are termed intrinsic motivation, extrinsic motivation, and amotivation. The fundamental stance of SDT is to view human beings as inherently curious, interested in learning, committed to growth, able to master new skills, and actively seeking outlets to utilize innate talents (Ryan & Deci, 2007). When this inherent disposition toward active development, growth, and interest in new activities is evident in the absence of external influences or rewards it is termed *intrinsic motivation*. In SDT, intrinsic motivation refers to participation in or enactment of an activity based entirely upon the satisfaction that is inherent within the activity (Ryan & Deci, 2000). The concept of intrinsic motivation is rooted in an oppositional stance to prior research that described behavior as a wholly controlled by environmental reinforcers (Skinner, 1953) or motivated by reinforcements linked to primary biological drives (Hull, 1943). By contrast, SDT describes intrinsic motivation as innate, and suggests that engagement in intrinsically motivated tasks can generate rewards linked to feelings of psychological satisfaction and movement toward more optimal functioning (Ryan & Deci, 2007).

Although intrinsic motivation is viewed as a fundamental human quality, the extent to which an individual is able to realize and act upon sources of intrinsic motivation may vary based upon his or her personal development or contextual surroundings (Ryan & Deci, 2000). While SDT does not consider environmental factors as the cause or source of motivation, the theory acknowledges that an individual’s social context may either facilitate or undermine motivation. When intrinsic motivation is
nurtured by one’s social context, it can actuate and activate growth potentials. However, intrinsic motivation can also be inhibited by social environments that exert controlling means. For instance, external rewards can undermine intrinsic motivation because the reward is generally contingent upon performance or completion of a task. This contingency reinforces the perception of an external *locus of causality*, a term which indicates the degree to which individuals perceive their behaviors to be freely chosen (Deci, Koestner, & Ryan, 1999). Other external influences, including deadlines, evaluations, and imposed goals may similarly diminish intrinsic motivation by reducing autonomy. By contrast, intrinsic motivation is enhanced by an internal locus of causality, which could be reinforced by factors including the perception of choice, acknowledgment of emotions, and opportunities for self-direction, primarily because these factors facilitate a heightened sense of autonomy (Ryan & Deci, 2000).

However, many activities are not intrinsically motivated. Activities that are not inherently interesting often comprise a substantial portion of the actions an individual may pursue in a typical day. They may be undertaken as a response to social pressures or demands, or in order to assume new responsibilities (Ryan & Deci, 2000). Alternatively, people may possess extrinsic reasons for engaging in non-intrinsic activities, including desires for greater health, attractiveness, or recognition (Ryan & Deci, 2007). SDT broadly classifies non-intrinsic motivation as either *amotivation* or *extrinsic motivation*. In contrast to intrinsic motivation, which indicates the enactment of activities based wholly on interest, enjoyment, and inherent satisfaction, amotivation refers to the process of going through the motions of a task without any interest or connection (Ryan & Deci,
Amotivation may result from a perceived lack of competence for an activity or from a sense that the behavior or activity has little to no value (Ryan & Deci, 2007). Although it is possible for individuals to be autonomous in their lack of motivation for engaging in activities (Vansteenkiste, Lens, De Witte, De Witte, & Deci, 2004), amotivation is more frequently correlated with a perceived lack of autonomy. Therefore, amotivation is typically associated with suboptimal functioning, negative experiences, and detrimental consequences, especially when it is directed toward activities that possess clear benefits (Ryan & Deci, 2007).

Extrinsic motivation concerns all behaviors that are motivated by expected outcomes, when those outcomes are either separable from or not inherent to the activity itself. SDT proposes that these categories of motivation can be conceptualized as existing along a continuum of autonomy, based upon the degree to which the motivation emanates from or reflects the self (Ryan & Deci, 2007). Stated differently, the continuum of autonomy, ranging from amotivation through extrinsic motivation to intrinsic motivation refers to the degree to which the associated behaviors or activities are self-determined (Ryan & Deci, 2000). This representation reinforces the SDT assertion that intrinsic and extrinsic motivation should not be conceptualized in a bipolar manner. Instead, people are understood as typically possessing both intrinsic and extrinsic motives that are simultaneously present in any given activity (Ryan & Deci, 2007). Moreover, studies grounded in SDT have demonstrated that extrinsic motivation does not necessarily undermine intrinsic motivation. This observation prompted a shift in theoretical assumptions. Although the original emphasis of SDT focused on differences between
intrinsic and extrinsic motivation, empirical evidence has demonstrated that a more useful distinction can be drawn between autonomous versus controlled forms of regulation (Vansteenkiste, Lens, & Deci, 2006). Autonomous regulations may be extrinsic or intrinsic, and are differentiated from controlled regulations based upon the extent to which the external regulation of the behavior has been *internalized* by the individual.

**Internalization**

SDT conceptualizes internalization as an active process by which individuals attempt to transform social norms and expectations into personally endorsed values. When external regulations are fully assimilated, individuals can be self-determined in enacting them because they more fully identify and accept them as their own (Deci & Ryan, 2000). The process of internalization is facilitated by the satisfaction of psychological needs for autonomy, competence, and particularly relatedness. The desire to feel connected to others plays a significant role in determining the degree to which an individual internalizes norms, values, beliefs, and behaviors of others (Vansteenkiste, Lens, & Deci, 2006).

SDT has identified four different types of extrinsic motivation for behaviors that vary based upon the degree of internalization, ranging from those that are experienced as externally controlled to those that are personally valued. Two of these types of extrinsic motivation are conceptualized as controlled forms of behavior. However, two types of extrinsic motivation align with a greater sense of internalization, such that they are considered relatively autonomous forms of behavior (Vansteenkiste et al., 2004). Each of
Figure 3. Types of motivation according to Self-Determination Theory (Clayton, 2015).

these types of motivation affects the overall capacity of the individual for persistence and well-being differently. This typology of motivation, conceptualized as existing along a continuum of self-determination (see Figure 1) provides a framework for understanding the manner by which external influences are internalized and integrated, such that extrinsically motivated activities can be experienced as more autonomous in nature because they support internal rather than external goals (Ryan & Deci, 2007).

Extrinsic Motivation and Autonomy

According to SDT, the least autonomous of the controlled extrinsic motivations is external regulation. Externally regulated behaviors are enacted solely to satisfy criteria related to rewards or external demands. The description of this form of motivation resembles the research of operant theorists like Skinner (1953), who detailed changes in response rates according to the presence or absence of different types of external
reinforcements. Externally regulated behaviors are experienced as forms of highly controlled actions that can result in a sense of disconnection or alienation from behaviors and activities (Ryan & Deci, 2000). Because the source of motivation is separable from the individual, maintenance of this type of motivation is usually dependent on a sustained presence of external reinforcement over time (Ryan & Deci, 2007).

*Introjected regulation* is the second type of controlled extrinsic motivation. Introjected regulation relies on satisfying contingencies of self-esteem to maintain self-worth (Ryan & Deci, 2000). It differs from external regulation in that associated behaviors are based on compliance with internal pressures rather than responses to external reinforcers (Ryan & Deci, 2000). Individuals enacting behaviors based upon introjected regulations typically exact internal contingencies of reward or punishment upon themselves, and tasks are thus often performed in relation to sociomoral emotional consequences. Achieving goals may be rewarded by feelings of pride, whereas any perceived failure may produce self-directed punishments in the form of negative feelings of shame, guilt, or anxiety (Ryan & Deci, 2007). Both external and introjected regulations are therefore considered less autonomous and self-directed, as the individual is controlled by external or internalized pressures and contingencies (Ryan & Deci, 2007). SDT therefore considers these forms of extrinsic motivation controlled forms of behavior (Vansteenkiste, Lens, & Deci, 2006).

The two remaining types of extrinsic motivation are equated with higher levels of autonomy and self-determination. *Identified regulation* refers to the propensity to view a goal associated with an activity as personally significant (Ryan & Deci, 2000). The
individual engages in the extrinsic action because she or he identifies with the purpose or value of the behavior (Ryan & Deci, 2007). Although the activity may originate from external sources, the ability of the individual to view the outcome of the process as meaningful for reinforcing identity or achieving desired internal goals distinguishes identified regulation from introjected regulation. Any enacted behaviors and actions are less related to satisfying the expectations of others, and more closely tied to self-originating desires (Ryan & Deci, 2000). Integrated regulation is the most autonomous form of extrinsic motivation. Integrated regulation occurs when the values of identified regulations are reflectively aligned with other intrinsic values, such that they become congruent with the other needs and desires that are central to that individual (Ryan & Deci, 2007). Integrated regulation is similar to intrinsic motivation, but is considered extrinsic because the drive to achieve goals is not solely based inherent interests, but also includes the desire to achieve associated outcomes (Ryan & Deci, 2000).

In contrast to the controlled regulations discussed above, identified and integrated regulations, along with intrinsic motivation, are considered autonomous forms of motivation. Studies of motivational types have shown that while intrinsic motivation is a better predictor of engagement with an activity, identified and integrated types of motivation tend to be better predictors of accomplishing tasks that require effort and discipline (Deci & Ryan, 2012). Therefore, while some behaviors and activities arise spontaneously from innate sources, it is also possible to encourage non-intrinsic behaviors in a manner that promotes autonomy and enables individuals to identify with valued outcomes, or to even integrate these goals into their personal identity.
**Psychological Needs**

The integration of goals is viewed as a process that is related to the satisfaction of basic psychological needs for the individual pursuing the goal. Three basic and universal psychological needs are suggested as essential for wellness and healthy functioning: autonomy, competence, and relatedness (Deci & Ryan, 2012). These needs are defined as “nutriments essential to growth, integrity, and well-being” (Ryan & Deci, 2007, p. 13). By referring to the three basic needs as nutriments, SDT proposes that the social environment must support or provide each of the three needs in order to promote the full benefits associated with internalized and intrinsic forms of motivation. While each need contributes independently to well-being, the presence of all three are essential for nurturing overall wellness (Reis et al., 2000).

As a basic psychological need, *autonomy* refers to the ability to choose and commit to a particular course of action in a manner that aligns with one’s character and values (Vansteenkiste, Ryan, & Deci, 2008). Multicultural scholars have questioned the identification of autonomy as a universal human requirement for psychological well-being (Markus & Kitayama, 2003). Although autonomy may be associated with traits like independence, separateness, or uniqueness in other contexts, SDT clarifies that from a motivational perspective, autonomy is more closely related to volition or choice. Cross-cultural studies have demonstrated that regulations can be autonomous or controlled when pursuing either individual or collective goals, but in either instance, the relative autonomy of one’s goals correlates positively with health and wellness (Chen, Vansteenkiste, Beyers, Soenens, & van Petegem, 2013; Chirkov & Ryan, 2001).
Competence refers to the ability to feel effective when exploring or interacting with one’s environment, and leads to actively seeking challenges that promote increased functioning (Deci & Ryan, 2000). The need for competence is fulfilled for an individual through experiences where that person is able to bring about desired outcomes (Reis et al., 2000). Competence can also be supported within a particular context when individuals receive information that communicates confidence in their ability to overcome challenges (Niemiec & Ryan, 2009). Relatedness is the final psychological need. It indicates the importance of belonging to social groups and both giving and receiving care within close, intimate relationships (Ryan & Deci, 2000). The conceptual basis for relatedness is derived from Bowlby’s (1958) attachment theory, and the need for relatedness is satisfied by the experience of feeling connected to significant others (Reis et al., 2000). Contexts that are supportive of relatedness provide experiences of acceptance, respect, care, and mutuality (Niemiec & Ryan, 2009). As a motivational theory that encompasses motivational regulations and psychological needs, SDT provides a useful lens for identifying constructs related to the process of goal setting, goal striving, goal attainment, and outcomes related to individual well-being that are associated with pursuing and achieving selected goals.

Goal Oriented Research

Over the past thirty years, goal research has become a prominent area of emphasis within the study of human motivation and personality (Emmons, 1989; Klinger, 1977; Little, 1983; Sheldon, 2002; Sheldon, 2004). McAdams (1996) described goals and goal strivings as one of three major aspects of personality. Goals are associated with
intentionality and personal concerns, which accompanies traits and dispositions and sense of self and self-narrative as the primary tiers of personality. Goal related studies have focused on the numerous ways that humans utilize goals for personal development. Overarching goal constructs include personal strivings, related to the cultivation of desired individual characteristics (Emmons, 1989) and possible selves, which represent images of desired future potentialities that motivate behavior (Markus & Ruvolo, 1989). More specific goal types include personal projects, which are short term, clear cut goals that individuals pursue (Little, 1983), life tasks, which are goals that become salient at different developmental stages of life (Cantor & Sanderson, 1999), and current concerns, which are possibilities that individuals may be contemplating at any given point in time (Klingler, 1977).

Within the domain of personal goals, it is an inherent assumption that human beings are constantly pursuing goals, although it may be the case the some goals are not linked with clarity in one’s awareness (Emmons, 1989). Goals are motivational constructs that specify and direct behavior, involve persistence, demand energy, promote self-regulation, and can enhance competence and skill development (Sheldon, 2014). A substantial body of research has demonstrated the potential of personal goal pursuit to bring about significant changes and outcomes in individual lives (Austin & Vancouver, 1996; Emmons, 1989; Sheldon, 2004). As goals have become increasingly viewed as influential sources of motivation and change, several prominent theories have emerged. Locke and Latham (2002) proposed a widely endorsed theory of goal setting that specifies the goal characteristics that are likely to result in goal achievement, regardless
of the goal that is selected by the individual. This articulation of goal setting has been
critiqued as possessing the potential to cause harm by narrowing focus in a manner that
neglects other areas of importance, increasing unethical behavior, inhibiting learning, and
reducing intrinsic motivation (Ordonez, Schweitzer, Galinsky, & Bazerman, 2009).
Alternative theories that account for both the relationship of the personal goal with the
well-being of the individual as well as the likelihood that the individual will accomplish
the goal may therefore represent preferable models for understanding goals related to
health and wellness.

One theory of goal setting and striving that considers both goal achievement and
personal well-being is the Self-Concordance Model (SCM; Sheldon & Elliot, 1999;
Sheldon, 2014). While Locke and Latham (2002) place little importance on the goal that
is selected by the individual, apart from emphasizing that is it realistic and achievable, the
central premise of the SCM is that the particular goals that are selected by individuals
matter greatly related to outcomes. The SCM describes self-concordant goals as those
that are consistent with one’s developing interests and enduring values (Sheldon & Elliot,
1999). The concept of self-concordance is derived from and can be understood in the
context of Self-Determination Theory as the degree to which goals are pursued for
autonomous reasons rather than controlled reasons. Autonomous reasons for selecting
and striving toward a particular goal correspond to the autonomous motivational
regulations identified by SDT, and may include interest or enjoyment (intrinsic), the
importance of the goal for the individual (identified), and the ability of the goal to reflect
one’s values (integrated). By contrast, controlled reasons for pursuing a goal correspond
to controlled motivational regulations, including goals selected to satisfy contingent self-worth, shame, or guilt (*introjection*), or pursuit of goals that are socially endorsed as desirable or for concrete gains or losses (e.g. money, grades, status) associated with their attainment (*external motivation*). Goals are often associated with multiple regulations, which interact to produce varying levels of self-concordance, and the more that an individual pursues a goal for autonomous reasons and the less that he or she pursues it for controlled reasons, the more the goal is considered to be self-concordant (Milyavskaya, Nadolny, & Koestner, 2014).

**The Self-Concordance Model**

The SCM (see Figure 2) begins with the construct of *goal self-concordance*, which is measured by determining the degree to which individuals identify the goals that they have selected as either controlled or autonomous. Self-concordance is predictive of *sustained effort*, the second construct in the model. Exploratory studies that contributed to the development of the SCM (Sheldon & Elliot, 1998; Sheldon & Kasser, 1998) revealed

![Figure 4. The Self-Concordance Model.](image)
that participants whose goals were low in self-concordance possessed the same levels of intention to work toward their goals as participants with self-concordant goals, but after six weeks of striving toward these goals, their actual effort levels were significantly lower. Although the participants with less self-concordant goals planned to exert strong effort toward goal attainment, over time they lost their initial inclination to pursue the goals that they had initially set. In the absence of the motivation provided by the alignment of goals with interests and values, even initially strong goal efforts faded over time (Sheldon, 2014). Effort is therefore predictive of goal attainment, the third element in the model. Studies have indicated that effort mediates the relationship between self-concordance and goal attainment, such that the association between self-concordance and goal attainment becomes non-significant when effort is included as a factor (Sheldon & Elliot, 1999). This suggests that individuals are more likely to attain self-concordant goals due to their ability to maintain greater sustained effort in working toward their achievement.

Changes in well-being is the final construct in the SCM. A key hypothesis of self-concordance theory is that the selection of self-concordant goals increases the likelihood that the process of working toward those goals will produce benefits for personal growth and development, mental health, and well-being (Ryan, Sheldon, Kasser, & Deci, 1996). Initial research with the SCM did not include need satisfying experiences as a variable, but instead explored the relationship between goal attainment and changes in well-being (Sheldon & Elliot, 1998; Sheldon & Elliot, 1999; Sheldon & Kasser, 1998). Goal attainment was predictive of increased well-being for participants across all of these
studies, while goal self-concordance had no main effect on well-being. However, it was noted that participants who attained self-concordant goals experienced greater overall levels of well-being than participants who attained less self-concordant goals. Stated differently, goal self-concordance was found to be a significant predictor of overall well-being after controlling for goal attainment. Accordingly, an additional variable representing the interaction of goal self-concordance x goal attainment was added to the model as a predictor of well-being (Sheldon & Elliot, 1999).

Self-Determination Theory has demonstrated that the satisfaction of basic psychological needs is a powerful influence on personal well-being (Deci & Ryan, 2008). In the context of the SCM, need satisfying experiences were hypothesized as a construct that could bridge the relationship between goal self-concordance, goal attainment, and changes in well-being. Because goals influence everyday behaviors (Cantor & Blanton, 1996), they are considered to be closely linked with daily experiences of competence, autonomy, and relatedness (Sheldon & Elliot, 1999). For instance, self-concordant goals are associated with increased effort and attainment, so it can be expected that individuals are more likely to have regular experiences of efficacy and accomplishment in the pursuit of these goals. Therefore, the psychological need for competence is more likely to be satisfied by pursuing self-concordant goals. Similarly, because self-concordant goals are an expression of an individual’s interests and values, it is more likely that persons striving toward self-concordant goals will experience satisfaction of the need for autonomy (Sheldon & Elliot, 1999). Relatedness is a more difficult construct to establish for self-concordant goals. It seems likely that values are learned in the context of close
relationships with influential individuals, so movement toward goals that align with personal values and interests is more likely to lead to feelings of relatedness with valued others. The likelihood that effort toward and attainment of self-concordant goals will provide experiences of competence, autonomy, and relatedness establishes a bridge between goal self-concordance, goal attainment, and psychological need satisfaction.

The other side of that bridge concerns the relationship between need satisfaction and well-being. According to self-determination theory, each need independently contributes to well-being, and the level to which satisfaction is experienced within each of the three areas determines one’s overall well-being. Need satisfaction is experienced by individuals as a daily, cumulative process that can be observed over time (Reis et al., 2000). Because well-being is often assessed by referencing experiences from the recent past, persons who have experienced more affectively positive experiences are more likely to report higher levels of well-being. Experiences that support feelings of competence, autonomy and relatedness are likely to generate positive affect in a manner that shapes individual perspectives regarding well-being because there is an innate need for these types of experiences (Sheldon & Elliot, 1999). Given this understanding, the link between the attainment of self-concordant goals and enhanced personal well-being is attributed to the likelihood that the process of achieving the goal is more likely to satisfy basic psychological needs for autonomy, competence, and relatedness. Conversely, when individuals select goals that are not self-concordant (i.e. goals based on external values or interests of others), they may invest a great deal of time and energy attempting to achieve
possible futures that turn out to lack meaning or cause harm even when attained, due to the neglect of one’s psychological needs (Sheldon, 2014).

Self-Determination Theory and the SCM in particular maintain an organismic perspective on development over the course of the life span (Rogers, 1964; Ryan, 1995; Sheldon, 2009), assuming that people have a natural tendency to move toward continued growth and maturity (Sheldon, 2014). This perspective shapes the hypothesized understanding of the manner by which individuals are able to articulate and select self-concordant goals. For instance, as individuals change goals over time, they typically select goals which are more self-concordant, and consequently experience increased well-being and goal attainment (Sheldon, Arndt & Houser-Marko, 2003). Joseph and Linley (2004) suggested that these findings contribute to a growing body of evidence for the human characteristics referred to as the actualizing tendency and the organismic valuing process. Rogers (1964) described the actualizing tendency as the capacity that individuals possess related to realizing their potentialities. Self-actualization implies that people are inherently oriented toward their own growth and development. The organismic valuing process refers to people’s innate ability to know what is important to them and what is essential for them to experience a meaningful and fulfilling life. It suggests that each individual can accurately determine their primary wants and needs at any given point in time. Based upon these two conceptual premises, persons are considered to be acting self-concordantly when they pursue choices and goals that explore their potentialities and lead toward fulfillment (Burke & Linley, 2007).
Empirical Evidence for the Self-Concordance Model

In an initial series of studies using structural equation modeling (Sheldon & Elliot, 1999), the SCM yielded a satisfactory fit to three data sets independent of the effects of other motivational constructs, including self-efficacy (Bandura, 1989) and implementation intentions (Gollwitzer, 1999). The relative self-concordance of goals was found to play two critical roles in the proposed model. Self-concordant goals enabled individuals to maintain sustained effort in striving toward their goals, which increased the likelihood of goal attainment. Additionally, self-concordance increased the odds that the process of goal striving and goal attainment was more likely to generate experiences of psychological need satisfaction that are essential to enhanced well-being. Therefore, the SCM suggests that the more self-concordant a goal is, the greater the odds that it will be pursued and achieved, and the more likely that well-being will be experienced as a result.

Longitudinal studies with first year college enrollees (Sheldon & Houser-Marko, 2001) indicated that students who selected self-concordant goals for their first semester of college were more likely to attain their goals than those who selected non-concordant goals. In addition, those students were also more likely to set self-concordant goals for their second semester, and reported higher levels of both goal attainment and adjustment to college at the end of their first year. This indicates that self-concordant goals may bring about a greater sense of identity in a manner that yields an ‘upward spiral,’ advancing individuals toward greater actualization and well-being (Sheldon & Houser-Marko, 2001). By contrast, across all of these studies, the participants who endorsed non-concordant goals were not only less likely to attain their goals, but also did not reap the
same benefit of increased happiness, fulfillment, or personal well-being even when they did manage to attain their goals (Sheldon & Elliot, 1999; Sheldon & Kasser, 1998).

Taken as a body of work, research related to the SCM indicates that striving toward goals that do not possess self-concordance for an individual may as well not take place. Working toward goals that do not align with individual interests and values does not seem to yield a sense of satisfaction for individuals, either in terms of effort or outcome (Sheldon, 2014).

Sheldon and Cooper (2008) conducted a year-long study of personal goals, in which participants (N=493) from a diverse community sample were asked to generate goals for varying roles in their lives (e.g. parent, work, school). Participant goals were evaluated for self-concordance and orientation toward individual or communal outcomes. Participants also completed instruments that measured the degree to which their goal motives were related to intimacy or achievement dispositions. Goals were rated as more self-concordant by participants when their goal orientations and motive dispositions were congruent with one another. For instance, participants who scored high in the need for intimacy and affiliation rated community-oriented goals as more self-concordant, while participants high in the need for achievement rated goals oriented toward individual agency as more self-concordant.

Expanding on this research, Sheldon and Schüler (2011) reported similar findings in a longitudinal experiment where participants completed motive disposition instruments, and were then randomly assigned to pursue either achievement goals or affiliation goals during the course of a semester. Participants who were assigned to goals
that aligned with their motive dispositions rated their goals as possessing greater levels of self-concordance and were more likely to attain their goals over time.

These findings were expanded upon by a third study (Sheldon, Prentice, Halusic, & Schüler, 2015) that explored implicit motives in addition to self-reported motive dispositions. The researchers measured participants (N=103) implicit and explicit motive dispositions and then randomly assigned participants to either achievement or affiliation related goal groups. Participants created goals oriented toward either relationships or achievement and rated the goals for self-concordance. The same pattern was again evident, such that self-concordance varied based upon the congruence between both implicit and explicit dispositions and the focus of the goal group to which the participants were assigned. These studies provide evidence that high self-concordance occurs when individual dispositions align with goal foci (Sheldon, 2014).

Although each person is considered to possess the necessary attributes for selecting self-concordant goals, it is not always the case that individuals choose goals that align with personal interests and values. The occurrence of non-concordant goals provides evidence of the influential nature of the relationship between the individual and his or her context. From the perspective of Western psychology, the differentiation between one’s inherent interests and values and the constraints and preferences of one’s cultural setting is viewed as closely related to personal development and individuation. However, this articulation of human development is not universal across cultures. Therefore, research has been conducted to explore the salience of the self-concordance model in non-Western cultures.
Multicultural Considerations

The relationship between self-concordance and subjective well-being has been studied among diverse cultural groups (Sheldon et al., 2004). The most prominent study involved undergraduate college students (N=551) from South Korea (n=194), Taiwan (n=163), the United States (n=153), and China (n=41). Participants completed instruments that gathered information about demographics, self-concordance of personal goals, and subjective well-being. The measures used in the study were created by psychologists native to each country who translated the instruments into the most appropriate language for the participants. Measures were tested for consistency by having a second bilingual individual translate the instrument back to English for the sake of comparison and revision.

Analyses of mean differences across cultures indicated that Asian participants reported much lower levels of well-being that participants from the United States. This finding was consistent with prior cross-cultural research related to subjective well-being (Diener, Suh, Smith, & Shao, 1995; Diener & Suh, 1999). By contrast, there were no strong tendencies observable in the differences in reported self-concordance among Asian participants and U.S. participants. For instance, in the types of motivation associated with selected goals, there were no significant differences between cultures in the reporting of external motivation for goals, but the South Korean participants were less likely to report introjected motivation than U.S. participants, and the Chinese participants were more likely to identify intrinsic motivation that U.S. participants. The mean levels of aggregate self-concordance were positive for every participant group, indicating that individuals
from every culture were more likely to feel autonomous than controlled in their goal selection. Additionally, South Korean and Chinese participants reported equal levels of overall self-concordance for their personal goals compared to U.S. participants. Taiwanese participants reported lower overall levels of self-concordance that were attributed to the traditional and collectivistic character of the particular institution and location from which the Taiwanese sample was drawn. Despite this exception, it was concluded that personal goals tended to connect to individual interests and values regardless of cultural or demographic differences (Sheldon et al., 2004).

The measure of goal self-concordance was predictive of well-being within each participant group as well as in the aggregate sample. The assumption that an orientation toward self-interest or personal values may not align with collectivistic cultures was not supported by this data, as self-concordance showed a positive correlation with well-being in each of the cultural groups in this study. Findings from this study supported the hypothesis that the pursuit of self-concordant goals is beneficial for personal well-being regardless of cultural contexts. While different types of goals may be perceived as self-concordant by individuals from different cultural groups, within each culture individuals are capable of selecting goals that align with internalized interests and values. When this occurs, those goals are more likely to enhance well-being (Sheldon et al., 2004). This finding is consistent with perspectives regarding optimal human functioning which stress the importance of individuals’ ability to assimilate and accommodate sociocultural norms, expectations, and constraints (Ryff & Singer, 1998; Sheldon & Kasser, 2001).
While a significant amount of empirical support has been generated for the propositions of the SCM, most of the studies associated with this model have occurred in face to face interactions between members of research teams and participant. To date, there is little evidence to indicate whether the propositions of the SCM are supported by individuals completing goal-oriented tasks in online environments. Therefore, the goal of this study is to contribute to the research base for the SCM by testing the fit of the model with data generated in an online wellness course. It is expected that participants in the study who rate their goals as more self-concordant will expend greater effort toward achieving those goals, making goal attainment more likely. In addition, participants who achieve their goals, particularly those who achieve goals that are more self-concordant, are anticipated to report greater satisfaction of basic psychological needs for autonomy, competence, and relatedness in a manner that facilitates the likelihood of enhanced well-being. The following chapter will present the methodological framework for the study, including participant data, sampling procedures, research design and threats to validity, instrumentation and measures, proposed data analysis, and anticipated findings.
Chapter 3: Research Methods

Health and wellness are fundamental concerns for human functioning that possess enormous significance for individual, organizational, and societal well-being. Colleges and universities have been identified as critical sites for promoting behaviors that support health and wellness. Despite widespread interest in this topic, little empirical evidence is available to guide wellness programs with practices that are intended to facilitate health-enhancing change processes among student populations. There is some evidence that educational interventions such as wellness curricula and classes may support growth in knowledge and behavioral change (Choate & Smith, 2003, Conley, Travers, & Bryant, 2013). However, the understanding and implementation of education using holistic wellness models (e.g. Granello & Witmer, 2012b; Hattie, Myers, & Sweeney, 2004) requires specialized content knowledge. This limits the scope of the impact for this approach for traditional, face to face classroom settings, as each course would need an instructor with specialized training in wellness. By contrast, online courses are an educational modality that can be scaled to large populations with significantly less staff support. Additionally, online courses provide standardized curricula that ensure every student encounters a consistent learning environment. Therefore, if online courses can effectively produce similar outcomes, they may provide an ideal delivery format to promote health and wellness behaviors among broad audiences.
In order for students to achieve psychological and behavioral learning outcomes linked to personal health and wellness, effective online courses must provide learning environments that support student motivation for engagement and persistence. Empirical research is required to identify the motivational influences that facilitate growth-oriented change in online educational formats. Therefore, the context for this study is an online course designed to promote knowledge and self-awareness about holistic wellness through content delivery, and psychological and behavioral outcomes through experiential education. The course that was used is titled *Wellness: Achieving a Healthy Lifestyle*, and has been offered for the past five years as an online elective for undergraduate and graduate students at a large, Midwestern research university. It is intended to facilitate student wellness and behavioral change by engaging enrolled students in a 10 week assignment that requires them to set and work toward individualized goals. The present study used course data from two course offerings (Autumn 2015 and Spring 2016 semesters) to examine the motivational elements connected with this assignment.

The self-concordance model (SCM; Sheldon, 2014; Sheldon & Elliot, 1999) was utilized as an empirically validated model of motivational influences related to goals. The model is made up of constructs including goal self-concordance (the degree to which goals are aligned with internal values and interests), sustained effort (the degree to which effort is exerted toward goal striving), goal attainment (the degree to which goals are accomplished), need satisfying experiences (the degree to which individual experience fulfillment of basic psychological needs of autonomy, competence, and relatedness), and
changes in well-being (the degree to which subjective well-being is reported). An additional variable is represented by the goal self-concordance variable multiplied by the goal attainment variable, as past studies utilizing the SCM have found that the satisfaction of psychological needs is dependent on the interaction between goal self-concordance and goal attainment (e.g. Sheldon & Elliot, 1999). There is a substantial body of empirical evidence that supports this model (e.g. Sheldon, 2014), but to date no research studies have explored applicability of the SCM for goal-based tasks in online classes. Therefore, the purpose of this study was to test the theoretical propositions of the SCM in an online educational setting that employs student goals to generate psychological and behavioral outcomes related to enhanced personal wellness.

The study investigated the following research questions:

1) Is goal self-concordance predictive of goal attainment for wellness-oriented goals selected by students in an online course?
2) Does sustained effort toward goals mediate the relationship between goal self-concordance and the goal attainment for students in an online course?

3) Are goal self-concordance and goal attainment predictive of changes in well-being for students in an online course?

4) Does the self-concordance model provide a good fit for the data generated by students completing a goal oriented assignment in an online wellness course?

**Research Design and Procedures**

The current study will explore the applicability and utility of the SCM to explain goal related processes and outcomes for a population of university students enrolled in an online wellness course. Components of the study that have been considered as part of the overarching methodology and identified research design include the handling of participant data, demographic and motivational variables, instrumentation and measures, sampling procedures, data analysis, threats to validity, and anticipated findings.

**Participants**

This study will focus on motivational constructs associated with a goal setting assignment for university students in an online wellness course. Therefore, the population for this study was recruited from students enrolled in an online elective course titled *Wellness: Achieving a Healthy Lifestyle* at a large, Midwestern public research university during the Autumn 2014 and Spring 2015 semesters. Because this course is offered as a general elective, no particular field of study was anticipated to be overrepresented in course enrollment, and students were generally representative of the campus population. Participants were at least 18 years of age and gave their consent to participate in this
study. Undergraduate, graduate, and professional students were eligible to enroll in the course and participate in the study, although it was expected that a majority of the participants would be undergraduate students, who made up a majority of the enrolled student population for this course. All students in the course were invited to participate through provision of a consent form that was included in a survey of demographic items administered concurrent with the Initial Goal Survey assignment for the class. The consent form indicated that the study was approved by the Institutional Review Board, ensured that students were aware that participation would not affect their grade, acknowledged that they could drop out at any time without penalty, and confirmed that their identity and personal information would be kept confidential. It was expected that many students would participate as involvement required no additional time or expense. Demographic information including sex, year in school, race, age, and citizenship was gathered to better understand and describe the population participating in this study.

The determination of power and sample size in structural equation modeling is complicated by the fact that theoretical models contain multiple variables and parameters that have different standard errors (Schumacker & Lomax, 2010). An *a priori* power analysis was conducted to determine the necessary sample size according to the procedures recommended by Schumacker and Lomax (2010). The alpha level of significance was set at 0.05 and the power for the theoretical model was set at 0.80 as per the standards suggested by Cohen (1992) to avoid committing a Type I or Type II error. Critical chi-squared statistics and noncentrality parameters were calculated using statistical software (G*Power 3.1.9; Faul, Erdfelder, Buchner, & Lang, 2009). The
minimum required sample size for a structural equation model for the given alpha of 0.5 and power of 0.8 was found to be 171. Therefore a sample of at least 180 participants was required to ensure sufficient power for an accurate examination of the research hypotheses. In the three course offerings prior to the beginning of this study, enrollment numbers were 200 (Spring semester 2013), 95 (Autumn semester 2013), and 250 (Spring semester 2014). Given prior course enrollments and allowing for a small percentage of dropouts or refusals to participate it was anticipated that the data set would exceed the minimum requirements for statistical power.

**Demographic Variables**

A set of demographic variables was gathered for the purpose of generating descriptive statistics regarding the sample. Variables of sex, year in school (university rank), race/ethnicity, age, and citizenship were included on a non-graded survey administered in week 6 of the course. Sex was treated as a categorical variable with three levels, male, female, and self-defined. Year in school was treated as a categorical variable with six levels, first year undergraduate, second year undergraduate, third year undergraduate, fourth year undergraduate, fifth-year + undergraduate, and graduate/professional. Race/Ethnicity was treated as a categorical variable with seven levels, African-American/African, Asian-American/Asian, Hispanic/Latino(a), Multiracial, Native American/American Indian, White/Caucasian, and Other Racial/Ethnic Identity. Age was treated as a continuous grouped variable that included age ranges of 18-22, 23-27, 28-32, 33-39, 40-49, 50-59, and 60 or above. Citizenship was treated as a categorical variable with two levels: U.S., and International.
Motivational Variables

**Goal Self-Concordance.** Participants completed a goal setting assignment for the course that required each student to select three particular wellness dimensions and write one goal and associated objectives for each area. As an example, a participant may have selected physical wellness as one of the three dimensions, created a goal related to that specific dimension (e.g. “I will lose five pounds this semester”), and then developed measurable objectives to work toward the goal (e.g. “I will work out for 45 minutes at least three times each week,” “I will eat at least one fruit or vegetable serving with each meal,” and “I will drink at least 8 cups of water per day for the semester”). Once students selected their goals and objectives for the course, goal self-concordance was measured using an idiographic methodology that has been established for use with self-concordance research (Ryan & Connell, 1989; Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001; Sheldon & Kasser, 1998). Participants were asked to rate each of their goals on four items related to different goal motives that use a Likert-type scale from 1 (not at all for this reason) to 7 (completely for this reason). Perceived goal motives for these items include external (e.g. “You are pursuing this goal because someone else wants you to or the situation demands it”), introjected (e.g. “You are pursuing this goal because you would feel ashamed, guilty, or anxious if you didn’t”), identified (e.g. “You are pursuing this goal because you really believe it’s an important goal to attain”), or intrinsic (e.g. “You are pursuing this goal because of the fun and enjoyment that it provides you”) regulations (Sheldon & Elliot, 1999).
## Table 1

### Overview of Key Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Study Instrument</th>
<th>Items</th>
<th>Week(s) Admin.</th>
<th>Source of Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Categorical</td>
<td>Demographic Survey</td>
<td>1</td>
<td>6</td>
<td>n/a</td>
</tr>
<tr>
<td>Year in School</td>
<td>Categorical</td>
<td>Demographic Survey</td>
<td>1</td>
<td>6</td>
<td>n/a</td>
</tr>
<tr>
<td>Race</td>
<td>Categorical</td>
<td>Demographic Survey</td>
<td>1</td>
<td>6</td>
<td>n/a</td>
</tr>
<tr>
<td>Age</td>
<td>Continuous</td>
<td>Demographic Survey</td>
<td>1</td>
<td>6</td>
<td>n/a</td>
</tr>
<tr>
<td>Citizenship</td>
<td>Categorical</td>
<td>Demographic Survey</td>
<td>1</td>
<td>6</td>
<td>n/a</td>
</tr>
<tr>
<td>Goal Self-Concordance</td>
<td>Continuous</td>
<td>Initial Goal Survey</td>
<td>4/goal</td>
<td>6</td>
<td>Sheldon &amp; Elliot, 1999</td>
</tr>
<tr>
<td>Sustained Effort Goal</td>
<td>Continuous</td>
<td>Goal Tracking Survey</td>
<td>1</td>
<td>7, 9, 11, 13, 15</td>
<td>Sheldon &amp; Elliot, 1999</td>
</tr>
<tr>
<td>Goal Attainment</td>
<td>Continuous</td>
<td>Goal Tracking Survey</td>
<td>1</td>
<td>7, 9, 11, 13, 15</td>
<td>Sheldon &amp; Elliot, 1999</td>
</tr>
<tr>
<td>Need Satis. – Autonomy</td>
<td>Continuous</td>
<td>Final Course Survey</td>
<td>6</td>
<td>15</td>
<td>Standage, Duda &amp; Ntoumanis, 2005</td>
</tr>
<tr>
<td>Need Satis. – Competence</td>
<td>Continuous</td>
<td>Final Course Survey</td>
<td>6</td>
<td>15</td>
<td>IMI; McAuley, Duncan &amp; Tammen, 1989</td>
</tr>
<tr>
<td>Need Satis. – Relatedness</td>
<td>Continuous</td>
<td>Final Course Survey</td>
<td>5</td>
<td>15</td>
<td>Richer &amp; Vallerand, 1998</td>
</tr>
<tr>
<td>Concordance x Attainment</td>
<td>Continuous</td>
<td>Initial Goal Survey and Goal Tracking Survey</td>
<td>n/a</td>
<td>n/a</td>
<td>Sheldon &amp; Elliot, 1999</td>
</tr>
<tr>
<td>Well-Being (T1)</td>
<td>Continuous</td>
<td>Initial Goal Survey</td>
<td>20</td>
<td>6 (T1)</td>
<td>PANAS; Watson, Tellegen &amp; Clark, 1988</td>
</tr>
<tr>
<td>Well-Being (T2)</td>
<td>Continuous</td>
<td>Final Course Survey</td>
<td>20</td>
<td>15 (T2)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes.** Study Instruments refers to instruments developed and administered for the proposed research. Week(s) Admin. refers to the week of the course when the instrument is provided to participants.
Identified and intrinsic scores were summed to produce an autonomous goal motive score, and external and introjected scores were summed to produce a controlled goal motive score. An aggregate self-concordance score for each goal was computed by summing the identified and intrinsic scores for each goal and then subtracting the external and the introjected scores for that goal. This procedure is based upon a construct from Self-Determination Theory termed the *perceived locus of causality* (PLOC; Ryan & Connell, 1989). PLOC is considered essential to Self-Determination Theory as it considers the relationship between intrinsic and extrinsic motivation (Sheldon, 2014). Numerous studies (e.g. Chatzisarantis, Hagger & Wang, 2010; Koestner, Lekes, Powers & Chicoine, 2002; Sheldon & Cooper, 2008; Sheldon & Elliott, 1999; Sheldon, Prentice, Halusic & Schüler, 2014; Sheldon & Schüler, 2011) have used PLOC methodology to assess motivational regulations, indicating strong construct validity for this measure. Measures of internal consistency in prior studies using this procedure have reported Cronbach’s alpha values ranging from $\alpha = .70$ to .80 indicating adequate reliability for this measure. Internal consistency was computed for measures of goal self-concordance in this study to ensure the reliability of the findings.

**Sustained Effort and Goal Attainment.** At five points during the semester, students were asked to complete a brief survey to assess their progress toward the goals that they selected. As per Sheldon and Elliot (1999) items included prompts for effort (e.g. “How hard are you trying to work toward this goal?”) and progress (e.g. “How well are you doing in making progress toward this goal?”). Sustained effort was computed by averaging participant scores for effort on each goal. Goal attainment was computed by
averaging participant scores for progress toward each goal. In prior studies, internal consistency for this method of determining sustained effort has been reported using Cronbach’s alpha values ranging from $\alpha = .75$ to .93, indicating adequate reliability for this measure. Similarly, internal consistency for this method of determining goal attainment has been reported using Cronbach’s alpha values ranging from $\alpha = .79$ to .90, indicating adequate reliability for this measure (Sheldon & Elliot, 1999). Internal consistency will be computed for measures of sustained effort and goal attainment in this study to ensure the reliability of the findings.

Need Satisfaction. Satisfaction of the three basic psychological needs articulated by self-determination theory was measured using items from instruments that have demonstrated adequate validity and reliability in prior studies. Autonomy was measured using six items from Standage, Duda, and Ntoumanis (2005). Competence was measured using six items from the perceived competence subscale of the Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989). Relatedness was measured using five items from the acceptance subscale of the Need for Relatedness Scale (Richer & Vallerand, 1998). This particular set of items from these three instruments has been used in multiple studies that include measures of psychological need satisfaction (e.g. Smith, Ntoumanis & Duda, 2007; Standage, Duda, & Ntoumanis, 2003; Taylor, Ntoumanis, Standage & Spray, 2010), providing construct validity for these measures. In each of these studies, internal consistency for these measures of psychological need satisfaction have been reported using Cronbach’s alpha values. Values for the autonomy variable have been reported as ranging from $\alpha = .75$ to .81. Values for the competence variable
have been reported as ranging from $\alpha = .76$ to .87. Values for the relatedness variable have been reported as ranging from $\alpha = .87$ to .91. Taken together, these studies provide support for the assertion that these measures possess adequate reliability. Internal consistency was computed for measures of need satisfaction in this study to ensure the reliability of the findings.

**Psychological Well-Being.** Participant well-being was measured using the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Tellegen, & Clark, 1988). This instrument was selected as it has been utilized in numerous studies within the research literature, including prior studies exploring the self-concordance model (SCM; Sheldon & Elliot, 1999; Smith, Ntoumanis, & Duda, 2007). The methodology for utilizing the PANAS in this study is based upon prior research with the SCM. The PANAS contains mood descriptors that generate scores for positive affect (e.g. inspired, proud) and negative affect (e.g. scared, hostile). Psychometric evaluations of the PANAS among non-clinical populations have reported internal consistency as .89 (95% CI = .88–.90) for the positive affect scale, and .85 (95% CI = .84–.87) for the negative affect scale (Crawford & Henry, 2004), indicating good reliability for the instrument.

The PANAS was completed two times by participants. The first administration ($T_1$) occurred concurrent with the goal setting assignment in week 6 of the 15 week course, and the second administration ($T_2$) was included with the final course survey, taken during the final week of the course. The $T_1$ administration of the PANAS in the initial goal survey asked participants to rate the degree to which they have felt the emotional states listed in the PANAS during the past month using a scale ranging from
1 (not at all) to 5 (extremely). The period of one month was selected to produce variables that were not overly susceptible to transitory influences but that could still be expected to change over the course of a semester (Sheldon & Elliot, 1999; Sheldon & Kasser, 1998). Both positive affect (PA) and negative affect (NA) variables were calculated along with an aggregate well-being variable that was computed by subtracting NA scores from PA scores. The final course survey included an identical administration of the PANAS using a one month time frame for rating positive and negative affect. A second set of scores, including PA, NA, and aggregate well-being variable was computed in the same manner indicated above, and internal consistency was calculated for positive and negative affect scores for both administrations of the PANAS.

**Sampling Procedures**

Participants in this study were asked to complete several electronic survey instruments within the learning management system of the online course during their enrollment in the class. Responses were linked to student identification numbers which made it possible to organize all data by individual case. The surveys were administered as quizzes, and linked to students’ grades for the course. Students were informed that for each of these surveys, their grade was wholly based upon completing the survey. They were not capable of earning more points as a reward for reporting greater goal effort or attainment, and they were not penalized for failing to work toward or reach their goals. Instead, full credit was given for responding to every item on each of the surveys. This was intended to minimize over-reporting of progress as students’ grades were not linked to their goal-related performance. An initial goal survey instrument was administered
during week 6 of the course. This was concurrent with the completion of the goal setting assignment for the course, and included items to measure goal self-concordance.

Additionally, participants completed an initial measure of well-being during week 6 along with a survey that gathered demographic information and consent to participate. By beginning data collection during the sixth week of the course, it was estimated that very few students would be likely to drop out of the study as all surveys were administered following the deadline for course withdrawal without financial penalty.

Goal tracking surveys were administered during weeks 7, 9, 11, 13, and 15 to assess effort and progress toward goals on a bi-weekly basis over the duration of the course. Mean scores (omitting any missing data) were calculated for the variables of effort and goal attainment for participants who completed at least three of the five goal tracking surveys. A final course survey instrument was administered during the final week of the course that included items to measure psychological need satisfaction variables and the second administration of the well-being instrument. Additional items were included on the final course survey that were not related to this study, but were solely used for the class curriculum. Appendix A contains a detailed listing of all instruments associated with this study.

**Initial Data Set Analysis**

Analyses of the data set was conducted with IBM SPSS Statistics for Windows, Version 26.0. Prior to any other analysis, the data set was examined for missing values and values that were beyond the minimum and maximum value for any given variable. Participants who did not complete any of following were removed from the study, as no
meaningful relationships could be inferred from their case: the initial goal survey, at least three of the five goal tracking surveys, or the final course survey. Additionally, the course learning management system was configured to allow students to submit more than one response to their surveys. This study only made use of the last entry submitted by individual students, as this represented the official submission of the instrument that was used for grading purposes in the course. After removing these cases, the only missing values in the data set were found among participants who completed three or four goal tracking surveys. Mean scores for goal tracking variables omitted missing data to create consistent scores for all participants. Histograms and box plots were created for all variables to identify any influential cases, outliers, or violations of assumptions related to linearity or normality. No outliers were identified. Motivational variables were computed from the raw data and scatterplots were generated for all continuous variables to check for linearity. The data were also examined for skewness and kurtosis. A procedure was determined to address any significant departures from parametric assumptions that involved employing an asymptotic covariance matrix along with the sample covariance matrix as per Schumacker and Lomax (2010).

**Correlation and Regression Analyses**

The research questions for this study replicated inquiries from prior studies (e.g. Sheldon & Elliot, 1999) of the self-concordance model in the context of online education. Each of the questions for the study were addressed sequentially by specific analytic procedures. The first three research questions replicated inquiries intended to be conducted prior to the creation of a structural equation model to establish preliminary
relationships between the variables that make up the model. Therefore, the first analysis explored the relationship between goal self-concordance and goal attainment. A correlation table was produced for all major constructs of the SCM. The bivariate correlation between goal self-concordance and goal attainment was of particular interest. It was hypothesized that there would be a positive relationship between the two variables.

The second research question examined whether the variable of effort mediated the relationship between goal self-concordance and goal attainment. Prior studies using the SCM (e.g. Sheldon & Elliot, 1999) have used the causal steps approach to mediation analysis (Baron & Kenny, 1986; Judd & Kenny, 1981). However, as statistical analyses have developed, this approach has drawn significant critique due to the low power of the procedure and the inability to quantify the intervening effect directly (Fritz & MacKinnon, 2007; Hayes, 2009). Therefore, this approach has been widely supplanted in the research literature by procedures based upon bootstrapping (Hayes, 2009). Bootstrapping has been shown to be a more valid and powerful method for testing mediation effects (Williams & MacKinnon, 2008), and was thus chosen for the current study. Subsequently, a mediation analysis was conducted using PROCESS (Hayes, 2013) to test the hypothesis that effort would mediate the relationship between self-concordance and goal attainment. Bootstrapping approaches to mediation are based upon the generation of empirical representations of the sampling distribution of the indirect effect. Thus, in the current study, the sample for the study \( (N = 253) \) was resampled during the analysis in a manner that mimicked the original sampling process and recommended
analytic procedures were used to determine whether effort mediated the relationship between self-concordance and goal attainment.

The third research question explored the relationship between goal self-concordance, goal attainment, and well-being. Regression and mediation analyses were conducted to explore these relationships. In the first regression analysis, T2 Well-being (a measure of well-being completed by participants upon completion of the goal-based assignment) was entered as the dependent variable. T1 Well-being (a measure of well-being completed by participants at the beginning of the goal-based assignment) was included in the equation as an independent variable, so that change in well-being would be predicted by other independent variables in the equation (Cohen & Cohen, 1983). The constructs of goal attainment, self-concordance, and the product of these two variables (representing the interaction between self-concordance and goal attainment) were entered as independent variables. It was hypothesized that goal attainment would be predictive of well-being and that self-concordance would not be a significant predictor. Additionally, it was hypothesized that the variable representing the interaction between self-concordance and goal attainment would be a significant predictor, indicating that the association between attainment and changes in well-being was stronger for participants with more self-concordant goals.

A second regression analysis was conducted to explore relationship of the same independent variables from the prior analysis with the aggregate variable for need satisfaction. Need satisfaction was proposed as a bridge between the first stage of the SCM (i.e. self-concordance to goal attainment) and the second stage of the SCM (i.e. goal
attainment to well-being). Therefore, this analysis regressed the variable for global need satisfaction on variables of self-concordance, goal attainment, and the interaction variable of self-concordance and goal attainment. It was hypothesized that goal attainment, self-concordance, and the interaction between goal attainment and self-concordance would all be significant predictors of need satisfying experiences.

Additional regression analyses were conducted to explore the relationship of need satisfying variables with well-being. The current study expanded upon prior studies (e.g. Sheldon & Elliot, 1999) by conducting two distinct analyses of these variables. The first analysis used T2 Well-being as the dependent variable, and T1 Well-being and the aggregate variable for global need satisfaction as independent variables. A second analysis separated the cumulative need satisfaction variable into its components of autonomy, competence, and relatedness prior to conducting the regression to explore the individual contributions of each measure of need satisfaction. It was hypothesized that all need satisfying variables would be predictive of well-being.

A final bootstrapping mediation analysis was conducted using PROCESS (Hayes, 2013) to determine whether the need satisfaction variables that were found to be significant predictors of well-being would also be found to mediate the relationship between goal attainment and well-being. It was hypothesized that these need satisfying variables would mediate the influence of goal attainment on well-being.

The fourth research question explored the degree to which the SCM was representative of the data generated by participants as they engaged with and completed a goal oriented assignment in an online wellness course. A structural equation model
(SEM) was constructed to validate the entire model simultaneously. It was hypothesized that the SCM would provide a good fit for the data, indicating that the theoretical assumptions of the model supported by prior investigations hold true in online educational environments.

**Structural Equation Modeling**

Structural equation modeling was used to statistically test the fit of the SCM to data generated by a sample of students enrolled in this course. The relative fit of the model to the data is the determining factor regarding support for the applicability of the hypothesized model within the domain of online education. Structural equation modeling (SEM; Schumacker & Lomax, 2010; Ullman, 2006; Weston & Gore, 2006) is a quantitative, multivariate research methodology. Within SEM, there are two primary types of variables. Latent variables are complex constructs that are not directly observable (e.g. intelligence) and are therefore inferred from a set of observed variables. Observed variables are a set of variables that are measured directly using tests or surveys (e.g. an IQ test) that are used to define or infer latent variables (Schumacker & Lomax, 2010). Both latent and observed variables can also be defined as independent or dependent variables (Ullman, 2006). A variable is considered independent if it is not influenced by any other variable in the model, and dependent if it is influenced by another variable in the model (Schumacker & Lomax, 2010).

SEM is commonly used to explore the relationships between one or more independent variables and one or more dependent variables, all of which may be either continuous or discrete (Ullman, 2006). Full SEM models are therefore capable of
examining relationships among a diverse set of variables. Regression, path analysis, and confirmatory factor analysis are all basic types of SEM (Schumacker & Lomax, 2010; Ullman, 2006). A regression model is made up of only observed variables where a single dependent variable is predicted by one or more independent variables. Path models are also made up of observed variables, but allow for multiple independent or dependent variables. Confirmatory factor models consist of observed variables that are hypothesized to measure one or more independent or dependent latent variables. Full structural equation models combine path and confirmatory factor models to test theoretical relations among latent variables (Schumacker & Lomax, 2010).

As a general linear model, SEM adheres to similar assumptions for normality of data as other linear statistical techniques, and as an inferential statistical technique, SEM does not indicate causality. Although causal relationships are hypothesized, causality cannot be fully established by SEM. However, this type of analysis can support close alignment between real world data and underlying theory. For effective use of this procedure, it is necessary to specify theoretical constructs from previous research or theory, and then use SEM to determine whether the hypothesized relationships are reflected in the sample data (Weston & Gore, 2006). Therefore, SEM is often utilized to test theoretical propositions.

An advantage that is unique to SEM is the capacity to estimate and test the relationships among constructs in a manner that models measurement error. By incorporating the use of multiple measures to represent latent variables, measurement error can be estimated through SEM, which provides additional information about the
measurement characteristics of the observed variables (Weston & Gore, 2006). In SEM, the scale items associated with observed variables are used as indicators of a latent construct. Using these items as indicators of a latent variable rather than components of a scale allows for estimation and removal of the measurement error associated with the observed variables (Ullman, 2006).

Structural equation modeling typically proceeds through a standard series of stages, including model specification, model identification, model estimation, model testing, and model modification (Schumacker & Lomax, 2010; Ullman, 2006; Weston & Gore, 2006). These five steps are utilized in a confirmatory approach by hypothesizing a theoretical model, gathering data, and exploring whether the data fit the model.

**Model Specification**

The first step in structural equation modeling (SEM) is to hypothesize a model based upon theory or available research. Model specification occurs prior to the collection or analysis of any data, and is often considered to be the most difficult step in the process of SEM. Models are constructed by specifying the relationships that exist, or do not exist between the variables that make up the model. Any unspecified relationships among variables are assumed to be equal to zero (Weston & Gore, 2006). Because the proposed study replicates prior studies in a new context of online learning, the model for the structural equation was based upon the theorized self-concordance model (Sheldon, 2014; Sheldon & Elliot, 1999).
Model Identification

Model identification is an essential step in SEM that occurs prior to the estimation of parameters. Parameters is a term used in SEM to indicate the relationships among variables. Each potential parameter in a model must be specified as either a free parameter that is unknown and left free to be estimated, a fixed parameter that is set to a particular value, or a constrained parameter which is unknown but designated to equal one or more other parameters (Schumacker & Lomax, 2010). The purpose of model identification is to ensure that parameter estimates can be determined. Models are considered to be under-identified if parameters may not be uniquely determined, just-identified if there is just enough information for parameters to be determined, or over-identified when there is more than enough information in the sample covariance matrix. The primary condition for establishing the identification of a model is the order condition, which states that the number of free parameters to be estimated must be less than or equal to the number of distinct values in the sample covariance matrix (Schumacker & Lomax, 2010). Degrees of freedom for the structural model were calculated to ensure that the model was over-identified prior to proceeding with any further analysis so that sufficient parameters were available for model modification and testing.

Model Estimation

Various estimation methods, or fitting functions that minimize the difference between the sample covariance matrix and the covariance matrix implied by the theoretical model are available to determine parameter estimates. This study utilized
Maximum Likelihood, the most commonly used estimation method, as it possesses large sample properties and has been shown to produce reasonable results even when small to moderate levels of nonnormality are present in the data (Lei & Lomax, 2005).

Model Testing and Modification

The final steps in the SEM process are procedures through which one can determine to what extent the theoretical model is supported by the sample data. Unlike other statistical procedures that have a single index that produces the most powerful measure of fit (e.g. the $F$ test in ANOVA) SEM utilizes a large number of model fit indices (Schumacker & Lomax, 2010). Most of these measures provide ways to compare the sample covariance matrix to the covariance matrix implied by the theorized model. When fit indices indicate similarity between these two models, it may be said that the data fit the theorized model. The theoretical model is thus confirmed or disconfirmed based on statistical tests of significance and model-fit criteria (Schumacker & Lomax, 2010).

Absolute fit indices are measures that provide an indication of how well proposed theories fit data and demonstrate which proposed model provides superior fit by estimating how well an a priori model fits the sample data (McDonald & Ho, 2002). Numerous absolute fit indices have been developed for SEM, and it is recommended that various criteria should be used in combination to assess the model fit (Hair, Anderson, Tatham, & Black, 1992). Commonly used indices include the model chi-square test and the root-mean-square error of approximation (RMSEA; Steiger, 1990). A statistically non-significant chi-square value indicates that the sample covariance matrix and the
matrix implied by the reproduced model are similar. The RMSEA is a standardized measure of $\chi^2$ that is scaled anywhere from 0 to a large positive value. The RMSEA indicates how well a model with unknown parameter estimates would fit the covariance matrix derived from the population. RMSEA is regarded as a highly informative fit index due to its sensitivity to the number of estimated parameters in the model and favoring of parsimony as it favors models with fewer parameters (Hooper, Coughlan, & Mullen, 2008). RMSEA indicates that a model is a good fit when it is less than .05, and an adequate measure of fit when it is less than .08.

Additional measures that are often employed include the goodness-of-fit index (GFI) and the standardized root-mean-square residual (SRMR; Bentler, 1995). The GFI measures the proportion of variance in the sample covariance matrix that is predicted by the theorized covariance matrix. By measuring the variances and covariances it shows how closely the model comes to replicating the observed covariance matrix (Hooper, Coughlan, & Mullen, 2008). Values greater than 0.95 are indicative of a good fit, and greater than 0.90 are indicative of an adequate fit (Schumacker & Lomax, 2010). The SRMR is a standardized version of the root mean square residual (RMR), both of which are measures of the square root of the difference between the residuals of the theorized model and the sample covariance matrix. Because the range of the RMR is calculated based upon the scales of each indicator, it is difficult to interpret for when items are comprised of various levels of measurement, but the SRMR resolves this concern and is more useful to interpret (Hooper, Coughlan, & Mullen, 2008). Values less than .05 are indicative of a good fit, and less than .08 are indicative of adequate fit.
When the fit of a theoretical model to the data is not as strong as desired, the model may be modified. However, it is important to retain the theoretical integrity of the hypothesized model. Extensive model modification may indicate that the data are not a good fit for the model, and it cannot therefore be considered representative for the particular context. LISREL output includes expected parameter changes, which indicate the estimated change in the magnitude and direction of each parameter. It is recommended that any parameters which can be fixed or freed in order to improve goodness of fit should be selectively manipulated in a stepwise manner and explored in a subsequent model, until a final acceptable model is determined (Schumacker & Lomax, 2010). Any changes should be considered carefully to ensure that the theoretical hypotheses are not compromised by changes to the model.

The final phase of this study was to apply the SCM to the data generated by participants in this study using SEM. Significance was explored for all parameter estimates for the paths that are central to the theorized model, and goodness of fit indices were utilized to ensure that the data provided an adequate fit to the model. Model modifications were made in accordance with the theory of the SCM to determine whether it could be altered to adequately fit the data generated by the students in the online course. All alterations to the model are discussed in the results and limitations section of the study.

**Threats to Internal Validity**

As a non-experimental design, correlational research does not involve manipulation of variables or random assignment of subjects, and is therefore vulnerable
to threats to internal validity (Campbell & Stanley, 1963). The research design of this study reduced the potential threats to internal validity. The items used to measure goal self-concordance were gathered from the Initial Goal Survey as part of a one-time survey administration. Similarly, the items used to measure psychological need satisfaction were gathered from the Final Course Survey via a one-time survey administration. The items used to measure participant well-being were administered two times, in the Initial Goal Survey and the Final Goal Survey, to examine any change in well-being as a result of participation in the goal assignment. The Goal Tracking surveys were administered five times over the course of the semester. The study was vulnerable to the threat of testing as participants were exposed to the measures more than once. Participants may have also felt compelled to provide responses that show progress toward goals. However, participants were encouraged to provide honest responses both explicitly in the framing of the survey, and implicitly through the awarding of full points toward their course grade for completing each survey regardless of their responses. These considerations helped to minimize the threat of testing for the study. Because all measures were completed over the course of a ten week period of time, it is not likely that the threats of history or maturation were likely to confound results. The psychometrics for the surveys utilized in this study have been examined in prior studies, reducing the threat of instrumentation. Subjects were not assigned to different groups, and participation was voluntary, so selection was not a concern. The threats of statistical regression and mortality were also minimized as all participants were enrolled as students in the course, making it unlikely that a substantial number of participants would either regress from extreme scores or drop
out of the study. The research design therefore addressed the standard threats to internal validity suggested by Campbell and Stanley (1963).

The research team included faculty and graduate students who provided instructional roles in the course. Therefore, there may have been some bias toward a desired finding of benefit for student participants. However, the purpose of the study was to test the applicability of the theoretical model, not the individual outcomes for course participants. Therefore, the threat of experimenter bias was addressed by the lack of desire to skew the results toward any specific conclusion or particular finding. Conclusions drawn from the study factored in threats that existed for internal validity, but it was not anticipated that any of the identified threats significantly compromised the findings.

**Threats to External Validity**

The proposed study explored the motivational constructs associated with a goal setting assignment in an online wellness course for university students. The participants and the context were therefore representative of a specific population in a very particular setting. Findings from this study are not intended to be generalizable to other settings, but are instead oriented toward understanding motivational mechanisms related to goals in the previously unexplored context of online education. Population validity was therefore circumscribed to university students who are enrolled in online courses. Frequencies were calculated for demographic variables to determine whether the population was representative of a standard student sample. Additionally, it was recognized that the participants were one segment of a larger student body who voluntarily enrolled in an
online wellness class. Caution must be exercised when generalizing findings for broader college student populations or online learners. Even so, findings from this study are anticipated to be trustworthy for this population, and may help to inform approaches to wellness education. Additionally, the data set generated by this study can be compared with findings produced in future studies using similar contexts.

**Results and Discussion**

The findings from this study were hypothesized to illuminate the elements of the SCM that were supported within the context of a goal setting assignment in an online learning environment. Specific research questions were created based upon a review of studies that explored the relationships between the variables that comprise the SCM in a variety of contexts. However, as no prior studies have explored the construct of self-concordance in an online setting, it was anticipated that this study would contribute to the literature on motivation, goals, and wellness. If the data from the online class is shown to provide a good fit to the SCM, then the propositions of the model can be utilized to more effectively frame the goal setting assignment to prime students for setting self-concordant goals, as this could promote student effort, goal attainment, psychological need satisfaction, and enhanced well-being. On a larger scale, similar courses could be produced that replicate this assignment in order to harness the scalability of online learning to encourage health and wellness oriented behaviors among large populations of adult learners.

This study has several limitations. First, students in this online course have self-selected to participate in a general elective on wellness. Therefore, the sample for this
study may not be representative of general university student populations. Findings related to this study should therefore be balanced with an awareness that the students sampled may already possess intrinsic motivation to initiate healthy behaviors, or dispositions to maintain these behaviors over time. Future studies could address this limitation by exploring the role of motivational processes in goal-related behaviors when all students are required to participate (e.g. first year survey courses that incorporate wellness education). Second, there are only limited studies of that have utilized the propositions of Self-Determination Theory in online learning environments. Findings from these studies have not always aligned with findings from SDT in more traditional face-to-face educational settings. This study was proposed to further understand how the SDT framework, and the SCM specifically may apply in online educational settings. Future studies can build upon these findings for greater clarity regarding motivational principles in online learning environments. Finally, as a non-experimental study, it is not advised to perceive findings from this study as evidence of causal relationships that produce goal attainment or psychological well-being. Future experimental studies could be conducted that utilize findings from this study. For instance, outcomes for goal attainment and well-being could be compared between two class sections after manipulating factors within one of the sections to augment the motivational constructs suggested by the SCM. This modification provides a logical extension of this study that could produce more generalizable findings that either support or disconfirm the value of implementing goal-oriented assignments that align with the propositions of the SCM in future online course offerings.
Chapter 4: Findings

A study was designed to explore the motivational constructs at work in an online, university course intended to facilitate students’ knowledge and implementation of wellness-oriented behavioral change. As the central assignment of the course involved setting and tracking progress toward goals selected for personal wellness, a review of the literature was conducted to identify a model that incorporated these various elements. The self-concordance model (SCM; Sheldon & Elliot, 1999) was identified as a model of motivational mechanisms related to goal setting, striving, attainment, and well-being that has been utilized in a number of different contexts (Sheldon, 2014). However, there was no evidence available for the applicability of the SCM in online learning environments. Therefore, this study replicated prior research studies conducted with the SCM to determine whether the propositions of this theoretical model would be similarly supported within this particular context.

All elements of the study were submitted to an institutional review board and were approved for use. Students enrolled in course sections offered in Autumn 2015 (N=165) and Spring 2016 (N=307) of the course “Wellness: Achieving a Healthy Lifestyle” were eligible to participate in this study. Each student received an email indicating that a research study was being conducted using data from the course. Students were invited to complete an optional, non-graded survey that included five demographic items (age, race/ethnicity, sex, university rank, and citizenship) and one item that
described the study and requested consent for participation. All other measures associated with the study were included in standard course assessments and assignments to ensure that no additional requirements were placed upon students who chose to participate. Data was obtained through students’ completion of instruments related to the central assignment of the course, which required students to select and work toward three wellness-oriented goals throughout their semester of enrollment. Students completed a survey regarding their perceptions of the goals that they had set and an initial measure of well-being in week six. Goal tracking surveys were completed on a bi-weekly basis between weeks seven and fifteen. The final course survey was completed at week fifteen, and included items related to students’ perception of the satisfaction of psychological needs of autonomy, competence, and relatedness during the goal-based assignment as well as a second measure of well-being. All of the measures for the course were computed from this raw data and explored using descriptive statistics, correlations, and regression analyses prior to testing all hypothesized constructs and paths in a structural equation model using LISREL 9.2 (Jöreskog & Sörbom, 2015). The following sections will share findings for all data related to this study, including a profile of the participant sample, response rates, data editing and computation of study variables, and analyses of research questions.

**Descriptive Statistics**

Of the 472 total students enrolled in the two course offerings, 327 (69.3%) completed the demographic survey. Within this group, 288 students (88.1%) of the students who completed the demographic survey gave their consent to have their course
data utilized in this research study. The study design required an examination of the relationship between variables derived from three primary instruments: the initial goal survey, the goal tracking surveys, and the final course survey. Responses to these instruments were paired by case with students who provided consent to participate. Students who failed to complete either the initial goal survey \((n = 20)\) or the final course survey \((n = 8)\) were removed from the participant data set, as there was no mechanism to impute missing values for these variables. Additionally, it was deemed necessary to remove all cases for students who completed less than three of the goal tracking surveys \((n = 7)\), as prior studies using the SCM employed a minimum of three surveys over time to measure sustained effort for participants. This produced a final data set of participants \((N = 253)\) which resulted in a response rate of 87.9% among those students who gave their consent to participate in the study, and a response rate of 53.6% among all students enrolled in the course offerings.

**Participants**

Descriptive statistics were analyzed for all study participants. Baseline measures were collected for 253 subjects. Of these subjects, 115 identified as male (45.4%), 136 identified as female (53.8%), and 2 (0.8%) selected ‘self-identify’ for their sexual identity. A majority \((n = 197, 77.8\%)\) of the participants identified as White/Caucasian, and 25 (9.9%) identified as African/African-American, 13 (5.1%) as Asian/Asian-American, 9 (3.6%) as Hispanic/Latino(a), 7 (2.8%) as multiracial, and 2 (0.8%) as other. Additionally, 244 (96.4%) reported domestic student status, and 9 (3.6%) identified as
Table 2

Sample characteristics \((N = 253)\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (Percent)</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>115 (45.4%)</td>
<td>45.4</td>
</tr>
<tr>
<td>Female</td>
<td>136 (53.8%)</td>
<td>99.2</td>
</tr>
<tr>
<td>Self-Identify</td>
<td>2 (0.8%)</td>
<td>100.0</td>
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<tr>
<td>Race/Ethnicity</td>
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<td></td>
</tr>
<tr>
<td>African/African-American</td>
<td>25 (9.9%)</td>
<td>9.9</td>
</tr>
<tr>
<td>Asian/Asian-American</td>
<td>13 (5.1%)</td>
<td>15.0</td>
</tr>
<tr>
<td>Hispanic/Latino(a)</td>
<td>9 (3.6%)</td>
<td>18.6</td>
</tr>
<tr>
<td>Multiracial</td>
<td>7 (2.8%)</td>
<td>21.4</td>
</tr>
<tr>
<td>Other</td>
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</tr>
<tr>
<td>White/Caucasian</td>
<td>197 (77.8%)</td>
<td>100.0</td>
</tr>
<tr>
<td>University Rank</td>
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<td></td>
</tr>
<tr>
<td>1\textsuperscript{st} Year Undergraduate</td>
<td>7 (2.8%)</td>
<td>2.8</td>
</tr>
<tr>
<td>2\textsuperscript{nd} Year Undergraduate</td>
<td>37 (14.6%)</td>
<td>17.4</td>
</tr>
<tr>
<td>3\textsuperscript{rd} Year Undergraduate</td>
<td>49 (19.4%)</td>
<td>36.8</td>
</tr>
<tr>
<td>4\textsuperscript{th} Year Undergraduate</td>
<td>99 (39.1%)</td>
<td>75.9</td>
</tr>
<tr>
<td>5\textsuperscript{th} or more Year Undergraduate</td>
<td>41 (16.2%)</td>
<td>92.1</td>
</tr>
<tr>
<td>Graduate/Professional</td>
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</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-22</td>
<td>193 (76.2%)</td>
<td>76.2</td>
</tr>
<tr>
<td>23-27</td>
<td>39 (15.4%)</td>
<td>91.6</td>
</tr>
<tr>
<td>28-32</td>
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</tr>
<tr>
<td>33-39</td>
<td>8 (3.2%)</td>
<td>97.2</td>
</tr>
<tr>
<td>40-49</td>
<td>4 (1.6%)</td>
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</tr>
<tr>
<td>50-59</td>
<td>2 (0.8%)</td>
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</tr>
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</tr>
<tr>
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</tr>
<tr>
<td>Domestic Student</td>
<td>244 (96.4%)</td>
<td>96.4</td>
</tr>
<tr>
<td>International Student</td>
<td>9 (3.6%)</td>
<td>100.0</td>
</tr>
</tbody>
</table>

international students. Regarding university rank, at the time of enrollment the sample consisted of 7 (2.8%) first year students, 37 (14.6%) second year students, 49 (19.4%)
third year students, 99 (39.1%) fourth year students, 41 (16.2%) undergraduates with 5 or more years of higher education enrollment, and 20 (7.9%) professional or graduate students. Given the high proportion of undergraduate student enrollment, the majority of participants ($n = 193, 76.2\%$) endorsed the age range of 18-22 years old, with 39 (15.4%) as 23-27, 6 (2.4%) as 28-32, 8 (3.2%) as 33-39, 4 (1.6%) as 40-49, 2 (0.8%) as 50-59, and 1 (0.4%) as 60 or older.

**Measures**

Participant responses to survey items were used to compute the motivational variables that make up the self-concordance model. Prior to any analysis of the data, reliability analyses were run to determine Cronbach’s alpha for the variables that make up the self-concordance model, including measures of goal self-concordance, sustained effort, goal attainment, psychological need satisfaction, and two administrations of the Positive and Negative Affect Scale (PANAS; Watson, Tellegen, & Clark, 1988).

**Goal-related measures.** Participants completed an initial goal survey and rated the degree to which they perceived extrinsic, introjected, identified, or intrinsic reasons for pursuing each of their goals. Participants rated items from 1 = “not at all for this reason” to 9 = “completely for this reason.” A self-concordance variable was computed by averaging participants’ intrinsic and identified ratings of their initial goals and subtracting the averaged external and introjected ratings ($M = 3.39, SD = 2.13$). This measure of goal self-concordance consisted of 12 items ($\alpha = .67$). Participants also completed five goal tracking surveys that asked how hard they were working toward their goals and how much progress they were making toward their goals. Ratings for each item
ranged from 1 = “not hard/well at all” to 9 = “very hard/well.” A sustained effort variable was computed by averaging the 15 items that participants used to rate how hard they had worked toward their three goals ($M = 6.78$, $SD = 1.08$, $\alpha = .86$). A goal attainment variable was computed by averaging the 15 items that participants used to rate their progress toward their three goals ($M = 6.66$, $SD = 0.99$, $\alpha = .83$).

**Psychological Need Satisfaction.** The final course survey included items that asked participants to rate the degree to which their experience in the online course satisfied their needs for autonomy (Standage, Duda, & Ntoumanis, 2005), competence (McAuley, Duncan, & Tammen, 1989), and relatedness (Richer & Vallerand, 1998). Items were rated from 1 = “not at all true” to 7 = “very true.” Variables for need satisfaction were created by averaging the scores of the items for autonomy (6 items; $M = 6.16$, $SD = 0.51$, $\alpha = .51$), competence (6 items; $M = 5.47$, $SD = 0.74$, $\alpha = .69$), and relatedness (5 items; $M = 6.23$, $SD = 0.72$, $\alpha = .81$). Finally, a global variable for psychological need satisfaction was computed by averaging the scores for all items across the three psychological need variables (17 items; $M = 5.95$, $SD = 0.51$, $\alpha = .80$).

**Psychological Well-being.** Participants completed the Positive and Negative Affect Scale (PANAS; Watson, Tellegen, & Clark, 1988) at two time points during the study. The first administration occurred within the initial goal survey in week 6 of the course, and the second administration occurred within the final course survey in week 15 of the course. For each occurrence, scores for positive affect and negative affect were computed by summing the scores for the 10 items that comprise each scale. Scores for each PANAS scale may therefore range between 10 and 50. The original PANAS study
Table 3

Descriptive statistics and reliability of motivational variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of Items</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive affect (T₁)</td>
<td>10</td>
<td>15.00</td>
<td>50.00</td>
<td>36.34</td>
<td>6.44</td>
<td>0.87</td>
</tr>
<tr>
<td>Negative affect (T₁)</td>
<td>10</td>
<td>10.00</td>
<td>39.00</td>
<td>22.18</td>
<td>6.09</td>
<td>0.83</td>
</tr>
<tr>
<td>Self-concordance</td>
<td>12</td>
<td>-2.83</td>
<td>8.00</td>
<td>3.39</td>
<td>2.13</td>
<td>0.67</td>
</tr>
<tr>
<td>Effort</td>
<td>15</td>
<td>3.53</td>
<td>9.00</td>
<td>6.78</td>
<td>1.08</td>
<td>0.86</td>
</tr>
<tr>
<td>Goal Attainment</td>
<td>15</td>
<td>3.60</td>
<td>9.00</td>
<td>6.66</td>
<td>0.99</td>
<td>0.83</td>
</tr>
<tr>
<td>Psychological Need</td>
<td>17</td>
<td>3.46</td>
<td>7.00</td>
<td>5.95</td>
<td>0.51</td>
<td>0.80</td>
</tr>
<tr>
<td>Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive affect (T₂)</td>
<td>10</td>
<td>14.00</td>
<td>50.00</td>
<td>37.37</td>
<td>6.42</td>
<td>0.88</td>
</tr>
<tr>
<td>Negative affect (T₂)</td>
<td>10</td>
<td>10.00</td>
<td>40.00</td>
<td>20.99</td>
<td>6.08</td>
<td>0.85</td>
</tr>
</tbody>
</table>

tested the instrument with undergraduate students enrolled in institutions of higher education in the U.S. \(N = 660\) and found that the average positive affect was 29.7, and the average negative affect was 14.8 points (Watson, Tellegen, & Clark, 1988).

In the present study, for the first administration, positive affect \(M = 36.34, SD = 6.44, \alpha = .87\) and negative affect \(M = 22.18, SD = 6.09, \alpha = .83\) were both found to possess strong internal consistency. For the second administration, positive affect \(M = 37.37, SD = 6.42, \alpha = .88\) and negative affect \(M = 20.99, SD = 6.08, \alpha = .85\) were again found to possess strong internal consistency. Finally, an aggregate well-being variable was calculated by standardizing the positive and negative affect scores for each
administration and then subtracting the standardized scored for negative affect from the scores for positive affect, as per Sheldon and Elliot (1989).

Assumptions of Parametric Data

The analytic procedures used for this study were all based upon standard assumptions of normality according to the general linear model. Each of the motivational variables involved in the analyses were examined to ensure that the data gathered met statistical assumptions of normality prior to statistical analysis. Z-scores for both skewness and kurtosis were calculated and the data was examined for statistical outliers. A significant negative skew was found for both measures of well-being as well as the measure of psychological need satisfaction, indicating that participants were more likely to report high scores for well-being and need satisfaction. A significantly positive value for kurtosis was also found for psychological need satisfaction, indicating that participants were more likely to endorse similar values toward the high end of the distribution, again signaling a high endorsement of need satisfaction. Given the size of the sample ($N = 253$) it was determined that the presence of significance for measures of skewness and kurtosis was not sufficient to question the usability of the data from this sample as these values are likely to be significant in large samples even when skewness and kurtosis are not overly different from a normal distribution. Therefore, histograms and Q-Q plots were generated for each factor to visually examine the distributions.

The histograms and plots derived for the data associated with the motivational variables for the study, as seen in Figure X, presented data that adhered reasonably closely to expectations for normal distribution. Additionally, an analysis of the data for
Figure 6. Histograms and Q-Q plots for motivational variables.

statistical outliers did not identify any data points that were beyond an acceptable range for the measures used in the study. Therefore, the data for this sample was determined to
Table 4

Tests of skewness and kurtosis for motivational variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Skewness</th>
<th>z-score for Skewness</th>
<th>Kurtosis</th>
<th>z-score for Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being (T₁)</td>
<td>-0.510</td>
<td>-3.33*</td>
<td>0.037</td>
<td>0.12</td>
</tr>
<tr>
<td>Self-concordance</td>
<td>-0.019</td>
<td>-0.12</td>
<td>-0.299</td>
<td>-0.98</td>
</tr>
<tr>
<td>Effort</td>
<td>-0.282</td>
<td>-1.84</td>
<td>-0.282</td>
<td>-0.92</td>
</tr>
<tr>
<td>Goal Attainment</td>
<td>-0.270</td>
<td>-1.76</td>
<td>-0.048</td>
<td>-0.16</td>
</tr>
<tr>
<td>Psychological Need Satisfaction</td>
<td>-0.930</td>
<td>-6.08*</td>
<td>1.971</td>
<td>6.46*</td>
</tr>
<tr>
<td>Well-being (T₂)</td>
<td>-0.652</td>
<td>-4.26*</td>
<td>0.236</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Note: * p < .001 level.

be acceptable for analyses based upon the general linear model, which describes the different quantitative methodologies that comprise this study.

**Variance by Demographic Variables**

Prior studies using the self-concordance model have found only minimal effects of gender on the variables that make up the SCM, none of which were deemed to interact with broader findings (Sheldon & Elliot, 1989). No prior studies have examined any additional demographic variables to determine differences in outcomes related to components of the SCM. An independent-means t-test was run to examine the main effects of sex on all major study variables. Two differences were found. Male students (n = 115) reported higher levels of well-being at the initial measure of well-being (M = 15.88, SD = 10.51) than female students (M = 12.68, SD = 10.46). This difference
was significant $t(249) = 2.41$, $p = .017$, with a small effect $r = 0.15$. Female students reported higher levels of relatedness ($M = 6.34$, $SD = 0.61$) than male students ($M = 6.10$, $SD = 0.80$). This difference was also significant $t(211.53) = -2.65$, $p = .009$, with a small effect $r = 0.17$.

In addition, several ANOVA analyses were conducted to check for variance based upon demographic variables of rank, ethnicity, citizenship, and age. Given the difference in sample sizes among these groups, Hochberg’s GT2 and the Games-Howell procedures were included to better understand the differences between groups. In every case, the differences that were found to be significant were between two samples with small populations. For instance, a significant difference was found between 28-32 year old participants ($n = 6$) and 40-49 year old participants ($n = 4$) for scores on the self-concordance variable ($p = .012$). However, this difference can likely be attributed to the sample size rather than any significant difference between people within these age groups and the motivational variable in question. Therefore, given the small effect sizes for the differences that were found in this sample it was determined that the differences by demographic variables were not influential findings that subsequently did not have any interaction with the major study findings.

**Findings**

Each of the research questions for the study were addressed by specific analytic procedures in a manner that replicated prior studies using the SCM in educational environments (e.g. Sheldon & Elliot, 1999; Sheldon & Kasser, 1998). The following
sections detail the analyses for the current study, which were conducted in a sequential manner according to the order of the research questions for the study.

**Self-Concordance and Goal Attainment**

The first research question for this study explored whether goal self-concordance is linked with goal attainment. Bivariate correlations were run for all of the major variables (well-being, self-concordance, effort, goal attainment, and psychological need satisfaction) that make up the Self-Concordance Model. It was hypothesized that a positive relationship would be found between the variables of self-concordance and goal attainment. The variables of self-concordance and goal attainment were found to correlate significantly ($r = .155, p = .014$). All additional variables were also found to be significantly correlated.

<table>
<thead>
<tr>
<th>T1 Well-Being</th>
<th>Self-Concordance</th>
<th>Effort</th>
<th>Goal Attainment</th>
<th>Need Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Well-Being</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Self-Concordance</td>
<td>.310**</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Effort</td>
<td>.246**</td>
<td>.142*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Goal Attainment</td>
<td>.301**</td>
<td>.155*</td>
<td>.768**</td>
<td>-</td>
</tr>
<tr>
<td>Need Satisfaction</td>
<td>.237**</td>
<td>.195**</td>
<td>.414**</td>
<td>.411**</td>
</tr>
<tr>
<td>T2 Well-Being</td>
<td>.662**</td>
<td>.264**</td>
<td>.340**</td>
<td>.419**</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
The Mediating Role of Effort

The second research question explored whether the variable of effort mediated the relationship between the variables of goal self-concordance and goal attainment. It was hypothesized that effort would mediate the relationship between goal self-concordance and goal attainment. A mediation analysis was conducted using PROCESS (Hayes, 2013) to test this hypothesis. Goal attainment was entered as the outcome variable, with self-concordance as the independent variable and effort entered as a potential mediator. The relationship between self-concordance and goal attainment was mediated by effort. The standardized regression coefficient between self-concordance and effort was statistically significant, as was the standardized regression coefficient between effort and goal attainment. The indirect effect of self-concordance on attainment was (.012)(.71) = .009.

The significance of this indirect effect was tested using bootstrapping procedures. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect was .009, BCa CI [.001, .016]. For bootstrapping procedures, if zero does not fall between the lower and upper bound of the confidence interval, then it can be claimed that the indirect effect is not zero with 95% confidence. Thus, the indirect effect was statistically significant. The mediator could account for more than half of the total effect, $P_M = .70$.

These results suggest that self-concordance is predictive of goal attainment through increasing the sustained effort of participants over the course of the semester.
Goal Constructs and Psychological Well-Being

The third research question explored the relationship between goal self-concordance, goal attainment, psychological need satisfaction, and well-being. Three regression analyses were used to explore these relationships. A multiple linear regression analysis was run to determine predictors of well-being from variables including goal attainment, self-concordance, and the variable that represents an interaction between self-concordance and goal attainment. T2 Well-being was entered as the dependent variable, and T1 Well-being was entered in the regression equation as an independent variable, so that any changes in well-being would be predicted by other independent variables in the equation (Cohen & Cohen, 1983). Goal attainment, self-concordance, and the product of goal attainment and self-concordance were also entered as independent variables. Forced entry was used to enter all predictors into the model simultaneously, as this is the recommended method for theory testing (Studenmund & Cassidy, 1992). It was
hypothesized that goal attainment would be predictive of well-being and that self-concordance would not be a significant predictor of well-being. Additionally, it was hypothesized that the computed interaction variable of the product between self-concordance and goal attainment would be a significant predictor of well-being, indicating that the association between goal attainment and changes in well-being was stronger for participants with more self-concordant goals.

The results of the regression indicated the predictors explained 49.6% of the variance ($R^2 = .496$, $F(4,248) = 60.96, p < .001$). As hypothesized, it was found that goal attainment significantly predicted changes in well-being ($\beta = .25, p < .001$) and self-concordance did not significantly predict changes in well-being ($\beta = .06, p = .24$). Counter to the hypothesized findings, the interaction variable of goal attainment and self-concordance did not contribute additional variance ($\beta = -.05, p = .29$). Goal attainment was therefore found to be associated with enhanced well-being, as found by Sheldon and

Table 6

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being ($T_1$)</td>
<td>.56</td>
<td>.05</td>
<td>.57*</td>
</tr>
<tr>
<td>Self-concordance</td>
<td>.04</td>
<td>.04</td>
<td>.06</td>
</tr>
<tr>
<td>Goal attainment</td>
<td>.41</td>
<td>.08</td>
<td>.25*</td>
</tr>
<tr>
<td>Goal attainment x Self-concordance</td>
<td>-.01</td>
<td>.01</td>
<td>-.05</td>
</tr>
</tbody>
</table>

*Note: $R^2 = .496$. * $p < .001$ level.*
Kasser (1998) and Sheldon and Elliot (1999). However, the association between goal-attainment and changes in well-being was not found to increase when participants' goals were more self-concordant.

A second proposition was tested that suggested the attainment of self-concordant goals would lead to experiences that satisfy psychological needs of autonomy, competence, and relatedness. To examine this path of the self-concordance model, the variable for global need satisfaction was regressed on variables of goal attainment, self-concordance (both variables centered), and a product term representing the interaction of these two centered variables. Based on prior studies (e.g. Sheldon & Elliot, 1999), it was hypothesized that goal attainment, self-concordance, and the interaction between goal attainment and self-concordance would all be significant predictors of need satisfying experiences. The results of the regression indicated the predictors explained 22% of the variance \((R^2 = .220, F(3,249) = 23.38, p < .001)\) in need satisfaction. As hypothesized, it

Table 7

Coefficients for regression of self-concordance, goal attainment, and interaction between goal attainment and self-concordance on need satisfaction.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-concordance</td>
<td>.01</td>
<td>.002</td>
<td>.16*</td>
</tr>
<tr>
<td>Goal attainment</td>
<td>.21</td>
<td>.03</td>
<td>.41**</td>
</tr>
<tr>
<td>Goal attainment x Self-concordance</td>
<td>-.01</td>
<td>.002</td>
<td>-.19*</td>
</tr>
</tbody>
</table>

Note: \(R^2 = .220\). *\(p < .01\), **\(p < .001\) level.
was found that goal attainment ($\beta = .41$, $p < .001$), self-concordance ($\beta = .16$, $p = .006$), and the interaction of goal attainment and self-concordance ($\beta = -.19$, $p = .001$) were all significant predictors of need satisfaction, indicating that participants who attained more self-concordant goals also reported more need-satisfying experiences during the semester. However, the negative $\beta$ weight for the interaction variable suggested that the attainment of self-concordant goals was less predictive of need satisfaction, a finding that runs counter to the original findings of Sheldon and Elliot (1999).

The final regression analysis for the self-concordance model was an examination of the relationship between need satisfaction and enhanced well-being. As per Sheldon and Elliot (1999) $T_2$ well-being was entered as the dependent variable, with both $T_1$ well-being and the cumulative variable for need satisfaction entered as independent variables. As per earlier analyses, $T_1$ well-being was entered into the regression equation to observe any changes in well-being as a result of the additional predictor variables. Need satisfaction explained 54.6% of the variance ($R^2 = .546$, $F(2,250) = 150.03$, $p < .001$) in participant well-being and was thus found to be a significant predictor of enhanced well-

Table 8

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being ($T_1$)</td>
<td>.57</td>
<td>.04</td>
<td>.58*</td>
</tr>
<tr>
<td>Need satisfaction (cumulative)</td>
<td>1.01</td>
<td>.14</td>
<td>.34*</td>
</tr>
</tbody>
</table>

Note: $R^2 = .546$. *$p < .001$ level.
being ($\beta = .34, p < .001$). However, a more nuanced understanding of the role of the components of this variable (autonomy, competence, and relatedness) was determined to be additive to the understanding of the relationship between participants’ need satisfaction and well-being. Therefore, a second regression analysis was conducted where the global need satisfaction variable was replaced by the separate psychological need variables for autonomy, competence, and relatedness.

The need satisfaction variables, when entered separately, explained 56.8% of the variance ($R^2 = .568, F(4, 248) = 81.43, p < .001$) in participant well-being. However, each of the variables were not found to contribute equally to the variance. Satisfaction of the psychological need for competence was found to be the strongest predictor of well-being ($\beta = .32, p < .001$). Conversely, neither autonomy ($\beta = .04, p = .400$) nor relatedness ($\beta = .09, p = .096$) were identified as significant predictors of well-being. Taken together, these analyses of the relationship between goal attainment, self-concordance, need

Table 9

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being ($T_1$)</td>
<td>.54</td>
<td>.04</td>
<td>.55*</td>
</tr>
<tr>
<td>Autonomy</td>
<td>.14</td>
<td>.16</td>
<td>.04</td>
</tr>
<tr>
<td>Competence</td>
<td>.71</td>
<td>.11</td>
<td>.32*</td>
</tr>
<tr>
<td>Relatedness</td>
<td>.20</td>
<td>.12</td>
<td>.09</td>
</tr>
</tbody>
</table>

*Note: $R^2 = .568$. * $p < .001$ level.
satisfaction and well-being may suggest that goal attainment, and to some degree the attainment of concordant goals in particular may generate experiences that satisfy psychological needs. More specifically, these analyses seem to indicate a previously unobserved relationship between goal attainment and the psychological need of competence, which may be the key determinant of enhanced perceptions of well-being for participants in a goal-related task.

A final mediation analysis was conducted using PROCESS (Hayes, 2013) to test the proposition that need satisfying experiences for competence were the means by which goal attainment influences well-being. T2 well-being was entered as the outcome variable, with goal attainment as the independent variable and competence as a potential mediator. The relationship between goal attainment and well-being was mediated by competence. The standardized regression coefficient between attainment and competence was

![Diagram](image.png)

\textit{Figure 8.} Standardized regression coefficients for the relationship between goal attainment and well-being as mediated by competence. The standardized regression between attainment and well-being, controlling for competence, is in parentheses.

Note. * \( p < .01 \)** \( p < .001 \)

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statistically significant, as was the standardized regression coefficient between competence and well-being. The indirect effect of attainment on well-being was \((.41)(.99) = .41\). The significance of this indirect effect was tested using bootstrapping procedures. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect was .41, BCa CI [.28, .55]. Thus, the indirect effect was statistically significant. The mediator could account for more than half of the total effect, \(P_M = .58\). These results suggest that goal attainment was predictive of well-being through enhancing the satisfaction of the psychological need for competence for participants as they worked toward their goals over the course of the semester.

**A Structural Model of Self-Concordance**

Each of the preceding analyses was conducted to establish the presence of relationships among the primary variables that make up the components of the self-concordance model (SCM; Sheldon, 2014; Sheldon & Elliot, 1999). The fourth research question asked whether the SCM provided a good fit for the data generated by participants who completed a goal oriented assignment in the online wellness course. Therefore, structural equation modeling (SEM) was used to test all relationships simultaneously, to determine a statistically sound model for the data gathered in this online course. It was hypothesized that the SCM would provide a good fit for the data, indicating that the theoretical assumptions of the model supported by prior investigations held consistently true in online educational environments.
Figure 9. Initial structural model: Theoretically central pathways and standardized parameter estimates.

Note. * $p < .01$ ** $p < .001$

An initial path model was constructed that replicated the self-concordance model identified in prior studies. The fit of this model was tested using the student edition of LISREL 9.2 (Jöreskog & Sörbom, 2015). Data for each of the primary variables that make up the SCM was imported into LISREL. A covariance matrix was generated and a statistical model was created that indicated severe multicollinearity and two factor loadings that were not significantly different from 0 ($p < .05$). The model was over-identified according to the order condition ($df = 9$). Model fit was assessed using several goodness of fit indices including the Chi-square statistic ($\chi^2$), the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR) and the goodness of fit index (GFI). For the initial model, $\chi^2 = 357.39$, $p < .001$, indicating the model is a poor fit for the data. Additionally, RMSEA = 0.391, which also indicates a poor fit for the data as it should ideally be below .05. The SRMR = 0.066, which is approaching a good fit, but should ideally be below .05. GFI = 0.809 for the initial model, which indicates that it does not adequately fit the data as this number should ideally be
above 0.95. These four values and the presence of non-significant factor loadings indicate that the model requires modification to better fit the data.

A basic principle of structural equation modelling is that models must be based upon theory to avoid exploratory analyses that search for significant data in the absence of theoretical justification (Schumacker & Lomax, 2010). Upon consideration of the initial model, and in light of earlier data analyses, two potential alterations to the model were determined to be appropriate. Earlier analyses had indicated that the interaction variable of self-concordance and attainment did not contribute significantly to need satisfaction. This variable was also found to contribute very little to the initial structural model. Additionally, competence had been found to mediate the relationship between attainment and well-being to a greater degree than the aggregate variable of psychological need satisfaction made up of autonomy, competence and relatedness. These indicators align with a theoretical proposition that for participants in this study goal attainment and the resultant gains in competence were greater contributors to well-being than the previously established self-concordance model. Therefore, a stepwise process of model testing was decided upon for further analysis. A first alteration would test a model with the interaction variable present, but a variable for competence in place of the variable for need satisfying experiences. A second revised model would test the initial model after removing the interaction variable. A final model would be tested that both replaced the need satisfying experiences variable with the competence variable and removed the interaction variable.
Figure 10. Revised structural model 1: Theoretically central pathways and standardized parameter estimates after substituting competence for need satisfying experiences.

Note. * $p < .01$ ** $p < .001$

**Model Testing**

The first model alteration involved testing the SCM model after replacing the variable for need satisfying experiences with a variable of competence, one component of the need satisfying experiences variable. A second model was constructed that remained consistent with the initial SCM except for this change. Data for each of the primary variables that make up the SCM was imported into LISREL. A covariance matrix was generated and a statistical model was created that again indicated severe multicollinearity and two factor loadings that were not significantly different from 0 ($p < .05$). The revised model was over-identified according to the order condition ($df = 9$) and yielded a $\chi^2 = 341.30$, $p < .001$, indicating the model is still a poor fit for the data. The additional goodness of fit indices (RMSEA = 0.382, SRMR = 0.061, GFI = 0.823) also show only marginal improvement, indicating that this respecified model did not provide an adequate fit for the data and required further modification. However, the standardized coefficients
for the pathway between goal attainment and competence and the pathway between competence and well-being both increased as a result of this change.

The second model alteration involved the removal of the interaction variable that represented the product of goal attainment and self-concordance, which had a non-significant factor loading that did not contribute to the initial model. A second model was constructed that remained consistent with the initial SCM except for the exclusion of the interaction variable. Data for each of the other primary variables that make up the SCM was imported into LISREL. A covariance matrix was generated and a statistical model was created that no longer presented any significant multicollinearity and only one factor loading that was not significantly different from 0 ($p < .05$). With this modification, the revised model was over-identified according to the order condition ($df = 6$) and now produced statistics indicating a much more adequate fit ($\chi^2 = 19.02, p = .004$; RMSEA = 0.093, SRMR = 0.045, GFI = 0.976). The chi-squared statistic was still statistically significant, indicating a poor fit for the data. However, the RMSEA for this model was approaching a good fit, while all other fit indices indicated that the model was a good fit for the data. Although this one modification had produced a significantly better fit for the

![Diagram](image)

*Figure 11.* Revised structural model 2: Theoretically central pathways and standardized parameter estimates after removing interaction variable from SCM.

*Note.* *p* < .01 **p** < .001
data, it had been predetermined that a fourth model would be generated that replicated the third model, but replaced the variable for need satisfying experiences with the variable for competence. It was anticipated that this additional modification might only marginally improve the fit, which would indicate that this current model would be preferred as it is more parsimonious to only make one change to the theoretical model.

The final model alteration involved a replacement of the variable for need satisfying experiences with the variable for competence and a removal of the interaction variable that represented the product of goal attainment and self-concordance. A fourth model was constructed and data for the variables that comprise this revised model was imported into LISREL. A covariance matrix was generated and a statistical model was created that also did not contain any significant multicollinearity and only one factor loading that was not significantly different from 0 ($p < .05$). With this final modification, the revised model was over-identified according to the order condition ($df = 6$) and now produced statistics indicating a significantly better fit for the data ($\chi^2 = 5.60, p = .469$; RMSEA < .001, SRMR = 0.026, GFI = 0.993). The chi-squared statistic was no longer statistically significant, indicating a good fit for the data, and all other fit indices now

Figure 12. Final structural model: Theoretically central pathways and standardized parameter estimates after removing interaction variable from SCM and substituting competence for need satisfying experiences.

Note. * $p < .01$ ** $p < .001$
indicated that the model was a good fit for the data. This fourth model revision can therefore be considered the final model for explaining the relationship between the motivational variables that make up the Self-Concordance Model for the participants in this study.

**Summary**

The theoretical self-concordance model (SCM; Sheldon, 2014; Sheldon & Elliot, 1999) did not provide an adequate fit for the data generated by participants in this study. This resulted primarily from the presence of several correlated errors, or variance that is not explained by theoretical constructs which covaried across multiple measures. In addition, an aggregate variable for psychological need satisfaction was found to have less statistical relevance than competence alone, one of its component variables. These considerations were identified in both preliminary analyses as well as the model testing stage of the structural equation model process. Therefore, modifications to the model were tested in a stepwise manner to determine the most parsimonious model that provided adequate fit for the data.

The fit was marginally improved by substituting a variable for competence for the variable of need satisfying experience. The overall fit of the model was greatly improved by removing the interaction variable of goal self-concordance and goal attainment. However, alteration of this model by again replacing need satisfying experiences with competence proved to be an even greater fit that satisfied criteria for all fit indices. A final model was determined that achieved adequate fit based upon the data set for this study. This model did not include the interaction variable specified by the original
theoretical model, and substituted a variable for competence in place of the theoretically specified variable of need satisfying experiences. Discussion of this final model within the context of this study of participants in an online course and further considerations, limitations, and future recommendations will be discussed in the following chapter.
Chapter 5: Summary, Conclusions, Discussion and Recommendations

The purpose of this study was to explore factors related to the pursuit of goals. More specifically, the study examined motivational constructs that have been proposed as significant contributors to goal achievement and the relationship between these factors and subjective well-being. Prior research has demonstrated support for the Self-Concordance Model (SCM; Sheldon, 2014; Sheldon & Elliot, 1999) as a theoretical representation of goal-related motivations. The structure of the SCM suggests that the key factor for understanding goal achievement and well-being is the construct of self-concordance, or the degree to which goals are aligned with enduring, internal values and interests. Self-concordant goals are perceived to produce greater effort in striving toward goals over time, which results in a greater likelihood of goal attainment. In addition, it is suggested that the pursuit of self-concordant goals is also more likely to satisfy psychological needs for autonomy, competence, and relatedness that in turn promote greater well-being (Sheldon, 2014; Sheldon & Elliot, 1999).

Summary

The current study proposed to extend the existing research related to the SCM by examining the applicability of this model in the context of an online university course. The class that was the subject for this study was created as an online, educational intervention designed to enhance college student health and wellness. The primary means
for facilitating these desired outcomes occurred through the central assignment for the course, which involved the selection of three personal goals based upon a holistic multidimensional model of wellness.

Students were asked to create goals with related, measurable objectives, and to report their progress toward these goals throughout their enrollment in the course. In prior course iterations, students reported high levels of adherence toward their goals, and provided qualitative responses in surveys administered at the end of the course that discussed their experience of this activity. Students reported diverse accomplishments, ranging from goals for spiritual wellness (e.g. “renew my faith life,”) to social wellness (e.g. “restore my fractured relationship with my mother,”) to physical wellness (e.g. “stop smoking”) over the course of ten weeks of goal-pursuant activity. Given the replicability of the course, these self-reported outcomes suggested that online educational interventions may provide opportunities to facilitate wellness-oriented outcomes across broad populations. However, further research was required to understand how the course structure was contributing to these reported results. Therefore, the current study was developed to better understand the factors that promoted goal attainment and increased well-being for participants in this course.

The SCM was selected as a model for several reasons. The theoretical propositions associated with the SCM were supported by a strong body of evidence in the research literature, and it was unique among goal oriented theories for explicitly including well-being as a goal-related construct. However, no prior studies had examined the applicability of the SCM in online learning environments. Therefore, the framework
for this study was developed in a manner that replicated prior research studies (e.g. Sheldon & Elliot, 1999; Sheldon & Kasser, 1998) conducted with the SCM to determine whether the propositions of this model would remain consistent within the particular context of an online university wellness class. Data was collected throughout two course offerings, and students ($N = 253$) met criteria for participation by both consenting to participate in the research study and completing all surveys associated with the study. Data obtained from these surveys was examined to ensure that all assumptions for statistical analyses were met. Additionally, reliability analyses were conducted following computation of motivational construct variables, each of which were found to possess similar reliability coefficients to prior studies. Finally, a comparison of differences by demographic population was conducted. This exploratory analysis yielded no findings indicating that subsequent statistical analyses would benefit from separating participants by demographic differences, so all analyses associated with the research questions for the study were completed using the entire participant population.

**Discussion of Findings**

**Research Question 1**

The first research question asked whether goal self-concordance was linked with goal attainment. It was hypothesized that a positive relationship would be found between the variables for self-concordance and goal attainment. Bivariate correlations were run for all of the major variables that make up the Self-Concordance Model. The variables of self-concordance and goal attainment were found to correlate significantly ($r = .155, p = .014$). While this finding satisfies the hypothesis that there is a positive relationship
between self-concordance and goal attainment, the coefficient weight was weaker than in previous studies. For instance, Sheldon and Elliot (1999) found a significant correlation between self-concordance and goal attainment ($r = .34, p < .05$). Additionally, it was of interest to note that all of the other variables (well-being, effort, and psychological need satisfaction) were also found to be significantly correlated with one another as well as with self-concordance and goal attainment. In fact, the weight of the Pearson product-moment correlation coefficient between self-concordance and goal attainment was noticeably lower than the weight of the correlation coefficient between most of the other variables, which were found to also possess higher levels of statistical significance (please refer to page 90 of this document for the full correlation table). The theoretical proposition put forth by the SCM that self-concordance was the key factor for understanding goal attainment and changes in well-being was therefore perceived to be less certain for the particular context of this study. The observed differences in the relationship between variables became a consideration throughout the remaining procedures that made up the study.

**Research Question 2**

The second research question explored whether the variable of effort mediated the relationship between the variables of self-concordance and goal attainment. Prior studies (e.g. Sheldon & Elliot, 1999) had demonstrated that when effort was introduced into the relationship between self-concordance and goal attainment, self-concordance became a non-significant factor. This finding was interpreted to suggest that self-concordance affected goal attainment by improving the amount of effort put forth over
time in pursuance of goals. In other words, goals that were more self-concordant were more likely to engage participants for a longer duration, and this sustained engagement increased the likelihood of accomplishment. It was therefore hypothesized that effort would mediate the relationship between self-concordance and goal attainment.

A mediation analysis was conducted using PROCESS (Hayes, 2013) to test this hypothesis. This procedure identified a statistically significant indirect effect and indicated that the variable of effort may account for up to 70% of the total effect, \( P_M = .70 \) on goal attainment. This was not a surprising finding, given that the correlation coefficient between effort and goal attainment was the strongest relationship observed in the previous correlation analysis (\( r = .768, p < .001 \)). The mediation model also showed a significant relationship between self-concordance and both effort and goal attainment, which supported the proposition that effort mediates the relationship between self-concordance and goal attainment. While these findings aligned with prior studies that established the SCM, a comprehensive discussion of these results must include more recent findings that have been published since the launch of the current study that challenge the effort-based assertion of the SCM.

These emergent studies propose automatic goal pursuit as an alternative mechanism for the attainment of self-concordant goals (Milyavskaya, Inzlicht, Hope, & Koestner, 2015). This proposition suggests that self-regulatory processes are a product of beneficial habits (Galla & Duckworth, 2015) or implicit biases that make goal-related decisions feel automatic. Therefore, goal-related activities may be experienced as more effortless by some participants rather than requiring intentional sustained effort.
(Gillebaart & de Ridder, 2015). One recent study explored this assertion by augmenting the standard methodology for self-concordance research (Werner, Milyavskaya, Foxen-Craft, & Koestner, 2016). The goal tracking survey process that typically assesses effort and progress was expanded to include questions that asked participants to consider whether they experience their goal pursuits as relatively taxing or easy. Additionally, the research protocol insured that these questions were delivered to participants at different time points to avoid potential conflation of progress with effort. The authors suggested that participants who respond to questions about effort and progress concurrently may judge the effort that they exert toward goals based upon their progress (i.e., ‘If I made progress, it must be because I tried hard’).

Findings from this study suggested that self-concordance was not associated with increased effort, and additionally that subjective ease was a stronger mediator of the relationship between self-concordant goals and goal attainment than effort (Werner, Milyavskaya, Foxen-Craft, & Koestner, 2016). For the purposes of the current study, this finding is notable as the effort reported by participants was a strong predictor of goal attainment, but did not seem to be solely premised upon the self-concordance of their goals. Therefore, it may be the case that there is an alternative explanation for the amount of effort reported in goal pursuits for participants in this study. For instance, if participants in the current study were conflating effort with progress, it is possible that individuals who were experiencing greater success in their goal pursuits may have also been reporting greater effort. However, this emerging evidence suggest that it is possible that their positive outcomes were the product of self-regulated behaviors that actually
generated greater ease in the pursuit of their goals. It would be worthwhile to possess
greater clarity regarding the degree to which either effort or self-regulation played a role
in goal striving, so that future iterations of the course could better support participants’
ability to institute lifestyle changes. Further discussion of this possibility follows in the
implications and recommendations section of this document.

Research Question 3

The third research question explored the relationship between self-concordance,
goal attainment, psychological need satisfaction, and well-being. Three regression
analyses and one mediation analysis were used to explore these relationships. These
analyses mark the first substantial difference in findings from the original studies that
produced the self-concordance model. For the first regression analysis, it was
hypothesized that both goal attainment and the interaction variable between attainment
and self-concordance would positively predict well-being, while self-concordance alone
would not be predictive of well-being. While goal attainment remained a significant
positive predictor of well-being (β = .25, p < .001), neither self-concordance (β = .06, p = .24) nor its interaction with goal attainment (β = -.05, p = .29) significantly predicted
well-being outcomes. These findings vary greatly from findings from the original study,
where self-concordance was unexpectedly found to predict well-being (β = .19, p < .05),
and the interaction variable (β = .23, p = .01) was also predictive of well-being (Sheldon
& Elliot, 1999).

Inclusion of the interaction variable in the self-concordance model was intended
to show that self-concordance moderated the extent to which goal attainment was linked
with well-being. However, in the context of this study, self-concordance did not appear to moderate the relationship between goal attainment and well-being. Nor was it found to be a significant predictor of well-being as an independent variable. Instead, goal attainment was the only variable of the three used in this analyses that possessed a significant relationship with well-being. This finding indicates that for participants in this study, any reported gains in well-being seemed to be more closely linked with progress toward goals than the degree to which participants perceived those goals as self-concordant.

A second regression analysis was conducted to explore the relationship between self-concordance, goal attainment, and the interaction variable of self-concordance and goal attainment with need satisfying experiences. It was hypothesized that self-concordance, goal attainment, and the interaction variable would all positively predict need satisfaction. The proposal of need satisfaction as a variable for the SCM is derived from self-determination theory. Sheldon and Kasser (1998) proposed that progress toward self-concordant goals is likely to involve experiences that satisfy psychological needs for autonomy, competence, and relatedness. These capacities, in turn, have been linked with personal growth and well-being (Deci & Ryan, 1985; Ryff, 1989). Therefore, need satisfaction was included in the SCM as a construct that bridges the relationship between goal attainment and well-being. In the current study, all three variables were found to positively predict need satisfying experiences. Therefore, based on these first two regression analyses, it was found that both self-concordance and goal attainment were significantly related to need satisfying experiences, but only goal attainment was significantly related to well-being.
Consideration of these findings prompted further inquiry as to the relationships between self-concordance, goal attainment, need satisfaction, and well-being. It was determined that a more nuanced understanding of these relationships could be obtained by expanding upon prior studies by conducting the third regression analysis of the current study in two different ways. The first analysis replicated the procedures of prior studies and explored the relationship between the aggregate need satisfaction variable and well-being. The second analysis expanded upon this analysis by separating the aggregate variable into its component measures of autonomy, competence and relatedness and exploring the relationship between each of these constructs and well-being. In the replication portion of this third analysis, the aggregate variable for need satisfaction was found to predict 54.6% of the variance ($R^2 = .546$, $F(2,250) = 150.03$, $p < .001$) in participant well-being and was thus found to be a significant predictor of well-being ($\beta = .34$, $p < .001$). However, when this variable was divided into its separate components, only competence was found to be a significant predictor of well-being ($\beta = .32$, $p < .001$). Neither autonomy ($\beta = .04$, $p = .400$) nor relatedness ($\beta = .09$, $p = .096$) were identified as significant predictors of well-being. Based upon this finding, the variable of competence was selected to replace the variable of aggregate need satisfaction for the mediation analysis associated with this research question.

A mediation analysis was conducted using PROCESS (Hayes, 2013) to test the hypothesis that competence would mediate the relationship between goal attainment and well-being. This procedure identified a statistically significant indirect effect and indicated that the variable of competence may account for more than half of the total variance.
effect, $P_M = .58$ on well-being. This finding suggests that goal attainment was predictive of well-being because participants’ progress toward identified goals was inherently linked with experiences that satisfied their psychological need for competence. Stated differently, participants who reported progress toward their goals were also more likely to report feeling greater levels of competence in their pursuits, and this in turn was the largest contributor to changes in well-being.

These findings help to explain discrepancies between the current study and prior studies of the self-concordance model. The construct of self-concordance is measured by assessing the degree to which individuals identify personal goals as autonomous and relevant. This measure is conceptually very similar to measures for the psychological needs for autonomy and relatedness. By contrast, goal attainment is measured by participants’ perceived progress toward their goals. This conceptually aligns more closely with items used to measure the psychological need for competence. Both self-concordance and goal attainment were found to positively predict the aggregate variable of need satisfaction, indicating that both of these variables were predictive of experiences connected to autonomy, competence, and relatedness for participants in the study. However, only goal attainment and competence were found to relate to well-being. Given the conceptual connection between goal attainment and competence and the fact that competence was the only measure of need satisfaction that predicted well-being, it follows that goal attainment was the primary source of any changes in well-being for participants in this study, and that these changes could be best explained by enhancement of participants’ experiences of competence over time.
Research Question 4

The final research question for this study involved an exploration of the relationships between all of the motivational variables for this study simultaneously within a structural equation model (SEM). One of the primary purposes of structural equation modelling is the testing of theoretical models, so the first model that was created replicated the SCM to determine whether the theorized model would provide a good fit for the data generated by participants in this study (please refer to Figure 9 on page 99 of this document). It was hypothesized that the SCM would provide a good fit for the data, indicating that the theoretical assumptions of the model supported by prior investigations would be consistent in the new context of online educational environments. However, there were multiple statistical concerns with the original model. SEM analyses indicated the presence of severe multicollinearity, a lack of significance in the relationships among several components, and insufficient results for every fit index used in this study. Therefore, the SEM analysis progressed to a sequence of model testing and modification to determine a statistically sound model for the data gathered in this online course.

Within structural equation model analyses, all model respecifications should be theoretically meaningful and specified a priori (Schumacker & Lomax, 2010; Ullman, 2006; Weston & Gore, 2006). Therefore, a sequence was determined prior to any further analyses ensure that this study would be confirmatory rather than exploratory. In addition to theoretical models, findings from prior regression and mediation analyses in the current study were used to inform the framework of the model testing process. The primary changes to the SCM that were considered for this process involved the removal
of the interaction variable and the replacement of the aggregate variable for need satisfaction with the variable for competence. Removal of the interaction variable was based upon the finding that self-concordance did not appear to moderate the influence of goal attainment on need satisfaction or well-being. Replacement of the aggregate variable for need satisfaction with the variable of competence was based upon regression and mediation analyses that had demonstrated stronger relationships based upon this change. A stepwise sequence was determined to test these models that involved testing each alteration separately, and then combining both changes into a final mode. After conducting these analyses, it was found that each alteration improved the fit indices for the model (please refer to Figure 10, page 101 and Figure 11, page 102 of this document), with the final model demonstrating adequate fit for the data in this study (please refer to Figure 12, page 103 of this document).

The final model that was determined for this study contains several notable departures from the original theoretical model. The removal of the variable that represented the interaction between self-concordance and goal attainment and the reduction of need significance to competence created significant relationships between all elements of the final model, with the exception of the path from self-concordance to effort. Therefore, this model demonstrates the degree to which the role of self-concordance was minimized for the participants in this study. Self-concordance was found to marginally predict effort when viewed in isolation from all other elements, but the significance of this relationship did not hold up when combined in a full SEM. Additionally, there was only minimal evidence that self-concordance moderated the
effects of goal attainment, and the resultant variable associated with this moderation detracted from the fit of the overall model. Self-concordance may have contributed to participants’ satisfaction of needs for autonomy and relatedness, but neither of these variables were found to be predictive of well-being. Therefore, these findings explain why the interaction variable for self-concordance and goal attainment that was a critical component of the theoretical model was found to possess no significance for the full SEM in this study.

The second major departure from the theoretical model involved replacing an aggregate variable for psychological need satisfaction. In earlier steps within the analysis of data, it was found that when need satisfaction was divided into its component parts only competence was predictive of well-being. Similarly, in the SEM, the substitution of competence for need satisfaction improved the weight of the relationship between the variables in the model and also improved the overall fit indices for the model. While removal of the interaction variable produced the largest changes in model fit, it was only after substituting competence for need satisfaction that the model obtained adequate fit across all indices. This finding strengthens the assertion formed earlier that for participants in this study, the satisfaction of needs for autonomy and relatedness paled in comparison to the influence of the need for competence. This discrepancy may be readily related to the particular context of the current study. For instance, within the context of an online course, it may have been difficult for participants to build strong associations with peers or instructors, reducing the role of relatedness in their overall experience of the course. However, the diminished effect of autonomy may be the most significant finding.
from this study, given the conceptual centrality that autonomy holds for both self-determination theory (SDT; Ryan, 2016; Ryan & Deci, 2000) and the SCM (Sheldon, 2014; Sheldon & Elliot, 1999) as well as the role this construct plays in both self-concordance and psychological need satisfaction. Therefore, this finding warrants an extended discussion.

The strongest statistical relationships for the participants in this study involved the constructs of effort, goal attainment, competence, and well-being. The role of autonomy is minimal for the measurement of these variables when contrasted with the conceptual congruence it shares with variables of self-concordance and aggregate need satisfaction. The computation of self-concordance as a statistical construct involves subtracting scores which represent the degree to which participants perceive their goals as controlled forms of motivational regulation from scores which represent autonomous forms of motivational regulation. In a sense, then, self-concordance can be seen as a measure of autonomous motivation, suggesting that participants associate more self-concordant goals with identified or intrinsic reasons for pursuing those goals. However, in the nine weeks of goal striving that were studied in this course, participants seemed nearly as likely to report progress toward autonomous, self-concordant goals as those that were rated as more controlled. This finding is at odds with the original studies that established the self-concordance model (Sheldon & Elliot, 1999) as well as prior replication studies that have examined the self-concordance model (e.g. Koestner, Lekes, Powers, & Chicoine, 2002; Sheldon & Houser-Marko, 2001; Smith, Ntoumanis, & Duda, 2007; Smith, Ntoumanis, Duda, & Vansteenkiste, 2011).
The most significant difference between the current study and the prior studies cited above is the particular context of the research. Participants in the current study selected goals and reported their pursuit of these objectives in order to fulfill requirements for assignments in an online university course. Within this context, the presence of external sources of motivation (e.g., regular engagement with the course environment, instructor feedback, academic performance) may have provided a source of consistent stimuli for goal pursuit that was not present in prior studies. The SCM is steeped in the theoretical propositions of self-determination theory (Sheldon & Elliot, 1999; Sheldon & Kasser, 1998) and the research literature from self-determination theory has frequently discussed the differences between autonomous and controlled motivational regulations. It has been well established that extrinsic sources of motivation can produce significant outcomes as long as the external stimulus is present (e.g., Deci & Ryan, 2000; Ryan & Deci, 2000). For the participants in this study, the sources of external reinforcement were consistent throughout the duration of their goal striving. The context for this study may have therefore played a role in reducing the influence of autonomy, and accordingly, self-concordance on other variables in the SCM.

By contrast, the effort that participants reported exerting when completing goal tracking surveys was the strongest predictor of goal attainment. Participants who reported that they were engaged in actively pursuing their goals were much more likely to also report progress toward attaining these goals. Goal attainment, a measure of progress toward selected goals, was found to be the primary predictor of well-being, and this relationship was shown to be mediated by satisfaction of the psychological need for
competence. In other words, participants who made progress toward their goals were more likely to experience enhanced feelings of competence, which in turn produced a greater likelihood for experiencing positive emotional states. Thus, for participants in this study, the likelihood of achieving higher levels of well-being through the pursuit of wellness-oriented goals was characterized by participants’ goal striving, which facilitated progress toward goal attainment.

**Implications**

There are several potential implications based upon findings from the current study. Findings demonstrate that online educational interventions designed to enhance college student health and wellness behaviors can have positive effects on student well-being. Moreover, the likelihood of achieving positive outcomes is primarily linked with course structures that encourage participants to engage in wellness-oriented behaviors. The inherent fidelity of online educational interventions suggests that similar interventions may be effective strategies for enhancing health-oriented behaviors among college student populations, and the utility of this intervention model may be generalizeable for a variety of populations.

**Facilitating Well-Being with Online Education**

Wellness-guided approaches to healthcare provide a broad vision for human functioning, expanding upon treatment-based models of medical intervention to include efforts to prevent illness, enhance individual well-being, and maximize health-oriented lifestyles (Witmer, 2012). As the wellness paradigm gains traction, the promotion of individual motivation to maintain personal health and wellness has become a critical
factor for effective healthcare (Granello & Witmer, 2012a). As a result, efforts to promote health and wellness on college campuses have been identified as critical factors for overall prevention efforts among the U.S. population (American College Health Association [ACHA], 2012). Students enrolled in college are representative of a broad cross-section of the U.S. population, suggesting that institutions of higher education have become a critical setting for addressing gaps in health equality (Freudenberg et al., 2013). Many colleges and universities have responded to this opportunity by supporting programs and services intended to foster individual capacities for enhancing well-being while encouraging the adoption of health-oriented lifestyles across multiple dimensions of human functioning. However, only limited research has been conducted with these types of interventions. Therefore, the current study explored one particular approach to health and wellness promotion through examining an online university course titled *Wellness: Achieving a Healthy Lifestyle*. Participants in this study completed a measure of well-being at two time points during their course enrollment. The first administration was concurrent with the selection of wellness goals at week 6, and the second administration occurred at the conclusion of the course. While the primary purpose for these measurements was to identify motivational constructs that enhanced participant well-being following a baseline measurement, it was also possible to use these measures to determine whether participation in the course had any effect on overall levels of well-being for participants.

A paired samples $t$-test was conducted to examine differences in well-being between the baseline administration at week six and the end of the course. Participants in
this study endorsed lower levels of well-being prior to engaging with the goal setting assignment ($M = 14.15$, $SD = 10.55$) than they did upon completion of the course ($M = 16.38$, $SD = 10.35$). This difference was significant $t(252) = -4.13$, $p < .001$, with a small effect $d = 0.21$. Therefore, the utility of an online educational intervention for producing changes in well-being is supported by this study, although it should be acknowledged that the magnitude of the change observed after nine weeks is small, but significant.

**The Importance of Effort and Attainment**

Based upon the findings from this study, changes in participant well-being appear to be primarily predicated upon the ability of the online intervention to engage participants in actions oriented toward behavioral change. As has been previously stated, there are differing perspectives regarding participants’ ability to attain selected goals. However, regardless of whether goal attainment is based upon subjective ease (Werner, Milyavskaya, Foxen-Craft, & Koestner, 2016) or effortful action (Sheldon & Elliot, 1999), it is critical that participants report engagement in goal pursuits and progress toward goal achievement. It may be the case that the nine week duration for goal striving that participants were provided in the context of this study was not sufficient to achieve a level of goal attainment necessary to experience changes in well-being. However, there is a likelihood that for many participants, this amount of time was adequate to establish habit based behaviors that could persist beyond the duration of the course. Studies of habit formation have demonstrated varying lengths of time required to establish the maintenance of new behaviors, with a median of about two months (Lally, van Jaarsveld, Potts, & Wardle, 2010). Therefore, participants who worked toward their goals may have
formed habits that will continue to promote lifestyle changes that yield health-oriented outcomes apart from their actual accomplishments from the course.

The benefits of engaging in goal-related behaviors are also connected to the concept of internalization. Within self-determination theory, internalization is considered an active process through which individuals transform external expectations and demands into personally endorsed values. When these regulations are fully assimilated, individuals are more likely to experience need satisfaction when engaging in associated behaviors because they more fully identify and accept them as their own (Deci & Ryan, 2000). Thus, wellness-oriented goals that were selected to fulfill externally imposed course requirements may become internally driven over time. In the current course configuration, there are strong external reinforcements for course participants. These occur primarily through requiring students to complete a goal assignment and to track their progress and effort toward identified goals. This framework appears to be important, as participants were likely to report engagement with the goal assignment, and engagement was predictive of changes in well-being. However, this may be a less than ideal framework for promoting the internalization of goals so that they sustain beyond the completion of the course. Participants in the course reported that changes in well-being were mediated by the satisfaction of the need for competence. However, prior studies have shown that the process of internalization is facilitated by the satisfaction of all psychological needs, particularly relatedness. The desire to feel connected to others plays a significant role in determining the degree to which an individual internalizes norms, values, beliefs, and behaviors of others (Vansteenkiste, Lens, & Deci, 2006). Therefore, it
may be beneficial for future iterations of the course to build in elements that promote opportunities for students to interact with peers or instructional staff.

**Generalizability of Educational Interventions**

Replication of the online class as a wellness-promoting intervention requires addressing several barriers. Currently the course is only available to students enrolled at one higher education institution. However, facilitation of the course requires only minimal staffing, which may make it feasible to scale the intervention for use with broader audiences. Additionally, the course content is delivered through brief, pre-recorded lectures, quizzes, and surveys that work together to facilitate increased knowledge about individual wellness and promote behavioral change. While further study is required to determine the effect of the intervention beyond enrollment in the course, the preliminary results from this study demonstrate that the intervention possesses some capacity to produce changes to individual well-being, and may encourage further lifestyle changes over time. Therefore, it may be worthwhile to extend the utilization of this intervention to contexts, sites, and locations other than academic settings.

It would be possible to integrate the course into settings including health care and human resources to engage patients or employees in programming that facilitates individual responsibility for health and wellness. This type of educational intervention could also be readily adapted for a variety of other populations including children or older adults. Implementation with youth may possess significant value as many lifestyle oriented behaviors are established early in lifespan development (Gordon-Larsen, Nelson, & Popkin, 2004). Additionally, the significant growth of the older adult population
(Ortman, Velkoff, & Hogan, 2014) has brought about an increased need for programs that promote personal wellness and quality of life (Fullen, 2016).

Concerns related to the expansion of this intervention within each of these settings are primarily logistical, as implementation would require access to personal computers in order to participate in the online educational environment. However the relative costs of ensuring access may be mitigated by economic gains realized by reductions in the cost of healthcare over time. This justification has been the basis for many workplace wellness programs. Studies that have examined the costs associated with this type of programming have shown lower annual growth in medical spending, reduced rates of poor health markers among participants, and overall savings of between $1.88 and $3.92 for every dollar invested in the programs depending on the factors included in the estimated returns (Henke, Goetzel, McHugh, & Isaac, 2011). Therefore, increased utilization of wellness-oriented interventions like the online course that was the subject of this study may benefit many segments of society.

**Limitations and Recommendations for Future Studies**

There were several limitations for the current study that could be addressed in future studies intending to explore the benefits of online, wellness-oriented educational interventions. These limitations included a reliance upon self-report measures, the potential conflation of motivational constructs by participants, the selection of one particular motivational theory to the exclusion of other theories that may help to explain course outcomes, the assessment of participant well-being based solely upon a subjective measure of emotional states, and a lack of longitudinal evidence to support the findings.
from the study. Each of these limitations will be expanded upon, with recommendations for the incorporation of these considerations in future studies.

**Self-Report Measures**

A limitation for this study was the reliance on participants’ self-report of well-being, effort, progress, and need satisfaction. All quantitative instruments are self-reported, which creates threats related to inaccuracy of reporting. It is widely understood that participants in research studies have a tendency to report what they perceive as expectations and what reflects most positively on their own abilities (Cook & Campbell, 1979). However, the variables of well-being and need satisfaction are subjective by nature, so they are reliant upon individual perceptions of these constructs. Additionally, the study attempted to mitigate the effects of social desirability by awarding full credit for assignments based solely upon completion of required surveys. Therefore, students received an equal number of points toward their grade regardless of whether they reported low or high levels of effort and progress toward their goals. This grading criteria was explicitly communicated to participants. However, it may still be the case that measures related to effort and progress were subject to social desirability bias.

Future studies could address this concern by exploring options for gathering behavioral evidence related to goal striving. Within the context of higher education it would be possible to obtain documentation of student utilization of campus resources in the pursuit of selected goals. For instance, students could provide evidence of visits to various tutoring services or instructor office hours (intellectual wellness), recreational sports centers or student health services (physical wellness), or counseling centers
(emotional wellness). The required documentation could be accomplished in a simple manner by having students upload signed notes from service providers, or could be even less obtrusive by having participants consent to tracking of services accessed with their student identification card. Any documentation of effort would help to ensure the validity of measures of goal striving and effort for participants in future studies.

**Conflation of Study Variables**

Recent studies have pointed toward the likelihood that the timing of goal survey administration may increase the possibility of construct conflation. The current study replicated the goal tracking process utilized in prior studies of the self-concordance model that asked participants to rate their effort and progress at regular intervals throughout the study. However, Werner, Milyavskaya, Foxen-Craft, and Koestner (2016) suggested that participants who respond to questions about effort and progress concurrently may judge the effort that they exert toward goals based upon their progress (i.e., ‘If I made progress, it must be because I tried hard’). Subsequently, more recent investigations have administered surveys at different time points to minimize the possibility that participants will confuse the separate constructs of effort and progress.

Recommendations for future studies are to separate goal tracking surveys into separate inquiries regarding sustained effort and goal progress. Additionally, findings from these newer studies have suggested that self-concordance was not associated with increased effort, and that a new measure of subjective ease was a stronger mediator of the relationship between self-concordant goals and goal attainment than effort (Werner, Milyavskaya, Foxen-Craft, & Koestner, 2016). Therefore, it is recommended to update
Incorporation of Additional Theoretical Inquiry

The current study was limited by replicating prior studies of self-concordance to the exclusion of additional motivational theories that are related to goal pursuits. The self-concordance model was selected for this study as it was the theoretical proposition that most explicitly connected individual well-being with goal pursuits. However, the findings from this study suggest that the theoretical model for self-concordance was not an adequate fit for data that was obtained within the context of online education. In the absence of any other possibilities, the only option for the current study was to use a process of model respecification and testing to determine a new model that provided an adequate fit for the data. However, the incorporation of instruments derived from alternative theoretical sources may have provided additional insights and connections that could not be observed within the context of the current study.

Recommendations for future studies include the exploration of additional theoretical models and propositions that may relate to the evidence found in the current study. Given the emphasis that the current findings place upon action based change, it seems likely that one viable alternative would be the incorporation of surveys derived from behavioral models of health promotion like the theory of reasoned action (Sheppard, Hartwick, & Warshaw, 1988). Another possibility can be based upon the finding that competence was a stronger predictor of well-being that the aggregate variable for need
satisfaction. The motivational construct of competence has been closely linked with Bandura’s (1989) concept of self-efficacy. However, self-determination theory differs from social cognitive theory by stating that competence only supports intrinsic motivation when it is accompanied by a sense of autonomy (Ryan & Deci, 2007). Because competence contributed to well-being more significantly than autonomy in the current study, it may be valuable to incorporate measures derived from social cognitive theory in future studies. Additional models or theories may also be incorporated based upon the motivational targets identified for future inquiry.

**Measurements of Well-Being**

The current study was largely based upon prior explorations of the self-concordance model (e.g. Sheldon & Elliot, 1999; Smith, Ntoumanis, & Duda, 2007) that relied heavily on the Positive and Negative Affect Schedule (PANAS; Watson, Tellegen, & Clark, 1988) as a measure of subjective well-being. The PANAS contains mood descriptors that generate scores for positive affect (e.g. inspired, proud) and negative affect (e.g. scared, hostile). While the PANAS is a well-regarded instrument in the research literature, it does not assess well-being from a holistic perspective. Given the holistic model of wellness that was utilized for this study, it is possible that additional explorations of participant wellness may have been additive for understanding changes in well-being based upon goal pursuits.

Recommendations for future studies include an augmented exploration of participant well-being. Potential sources of information might include information associated with biometric screenings that would include markers of physical wellness as
well as biological indicators for stress levels. Additionally, many brief instruments that possess adequate reliability and validity have been developed as assessments of various dimensions of individual well-being. These include measures of stress like the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983), measures of social, psychological, and emotional health like the Mental Health Continuum – Short Form (Keyes, 2009), and measures of holistic wellness like the Five Factor Wellness Inventory (Myers & Sweeney, 2005b). Any or all of these short surveys, or additional evidence-based instruments could be integrated into the course design, and might augment the understanding of changes to participant wellness without generating significant survey fatigue.

**Longitudinal Evidence**

The current study explored the changes associated with participation in an online course. However, as previously discussed, one of the critical findings from this study was that changes to participant well-being were associated with progress toward goals and enhanced experiences of competence as a result of these pursuits, regardless of the degree to which those goals were perceived as self-concordant. However, a substantial body of research from self-determination theory suggests that while short-term persistence in new activities can be promoted through controlled forms of regulation based upon external reinforcement, these types of motivation do not support long-term adherence to new behaviors (Vansteenkiste & Sheldon, 2006). Unfortunately, based upon the current study design, it is impossible to assess whether the behaviors that participants reported during enrollment in the course were maintained over time. Evidence related to the maintenance
of and adherence to changes for individual lifestyles may provide the strongest claims for widespread adoption of interventions similar to the one observed in this study.

It is recommended that future studies expand upon the current findings to explore sustained effort and changes to participant wellness beyond enrollment in the online course. Findings from these inquiries would help to clarify evidence from studies on habit formation as well as theories regarding internalization processes that shift behaviors based on controlled motivational regulations to behaviors that are experienced as autonomous and intrinsic. Additionally, longitudinal follow-up surveys with participants would help to clarify the role of self-concordance for goal attainment and well-being by exploring whether the effect of self-concordance becomes more salient beyond the constraints of an externally regulated environment like an online class. Findings associated with longitudinal studies could extend the results of the current study in a manner that would help to refine future online educational interventions by clarifying the influence of self-concordance over time. Each of these recommendations would expand upon the limited knowledge associated with online educational environments and strengthen future efforts to facilitate individual well-being through interventions based within this context.

**Conclusion**

The multidimensional, holistic construct of wellness represents an emerging paradigm that emphasizes learning, awareness, and self-endorsed lifestyle changes to actualize inherent potentialities for health and growth (Dunn, 1961; Granello & Witmer, 2012a; Hettler, 1980; Myers & Sweeney, 2005a; Roscoe, 2009). The utilization of
salutogenic frameworks (e.g. ACHA, 2012) has become a prominent component of efforts to promote healthy student development at many institutions of higher education. One approach that has been implemented and studied is the provision of academic courses that emphasize wellness education (Choate & Smith, 2003; Conley, Travers, & Bryant, 2013; Myers & Sweeney, 2008). While these studies show promise for the potential benefits of wellness education, the lack of broad evidence illustrates a clear need to gain a better understanding of the effects and outcomes of educational interventions intended to promote health and wellness.

The current study explored findings associated with data generated by participants \((N = 253)\) in an online university course titled *Wellness: Achieving a Healthy Lifestyle*. Enrolled students selected three wellness-oriented goals, and tracked their progress toward achieving these goals for the duration of the course. Initial findings based upon two administrations of a measure of subjective well-being (baseline and 9-week follow-up) identified a significant change in well-being for participants. In an effort to understand the motivational constructs that contributed to these changes, the Self-Concordance Model (SCM; Sheldon, 2014; Sheldon & Elliot, 1999) was selected and utilized as a potential theoretical explanation for course outcomes. Methodology from prior studies using the SCM was replicated to generate and explore data from the course. In addition to the measures of well-being, participants completed a series of surveys to report the self-concordance of the goals they selected, the progress and effort exerted in the pursuit of these goals, and the satisfaction of psychological needs that were experienced during the course. Data from the study was analyzed using correlation,
regression, and structural equation modelling analyses. Results indicated that the key factors for changes in well-being for participants in this online context was engaged action toward the realization of goals, which produced experiences that satisfied participants psychological need of competence. Participants who reported greater effort and progress toward their selected goals were more likely to experience a greater sense of self-efficacy (Bandura, 1989) which resulted in enhanced perceptions of subjective well-being. This finding is at odds with previous studies using the SCM, which endorsed the construct of self-concordance as the critical element for understanding positive outcomes related to goal attainment and well-being.

Findings from this study have several implications. The effectiveness of online educational interventions to produce changes in participant well-being shows promise for implementation in multiple contexts. However, further understanding of the motivational constructs that influence changes to behavior and well-being is required to refine the intervention over time. The diminished role of self-concordance may be attributable to the online educational setting that was the context for this study. Participants were therefore subject to consistent external sources of motivation, which may have decreased the influence of autonomy for sustaining goal oriented behaviors that result in improved well-being. Future studies can extend the findings of this study by incorporating additional motivational theories and measures of well-being. Additionally, it would be valuable to add a longitudinal perspective to this inquiry by instituting follow-up measures to track behavioral maintenance and participant well-being in the weeks or months following completion of the course.
As greater clarity is obtained regarding the motivational constructs at work in this particular intervention modality, the elements that constitute future course offerings can be refined to support the motivational processes that best facilitate lifestyle change and well-being. Additionally, consideration may be given to expanding the generalizability of the intervention. Future research could examine the effectiveness of online educational interventions across a range of populations (e.g. children and older adults) and settings (e.g. health care environments, schools, workplace wellness programs, assisted care facilities). This initial study has demonstrated that online wellness-oriented educational interventions have the potential to facilitate desirable outcomes for health and well-being. Future exploration can expand the effectiveness of this approach in wide-reaching efforts to proactively support health and wellness.
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Appendix A: Instruments for Data Collection

Instrument A: Initial Goal Survey

| Goal 1. Take a moment to remember your first goal, and indicate the wellness domain that you are addressing through this goal (dropdown menu containing: cognitive wellness, emotional wellness, physical wellness, career wellness, financial wellness, spiritual wellness, environmental wellness, social wellness, creative wellness) |
| Consider the following four reasons for creating your goal, using the scale provided to indicate how relevant that reason is for you, where 1 = “not at all for this reason” and 9 = “completely for this reason” |
| You are pursuing this goal because someone else wants you to or the situation demands it | 1 2 3 4 5 6 7 8 9 |
| You are pursuing this goal because you would feel ashamed, guilty, or anxious if you didn’t | 1 2 3 4 5 6 7 8 9 |
| You are pursuing this goal because you really believe it’s an important goal to attain | 1 2 3 4 5 6 7 8 9 |
| You are pursuing this goal because of the fun and enjoyment that it provides you | 1 2 3 4 5 6 7 8 9 |

| Goal 2. Take a moment to remember your second goal, and indicate the wellness domain that you are addressing through this goal (dropdown menu containing: cognitive wellness, emotional wellness, physical wellness, career wellness, financial wellness, spiritual wellness, environmental wellness, social wellness, creative wellness) |
| Consider the following four reasons for creating your goal, using the scale provided to indicate how relevant that reason is for you, where 1 = “not at all for this reason” and 9 = “completely for this reason” |
| You are pursuing this goal because someone else wants you to or the situation demands it | 1 2 3 4 5 6 7 8 9 |
| You are pursuing this goal because you would feel ashamed, guilty, or anxious if you didn’t | 1 2 3 4 5 6 7 8 9 |
| You are pursuing this goal because you really believe it’s an important goal to attain | 1 2 3 4 5 6 7 8 9 |
| You are pursuing this goal because of the fun and enjoyment that it provides you | 1 2 3 4 5 6 7 8 9 |
Goal 3. Take a moment to remember your third goal, and indicate the wellness domain that you are addressing through this goal (dropdown menu containing: cognitive wellness, emotional wellness, physical wellness, career wellness, financial wellness, spiritual wellness, environmental wellness, social wellness, creative wellness)

Consider the following four reasons for creating your goal, using the scale provided to indicate how relevant that reason is for you, where 1 = “not at all for this reason” and 9 = “completely for this reason”

<table>
<thead>
<tr>
<th>Reason</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>You are pursuing this goal because someone else wants you to or the situation demands it</td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>You are pursuing this goal because you would feel ashamed, guilty, or anxious if you didn’t</td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>You are pursuing this goal because you really believe it’s an important goal to attain</td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>You are pursuing this goal because of the fun and enjoyment that it provides you</td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
</tbody>
</table>

Below is a list of words that describe different feelings and emotions. Read each item and indicate to what extent you have felt this way over the past week: 1 = “Not at all,” 2 = “A little,” 3 = “Moderately,” 4 = “Quite a bit,” 5 = “Extremely”

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interested</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Distressed</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Excited</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Upset</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Strong</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Guilty</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Scared</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Hostile</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Enthusiastic</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Proud</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Irritable</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Alert</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Ashamed</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Inspired</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Nervous</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Determined</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Attentive</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Jittery</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Active</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Afraid</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Instrument B: Demographic Information and Consent to Participate

<table>
<thead>
<tr>
<th>Demographic Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex:</td>
</tr>
<tr>
<td>What is your current age:</td>
</tr>
<tr>
<td>Racial/Ethnic Identification:</td>
</tr>
<tr>
<td>What is your current school rank:</td>
</tr>
<tr>
<td>Citizenship:</td>
</tr>
<tr>
<td>Consent to Participate in Research (please refer to Appendix B for full document)</td>
</tr>
</tbody>
</table>

Instrument C: Goal Tracking Survey

Goal 1. Take a moment to remember your first goal, and indicate the wellness domain that you are addressing through this goal (dropdown menu containing: cognitive wellness, emotional wellness, physical wellness, career wellness, financial wellness, spiritual wellness, environmental wellness, social wellness, creative wellness)

Rate how hard you are trying to pursue this goal, from 1 = “not hard at all” to 9 = “very hard”

Rate how well you’re doing with this goal, from 1 = “not well at all” to 9 = “very well”

Goal 2. Take a moment to remember your second goal, and indicate the wellness domain that you are addressing through this goal

Rate how hard you are trying to pursue this goal, from 1 = “not hard at all” to 9 = “very hard”

Rate how well you’re doing with this goal, from 1 = “not well at all” to 9 = “very well”

Goal 3. Take a moment to remember your third goal, and indicate the wellness domain that you are addressing through this goal

Rate how hard you are trying to pursue this goal, from 1 = “not hard at all” to 9 = “very hard”

Rate how well you’re doing with this goal, from 1 = “not well at all” to 9 = “very well”
**Instrument D: Final Course Survey**

Goal 1. Take a moment to remember your first goal, and indicate the wellness domain that you are addressing through this goal (dropdown menu containing: cognitive wellness, emotional wellness, physical wellness, career wellness, financial wellness, spiritual wellness, environmental wellness, social wellness, creative wellness)

<table>
<thead>
<tr>
<th>I achieved this goal and its stated objectives</th>
<th>1 2 3 4 5 6 7</th>
</tr>
</thead>
</table>

Goal 2. Take a moment to remember your second goal, and indicate the wellness domain that you are addressing through this goal

<table>
<thead>
<tr>
<th>I achieved this goal and its stated objectives</th>
<th>1 2 3 4 5 6 7</th>
</tr>
</thead>
</table>

Goal 3. Take a moment to remember your third goal, and indicate the wellness domain that you are addressing through this goal

<table>
<thead>
<tr>
<th>I achieved this goal and its stated objectives</th>
<th>1 2 3 4 5 6 7</th>
</tr>
</thead>
</table>

Please rate the following items for all three goals

<table>
<thead>
<tr>
<th>Please rate the following items for all three goals</th>
<th>1 2 3 4 5 6 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>My work toward my goals has had a positive impact on my personal wellness.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>I feel motivated to continue these wellness-oriented behaviors after the course ends.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>It was challenging to fulfill the objectives for my goals.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>I need to revise my goals to make them more realistic for my life right now.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>

Below is a list of words that describe different feelings and emotions. Read each item and indicate to what extent you have felt this way over the past week:

<table>
<thead>
<tr>
<th>Below is a list of words that describe different feelings and emotions. Read each item and indicate to what extent you have felt this way over the past week:</th>
<th>1 2 3 4 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interested</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. Distressed</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. Excited</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. Upset</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5. Strong</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6. Guilty</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7. Scared</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8. Hostile</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9. Enthusiastic</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>10. Proud</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>11. Irritable</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12. Alert</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13. Ashamed</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14. Inspired</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>15. Nervous</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>16. Determined</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>17. Attentive</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>18. Jittery</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>19. Active</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>20. Afraid</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

**Please rate the following items using the scale:**

1 = “not at all true,” 4 = “somewhat true,” 7 = “very true”

<table>
<thead>
<tr>
<th>Item</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>In this class I decided which goals I wanted to work toward</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>I think I am pretty good at the goals that I set for myself in this course</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>During my time in this class, I felt supported by the instructors</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>I had to force myself to set and work toward the goals for this class</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>I think I did pretty well at this activity compared to other students</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>My instructors were understanding of my goals for this course</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>In this class I had a say regarding what goals I wanted to achieve</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>After working at these goals for a while, I felt pretty competent</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>When I had questions about my goals, I felt that my instructors listened to my concerns</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>In this class I felt like I had a certain amount of freedom related to my goals</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>I am satisfied with my performance on the goal setting assignment</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>My goals were valued by the instructors in this course</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>In ESCE 5271 I felt that I worked toward these goals because I wanted to</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>I was pretty skilled at the tasks associated with my goals for this course</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>In my work toward my goals, I felt safe in this course</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>For the goal setting assignment, I had some choice in what I wanted to do</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>The goals that I set ended up being things that I couldn’t do very well</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>How has your work toward your goals impacted your understanding of wellness?</td>
<td></td>
</tr>
<tr>
<td>How has your work toward your goals this semester impacted your personal wellness?</td>
<td></td>
</tr>
<tr>
<td>What about your goals worked well for you?</td>
<td></td>
</tr>
<tr>
<td>What about your goals was challenging for you?</td>
<td></td>
</tr>
<tr>
<td>What (if anything) will you change about the way you set goals for yourself following this course?</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Consent to Participate in Research

The Ohio State University Consent to Participate in Research

This is a consent form for research participation. It contains important information about this study and what to expect if you decide to participate.

Subject Rights:
Your participation is voluntary and will not affect your grade for this course. You may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you are a student or employee at Ohio State, your decision will not affect your grades or employment status.
If you choose to participate in the study, you may withdraw from participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights you may have as a participant in this study.

Purpose of the study:
The proposed research will study students’ experience in the online course ESCE 5271: Wellness: Achieving a Healthy Lifestyle. The purpose of gathering this data develop an understanding of how students set and achieve wellness goals, and the outcomes associated with those goals. As an enrolled student, you are being asked to participate in
this research because your experience of the course will help to improve future course offerings.

Procedures/Tasks:
All enrolled students in ESCE 5271: Wellness: Achieving a Healthy Lifestyle must complete surveys related to the goal setting assignment. This study will use information from these surveys to develop an understanding of the overarching goal process. All data will be transferred from CARMEN to an external file, and all identifying information will be deleted in this process. The final data set will be kept in an encrypted folder for analysis, and any findings will be discussed in aggregate form. Participation in this study is completely voluntary and is not required to participate in the class. Your decision to participate will not result in any extra assignments or obligations, and will not affect your final grade.

Duration:
No additional time will be requested of any participant beyond the time necessary to complete the course surveys, which are already part of your course assignments. You may leave the study at any time without any penalty to you.

Incentives:
No compensation or other incentives will be provided in return for participation in this study.
Confidentiality:

Efforts will be made to keep your study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your participation in this study may be disclosed if required by state law. Also, your records may be reviewed by the following groups:
Office for Human Research Protections or other federal, state, or international regulatory agencies;
The Ohio State University Institutional Review Board or Office of Responsible Research Practices.

Contacts and Questions:

For questions, concerns, or complaints about the study, or you feel you have been harmed as a result of study participation, you may contact Paul Granello, Associate Professor in Counselor Education (granello.2@osu.edu; 614-688-4931).

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

Yes, I give consent to have information from course materials used in this study.

No, I do not consent to have any information from my course materials included in this study.